

Role of Informal Institutions in Explaining Water Governance Performance: A Case of Inequality and Corruption in Megacity Delhi, India.

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Summary

Complexity and inefficiency characterize water governance in India. Water management has economic, political, social and environmental dimensions and involves both state and non-state actors. Water governance includes setting goals and making and implementing rules and regulations. The quality of water governance depends on how well the rules, which are formal institutions, and the decision making procedures of a political regime are handled by various actors. Effective water governance is the ability to generate not only rules but also to achieve the goals prescribed by formal institutions. In India, however, informal institutions are an obstacle to effective implementation of formal institutions and lead to poor water governance performance.

Rapid economic development and changes in the consumption patterns of the world's huge population is increasing the pressure on water resources. Especially in the megacities of developing countries the changes are faster than the management capacity of authorities. Water problems are becoming endemic. Not only water shortages, but also inequality in cities is impacting on water governance performance. Inequality in the distribution of resources has a direct influence on the overall development of society. This in turn leads to problems in the social dimensions of water governance where the roots of corruption lie.

Delhi, which is known as a city of migrants has suffered from non-uniform water distribution. The poor have been hit the hardest by this situation. A significant percentage of the population in Delhi is not served with an adequate supply of water on a regular basis. The water distribution system of Delhi is characterized by a high degree of inequality. This is tied to the country's caste system which was established thousands of years ago. The power structure that resides in the caste system can be seen in economics and politics. The wealthy and politically strong are the most influential. The exclusion of members of the lower caste by the so-called upper castes produces exploitative institutions and a maldistribution of resources, and feeds corruption in society.

This study is based on a comprehensive examination of the class structure of the city and analyses urban water governance performance in Delhi. The research question

guiding the study is: Why has water governance in Delhi not been effective in providing basic water services to the inhabitants of Delhi? The dissertation argues that for decades water governance policy was not working effectively because of its failure to identify and address various risks. These risks are caused by a combination of various factors, including haphazard urban planning, the authorities' inadequate capacity to deal with the changes caused by this haphazard planning, old and outdated laws, lack of clarity among various laws and lack of political will to achieve the goals prescribed in policies.

In February 2015 a new political party called Aam Aadmi Party (AAP) came into power and took some initiatives to resolve water problems in Delhi. AAP started to work towards an equitable water supply by introducing some new policies. Although it will take years to resolve Delhi's water management problems, the sudden changes brought about by AAP cannot be ignored. This dissertation thus also considers the new policies introduced after the 2015 election and the extent to which they are targeting the fundamental underlying issues addressing water governance in Delhi. It questions how deep these changes are and speculates as to whether they will be effective at addressing the fundamental problems that have plagued Delhi's water governance in the past, that is, the problems of caste system and corruption.

The study is based on the theoretical concepts of historical institutionalism and path-dependence. The influence and stickiness of informal institutions and their significance for water governance in the city were examined. The informal institutional analysis undertaken for this research is conducted from a historical dependency perspective. Old religious values and social norms have great influence on water governance. These religious values and social norms shape societal patterns and cultural traditions. As they are deeply embedded in the social system, new and independent institutional patterns are slow to emerge. Institutional change is a slow process.

To answer the research question, a research design based on an analysis of secondary literature and primary data collection was followed. Data was collected from interviews and household surveys at different locations in Delhi. The case study regions are two economically distinct but closely situated residential colonies. In this dissertation,

the proxy indicator method is utilized to analyze the different building blocks of good governance such as transparency, accountability and participation. These proxies give impressions about the presence of corruption in the water supply chain in the city.

There are multiple dimensions to water, including physical, chemical and economic. Yet, here it is concluded that Delhi's water problems are largely governance-related problems; that, is they can be solved. Poor water governance leads to social crisis as poor water quality hits the city's poor and marginalized population the hardest. It is the poor who can least afford water and end up paying higher prices than those having official water connections. The discrimination against the poor in society has created an environment in which corruption thrives, including in the water sector. Corruption tends to expand existing inequalities.

It is argued in the study that corruption in water distribution is the result of corruption that takes place at various steps in Delhi's water management, such as during policy making and the implementation of regulations, tendering and procurement decisions, and planning and budgeting. A lack of transparency in the work of water authorities, a lack of management accountability, limited awareness among citizens about the implications for water use tied to deeply rooted issues of religion and culture, and finally a lack of participation from stakeholders in decision making processes are major parts of the problem.

The results from the study indicate that Delhi's water crisis is highly influenced by the caste system which although outlawed is de facto still in practice in India and rampant corruption. The caste system and other religious and cultural values are major obstacles to good water governance. The Indian government may have plans in the form of policies and laws to address inequality and corruption, but it fails to achieve desired outcomes because of weak enforcement and implementation. Politicians have ignored major problems of public interest such as resolving the issues of provision to water, housing and electricity, as they are more interested in winning the next elections with same promises. The study shows there is a great need to build citizen's capacities to understand related laws and awareness on their rights, to engage them in the process of

decision making. The study also shows need to develop tools for better transparency and accountability to enhance coordination and cooperation among various government departments working to address the city's water problems.

The study suggests that one possible path to change is people themselves. If social movements were to demand equal treatment and clean and transparent government practices, conditions in the water sector might improve. The 2015 election in Delhi may suggest that a step in this direction has been taken but people have voted a new party into power. Social movements can demand more effective governance. Social movements can serve as a basis for effective action by means of which political changes and the implementation of constitutionally anchored equity laws can be driven forward.

Zusammenfassung

Komplexität und Ineffizienz charakterisieren die Wasserpolitik in Indien. Wassermanagement hat ökonomische, politische, soziale und ökologische Dimensionen und schließt sowohl staatliche als auch nicht-staatliche Akteure ein. Wasserpolitik beinhaltet die Festlegung von Zielen, das Aufstellen von Regeln und Regulierungen sowie deren Umsetzung. Die Qualität der Wasserpolitik ist davon abhängig, wie die verschiedenen Akteure mit diesen Regeln – einer Form formaler Institutionen – und Entscheidungsverfahren umgehen. Effektive Wasserpolitik kennzeichnet die Fähigkeit, Regeln nicht nur aufzustellen, sondern die durch diese formalen Institutionen vorgeschriebenen Ziele auch zu erreichen. In Indien allerdings sind informelle Institutionen ein Hindernis für die effektive Umsetzung formaler Institutionen und führen zu einer schwachen wasserpolitischen Leistung.

Rapide wirtschaftliche Entwicklung und Veränderungen im Konsumverhalten der Weltbevölkerung erhöhen den Druck auf Wasserressourcen. Insbesondere in den Megacities der Entwicklungs- und Schwellenländer können die Behörden mit dem Tempo der Veränderungen kaum Schritt halten. Probleme beim Wassermanagement werden so zum Dauerzustand. Dabei verringert nicht nur Wasserknappheit, sondern auch Ungleichheit innerhalb der Städte die Leistung der Wasserpolitik. Ungleichheit bei der Verteilung von Ressourcen hat einen direkten Einfluss auf die Gesamtentwicklung einer Gesellschaft. Dies führt zu sozialen Problemen in der Wasserpolitik, die wiederum Korruption begünstigen.

Delhi, bekannt für den hohen Migrantenanteil seiner Bevölkerung, leidet unter der ungleichmäßigen Wasserverteilung. Die Armen trifft diese Situation am härtesten. Ein signifikanter Prozentsatz der Bevölkerung Delhis erhält keine regelmäßige adäquate Wasserversorgung. Das Wasserverteilungssystem von Delhi kennzeichnet ein hoher Grad an Ungleichheit. Dies hängt mit dem Kastensystem des Landes zusammen, das sich vor tausenden von Jahren etabliert hat. Die dem Kastensystem innewohnenden Machtstrukturen zeigen sich in Wirtschaft und Politik. Wohlhabende und politisch starke Personen sind am einflussreichsten. Der Ausschluss von Mitgliedern der unteren Kaste

seitens der sogenannten höheren Kasten schafft ausbeuterische Institutionen und eine ungleiche Ressourcenverteilung, und nährt die Korruption in der Gesellschaft.

Diese Studie basiert auf einer vergleichenden Untersuchung der Klassenstruktur Delhis und analysiert die Leistung der Wasserpolitik der Stadt. Ihre Leitfrage lautet: Warum konnte die Wasserpolitik in Delhi eine grundlegende Wasserversorgung der Einwohner nicht sicherstellen? Diese Dissertation argumentiert, dass die Wasserpolitik über Jahrzehnte ineffizient blieb, weil sie verschiedene Risiken nicht erkannte. Diese Risiken entstehen durch die Kombination verschiedener Faktoren: willkürliche Stadtplanung, verbunden mit dem Unvermögen der Behörden, diesen Veränderungen gerecht zu werden, alte und unzeitgemäße Gesetze, Unklarheiten im Verhältnis verschiedener Gesetze zueinander sowie das Fehlen des politischen Willens, die von der Politik selbst gesetzten Ziele auch zu erreichen.

Im Februar 2015 kam eine neue politische Partei, die Aam Aadmi Party (AAP), an die Macht und ergriff seitdem einige Initiativen, um die Wasserproblematik in Delhi zu lösen. Mithilfe mehrerer neuer Politiken erreichte die AAP eine gleichmäßigere Wasserversorgung. Obgleich es noch Jahre dauern wird, Delhis Wassermanagementprobleme zu lösen, kann der plötzliche Wandel durch die AAP nicht ignoriert werden. Diese Dissertation betrachtet daher auch die nach der Wahl 2015 neu eingeführten Politiken und untersucht, inwieweit sie die Kernprobleme der Wasserpolitik in Delhi adressieren. Sie hinterfragt, wie tief diese Veränderungen greifen und ob sie die bisherigen Langzeitprobleme der Wasserpolitik in Delhi effektiv werden lösen können: Kastensystem und Korruption.

Die Studie basiert auf dem theoretischen Konzept des historischen Institutionalismus und der Pfadabhängigkeit. Sie analysiert den Einfluss und die feste Verwurzelung informeller Institutionen und ihre Bedeutung für die Wasserpolitik in der Stadt. Dabei nimmt sie die Perspektive der historischen Abhängigkeit ein. Althergebrachte religiöse Werte und soziale Normen haben großen Einfluss auf die Wasserpolitik. Sie prägen gesellschaftliche Mustern und kulturelle Traditionen und sind

tief im sozialen System verwurzelt. Neuere und unabhängige Institutionen sind hingegen erst noch im Entstehen, da institutioneller Wandel ein langsamer Prozess ist.

Zur Beantwortung der Forschungsfrage diente ein auf der Analyse von Sekundärliteratur und Primärdatenerhebung basierendes Forschungsdesign. Die Primärdatenerhebung umfasste Interviews und Haushaltsbefragungen an verschiedenen Orten in Delhi. Die als Fallstudien ausgewählten Stadtviertel sind zwei wirtschaftlich unterschiedlich situierte, aber benachbarte Wohnsiedlungen. Zur Analyse der verschiedenen Aspekte guter Regierungsführung wie Transparenz, Verantwortung und Partizipation wurde die Proxy-Indikator-Methode verwendet. Proxy-Indikatoren geben Einblick in das Auftreten von Korruption entlang der Wasserversorgungskette der Stadt.

Wasser hat zahlreiche Dimensionen, darunter eine physische, chemische und ökonomische. Nichtsdestoweniger schlussfolgert die Studie, dass Delhis Wasserprobleme eigentlich Probleme der Wasserpolitik sind, d.h. sie könnten politisch gelöst werden. Da schlechte Wasserqualität die Armen und Marginalisierten der Stadt am härtesten trifft, führt schlechte Wasserpolitik zur sozialen Krise. Es sind die Armen, die sich hohe Wasserpreise am wenigsten leisten können und schlussendlich mehr zahlen müssen als diejenigen, die über reguläre Wasseranschlüsse verfügen. Die Diskriminierung der Armen in der Gesellschaft hat eine Umgebung geschaffen, in der Korruption gedeiht – so auch im Wassersektor. Korruption neigt dazu, bestehende Ungleichheiten zu vergrößern.

Die Studie argumentiert, dass Korruption bei der Wasserverteilung das Ergebnis von Korruption bei verschiedenen Schritten des Wassermanagements ist, darunter Politikgestaltung und Regulierung, Ausschreibungen und Beschaffung sowie Planung und Budgetierung. Mangelnde Transparenz der Funktionsweise der Wasserbehörden, fehlende Rechenschaftspflichten des Managements und das geringe Bewusstsein der Bevölkerung für religiöse und kulturelle Einflüsse auf die Wassernutzung sowie die mangelnde Teilhabe von Interessengruppen an politischen Entscheidungsprozessen stellen große Teile des Problems dar.

Die Studienergebnisse zeigen, dass Delhis Wasserkrise stark vom Kastensystem und der ungezügelter Korruption beeinflusst ist. Das Kastensystem und andere religiöse

und kulturelle Werte sind wesentliche Hindernisse für gute Wasserpolitik. Die indische Regierung beabsichtigt zwar mit verschiedenen Politiken und Gesetzen, Ungleichheit und Korruption zu verringern, aufgrund von Schwächen im Vollzug und in der Umsetzung kann sie jedoch die erwünschten Ergebnisse nicht erreichen. Politiker haben zentrale Probleme des öffentlichen Interesses wie Wasserversorgung, Wohnen und Elektrizität vernachlässigt, um stattdessen den nächsten Wahlkampf mit ebensolchen Versprechen zu bestreiten. Die Studie zeigt, dass ein großer Bedarf besteht, die Bürger zu befähigen, die einschlägigen Gesetze zu verstehen und sich ihrer Rechte bewusst zu werden, um sie so auch am Entscheidungsprozess zu beteiligen. Die Studie verweist außerdem auf die Notwendigkeit, Mechanismen für eine verbesserte Transparenz und Rechenschaftspflicht zu entwickeln, um sowohl die Koordination und Kooperation zwischen verschiedenen, an der Lösung der Wasserkrise beteiligten Regierungsressorts zu verbessern.

Der Studie zufolge könnte ein Wandel auch von der Bevölkerung selbst ausgehen. Würden soziale Bewegungen eine Gleichbehandlung sowie saubere und transparente Regierungspraktiken einfordern, könnten sich die Bedingungen der Wasserversorgung verbessern. Die Wahlen in Delhi in 2015 legen nahe, dass ein Schritt in diese Richtung getan wurde, indem die Bevölkerung eine neue Partei in die Regierung wählte. Soziale Bewegungen können als Basis für effektive Aktionen dienen, um politische Veränderungen sowie die Durchsetzung verfassungsmäßig verankerter Gesetze zur Verteilungsgerechtigkeit voranzutreiben.

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Table of Contents

Summary	3
Zusammenfassung	7
Foreword and Acknowledgments	11
Table of Contents	14
List of Figures	20
List of Tables	21
List of Boxes	23
List of Abbreviations	24
1. Introduction: Challenges in Urban Water Management and Urban Divisions in Megacity Delhi	27
1.1. Problem Statement	28
1.2. Delhi's Water Problems	30
1.3. Research Question	33
1.4. Hypothesis	34
1.5. Explanatory Framework and Definitions of Key Terms	37
1.5.1. Good Governance	37
1.5.2. Water Governance	37
1.5.3. Institutions	38
1.5.4. Formal Institutions	38
1.5.5. Informal Institutions	39
1.5.6. Governance and Institutions	39
1.5.7. Water Governance and Institutions	39
1.5.8. Culture	40
1.5.9. Social Norms	40
1.6. The Dependent Variable: Water Governance Performance	41
1.7. Background to the Case Study	43
1.8. Theoretical Relevance	46
1.9. Methodology and Sources	50
1.10. Structure of the Dissertation	51

2.	Theoretical Framework: Highlighting Importance of Historical Events and Explaining the Role and Importance of Informal Institutions.....	53
2.1.	What are Institutions?	53
2.1.1.	Emergence of Informal Institutions	55
2.1.2.	Challenges in doing Research on Informal Institutions	58
2.2.	New Institutionalism.....	58
2.3.	Historical Institutionalism.....	60
2.3.1.	Path-dependence	63
2.3.2.	Limitations of Historical Institutionalism.....	64
2.4.	Linking the Theoretical and the Case Study Arguments	65
2.5.	Linking Water Governance Performance and Informal Institutions.....	68
2.6.	Explaining the Concept of Informal Institutions	71
2.6.1.	The Concepts of Caste and Class – Forms of Social Stratification	72
2.6.2.	The Concept of Corruption	76
2.6.2.1.	Causes of corruption	78
2.6.2.2.	Consequences of corruption.....	80
2.7.	Working Hypotheses.....	82
	Conclusion	85
3.	Concepts of Governance: Water Governance and Its Assessment.....	87
3.1.	Understanding Governance and its Relationship with Institutions.....	88
3.2.	Concept of Good Governance.....	90
3.2.1.	Why promote Good Governance?	92
3.2.2.	Importance of Urban Governance.....	93
3.3.	Understanding Water Governance	95
3.3.1.	A key to Achieving the Millennium Development Goals	96
3.3.2.	Water Governance for Poverty Reduction.....	96
3.3.3.	Promoting Equality	97
3.3.4.	Safeguarding Human and Environmental Health	97
3.4.	Water Governance: Meaning and Approaches to its Analysis.....	98
3.5.	Analytical framework for water governance performance	100

3.5.1.	Water Governance Performance	100
3.5.2.	Measuring Performance	101
3.6.	Water Governance Assessment Framework	102
3.6.1.	Objective of Water Governance Assessment.....	102
3.6.2.	Components of Water Governance Assessment	103
3.6.2.1.	Water Institutions.....	103
3.6.2.2.	Governance Principles	107
Conclusion	109
4.	Methodological Framework.....	110
4.1.	The Districts of Delhi.....	112
4.2.	Selection of Studied Localities	114
4.3.	Data Collection Framework	119
4.3.1.	Archival Research.....	120
4.3.2.	Primary Data Sources	120
4.3.2.1.	Interviews.....	121
4.3.2.2.	Household Surveys	122
4.4.	Methodological Approach	125
Conclusion	127
5.	Overview of Water, Culture and Politics in India	128
5.1.	The Indian Caste System and Social Inequality	129
5.1.1.	Influence of India's Caste based Social Diversity on its Political System	132
5.1.2.	Quota System as an Outcome of the Caste System	133
5.2.	Relationship between Water and Indian Culture	134
5.3.	Various forms of the Caste System.....	136
5.4.	Features of the Indian Society.....	138
5.5.	Formal Indian Political Structure.....	139
5.5.1.	The Constitution.....	140
5.5.2.	The Parliament	141
5.5.3.	Democracy and (its) Deficiencies in India.....	141
5.6.	Informal Politics in India	144
5.6.1.	Indian Political Culture	145

5.6.2.	Indian Political Parties	145
5.6.3.	Summarizing Indian Political Parties and Their Ideologies	147
5.7.	Informal Politics in the Water Supply Sector of Delhi	148
Conclusion	153
6.	Urbanization Pattern and Water Situation in Delhi.....	155
6.1.	Introduction.....	156
6.1.1	Water Management and Megacities.....	157
6.1.2.	Urban Water Supply Pattern in Megacities of Southeast Asia Including India	161
6.2.	Case Study: Delhi	167
6.2.1.	Accelerated Population Growth in Delhi	168
6.2.2.	Population Characteristics in Delhi	171
6.2.3.	Income and Employment in Delhi	172
6.2.4.	Income Disparities in Delhi	173
6.2.5.	Urbanization Patterns in Delhi.....	174
6.3.	Delhi and its Water	181
6.3.1.	Overview of Water Problems in Delhi.....	182
6.3.2.	Water Sources in Delhi	185
6.4.	Water Supply Scenario in Delhi before AAP	187
6.5.	Status of Water Supply in Surveyed Colonies	191
6.6.	Additional Issues Contributing to Water Problems in Delhi	193
6.6.1.	Existing Technology	194
6.6.2.	Economic Aspects.....	195
Conclusion	198
7.	Measuring and Assessing Delhi’s Water Governance Performance.....	200
7.1.	Water Governance Performance in Delhi	200
7.1.1.	The Physical Dimension: Supply-Demand Gap and Intermittent Supply	201
7.1.2.	The Chemical Dimension: Water Quality Issues.....	205
7.1.3.	The Economic Dimension: Entry of Alternate Suppliers	210
7.2.	Delhi Water Governance Assessment.....	213
7.2.1.	The Assessment of Water Institutions	214

7.2.1.1.	Features of Water Legislation in India.....	215
7.2.1.2	Meaning of Right to Water	220
7.2.2.	Water Sector Policy	221
7.2.3.	Organizations	223
Conclusion: Water Governance Assessment in Delhi.....		226
8.	Influence of Caste, Class and Corruption (3Cs) on Delhi's Urban Water Supply.....	228
8.1.	Inequality and Corruption	228
8.2.	Conceptualizing Water Inequality through Examining Social Differences.....	230
8.3.	Internal Migration and Class Change in Delhi	233
8.3.1.	Delhi's Upper, Middle and Lower Classes	234
8.3.2	Social Injustice Reflected through Class Distinction in Delhi.....	238
8.4.	An Overview on Corruption in India	240
8.5.	Corruption Mechanisms in Delhi's Water Sector.....	242
8.5.1.	Policymaking and Regulation	243
8.5.2.	Planning, Budgeting and Transfers.....	244
8.5.3.	Tendering and Procurement.....	245
8.5.4.	Construction and Operations.....	247
8.5.5.	Payments and Access	248
8.6.	Driving Forces for Corruption in the Study Area	250
8.6.1.	Measuring Transparency.....	251
8.6.2.	Measuring Accountability.....	254
8.6.3.	Measuring Participation	256
8.7.	Investigating Adaptive Capacity of Citizens and Management Capacity of Authorities.....	260
8.7.1.	Available Financial Resources.....	261
8.7.2.	Level of Education	262
8.7.3.	Level of Knowledge and Awareness	264
8.8.	Management Capacity of Government	266
Conclusion		267

9.	Major Findings, Recommendations and Future Research	
	Investigations.....	270
9.1.	Central Argument.....	270
9.2.	Limitations of the Study.....	272
9.3.	Revisiting the Research Question.....	273
9.4.	Discussion of the Major Empirical Findings	273
9.4.1.	Crisis of Governance.....	274
9.4.2.	Significant Political linkages: A Historical Overview.....	274
9.4.3.	Lack of Political Will.....	275
9.4.4.	Influence of Caste System on Participation	275
9.4.5.	Influence of Institutional Complexity on Transparency and Accountability.....	276
9.5.	Recommendations: Social Movements.....	277
9.5.1.	Influence of Social Movements on Indian Democracy.....	278
9.5.2.	Anti-Corruption Movement and Rise of the AAP	279
9.5.3.	The AAP and Delhi’s Water Policy Change.....	280
9.6.	Theoretical Contributions	283
9.7	Research Issues to be Investigated in the Future	284
	Publications	286
	Appendix I: Millennium Development Goals.....	330
	Appendix II: List of Interviewees.....	331
	Appendix III: Interview Questions (Unstructured).....	333
	Appendix IV: List of the Videos	337
	Appendix V: Survey Questions.....	338

List of Figures

Figure 1: Corruption and Income Inequality	36
Figure 2: Showing Megacities by the year 2015 worldwide.	43
Figure 3: Impact of Informal Institutions on Water Governance.	68
Figure 4: Building Blocks of Good Governance	92
Figure 5: Different Components of Water Governance Assessment.....	103
Figure 6: Selected Localities in Megacity Delhi.....	119
Figure 7: Highly congested Streets of Delhi with various kinds of traffic together.	175
Figure 8: Various Housing Structures Reflecting Income Disparities in Delhi.....	180
Figure 9: Opinion of Interviewees regarding Water Problem in Delhi.	184
Figure 10: People Filling Water from a Government Tank in Delhi.....	190
Figure 11: Two Taps are common in many Households; one is from municipality (could be illegal) and another is from bore well.	192
Figure 12: Interconnected Issues of Delhi's Water Problem.	198
Figure 13: Showing Water Supply-Demand Gap.	202
Figure 14: People Storing Water – An Evidence of Intermittent Water Supply.	204
Figure 15: Opinion of water users about Water Quality.....	207
Figure 16: Municipal Waste outside a Community in West Delhi.....	209
Figure 17: A household taking tap water provided by the DJB.....	210
Figure 18: Interrelationships of several factors directly or indirectly affecting Water Governance Performance in Delhi.....	215
Figure 19: Influence of Caste System on Corruption Emergence.	232
Figure 20: Contrasting areas in Delhi showing living of poor and rich.....	237
Figure 21: Information Provided to Household About Developments/Schemes.....	254
Figure 22: Various Routes of Accountability.	256
Figure 23: Level of Awareness of People of Different Problems arising from Water. ..	258
Figure 24: Participation of People in Society/Community Meetings.	259
Figure 25: Education Level of Respondents during Survey.	263
Figure 26: Level of Awareness about Water Resources Protection of Respondents during Survey.	265

List of Tables

Table 1: Mixed Picture of Megacities.....	45
Table 2: Timeline for Expression of Right to Water as Non-Legally Binding Declaration to Legally Binding upon States.....	106
Table 3: Summary of Selected Districts and Localities in Delhi.....	118
Table 4: Data Collection Techniques and Sources.	124
Table 5: National Parties in India and their different Ideologies.....	148
Table 6: Urban Population Growth in India’s Big Cities (%)	149
Table 7: Country-Wise Access to Water within South Asian Countries.....	161
Table 8: Urban Situation in India: 1901 – 2011.	163
Table 9: Urban Settlement Classification.	164
Table 10: Urban Water Supply in Selected Indian Cities.	166
Table 11: Decennial Population Growth in National Capital Territory of Delhi.	169
Table 12: Migrants in Delhi.....	171
Table 13: Population Characteristics in Delhi.	172
Table 14: Population Percentage by Religion.....	172
Table 15: Different Kinds of Settlements in Delhi.	177
Table 16: Access and Ownership to Consumer Assets.....	181
Table 17: Different Causes lead to different water scarcities.	183
Table 18: Sources of Water Supply of Delhi.....	186
Table 19: Zone Wise Bacteriological Report of DJB’s Tap Water.	189
Table 20: Inequitable Water distribution in Delhi.	189
Table 21: Urban Water Supply Description of the Surveyed Colonies	193
Table 22: Showing Revenue Losses	196
Table 23: Water Quality Indicators.....	208
Table 24: Costs for Water When Water is not Supplied by Authorities.....	211
Table 25: Performance Indicators of Water Sector Performance in Delhi.	212
Table 26: Complexity of Governance Institutional Share in Responsibilities.....	225
Table 27: Stakeholders in Delhi Water Sector.....	226
Table 28: Summarizing the Corruption Risks Associated with Water Sector in Delhi..	250

Table 29: Percentage of People living Below Poverty Line in Delhi and in India.	262
Table 30: Different Channels to Fight Corruption in India	267

List of Boxes

Box 1: Millennium Development Goals	82
Box 2: Socio-Political Aspect of Water Governance: Working Definition.....	100
Box 3: Definitions of Rights and Basic Rights of Individuals.....	142
Box 4: Bengaluru: City Staring at Water Crisis.....	167
Box 5: Delhi World`s Second Most Populous Megacity.....	169
Box 6: Concepts and Definitions of Different Settlement Structures in Delhi.....	179
Box 7: Groundwater Quality in Delhi.....	205
Box 8: Corruption Risk Example.....	247

List of Abbreviations

AAP	Aam Aadmi Party
ADB	Asian Development Bank
AE	Extended Aeration
ASP	Activated Sludge Process
BIOFORE	Physical, Chemical and Biological Removal Treatment
BIS	Bureau of Indian Standards
BJP	Bhartiya Janta Party
BPAC	Bangalore Political Action Committee
CAG	The Office of the Comptroller and Auditor General
CBI	Central Bureau of Investigation
CEDAW	Convention of the Elimination of All Forms of Discrimination Against Women
CGWB	Central Ground Water Board
CGWD	Citizen Front for Water Democracy
CIC	The Chief Information Commission
CMS	The Centre for Media Studies
COMEST	Commission on the Ethics of Science and Technology
CP	Connaught Place
CPCB	Central Pollution Control Board
CPI	The Communist Party of India
CSE	Centre of Science and Environment
CVC	The Central Vigilance Commission
DCB	Delhi Cantonment Board
DDA	Delhi Development Authority
DJB	Delhi Jal Board
DMC	Delhi Metropolitan Council
DoUD	Department of Urban Development
DPCB	Delhi Pollution Control Board

DVB	Delhi Vidyut Board
EEA	European Environmental Agency
ESCAP	United Nations and Economic and Social Commission for Asia and the Pacific
GDP	Gross Domestic Product
GSDP	Gross State Domestic Product
HI	Historical Institutionalism
IAC	India Against Corruption
ICAC	Independent Commission against Corruption
INR	Indian Rupees
IOM	International Organization for Migration
IS	International Standards
IWRM	Integrated Water Resources Management
JJ	Jhuggi Jhopri
LPCD	Litre per Capita per Day
MCD	Municipal Corporation of Delhi
MCM	Million Cubic Meters
MDA	Metropolitan Development Authorities
MDG	Millennium Development Goals
MG	Million Gallon
MLD	Million Litres per Day
MoUD	Ministry of Urban Development
MoWR	The Ministry of Water Resources
MPD	Master Plan Delhi
NCRPB	National Capital Region Planning Board
NCT	National Capital Territory
NDMC	New Delhi Municipal Corporation
NFC	New Friends Colony
NIUA	National Institute of Urban Affairs
NWP	National Water Policy

NWP	National Water policy
OECD	Organisation for Economic Co-operation and Development
OHCHR	United Nations High Commissioner for Human Rights
PIDR	Public Interest Disclosure Resolution
POBO	Prevention of Bribery Ordinance
PPB	Parts per Billion
PUB	Public Utilities Board
Rs.	Indian Rupees
RTI	Right to Information Act
SC	Schedule Caste
SDA	Slum Designated Areas
ST	Schedule Tribe
STP	Sewage Treatment Plant
TERI	The Energy Research Institute
UDHR	The Universal Declaration on Human Rights
UFW	Unaccounted Flow of Water
ULB	Urban Local Bodies
UNCAC	UN Convention against Corruption
UNCHS	United National Center for Human Settlements
UNDP	United Nations Development Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNW-DPAC	UN-Water Decade Programme on Advocacy and Communication
UYRB	Upper Yamuna River Board
WHO	World Health Organization
YAP	Yamuna Action Plan

1. Introduction: Challenges in Urban Water Management and Urban Divisions in Megacity Delhi

**Use me wisely and I will sustain you.
Water!!!!**

(Pete McBride; January 2014; Available at: MWNL Blog; Wordpress.com)

New Delhi, officially known as the National Capital Territory (NCT) is the capital of India and is one of the fastest growing metropolises in the world with a population of 25 million (United Nations 2014b). The case of Delhi is representative of the situation of urban water systems in many megacities such as Karachi¹, Lagos, and Sao Paulo in the developing world due to poor planning, poor governance and weak regulatory frameworks (Jideonwo 2014; The World Bank et al. 2012). The poor quality of urban services means some people must struggle to get water on a daily basis. These people must either rely on the mercy of private water providers or get water by illegal means or by extracting groundwater. The biggest issue Delhi faces related with its water management is poor services where water is not distributed uniformly and does not reach everyone. Specific sections of society face acute water problems. This problem of inequality has led to corruption. Corruption is prevalent in India and has contributed to inequality in Delhi's water sector. In other words, they are interlinked as cause and consequence of each other.

This study focuses on the issues and concerns surrounding the water problems of Delhi and points to the relationship between the caste system of India, the distribution and availability of water in the city, and the cultural and social dimensions of the country which result in corruption in the water sector. It will be argued that the poor performance of water governance which is measured along three dimensions (physical, chemical and economic) was influenced by the caste system and corruption which has emerged from

¹ Source: Shazia Hasan, 'Half of water supplied to city lost due to leakages', moot told. <http://www.shehri.org/programs/NC-25112014.pdf>. Accessed 24 January 2016.

the inequality, which has become institutionalized over time. These three dimensions describe the supply-demand gap in water supply, problems with water quality and higher water prices for those who do not have official water connections.

1.1. Problem Statement

Delhi's population has increased from 40,000 in 1911 to 14 million in 2001, its population is expected to grow even more (United Nations 2014b; Singh and Singh 2005: 98). This tremendous growth began after independence in the year 1947 when migrants from Pakistan entered the city (Saigal et al 1994). Delhi's population growth rate was as high as 41% per year from 1996 to 2011 (Sorensen and Okata 2011: 122); Delhi has become the second largest metropolitan city in the world after Tokyo (United Nations 2014b).

Migrants from other neighbouring states enter Delhi in search of employment because of the city's industrial complexes and economic activities. Fast and acute migration in Delhi has brought about challenges and opportunities. A major challenge is the management of Delhi's water. The problem is not only one of shortage, but also several other core issues related with water availability, its allocation and its role in the further growth of this city. A significant percentage of the population in Delhi is not served with an adequate supply of water on a regular basis (Singh and Singh 2005: 100). This problem is associated with water governance performance and that is the subject of this dissertation. Delhi's water crisis is a crisis of governance. This is a widely accepted view among the majority of Delhi's population which elected a new political party, Aam Aadmi Party (AAP) into government in February 2015. The party promised to deal with the many problems Delhi has, such as lack of water availability, safety for women, air pollution, poor educational institutions, and serious transportation problems. One of the main agendas of the AAP is to solve the water problem for the people of this large city.

The problem of water in Delhi is not new; it has existed for many decades and grew worse with time as more and more people moved into the city. This dissertation attempts to understand the reasons and identifies the causes of under performance of Delhi's water governance. The new government's ability to address the problems will be

unlikely to succeed if the root causes of the water governance problem are not understood.

There are several discussions and understandings of Delhi's water problems which dominate²: (1) The already large and still growing population of Delhi results in a huge water demand. The total amount of water available to the city is less than the needs of the entire population. Every day hundreds of migrants from other states come to Delhi and place pressure on the city's water resources. (2) Migrants in Delhi occupy and use land. They have set up thousands of unauthorized and illegal colonies. The population in these illegal colonies suffers from lack of basic services such as water supply. One of the causing reasons for this situation is that the migrants arrived in the city in unplanned fashion. The water utility 'Delhi Jal Board' (DJB) had not planned technically to provide water to them and also due to their illegal status they are not entitled to get an official water connection. (3) The two major sources of water in Delhi are the river Yamuna and groundwater. Both are in critical situations due to surface water pollution and excess groundwater extraction. The Yamuna river has been declared a dead river because of its high pollution load and the amount of water withdrawn from it (Aarshi 2013). The groundwater table has been sharply depleted and is at critical levels in several areas of Delhi. (4) The DJB which is responsible for the supply of water and collection of wastewater in Delhi is going through financial, institutional, and political crisis. As a result the DJB was not able to perform its role effectively with respect to adequate water supply and uniform water distribution. (5) There has been a big disconnect between how water management strategies were planned and measures were discussed (examining the sector technically, politically, socially and economically) and the way strategies were adopted and implemented. There is a gap between what is on paper and what is taking place in reality (Narain and Pandey 2012; Agarwal and Krause 2013; Singh 2006).

All of the above mentioned issues in the water sector of Delhi need to be taken into account as a part of the broader picture. They form a crucial part of the overall

² Usually large population and its pressure on the resources is considered as the major cause of several kinds of problems in megacities including water problems; similar is the case with Delhi and its growing population.

analysis of water problems in Delhi. Yet, what these explanations miss is the social and political dimensions and diversities of the population of a large city such as Delhi.

Against this background, this dissertation argues that the water problem in Delhi is not just a physical but also a social and political issue. Therefore, there is a need to understand the political culture, that is the social and cultural dimensions affecting the water sector of Delhi. This dissertation also argues that the water distribution system of Delhi is characterized by a high degree of inequality which is tied to the city's power structure. This power structure can be seen in economics and politics where wealthy and politically strong people are the most influential.

Therefore, the main argument of the dissertation is tied to informal institutions of the ancient caste system in India and rampant corruption. Corruption is referred as a consequence of inequality which is the product of caste structure in the water distribution system. Over time corruption became institutionalized because of strong effects of path-dependency and the weakness of formal institutions which are again influenced with the informal institutions. The study is focused on the division of society produced by the caste system and the hatred and discrimination which it generates for lower caste people. The exclusion of lower caste people by the so-called upper castes produces exploitative institutions and inappropriation of resources to other group, which results in corruption in the society.

1.2. Delhi's Water Problems

Much of global population growth is concentrated in developing countries. In contrast, many industrialized nations are experiencing population decline (Indian National Science Academy, Chinese Academy of Sciences, U.S. National Academy of Sciences 2001: 11; CQ Researcher 2010). India has also witnessed a rapid population growth rate of 1.64% as compared to the world population growth rate of 1.23% (Matsagar 2015; Fernando 2011). India's urban population has increased with its overall population growth from 222 million (26% of the population) in 1990 to 410 million (32%) in 2014 and is expected to grow to 814 million (50%) by the year 2050 (World Economic Forum 2014b: 6). India has huge interstate living standard differences ranging

from 12,000 rupees per head in Bihar to 100,000 rupees per head in Goa. There are other interstate disparities in the level of education, population growth, infrastructure development and overall structure and public services of regions. These differences in living standards have negative implications for the economic functioning of the country; there are undesirable and huge migrations from relatively poor regions towards wealthy regions (Cherodian and Thirlwall 2013). Internal migrants in India constitute a large proportion of the population: 28.5 per cent of the total population or 326 million people. Their key destination areas include Delhi, Maharashtra, Gujarat, Haryana, Punjab and Karnataka. They tend to come from Uttar Pradesh, Bihar, Rajasthan, Madhya Pradesh, Andhra Pradesh, Chattisgarh, Jharkhan, Odisha, Uttarakhan and Tamil Nadu (UNESCO 2013: 4)

Among all of the regions of the country, Delhi is the most populous city followed by Mumbai and Kolkata (World Economic Forum 2014b). Delhi also has a higher percentage of urban areas. 93% of its population was urban in the beginning of the 21st century as compared with 53% in 1901 (Government of NCT of Delhi 2012-13). Delhi is a rich state with the highest per capita income in the country. The per capita income of Delhi at current prices reached the level of Rs. 212219 in 2013-14 as compared to Rs. 185421 in 2012-13 and 161446 in 2011-12 (Government of NCT of Delhi 2014-15). Delhi's main economic activities include trade, commerce and industrial activities. The city has a huge potential for further economic growth in addition to being the political centre of the country. Although a rich state with the highest per capita income, a significant percentage of the population of Delhi lives below the poverty line. According to the Delhi Economic Survey 2014-15, about 10% of the population was living below the poverty line, defined by the Planning Commission as having a monthly income of below Rs.1134.00 in the year 2011-12 (Government of NCT of Delhi 2014-15).

Due to economic development and rapid migration, Delhi has become a city of imbalances in terms of economic levels, resource distribution and livelihood opportunities. Rapid and diverse migration also has brought '*new divisions*' into the city, which have greatly influenced political and social boundaries of the city (Kumar 2013). On an average almost every family in Delhi owns assets worth Rs. 7,42,000, but everyone in Delhi is not rich. One third of the households of the city have assets of value

less than Rs. 50,000 which reflects sharp differences between rich and poor in their living standards (Singh et al. 2009: 181).

Delhi has a diverse population; it is a city of rich people, also has a sizeable middle class and a large number of poor people. Delhi has mixed economic group of population, 6 per cent of the population is very rich and another 12 per cent is considered rich; the largest proportion of the population in the city is contributed by its middle class (48 per cent), out of which 28 per cent belongs to the upper middle class and 20 per cent to the lower middle class society (Singh et al. 2009). On the other hand 6 per cent of the people of Delhi are very poor and another 28 per cent are poor; many of these live in slums or unauthorized colonies which are found all over the city but are not included in the urban planning scheme of the city (Singh et al. 2009). As the population in Delhi has increased, the number of unauthorized colonies has also increased since 1960s (Singh et al. 2009; Delhi Urban Art Commission 2014). A significant percentage of Delhi's population is living in those colonies where most of the population was without access to safe drinking water (Agrawal 2013).³

The distinct and growing urbanization pattern of Delhi has influenced the way water has been managed. Allocation of water in Delhi to different socio-economic groups presents strong contrasting inequalities where those without water live adjacent to the areas of the city where water is supplied around the clock (Singh 2001: 26); for example, Zakir Nagar in Okhla is closely situated to New Friends Colony where water is supplied efficiently. Areas with sufficient water supply tend to be the areas where people are well off in their earnings. The population living in unauthorized colonies is officially not connected to the water pipeline network. It takes them hours to get water (Truelove 2007). In these colonies, some people have installed booster pumps or store water in underground or rooftop tanks (Datta 2012). The situation is worst during the summer months when water demand is higher (Jolly 2010). According to the 2011 census, 24.8 per cent of households in Delhi are not connected with official water connections to get treated piped water. In the year 2011-12, a population of 3.2 million in Delhi was served

³ United Nations, General Assembly Resolution 64/292. *The Human Right to Water and Sanitation*, A/64/L.63/Rev.1 and Add.1 (2010). www.un.org.

with 1000.94 Million Gallons (MG) of water through tankers⁴ with average supply of 3.82 litres per capita per day in comparison to the prescribed standard for domestic purposes of 172 litres per capita per day (Comptroller and Auditor General of India 2013).

1.3. Research Question

Delhi receives its water from three different sources: (1) About 86% of Delhi's total water supply is from surface water. The main sources are the Yamuna, the Ganga and the Bhakra System. Together they provide about 2,589 million litres of water per day (MLD), (2) sub-surface water is another source of water for Delhi which comes from ranney wells and tube wells and contribute about 369 MLD and (3) groundwater sources provide about 292 million cubic meters (MCM) (Rai 2011). Despite these different water sources, Delhi has experienced tremendous water challenges. Water management is the responsibility of the public utility, the DJB. The role of the private sector in water management in Delhi is not very large. The private sector does not have major responsibilities linked to water provision. DJB is responsible for the supply and distribution of water and collecting wastewater in Delhi. Although the largest democratic country in the world, Indians have limited voice and limited chance to raise their voices on issues. "India is a representative rather than participatory democracy" (Singh 2013: 3). Only in the time of elections, do politicians go to the voters. NGOs and the media are the main means for people to give their opinions on the issues and regarding the decisions taken by the government (Singh 2013).

In this study the role of private actors is not addressed in much detail because they are not the main part of the problem. Their role is very limited; water in Delhi is publically owned and managed. The management and pattern of water supply in Delhi is sharply divided along the classes found in the overall population. This study will look at the factors which affect the water distribution system. Supplying water to all is a goal of water governance and is also an indicator of its effective performance.

⁴ Water transferred through trucks to the areas in need during the phase of emergency. With this means water is carried in containers and trasported (Adams et al. 2012).

The central question, this study will answer is:

Why has water governance in Delhi not been effective in providing basic water services to the inhabitants of Delhi?

This dissertation also considers the new water policies introduced after the 2015 election and the extent to which they appear to address the fundamental underlying issues addressing water governance in Delhi. The study looks at the recent changes and considers how effective they may be at addressing the fundamental problems that have plagued Delhi's water governance in the past, that is, the problems of the caste system and corruption?

The dissertation argues that the previous policy was not working effectively due to factors introduced and examined later. In order to understand and analyse water governance performance in Delhi, I start by asking several core questions: Is there a water problem in Delhi and if there is, is it the result of natural factors or has it been created? If it was created, then how? What were the interests of those who were involved? And how have these interests impacted on this particular issue of ineffective water supply?

1.4. Hypothesis

In times when fewer people had education it was predicted that education could be used to eradicate the caste system from Indian society. But even today it is found among educated society. The “[c]aste system has become [an] inseparable aspect of Indian society” (Siddaramu 2013: 1). The caste system has influenced all areas of society, including education, politics, religion and economy (Siddaramu 2013).

According to the International Dalit Solidarity Network (2014:12), the “caste system divides people into unequal and hierarchical social groups”. The ones who are at the bottom of this hierarchy are considered impure and polluted; they are the lowest caste of this system and are called Dalits. There are an estimated 260 million Dalits worldwide,

of whom 166,635,700⁵ live in India (International Dalit Solidarity Network 2014). Members of the higher caste enjoy wealth and opportunities whereas members of the lower caste are deprived from resources, perform menial jobs and face discrimination.

Corruption has been part and parcel of India since ancient times. Ancient Hindu and Buddhist texts mention about cases of corruption⁶. Similar to several other countries including Sri Lanka and China, corruption in India is widespread (Perception Index, Transparency International). In 2005 it was found that 50 percent of the people in India had experienced having to pay bribes or peddling in order to get services or a job done in a public office (Abdulraheem 2009). Corruption in India is found everywhere in government offices. There is corruption in politics, the private sector, the media, the judiciary, the police and even in religious institutions.⁷ Corruption is prevalent throughout India. It can be seen from cities to villages, and especially in government offices.⁸

One of the main features of corruption which is taken into account in this study is its relationship with inequality.

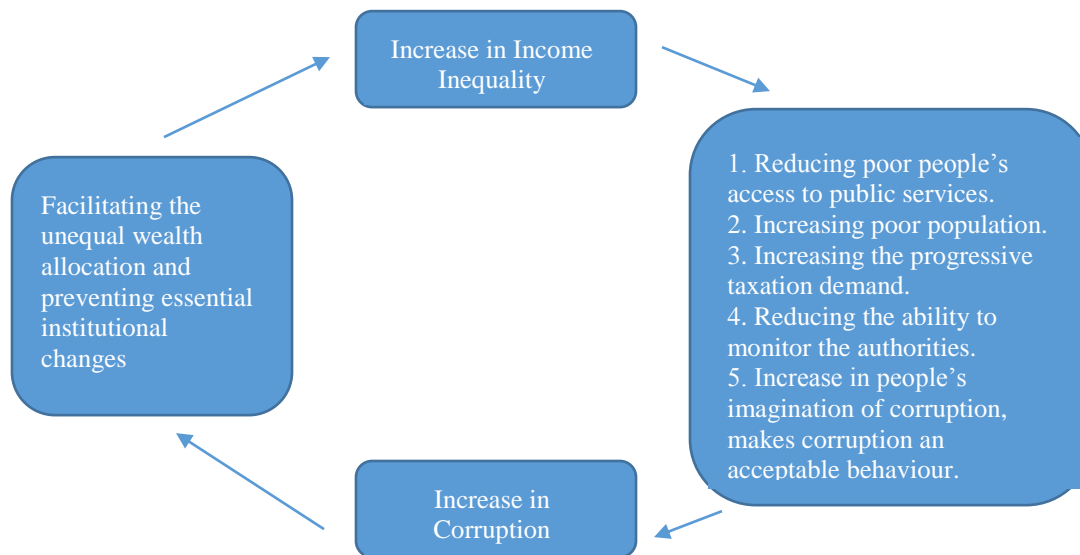
⁵ Source: International Ecumenical Peace Convocation, Decade to Overcome Violence. 'Fact Sheet: Now we are Fearless.' Available at http://www.overcomingviolence.org/fileadmin/dov/images/women_campaign/Dalit%2520Fact%2520Sheet.pdf. Accessed on 28 January 2016.

⁶ Information obtained from an employee of a non-political and non-governmental organization in India on 11th August 2014.

⁷ In India, police departments are under the jurisdiction of the Central Government. Local representatives, however, may also play a role. According to one interviewee, when a person involved in a crime belongs to the same caste as the regional party in power, than it may be there will be no inquiry or legal action taken against him (anonymous interview with an Indian government official, 19th June 2014).

⁸ Mishra, Akshaya, "Everyday Corruption in govt. offices beats 2G by a mile", Firstpost. Published on 24th May 2011. Available at <http://www.firstpost.com/politics/everyday-corruption-in-govt-offices-beats-2g-by-a-mile-14679.html>. Accessed on 12 July 2017.

Figure 1: Corruption and Income Inequality



Source: (Samadi and Farahmandpour 2013: 4).

Drawing on the literature about the ancient caste system and corruption and its relation with inequality, this dissertation argues that the poor performance of water governance in Delhi is a product of the ancient caste system and institutionalized corruption. Corruption in the water sector has been institutionalized in the political and social systems of the country. This dissertation will examine two hypotheses with respect to the caste system and corruption:

(a) Water governance performance deteriorated because of the high level of inequality in the water distribution system. This inequality came about because of the concept of the caste system in Indian society which symbolizes inequality and discrimination for a specific population.

(b) Wide spread corruption in the country is one of the factors which explains why water governance did not perform effectively in Delhi.

1.5. Explanatory Framework and Definitions of Key Terms

Both the caste system and corruption are not easy to wipe out as both are informally institutionalized. The caste system and corruption affect water governance in Delhi in different ways and hinder good governance. Below is a brief overview about the key terms used to describe and express these variables:

1.5.1. Good Governance

Good governance is an umbrella term, which has several different characteristics. Governance can be considered ‘good’ when it is participatory, responsive, transparent, and accountable, follows the rule of law, and is effective and efficient. Good governance gives the assurance of reduction in corruption and also takes human rights seriously (United Nations and Economic and Social Commission for Asia and the Pacific (ESCAP) 2009). Thus, good governance is a process under which all the decisions affecting public affairs are implemented in a way so that goals are achieved. Good governance gives surety to poor and marginalized groups that they are also included in the process of decision-making through participation and can contribute to the process of development, which affects their lives. One of the very important tasks of good governance is to give surety that all people have adequate access to basic services (United Nations and Asian Development Bank 2007: 32).

1.5.2. Water Governance

The most commonly used definition of water governance is a “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” (Jacobson et al. 2013: 3). Similar to good governance, good water governance takes into account the reduction of corruption in the water sector and protection of human rights related with water. The social dimension of good water governance points towards equity. Yet, water is distributed unevenly in time and space and among various socio-economic groups of society. Many countries have agendas to end poverty but without appropriate provision to water this goal cannot be achieved because economic growth of

any nation depends highly on water. The economic dimension of water governance points towards the responsibility of maintaining an economics of water where everyone is able to pay for its use. The political dimension of good water governance focuses on participation of all stakeholders in decision-making processes and not only on the ones who are politically strong. It also emphasizes equal rights and opportunities for all. The environmental dimension of good water governance emphasizes “sustainable use of water and related ecosystem services” (Jacobson et al. 2013).

1.5.3. Institutions

Institutions are defined as the rules governing the behaviour of actors (Pahl-Wostl 2009; North 1990). They can be formal or informal depending upon the process of development. In an ideal case, formal institutions are stronger than informal institutions and they may complement each other to achieve goals. They are conflicting when informal institutions are found to be more effective than formal institutions (Pahl-Wostl 2009). Institutions influence the distribution of resources and power in society as they favor the resources and powers who had created them (Campbell 2004: 2). Institutions are created by humans to bind their social interactions and imposed as constraints in the form of codes of conduct to reduce uncertainty expectations regarding behaviour. Institutions set restrictions on the behaviour of humans and thus add a degree of predictability regarding their actions (Dobler 2009: 2). Institutions create a legal and social framework for the movement of humans and the life around them.

1.5.4. Formal Institutions

Vartuhi Tonoyan, Robert Strohmeier, Mohsin Habib and Manfred Perlitiz (2010) define formal institutions as “those written or formally accepted rules and regulations which have been implemented to make up the economic and legal set-up of a given country” (Tonoyan et al. 2010: 805). Formal institutions function as the regulatory pillar of a nation.

1.5.5. Informal Institutions

Informal Institutions are defined in terms of cultural values, which are flexible. Informal institutions can be categorized as social norms and political processes, which can either help or hinder the development process (OECD 2007). Informal institutions are difficult to handle as the rule-making process is less transparent and the key actors are more difficult to identify. Even the actors who are responsible for their creation and enforcement may deny that they have created informal institutions. Thus, the origin of informal institutions is often unclear (Helmke and Levitsky 2006: 7). Corrupt and illegal activities typically occur in a non-transparent environment. It is not easy to detect the actors involved in such transactions. Informal institutions cannot easily be shaped and changed by authorities because of their indigenous character unlike formal institutions where rule-making authorities have more power to act. Informal institutions are followed without any proper and written guidelines.

1.5.6. Governance and Institutions

The performance of governance is highly influenced when there is weak rule of law, lack of accountability, lack of provision of information and high levels of corruption. In this study corruption is considered to be an informal institution, which has emerged from the social norms of society. The governance regime is influenced by the strength of formal and informal institutions (Pahl-Wostl 2009). Ineffectiveness in formal institutions contributes to the persistence of corruption, which in turn leads to ineffective governance performance (Pahl-Wostl 2009).

1.5.7. Water Governance and Institutions

Traditionally the water sector has been considered a sector where technology is a decisive factor and where there are fewer chances of learning for those who have no technical background or information. This can lead to less stakeholder participation in the process of decision making (Pahl-Wostl 2009; Gleick 2003). The most identified barriers to change are the openness of institutions to change (Pahl-Wostl 2006; Pahl-Wostl 2009).

Informal institutions are not easy to eliminate, especially when they are linked to higher social and religious values. Informal institutions influence formal institutions. This is the case with water policy, where informal institutions contribute to deteriorated water governance performance.

1.5.8. Culture

“Culture is man-made”, which is confirmed by others and passed on to new generations. Culture provides a meaningful context where individuals learn to behave (Trompenaars 1998: 24). Fons Trompenaars and Charles Hampden-Turner (1998) explained culture in three different layers. First is the outer layer which is the observable reality of language, religious beliefs, food, fashion, art. These examples symbolize the deeper level of culture where culture is used as the totality of the way of life (Trompenaars 1998; Awoniyi 2015). Second is the middle layer of norms and values where norms are shared by the groups as “right” and “wrong” whereas values determine “good” and “bad”. Norms can be developed as formal and written laws and if not they are labelled as a social control (Trompenaars 1998). The third layer is the core of basic assumptions where people act upon nature to solve their daily life problems. For example, the dealing of Dutch with rising water which is by nature (Trompenaars 1998). Therefore, culture is nothing more than the way people organize themselves over the years to solve the problems and challenges they face. “Culture is always a matter both of what binds together and of what keeps apart” (Frow 2000: 2). Cultural differences across nations arise from their underlying value systems and that is the cause people behave differently under similar circumstances (Khairullah, and Khairullah 2013).

1.5.9. Social Norms

“Social norms are customary rules of behaviour that coordinate our interactions with others” (Young 2008: 1). Once a particular pattern of doing things is established as a rule, it remains in continuation because people prefer to follow it with the expectation that others are going to follow it too.

1.6. The Dependent Variable: Water Governance Performance

Water governance addresses a large spectrum of social, economic, political and environmental aspects related to water. A priority is placed on the social and political dimensions of water governance because it is assumed that in the case of India, a multi-cultural and multi religious country, these factors are stronger than formal laws and regulations and play a significant role in the system of government and in water governance.

Social and political aspects of water governance are considered as a function of informal and formal institutions including the organizational structures which regulate and control access to water resources, and their usage, distribution and status. Social dimension symbolizes values, traditions and attitudes associated with water because in several cultures and religions water has a spiritual value. Religion may define various rules for water usage. The political dimension of water governance includes legal aspects, policies and rules, the degree of participation of stakeholders and their rights and power on water. Linking the two dimensions provides the rules of the game that determine how water is governed. The religious and political dimensions of water usage provide the architecture of water governance institutions, that is, water laws, water policies and water organizations.

Several factors can influence the performance of water governance, the achievement of goals and the finding of a balance between its various dimensions. Good water governance performance would ideally mean that everyone gets a 24 hour supply of good quality and affordable water and there is no harm to the environment through its supply. Water use also should be sustainable. In this study, the performance of water governance is explained by looking at the supply-demand gap, the quality of water, the water-pricing structure, and issues related with the environment and its sustainability. Therefore, water governance performance is taken as the dependent variable.

Despite the concerns about the complexity of the functions and multiple dimensions of water governance, there are several indicators in place which show the performance of water governance. There are various ways to measure the performance of

water governance functions. In terms of water quality, it is possible, for instance to evaluate the implementation of national water policy. When access to clean drinking water in a rural area is increased from 20 to 30 per cent it is an improvement, but when the goal prescribed in the policy was 100 per cent water governance may still be determined to be ineffective (Jacobson et al. 2013). To identify the most suitable and most relevant indicators to measure the dependent variable, the literature on water pricing policy, the legal framework for water, the water distribution patterns in Delhi, and the implementation of existing standards on water quality were analysed.

The indicators of water governance performance selected for this study are related to water's physical, chemical, and economic dimensions:

Physical dimension: The physical dimension of water governance symbolizes the gap between daily demand for water compared to the amount of water which is supplied by the responsible authorities. An adequate drinking water supply should be the priority of any water authority; if that is not met it indicates poor performance.

Chemical dimension: The chemicals found in water can be used as an indicator of water quality. It is not only the quantity but also the quality of water which should be provided by water authorities. Water governance is effective when safe and clean water is made available to citizens.

Economic dimension: It is the responsibility of the water authorities to provide water economically so that the economic burden on the poor is minimized. The economic dimension of water governance addresses the issue of water pricing and whether or not everyone can afford to pay for water. As will be shown in subsequent chapters, people living in poor urban areas or in slums in Delhi are not connected to the official water supply network. They get water either from private vendors or water tankers or they turn to bottled water which costs them more than the water supplied by authorities through official water connections.

Megacities pose a mix of opportunities, risks and challenges in relation to economic growth, basic services, and better life styles. They also hold the promise of better education and employment. Cities have much human capital in the form of the skills, ideas and the knowledge of their inhabitants. Cities act as a magnet for industries and entrepreneurs (International Risk Governance Council 2010). The World Economic Forum highlighted that cities are the center of innovation, ideas and wealth creation. Cities are an essential factor for future growth and the “lifeblood of the global economy” (World Economic Forum 2014a). Not surprisingly, large numbers of people are migrating towards cities and urban areas. According to the United Nations, by the year 2050 about 66% of the world’s population will live in cities; in the year 1990 there were only 10 cities with more than 10 million populations that is ‘megacities’ and total of 153 million inhabitants in those cities. Today this number is tripled and there are 28 megacities and the population they contain has grown to 453 million (United Nations 2014b). The rate of urbanization in developing countries is increasing especially in the global South; China alone has six megacities and will have six more by the year 2030. Four Indian cities namely, Ahmadabad, Bangalore, Chennai and Hyderabad are also projected to be counted as megacities in the near future (United Nations 2014b).

Many countries including India, China, Indonesia, and Pakistan are fighting against poverty within their regions. That is why cities are considered as important drivers of development and poverty reduction due to the economic activities and employment opportunities they provide (United Nations 2014b). Due to unplanned and haphazard growth, the development and the opportunities provided by cities are threatened. Now urban areas are more unequal than rural areas (Verme et al. 2014); they show more risks for their inhabitants in the form of inefficient basic services, poor health care, inefficient public security including in relation to the natural environmental quality. The challenges are different in different places. A very common challenge of megacities in developing countries is to deal with inefficiencies in the provision of basic services. Sustainable water management is an important issue at the core of city development. For a city that aims to become poverty free and slum free - development, poverty reduction and water management must go hand in hand.

Summarizing Opportunities and Risks Associated with Megacities

Table 1: Mixed Picture of Megacities	
Opportunities	Risks and Challenges
Drivers of economic growth	Visible urban divide and increased inequality
Potential to reduce poverty	Tremendous pressure on natural resources
Improved living conditions	Public Insecurity
Business opportunities	Crime and Corruption
Education facilities	Pollution
Provision to global connectivity	Environmental Degradation

Source: (International Risk Governance Council 2010; Kraas et al. 2005).

On a global scale, more people live in urban areas than in rural areas; global urban population is estimated to increase further (United Nations 2014b). As the urban population increases, size of the cities is increasing. Delhi is an example of the growth and change affecting the growing number of megacities in the world. For many megacities especially in developing countries a major problem is the limited capacities of their national and local governments to invest, plan and manage demographic transition efficiently, equitably and sustainably (Biswas 2009, c2006). Many people live in illegal or informal homes with inadequate or no public service provision. In many urban centres in Africa and Asia, much of the population has no water supply and no waste collection services (United Nations 2011). These inadequacies show the limited and ineffective functionality of authorities.

For this dissertation, the case of Delhi was selected as it is the capital of India and a city where there are large income differentials and mixed performance in terms of provision of basic services. As the capital, one would expect better services than in other cities.

1.8. Theoretical Relevance

In order to answer the research question and to examine the hypotheses, this study applies the approach of historical institutionalism (HI) and the concept of path dependence, a branch of new institutionalism. ‘New institutionalism’ was launched by political scientists’ March and Olsen in the year 1984 (March and Olsen 1984); since then it has continued to provide a useful perspective for analysing political dynamics and the outcomes that shape everyday life (Bell 2002; Koelble 1995; Lowndes 1996).

Peters (2012: 1) states that “the roots of political science are in the study of institutions”. New Institutionalism is about obtaining a greater understanding of political nature where institutions shape the nature of actors and their behaviour by guiding them through policies, laws and norms. New institutionalism is concerned with informal and formal institutions and their interaction, the creation of institutions, and the instances of continuity and change in/of an institution that are not easy to manage or control. “Historical Institutionalism is neither a particular theory nor a specific method” (Steinmo 2008: 118). Steinmo (2008) talks about distinguishing features of historical institutionalism such as its focus on real world empirical questions. It does this by giving importance to history. Historical institutionalism gives special attention to institutions because of their guiding character and ability to shape and structure political behaviour and its outcomes (Steinmo 2008: 118). The focus in historical institutionalism is on patterns and events which happened in the past and how they shape human behaviour (Pierson and Skocpol 2002). Historical institutionalists are interested in addressing real world questions in order to educate the public and scholars. Historical institutionalists take history seriously; in order to analyse processes over a considerable period of time, may be in decades or even centuries. Historical institutionalism does not only investigate past but looking at processes over time (Pierson and Skocpol 2002). Any extension in the time frame widens the range of experiences to be looked at and makes more data available, which may generate more variations in outcomes. Another important aspect with respect to widening of the time frame under study is especially important for political scientists because many phenomena of great interest such as revolutions,

democratization and construction of welfare states do not occur frequently or occur in any particular slice of time (Pierson and Skocpol 2002). Similar to the concept and trend of democratization in politics, cultural changes are slow-moving and do not occur frequently.

Big and real world related questions are often addressed by historical institutionalists. The questions they raise tend to be of great interest to the public and to fellow scholars. Historical institutionalists also take time to develop explanatory arguments about the outcomes and puzzles they come across. Historical institutionalists specify the sequence of historical events in order to trace processes. They also typically analyse the combined effects of institutions and processes developed overtime rather than looking at a particular institution or process at a particular time (Pierson and Skocpol 2002: 696).

Historical institutionalism is taken as the most suitable theoretical approach to examine the hypotheses of this dissertation because it talks about posing puzzles such as why something happened, why certain patterns took shape over time, and why actors made particular choices? Institutions play a significant role in understanding differences among countries, states and regions. This is true also for water governance, and explaining why water governance is effective in some places but not in others; the decisions and choices about the use and management of water which we call water governance emerges through institutions (Gallaher and Heikkila 2014). Development and improvement in the effectiveness of water governance is therefore very closely related with water institution reform. The rules that regulate water usage are defined as formal and informal rules (Sehring 2008).

Bringing about institutional change is difficult. This is sometimes referred to as the stickiness of institutions. The difficulty of leaving a certain path of institutional rule can be explained by the concept of path-dependence (Windhoff-Héritier 2007). Once a pattern is established it cannot be changed or reformed easily. Bringing about change usually involves strong steps and large transaction costs. Overall institutional performance depends very much on the nature of the relationship between formal and informal institutions. Research suggests that informal institutions are more influential in

some particular circumstances than formal institutions (Ananda et al. 2006). The idea that is followed here is that institutions influence behaviour, beliefs, networks and culture in the form of beliefs, social connectedness, mental models and behaviours. It explains two-way causality where institutions shape culture and culture influences the choice over institutions which result in path dependent choices over institutions (Bedner and Page 2005).

In India, water institutions (comprised of water laws, water policies and water organizations) play a vital role in managing water. Water policies set the laws and rules for how water is allocated to different uses. Water laws are meant for all the legal aspects that govern or rule the issues related to surface and groundwater. Managing water is important for economic development and poverty alleviation (Ananda et al. 2006). -by knowing this fact and with increasing water scarcity and an increasing frequency of conflicts over water, the institutional arrangements governing water in India are receiving more attention. As the demand of water in India is growing along with the growing population, industrialization and urbanization, the demand for new institutional arrangements is also increasing (Saleth 2004).

In India, most water institutions were developed at a time of surplus water and when water demand was not as high as it is today. These institutions are increasingly ineffective in addressing the governance challenges India has today in its water sector. Early institutional choices can influence the long term development and economic success of a society (Bedner and Page 2005; Saleth 2004). The current framework for access to and control over water is influenced by India's colonial history. The basic principles tied to access and control over groundwater are derived from the Indian Easement Act of 1882; according to these Acts landowners had been provided with easement rights on the water found beneath their land (Cullet 2012). In India rights to water are linked with rights to property. Since colonization, groundwater has a direct link with the land above it and the owner has full authority to use it. In recent years, several new laws have been adopted but from rights to water perspective they do not reflect environmental and sustainability concerns nor do they address equitable use of groundwater especially for the poor and marginalized who do not enjoy land ownership, and are thus deprived of access to water (Cullet 2012). The rule came into effect when

there was more need to cultivate crops but the knowledge about groundwater hydrology was limited. The rule has implications with over-extraction and contamination of groundwater that is against the right to pollution-free water especially in the recent times of growing population and rising demand as people rely more on groundwater for their daily needs. The rule only takes care of landowners and their rights to water but does not address those without land (Environmental Law Research Society 2012: 40).

The informal institutional analysis undertaken for this research is done from a historical dependency perspective and argues that water governance has been greatly influenced by old religious values and social norms. These social norms are linked to societal patterns or cultural traditions that have become a part of the system. This study utilizes the concept of path-dependency: “once the actors have ventured far down a particular path, however, they are likely to find it very difficult to reverse course” (Pierson and Skocpol 2002: 699). Path-dependence is common in historical institutionalist scholarship. An example is the canal irrigation system in India, which was set up by the colonial government and still exists. Numerous institutions (corruption, social exclusion, cultural diversity and inequality) have grown around this canal irrigation system. There are, however, hardly any ‘drivers’ that would create pressure for major change (Infrastructure Development Finance Company 2011).

In India during colonization, administrative, economic and political decisions were taken by the British who ruled the country; their effect is still felt in Indian society after colonization, even after more than half a century of independence. The adoption of English as the official language of India was started by the British (Mohammad 2008). All government and official information is available in English. English is however not easily accessible and understandable in different parts of the country. The use of English thus hinders the participation in decision making processes by those who do have any understanding of the English language. Similarly, after independence for the welfare of the citizens, the Indian government implemented several programs, policies and rules that addressed the needs of that time but which are no longer sustainable in this time; those rules shaped the pattern of society and it is difficult now to change them. For example, at the beginning of the eighteenth century an initiative was taken by the colonial government to build large-scale canal irrigation structures as a business to increase crop

production. The situation of those projects around AD 1900 was far better in terms of operation and management and financial returns than it is today (Infrastructure Development Finance Company 2011). Indian States have tried to keep the colonial tradition alive by building massive irrigation structures but the motives have changed. The projects are now driven by politics to benefit some specific groups and corrupt practices are also included (Wade 1982; Infrastructure Development Finance Company 2011). “The main aim of an irrigation scheme is to improve the wellbeing of citizens” (Afroz 1988: 146), but these projects have shown several negative environmental impacts and impacts on human health. Social impacts are also associated with these projects (Afroz 1988). Displacement and migration of large numbers of people are major concerns associated with these projects. Around 16.4 million people have been displaced in the last 54 years and the displaced population faces the consequences of these development induced projects in the form of destroyed family and community life, destruction of cultural activities, increased risks of epidemics and health problems (Negi and Ganguly 2011).

1.9. Methodology and Sources

The research uses the single case study method to analyze water governance performance. To study the entire city in detail for the analysis was not financially nor from a time perspective possible. Therefore, some selective areas within the city were studied. The regions were determined according to the criteria of the major argument of the dissertation which addresses inequality of water distribution in two economically distinct but closely situated residential colonies. Household surveys and deep analysis was conducted in those areas. The areas are considered as the representative of a particular type of areas in the city.

The data obtained from different sources in different forms such as official reports, government documents, archive material, interviews and data from household surveys was qualitatively analyzed and compiled in numerous tables, graphs and diagrams.

1.10. Structure of the Dissertation

The structure of the dissertation reflects the entire sequence of the analysis made to support the major argumentations made in the study including operationalization of the variables.

Chapter 1 introduces the research topic with background information and statement of the research problem. It highlights the research question and the central argument of the study. The chapter gives a brief overview of terminologies utilized and an overview of the megacities and the challenges they pose in the form of water management. Later the theoretical relevance, hypotheses and methodology are outlined.

Chapter 2 explains the adopted theory to analyse water governance in Delhi. The chapter provides details on the theoretical aspects of the variables: water governance, caste system and corruption. Under the light of existing theoretical literature, a conceptual framework for the present study is provided.

Chapter 3 describes the concepts of governance, good governance and explicitly water governance. The importance of water management is highlighted in poverty reduction, promoting equality, safeguarding human and environmental health. The chapter further explains the analytical framework for water governance performance assessment utilized for this study.

Chapter 4 outlines the research design adopted for the study. It provides the selection criteria and procedure of identification and selection of different zones and studied areas for the household survey which was conducted in the city. It further details the methods adopted to collect data and identifies the major sources from where the data was collected. The chapter explains the methods applied to operationalize the independent variables.

Chapter 5 describes the historical relationship of water and culture and provides the basis for taking culture into account while managing water. The chapter looks at

culture, religion, societal behaviour and patterns and the political system of India. The chapter analyses the interconnected relationship of these concepts to water distribution patterns.

Chapter 6 attempts to examine the overall water management situation in Delhi. It investigates water scarcity, urbanization patterns and water distribution. In general, the chapter highlights the nature of water supply problem in various residential colonies and describes the water problem within the surveyed colonies of Delhi.

Chapter 7 details how water governance performance can be measured and explains the steps taken to assess Delhi's water governance performance. It shows the various dimensions of water governance in Delhi and the problems of its ineffectiveness. It further sheds light on water institutions where water laws and water policies are analysed and later water organizations and their functionality is assessed.

Chapter 8 details the influence of independent variables on the dependent variable. It primarily focuses on the relationship of the caste system and corruption. This chapter gives a new concept to the water inequality which is analysed through the lens of the caste system. The chapter explores corruption in India and its prevalence in the water sector. Further it elaborates the consequences of corruption at the city level and at the household level.

Chapter 9 which is the final chapter of the dissertation concludes the study and answers the proposed research question. Based on the major findings of the study, recommendations are made to improve the water situation of megacities which in case of Delhi is the outcome of the caste system. The study ends with highlighting some of its theoretical contributions and research issues to be investigated in the future.

2. Theoretical Framework: Highlighting Importance of Historical Events and Explaining the Role and Importance of Informal Institutions

This chapter lays out the theoretical approach to analyzing water governance in Delhi drawing on the literature on institutions, and especially informal institutions, historical institutionalism and path-dependency. These literatures provide appropriate lenses for analysing the factors influencing water governance performance. By combining the approaches of historical institutionalism and path-dependency, this dissertation aims to explore how informal institutions exert an influence on the performance of water governance. In the first section, a detailed introduction of historical institutionalism and path-dependency is provided which is followed by an explanation of the importance of informal institutions and the limitations of historical institutionalism.

The chapter highlights the linkages between the theoretical aspects and the case study and explains the appropriateness of the adopted theoretical framework. The chapter looks in depth the adopted variables, namely, water governance, the caste system and corruption and discusses their theoretical bases. The dependent variable, water governance, is explored and its definition is formulated. The chapter details how informal institutions influence water governance performance and explains the concepts of the caste system and corruption. It further elaborates upon the hypotheses through which the influence of informal institutions upon water governance are examined.

2.1. What are Institutions?

According to Douglass North, “[i]nstitutions are the humanly devised constraints that structure political, economic and social interaction” (North 1991: 97). In his essay on ‘Institutions’ North analyses the role of formal and informal institutions in economic history. The essay gives an explanation of the evolution of institutions and connects the past with the present and the future (North 1991: 97). North argued that “institutions provide the incentive structure of an economy; as that structure evolves, it shapes the direction of economic change towards growth, stagnation, or decline” (North 1991: 97).

Institutions shape and constrain political behaviour and decision making processes and outcomes. Laws, customs and other established practices found in different organizations work as a guideline for the actors and play a powerful role in shaping their behaviour. There are both formal and informal institutions. Formal institutions refer to constitutions, laws, and property rights. Informal institutions refer to sanctions, taboos, customs, traditions and codes of conduct (North 1991). It is important to focus not only on formal institutions but also on informal institutions because unwritten laws are contributing to shaping the behaviour of individuals. North (1993) argued that, “formal rules are an important part of the institutional framework but only a part. To work effectively they must be complemented by informal constraints (conventions, norms of behaviour) that supplement them and reduce enforcement costs. If the formal rules and informal constraints are inconsistent with each other the resulting tension is going to induce political instability” (North 1993: 18).

John L. Campbell claimed that, “Institutions are the foundation of social life” (Campbell 2004: 1). Institutions comprise formal and informal (rules) and the formal mechanisms for rule making and enforcement that govern the interactions of individuals, corporations and other organizations. Institutions influence the distribution of resources and power in society as they favor the resources and powers which created them. Campbell also argued that institutions guide the way to stability in society because they have the power to regulate conflicts. Institutions help in determining the ability of people to understand the world and enable them to perform in it (Campbell 2004: 2).

According to Sven Steinmo (2001), institutions are rules which act as the foundation for political behaviour. “Institutions define the rules of the political game and as such they define who can play and how they play. Consequently, they ultimately can shape who wins and who loses. If politics is the study of who gets what, when and why? Then institutionalists argue that institutions should be at the heart of that study” (Steinmo 2001a: 2) Steinmo categorized institutions into formal institutions, such as rules, and informal institutions, such as cultural norms. Their presence is a reason for organized politics. Their absence will lead politics into a haphazard condition (Steinmo 2001a: 1). Institutions are created by humans to bind their social interactions and are imposed as constraints in the form of codes of conduct. Such codes reduce uncertainty and establish

expectations regarding defined behaviour. In a way institutions set restrictions on the behaviour of humans and make their actions more predictable (Dobler 2009: 2). Institutions create a legal and social framework for the movement of humans and the life around them. In general, rules that constitute the political, legal, economic and social environment are formally written down in a rule book and are considered as formal institutions. Yet, life is not constrained solely by formal institutions. Morals, norms, values, habits, conventions, traditions and codes of conduct also influence human behaviour. These cultural factors are called informal institutions (Dobler 2009: 2).

A precise and analytically useful definition of informal institutions is given by Gretchen Helmke and Steven Levitsky (2004) “informal institutions are socially shared rules, usually unwritten, that are created, communicated and enforced outside of officially sanctioned channels” (Helmke and Levitsky 2004: 727). In contrast, formal institutions are the rules that are created and enforced through proper and official channels (Helmke and Levitsky 2006: 5). Helmke and Levitsky (2006) provide an overview about the difference between formal and informal institutions. They make four main points: 1) there is a need to define the difference between informal institutions and weak institutions, 2) there are other kinds of informal behavioural regularities which should also be distinguished from informal institutions, 3) there are differences between informal organizations and informal institutions and 4) it is necessary to differentiate informal institutions from broad terms of culture which is in fact a critical area for research; culture may help to shape informal institutions (Helmke and Levitsky 2006: 6). The following section of the chapter will look in depth into informal institutions, including their emergence and their pattern of change.

2.1.1. Emergence of Informal Institutions

In the case of formal institutions, it is relatively easy to identify the actors and the mechanisms of rule creation which are generally public and official. In contrast, with informal institutions the rule- making process is less transparent and the key actors are more difficult to identify. Even the actors who are responsible for the creation and enforcement of informal institutions, may deny that they have created them. Hence, the origin of informal institutions often remains unclear (Helmke and Levitsky 2006: 7). For

example, corrupt and illegal activities typically occur in a non-transparent environment. It is not easy to detect the actors involved in corrupt and illegal transactions. Informal institutions cannot be shaped and changed by the authorities because of their indigenous character unlike formal institutions where rule-making authorities have power. Unlike with formal institutions which receive their legitimacy through the State (Lauth 2000), informal institutions are self-governing and they do not follow any proper and written guidelines.

Nevertheless, “despite their unofficial nature, informal institutions can be precisely understood and described at the analytical level, as they manifest their own functioning logics and rules of identity” (Lauth 2000: 5). One approach that has been identified by Peter A. Hall and Rosemary C.R. Taylor (1998) is a *cultural* approach through which informal institutions emerge (OECD 2007).

To date not much research has been done to answer the question of how informal institutions have emerged. They may emerge for a variety of reasons and in a variety of different ways. Informal institutions are classified as either reactive or spontaneous. Reactive informal institutions are created by actors (bureaucrats, legislatures, judicial and organizational norms) to fill a gap or as a substitute to formal institutions. Spontaneous informal institutions emerge independent of formal institutions. Some of the examples of spontaneous informal institutions include customary laws and kinship-based norms, as well as norms of clientelism, patrimonialism and other particularistic institutions (Helmke and Levitsky 2003: 17). The concept of clientelism explains the relationships which have resulted from “personally stratified relationships” (Lauth 2000). These relationships are based on mutual benefits. Clientelism is perceived as a negative term due to the uneven distribution of benefits to a certain group in exchange for political support. For example, in Delhi some areas are provided with basic facilities even if they are counted as illegal settlements because of their vote support during elections. Patrimonialism is all about personalized power at all levels of authority. It is about loyalty with the leader of the institution rather than the institution itself which is gained through provision of personal favors (Pham 2005: 57).

There are four reasons identified by Helmke and Levitsky why informal institutions emerge. One is the “incompleteness of formal institutions”, when the general parameters for actor behaviour are catalysed by informal institutions and these institutions become more powerful than the laws of the state. Informal institutions may emerge to facilitate procedures when formal institutions do not cover all contingencies related to actors’ work or they do not fully address associated problems (Helmke and Levitsky 2004). Second, actors may also create informal institutions to achieve certain goals, which are too expensive to achieve through formal institutions. In those cases, informal rules are the ‘second-best’ strategy for actors. Third, formal institutions may be weak or not enforced properly. In these cases, actors do not develop or create informal institutions; they turn themselves towards them because formal institutions are weak already. And the last is when informal institutions are created for the sake of achieving objectionable goals openly. Informal institutions allow actors to pursue all kinds of activities without considering their legality (Helmke and Levitsky 2006: 20).

Helmke and Levitsky (2006) argue in terms of coordination; they suggest that informal institutions are the outcome of a bargaining process among actors who seek to maximize their benefits and gains (Helmke and Levitsky 2006: 21).

Another explanation for the emergence of informal institutions is by historical means, a process of path-dependence. This idea will be explained in the section on historical institutionalism. Once informal institutions have emerged, they may become highly resistant to change, when change occurs, it is expected to be slow (Helmke and Levitsky 2006; Lauth 2000; North 1990). Unlike formal institutions which are guided and controlled by the State, informal institutions do not possess a centre to direct and coordinate their actions and therefore their change is extremely slow (Lauth 2000). There are variations found in the changing pattern of informal institutions, which depends upon the way they have emerged. Helmke and Levitsky suggest that informal institutions created by elites are more accepting of change. They gave the reason for this as the small number of actors interacting with each other. In cases where informal institutions are created by a society where comparatively large numbers of actors are involved, in a scattered manner with repeated interaction, shifting of all the actors around a new set of rules is more difficult (Helmke and Levitsky 2006: 22). In a kind of bottom-up

emergence, coordination must take place within large groups so that once an informal institution is in place it is difficult to change. The large size of the group makes coordination difficult.

But under certain conditions even deep rooted and decentralized social norms may change relatively quickly. A very good example is foot binding in China, which disappeared in just one generation (Helmke and Levitsky 2006: 22). Change in informal institutions tends to be a rather slow process although in some cases it can occur more quickly. There is a clear need to give attention to the questions of how and why informal institutions change. Helmke and Levitsky (2006), present three types of informal institutional change: (1) formal institutional change (2) changes in underlying distribution of power and resources, and (3) changes in shared beliefs and collective experiences (Helmke and Levitsky 2006: 22).

2.1.2. Challenges in doing Research on Informal Institutions

The challenge of doing research on informal institutions lies in the way they occur. Formal institutions are easy to detect and measure due to their written and officially communicated behaviour. In contrast informal institutions are unwritten requiring a much bigger effort to identify them. For example, a country's constitution can inform us about the system of government it has whether a parliamentary or a presidential system. The constitution typically does not give any information about the existence of kinship relations. Identification of the social networks on which informal institutions are usually based are difficult to measure. A really substantial knowledge about the communities, their behaviour and their social values is needed. Ethnographic research is a useful tool for identifying informal institutions (Helmke and Levitsky 2006: 25).

2.2. New Institutionalism

“The roots of political science are in the study of institutions” (Peters 2012: 1). Efforts towards redirecting the focus of contemporary political science as well as the phrase ‘new institutionalism’ are derived from the work of James G. March and Johan P. Olsen (1984; 1989; 1994; 1996) (Peters 2012: 1). New institutionalism is about the

behaviour of political actors which is shaped and conditioned by the institutional context in which they operate (Bell 2002). New Institutionalism is a field in contemporary political science research that developed out of old institutional analyses. 'New institutionalism' was launched by political scientists' March and Olsen in the year 1984 in their path breaking article, "The New Institutionalism: Organizational Factors in Political Life." Here they argue that 'old institutionalism' is focused on the study of public constitutional laws and the formal operation of political institutions and displays little interest in social behaviour and its impacts on public policies. There was a move away from formal institutions in March and Olsen's 'new institutionalism'. The behavioural revolution pointed towards organized social institutions within which political behaviour, driven by rules, norms and cultures occurs (March and Olsen 1984; Hall and Taylor 1996). "The new institutionalism offers a perspective on how political life is organized, functions and changes in contemporary democracies. The term includes a set of theoretical ideas, assumptions and hypotheses concerning the relations among institutional characteristics, political agency, performance, and institutional change, and the wider social context of politics. In contrast with an older institutionalism that used formal-legal rules as proxies for political action, the new institutionalism is behavioural" (Olsen 2007: 2).

Lisa Marriott (2008: 59) contends that new institutionalists do not rely only on a belief in behaviour in order to explain the processes and outcomes of governments but rather that institutions constrain behaviour. In order to understand behaviour, institutional analysis is important. Not only formal rules and laws explain political behaviour and policy outcomes. To understand and explain political outcomes it is also necessary to understand the informal distribution of power and attitudes (Thelen and Steinmo 1992: 4). New institutionalism continues to provide a useful perspective for the analysis of political dynamics and the outcomes that shape everyday life. Institutionalism has become so common that each of the disciplines of social science has its own 'new institutionalism' (Bell 2002; Koelble 1995; Lowndes 1996). New Institutionalism aims to provide a greater understanding of political nature and the ways in which institutions shape the nature of actors and their behaviour by guiding them through policies, laws and norms (March and Olsen 2005). New institutionalism addresses informal and formal

institutions and their interaction, the creation of institutions, and the continuity and change in and of institutions that are not easy to manage or control (Hall and Taylor 1996).

In sum, new institutionalism is a prominent theory which focuses on comprehensive studies of institutions, the way they affect society, the way different institutions interact with each other, and how institutions shape the behaviour of individuals and bring about changes. The core assumption of this approach is that institutions matter because “they shape or influence the behaviour, power and policy preferences of political actors” (Bell 2002).

2.3. Historical Institutionalism

In recent years, the analysis of political outcomes is increasingly focused on institutionalism. It is assumed that institutional rules constrain human interactions and are important to understanding decisions taken by actors. In other words, human interactions are shaped by institutions (Javid 2012: 34). In the social sciences, Hall and Taylor (1996) identify three dominant institutionalisms: rational choice, sociological and historical institutionalism; each explains the role that institutions play in determining social and political outcomes but with distinctive approaches (Hall and Taylor 1996). Steinmo (2001) did not try to differentiate among them but tried to point out the differences among historical institutionalism, rational choice institutionalism and sociological institutionalism. According to Steinmo (2001) the three kinds of institutionalism see institutions as rules that shape the behaviour of actors (Steinmo 2001b). All three approaches were developed in reaction to the behavioural perspectives and seek to understand the role of institutions in order to determine social and political outcomes (Hall and Taylor 1996). Thus, in rational choice institutionalism actors use institutions to maximize their benefits by acting strategically within a given institutional context while sociological institutionalism emphasizes on the cultural context where institutions are embodied to structure the interaction of various actors within society.

According to Steinmo (2008), “Historical Institutionalism is neither a particular theory nor a specific method. It is best understood as an approach to studying politics”

(Steinmo 2008: 118). Steinmo talks about some distinguishing features of historical institutionalism such as its focus on real world empirical questions from a historical perspective. Historical institutionalism gives special attention to institutions because of their guiding character in shaping and structuring political behaviour and its outcomes (Steinmo 2008: 118).

Three important features of historical institutionalism mentioned by Paul Pierson and Theda Skocpol (2002) in contemporary political science are: (1) big and real world related questions are addressed by historical institutionalists that tend to be of great interest to the extended public and to fellow scholars. (2) Historical institutionalists take time to develop explanatory arguments about the outcomes and puzzles they come across. Historical institutionalists specify the sequence of historical events in order to trace processes. (3) Historical institutionalists analyse the combined effects of institutions and processes developed overtime rather than looking at a particular institution or process at a particular time (Pierson and Skocpol 2002: 696).

In historical institutionalism, analysis starts with puzzles such as why something has happened or why certain structures or patterns took shape at a particular time and place. The focus in historical institutionalism is on patterns and events which happened in the past rather than on taking into account human behaviour (Pierson and Skocpol 2002). Historical institutionalists are interested in addressing real world questions in order to educate the public and scholars. Historical institutionalism looks at processes over time (Pierson and Skocpol 2002). Any extension in the time frame analysed widens the range of experiences to be looked at and makes more data available, which may generate more variations in outcomes. Many phenomenon of interest to political scientists such as revolutions, democratization and construction of welfare states do not occur frequently or at any particular slice of time (Pierson and Skocpol 2002).

Historical institutionalism is a process tracing of events which happened in the past but whose influence is still felt.

The basic goal of historical institutionalism is to analyze and understand past processes to discover the laws which governed these processes. The fundamental

Cartesian principle is that “the world – and everything in it – is governed by basic laws. If we can understand these laws, we can understand and ultimately control the world we live in” (Steinmo 2008: 120).

Steinmo (2008) mentioned three important ways in which history matters: One, political events which happened in the past have direct impacts on the decisions taken afterwards or on events which later occur. An example is the process of industrialization, which is different for late developers than early developers (Steinmo 2008: 127). Second, actors learn from their past experiences. Historical institutionalists give extra importance to social, political, economic and cultural contexts because they believe that behaviour, attitudes and strategic choices take place within those contexts. Regardless of time, space and context, historical institutionalists treat political actions differently by situating them in an appropriate context (Steinmo 2008). Finally, history affects actor’s beliefs, values and preferences (Steinmo 2008: 127; Fioretos et al. 2016).

According to Robert D. Putnam, Robert Leonardi and Rafael Nanetti (1993) historical institutionalists trace the sequences in government and politics and emphasize timing and sequences in institutional development. They also mentioned that “*Institutions are shaped by history*” – institutions are resistant to change because of their inertia and the power to stay. “*History matters because it is path-dependent, what comes first conditions what comes later*” (Putnam et al. 1993: 7). Hall and Taylor (1996: 7) addressed four dominant features of historical institutionalism: 1) it tends to conceptualize the relationship between institutions and individual behaviour in relatively broad terms. 2) It emphasizes the asymmetries of power associated with the operation and development of institutions. 3) It explores the impact of path dependence and unintended consequences. 4) It is concerned with integrating institutional analysis with the contribution that other kinds of factors such as ideas, can make to political outcomes.

Historical institutionalism conceptualizes the relationship between institutions and individuals and explores the impact of path dependence and unintended consequences. In this thesis the influence of informal institutions on the actors and the choices they make at key choice points, will be described under path-dependency. The reason is the old and deeply rooted cultural norms and values of India and their great influence on the

behaviour of actors and also on formal institutions, which cause inefficiencies in the working of water governance in Delhi.

2.3.1. Path-dependence

According to James Mahoney (2001), path dependence refers to a specific type of explanation about the historical events through a series of sequential stages where a range of options is available to the actor. At certain stages actors make choices; at these so-called ‘critical junctures’¹⁰ or choice points selection is made among two or more alternatives available at the time. The choice made is extremely important because it will lead to the creation of institutional patterns which will continue over a span of time (Mahoney 2001a: 112).

Mahoney (2001) said about path-dependence: “it is difficult for actors to reverse the effects of choices made during critical junctures”: the decisions are difficult to change because they lead to the formation of institutions which are persistent by nature. These are the institutions which are taken as the development paths followed by countries (Mahoney 2001a: 114). “In a path-dependent framework, institutions persist over time in the absence of the processes responsible for their original development” (Mahoney 2001a: 114; Stinchcombe 1987). The stability in the pattern of these institutions brings them into a situation of lock-in where their transformation is extremely difficult (Mahoney 2001a: 114, Stinchcombe 1987; Campbell 2004: 65; Pierson 2000a). “The concept of path-dependence is used by historical institutionalists to explain welfare reform, the outcomes of political revolutions, the persistence of different types of capitalism, and many policy developments” (Campbell 2004: 65; Pierson 2000a; Mahoney 2001b).

The various options which are present at the time of a critical juncture are also typically rooted in prior events and processes.

¹⁰ Critical juncture is defined as a point where the key actors have a range of options available to them in order to make their choice. Once a particular option is selected at that moment of time from the available options it becomes much more difficult to return to the same point when multiple options were available (Mahoney 2001b: 6).

Mahoney (2000) explained a type of sequence within the framework of path-dependence that is self-reinforcing sequence. Self-reinforcing sequences have continued adoption tendencies and deliver increasing benefits because of it. Over the span of time it becomes very difficult to transform this pattern of creation even if the alternative options or mechanisms are more efficient (Mahoney 2000). Mahoney also argued that to understand the specific mechanisms that produce self-reinforcement is of crucial importance because the other alternative mechanisms will suggest different ways in which patterns marked by path dependence might be reversed as these additional mechanisms can underpin reproductive processes including functional, power and legitimation mechanisms (Mahoney 2000). Another important claim is once a country or region takes a path it is likely that it will stay on the same path in future and that initial choices cannot be reversed easily without large cost involvements (Saint-Martin 2005: 9). It is important to mention here that from the idea of reinforcing consequences institutional change cannot take place; in contrast, institutional change follows a particular path and actors adapt to those changes. Self-reinforcing sequences follow the ‘process of reproduction’. It was mentioned by Pierson that initial disturbances are essential as they spark a powerful start to move the system in a direction different from the one which was followed earlier (Pierson 2000b; Mahoney 2000: 527).

In sum, path-dependence is an approach which explains how actors’ choices made in the past create institutions, which in turn shape actor behaviours and lead to the development of institutional patterns (Mahoney 2001b).

2.3.2. Limitations of Historical Institutionalism

One of the primary critiques of the historical institutionalist approach is that is not suitable for explaining institutional changes. This is confirmed by the literature on path-dependence. The approach is suitable in explaining the persistence of particular kind of pattern but not pattern change. Historical institutionalists are not quick in identifying “the general process involved in institutional creation and change” which makes it difficult for them to explain “why policy change occurs or under what conditions it occurs” (Kalliga 2006: 46). Historical institutionalism is useful in explaining the persistence of any policy, which is initiated but is less able to explain the initial adoption of that policy.

Historical institutionalists lack the kind of universally applicable concepts on which deductive theories are based; rather they are more focused on inductive approaches where they develop their hypotheses inductively by making an empirical observation and detecting patterns (Thelen and Steinmo 1992:12).

Historical institutionalism is accepted as an approach to explain the obstacles created by institutions and opportunities for reforms but it does not explain the ideas, which may influence decisions (Marriott 2010: 65; Beland Daniel 2005).

2.4. Linking the Theoretical and the Case Study Arguments

Informal institutions which emerged in the past centuries and took different forms over time are examined in this study. Corruption is one form of an informal institution as it has emerged out of the unwritten laws of society. Those unwritten laws address the values and beliefs of society. Corruption is associated with the caste system and religion where personal relations have great importance. For example, giving gifts is a customary trend in Indian society, but offering gifts in return for services for which one is not eligible creates an environment for illegal activities (Teorell 2007). People prefer individuals of their own caste in the society to provide services or help them in various other ways such as school or university admissions, employments opportunities (Prasad 2013).

Various causes for the emergence of informal institutions can be found in theory. One explanation is the incompleteness of formal institutions (Helmke and Levitsky 2004). When formal institutions are weak and do not cover all necessary contingencies for enforcement, informal institutions are turned to for support. The incompleteness of formal water governance institutions includes the lack of enforcement of state laws, which has opened the doors to corruption. Corruption has become an integral part of the functioning of the water sector in India.

There is a social dimension to water governance, and in particular how to obtain an equitable distribution of water resources. In order to understand the social dimensions of water governance it is highly essential to understand the informal institutions in India and their influence on society. It is also essential to know how the society utilizes water.

In this dissertation, the definition of informal institutions varies from family relations to cultural values; social norms to traditional and religious practices. It emphasizes that they are important to include in the analysis and can hinder or help development in different ways. India's culture is still pervaded by the concept of the caste system which discriminates against lower caste people, even though it has been formally outlawed by the Constitution (Government of India 2007).

In Delhi the impact of informal institutions is both positive or negative; informal water suppliers are able to get water to those parts of the city where no water is supplied by the authorities but they have to deal with issues of violence. They also cause long term environmental problems for the city because they illegally extract large amounts of groundwater.

As stated by Steinmo (2008) history matters. In the case of water governance in Delhi, history has great importance because of the caste system and other cultural and religious values which are still followed and influence the behaviour of actors. In particular, informal institutions matter and are researched for this dissertation, drawing on path dependent historical events. Clarification was provided by Putnam et al (1993) on history and why it matters "history matters because it is path-dependent, what comes first conditions what comes later" (Putnam et al. 1993: 7). The high rate of migration to Delhi from other neighbouring states, the way migrants have occupied the city in different pockets, the way elections are fought and the tendency of political leaders to give preferential treatment to people of a similar caste or religion, are influenced by historical legacies (Haider 2016). It is not only the religious values that directly influence water governance but also cultural and social norms and societal patterns play a role. Participation of women in stakeholder's meetings is avoided because of social norms although she is the one in the household who takes care of water (Berry and Mollard 2010).

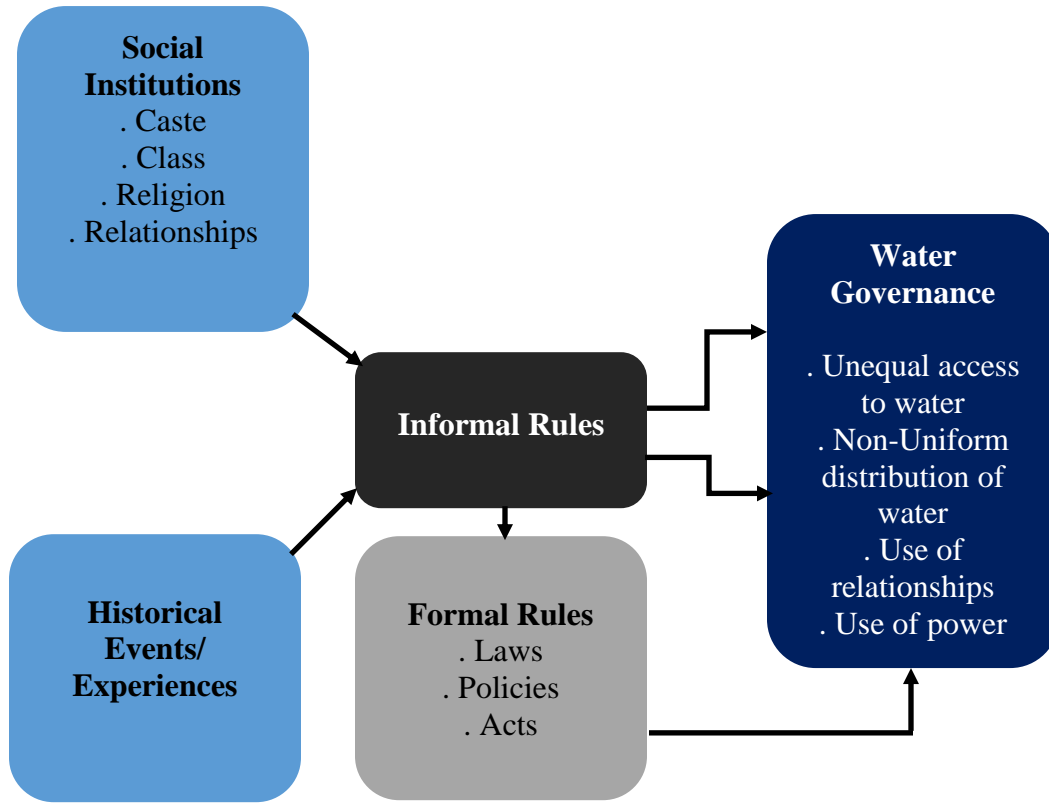
The caste system influences the way Indians live and the services provided to individuals who are of different castes.

Indian Caste System is inclusive and deeply rooted.

The caste system is a phenomenon of ancient India; it has come to be almost synonymous with the concept of class in contemporary society. The class concept in Delhi emerged from the caste system and consists of the same features; in the class concept, societal divisions are based on the financial stability of a group. The transformation of the caste system into class is in a 'lock-in' situation and has become extremely difficult to abolish.

Self-reinforcing processes are making it difficult for political actors to switch to other policies even though they know that the existing path is not really producing efficient outcomes. After independence, several laws and policies were introduced to abolish inequality and to support lower caste people. The changes were embedded in the Constitution, which rejected the caste system and introduced the concept of equality for all. The Reservation Policy in India was introduced to strengthen the social mobility of lower caste groups by providing them guaranteed places of work in the government sector through a quota system. This policy has had both positive and negative impacts which are discussed later in chapter eight in detail.

Figure 3: Impact of Informal Institutions on Water Governance.



Source: Author.

2.5. Linking Water Governance Performance and Informal Institutions¹¹

People have diverse perceptions of water. For some it is an economic or practical commodity. For others it is related to their religion; this makes water management and water governance highly complex. “Water is a multiple entity, it possesses its own biophysical laws and properties” (Truelove 2011: 44). Social conflicts may arise among industrialists, irrigators and urban and rural populations over the distribution and

¹¹ The quality of governance is measured on the basis of its building blocks which are also an evidence of the quality of institutions that are needed to promote development; high quality institutions enable better governance (OECD 2007). Good governance is crucial for human development and poverty reduction. Ineffective governance hits the poor the most. In emerging and developing countries where formal institutions are usually poorly established, informal institutions have more importance and can hinder or can help in the development or to get services. These informal institutions such as trust, social capital, family structures and social norms are deeply rooted and they compete or complement formal institutions or often substitute for them (OECD 2007).

utilization of water. To understand social conflicts, it is essential to understand how different groups value water and what is the meaning and role water plays in their lives. This is also important for understanding and evaluating behaviour and actions of actors towards environmental protection. Mallory James, Anne-Maree Dowd, Shelley Rodriguez and Talia Jeanneret (2012), Ute Goeft (2008) and Deanna Kemp, Carol J. Bond, Franks, Daniel M. Franks and Claire Cote (2010) have pointed to the concept of social values related with water, an area that is underemphasized by decision makers who tend to give preference to legal, technical and economic perspectives in their discussions (James et al 2012; Goeft 2008; Kemp et al 2010).

In various countries including India where water has a religious value, regulation of water is a sensitive issue. Indian's perception of water as divine is a social phenomenon; the morning and evening prayers of Indians with a handful of water are a part of daily life (Rodda 2004). Understanding such social phenomenon is very important for the case study presented in this dissertation. Water governance performance is highly influenced by the value of water, especially in deeply-rooted cultural and religious terms because of the role played by water in all of India's religions (Sharma 2004). Despite the walk of time, religious and cultural values change slowly if at all. Yet pressures on water governance are increasing due to the burdens created by an increasing population and the increasing demand for water in industry and agriculture.

Various aspects of water management have ritualistic meaning in India and are woven into religions and cultural habits. Rivers have religious significance due to the belief that bathing in a holy river removes all past sins. Dipping worship items into holy water is also considered to be of great spiritual value (Rodda 2004). Various religious and cultural activities are associated with holy rivers; for example, traditional cremations are performed in and along holy rivers (Misra 2010). These religious rights contribute to the high pollution load of India's water resources and significantly influence water governance performance (Das and Tamminga 2012). Cultural impacts are also evident in the pattern of water distribution in Delhi. The way water is distributed gives clear hints about the dominance of culture and beliefs in Indian society, and the role of the caste system. In other countries and megacities such as Jakarta, Indonesia and Dhaka,

Bangladesh water distribution is linked to the concept of class (Bakker et al. 2006; Haq 2014).

Informal institutions and governance can be seen in India's network based society. The relationships found in social networks rather than formal rules determine many decisions¹². Informal institutions play a strong role in the country and are linked to one of its biggest problems: corruption. "Social networks help to explain the nature and extent of corruption" (Gehlbach 2001: 4). Social networks serve as both substitutes for and a complement to money. They can facilitate corrupt transactions, which make it more profitable or easier to get services (Gehlbach 2001). Social networks play a crucial role in determining the size of the bribe; lower bribe payments can be made with good social relations (Chavis 2011; Gehlbach 2001). Social networks make the process faster by offering bribes or can be given just as a token of friendship (Gehlbach 2001). Social networks can help in identifying an official who can be bribed. A bribe can be seen as an investment which is made in exchange for services (Gehlbach 2001). There may be bribery discrimination between potential payers (Teorell 2007); in such a situation, the winners are usually those with stronger social networks. Corruption is thus linked to social networks and greatly influences the social dimension of water governance where water is non-uniformly distributed to those who can pay bribes and have strong social connections.

Since, water governance performance is tied to the caste system, class and corruption, the succeeding chapters of the dissertation will take up each of these points individually and explore them empirically in the context of the case study. This is intended to help in concluding about the root causes of poor water governance performance in Delhi and will show some directions for the development of recommendations for institutional and community based solutions. Community plays a very important role in the development and implementation of water management policies and programs.

¹² In this study social relations include family relations, friendships, and relations on the basis of caste and religion. Transactions may be made on the basis of social relations. The building of trust is also based on social relations.

2.6. Explaining the Concept of Informal Institutions

The major focus of this dissertation is on informal institutions and their influence on water governance. As noted by the OECD informal institutions have an impact on development outcomes; ignorance about them can become very expensive for both developed and developing countries (OECD 2007). The impact of informal institutions can be negative or positive depending on the specific country context; even within the same country context the outcomes from the impact of informal institutions can be different (OECD 2007).

There are various informal institutions such as different religions, cultural values, and class. They are often linked to different criteria determined by, for example, skin color, birth, religion, money, nationality and race from the society where a certain group is not allowed to participate and have no voice, which makes their influence very limited on issues under discussion (OECD 2007:15).

In this dissertation three types of informal institutions are examined: *caste system*, *class and corruption (the 3Cs)*. These 3Cs influence water governance in different ways. The caste system is specific to India while class and corruption are global issues.

In developed and developing countries, rich and poor nations generally people rely on informal institutions to facilitate transactions and to gain access to services. Generally, informal institutions tend to be of much more importance in poor and developing countries because of weak and under developed formal institutions. Even the political systems of such countries are dominated by informal institutions (OECD 2007). Formation of informal institutions is recognized as highly important especially in those countries where authorities have limited power to provide facilities. On community level people organize themselves in order to have access to water, health scheme facilities, construction of roads and sanitation facilities. One example is South Africa, where village associations depend on trust and peer pressure to obtain access to credit, loans and insurance. These services are utilized to facilitate public road and sewage system construction. Another example is the community based health insurance schemes found all across Africa, which are based on informal institutions (OECD 2007).

In case of India, development is achieved in various projects of water sector and forest management through informal institutions where communities take part, it is called 'self-help' approach. The self-help approach avoids bureaucratic processes, but also has some negative implications. Difficulties include the lack of long term planning due to conflicting interests of different stakeholders and non-homogenous groups, which may create hindrances for sustainable long-term development, and achievements from the projects can be undermined (OECD 2007: 107).

In various cases, where formal institutions are not able to support the entire system effectively, informal institutions are relied upon. For example, South Africa's mini bus taxi service industry evolved in response to shortcomings in the country's public transport system which was plagued by high prices, low quality service and a messy operating network (OECD 2007). Another example, is the emergence of private water suppliers in case of Delhi, where water services from the public utility were not satisfactory.

2.6.1. The Concepts of Caste and Class – Forms of Social Stratification

Inequality is a global issue and has been an essential feature of all societies since prehistoric times (Suchinmayee 2008). With the walk of time, inequality has changed in form but persists. Inequality can be found in many areas: the distribution of resources, wealth, income, knowledge or status related with individuals, households or communities (Suchinmayee 2008). It is like a social structure constructed layer upon layer of different social groups. Inequality deprives lower groups from resources by diverting them to higher status groups. Lower status groups are discriminated against in various ways, such as in terms of livelihood opportunities, education and employment (Dhesi 1998). One of the major concerns in analyzing inequality is to understand its impacts on social sustainability.

The concept of caste had been well researched, but some relevant questions remain open. Why does the caste system survive even in modern, contemporary times? This section is focused on the meaning of the caste system, what it brings into society, and how it impacts society.

Various authors have various theoretical descriptions about the caste system. According to André Beteille, caste is a hierarchical system referred to as a group of people who are characterized by their hereditary membership, and a specific life style which is also restricted to a particular occupation (Béteille 2002). Berreman related the caste system to birth-ascribed groupings which are ordered in a hierarchical manner but have distinct cultures (Berreman 1968). According to Louis Dumont (1980), caste is a complex group inclusive of various groups of diverse levels in which various functions such as endogamy and occupation is attached (Dumont 1980).

Sociologists and social anthropologists have identified different approaches to caste (Subedi 2013). Caste is used without considering geographical boundaries and linked to a class-based system in which there are hierarchies and the boundaries between different layers are unbreakable (Subedi 2013; Leach 1967). Caste may also be connected to a specific traditional social organization tied to Hinduism. Caste is found in Hindu-based societies, such as India, Bangladesh, Nepal and Sri Lanka (Leach 1967; Dumont 1980; Subedi 2013). In a caste system, groups are differentiated by large differences in terms of their living standards. These visible differences are easy to recognize and aid in the labelling of groups (Leach 1967). Caste is also related to religion and cultural values. In this sense, caste is considered as a social organization (Subedi 2013; Leach 1967; Dumont 1980; Hutton 1946). Various authors (Leach 1971, c1960; Berreman 1968; Appadurai 1986; Gould 1987-1990) have labelled caste as a cultural or structural phenomenon. Max Weber, in contrast, argued that “caste is a fundamental institution of Hinduism” and is specific to culture. Weber also found caste systems among Buddhists (Weber et al. 2007, ©1948; Leach 1971, c1960). In contradiction to Weber, other authors such as F.G. Bailey, Fredrik Barth, Andre Beteille argued that caste should be considered as a structural feature which is not specific to Hinduism in India but also related to other countries and other societies (Subedi 2013; Gould 1987-1990; Bailey 1957; Barth 1971, c1960; Béteille 2002).

First, attention will be drawn to the caste system as a social structure and later to its diverse characteristics which are not societal and location specific.

According to the “Caste as a Hindu Social Construct” school of thought – the caste system is unique and cannot be compared with any other kind of social system (Subedi 2013: 55). The unique feature is that differentiations are birth or ancestry ascribed and not by any physical feature or skin colour (Saenz et al. 2015; Subedi 2013). According to Weber, caste is an integral part of Hinduism and in this religion caste comes first before anything else (Weber et al. 2007, ©1948). Weber looked in a comparative manner between caste and other social groups and said that caste is a closed system where movement from one layer to another is restricted. He saw it as a more perfect system than class where changes cannot be made. Weber related Hinduism and caste with Karma which is related with the concept of rebirth (Weber et al. 2007, ©1948). According to Karma if someone fulfills all the duties of his or her specified caste they will be rewarded after rebirth (Subedi 2013). Another very important characteristic of the caste system analysed by Dumont (1980) that caste system is a religious hierarchy rather than a political hierarchy. The principle on which the caste system is based is the concept of purity and impurity which is again related with religion. Dumont emphasized the totality of the caste system and not its individual members. He also considered the caste system as a cultural or religious form of social inequality (Subedi 2013; Dumont 1980).

The caste system is about social inequality, a global issue. Comparing the caste system in India with other hierarchical organizations elsewhere, Berreman (1972: 197) argued that, “to define caste in terms of its uniquely Indian attributes eliminates or at least diminishes its use as a cross-culturally comparable phenomenon”. According to Berreman, the Indian caste system refers to several groups of society where each section is ranked vertically. In this way other social structures such as racial ranking of groups in the United States is similar to the Indian caste system (Berreman 1972). According to comparative social theorists, the caste system does not possess unique religious features or structures; social stratification and social differentiation are comparable forms of inequality (Subedi 2013). Berreman (1972) argued that all the social systems with hierarchical subdivisions including the caste system where membership is hereditary and permanent follow the same concept no matter where they occur. The concept of caste is also not only limited to Hinduism (Berreman 1972). There are some studies, such as the study of Barth in Pakistan which provides evidence that the caste system is not only

bound to Hinduism but is also found in Muslims, Sikhs and Christians (Barth 1971, c1960). He provided several similarities between the two structures which are enough to conclude that caste system is not unique to Indian Hinduism, it is applicable in other societies in other countries (Subedi 2013; Barth 1971, c1960). Barth compared the system of social stratification in Swat with Hindu caste system, even though the communities in Swat are Muslims. He found that in Swat, the division of groups is similar to a caste division, where lower status people provide services to higher status groups. In Swat, some occupations are considered as polluted similar to the case in the caste system where impurity derives from lower caste people. Barth pointed out that social inequalities are a matter of structure, how they have been grouped and how people of various groups are treated by others. Social stratification is a pattern followed where the role of culture is a secondary aspect to consider (Subedi 2013; Barth 1971, c1960). Even in India Muslim communities are divided into groups and follow the notions of pollution and untouchables, highlighted by Barth (Subedi 2013).

The concept of class is a western phenomenon that is found especially in Britain and the United States. This is a phenomenon where people rank themselves into different categories within a system of economic stratification. Similar with caste, the concept of class varies from place to place. It revolves around life styles, occupations or level of income. Similar with caste, where people are judged or respected depending on their castes, an expression of “respectable class” and “dangerous class” exists (Wright 2003: 1). In contrast with caste, class does not follow the features of religion, ethnicity, or gender. Class is also defined in terms of standard of living. Various rungs of class are named as: upper class, upper middle class, middle class, lower middle class and lower class; this is the concept which is the most obviously followed in countries like United States (Wright 2003). In this manner the class concept is different from other classifications and focuses primarily on income inequality.

Class has characteristics of both Weberian and Marxist¹³ traditions of social theory which means other determinants such as geographic location, race or gender, and

¹³ Weber’s analysis of social stratification is not based on or linked with historical analysis of social development. According to Weber class stratification has a clear economic dimension. He also mentioned two other dimensions of stratification such as Status and Party in order to have clear understanding about

discrimination are useful in analyzing that why some people end up in different classes – but the concept of class in itself is the link of people to income generating assets (Wright 2003; Weber 1978). Weberians and Marxists examined the concept of class along two most important theoretical traditions. They both agree with the importance of social relations which link people and economic resources; they also discuss the effect of social relations on the interests of people towards their physical survival (Wright 2003; Weber 1978). Marxist class analysis asserts that poverty is not related with laws of nature, but is created by our designing of social institutions in a manner that exploits the poor (Wright 2003; Weber 1978). Marxists argue that history is basically all about the struggle between classes of dominance. Marxists emphasize that social analysis should be focused on class structure and class relations in order to have a complete understanding of who is benefiting or dominating the most and why policies are directed to particular benefits (Weber 1978).

Some studies also point out the behaviour of people of different classes. The upper classes often have greater resources and more freedom and independence which facilitates unethical behaviour. Lower class individuals live with fewer resources, under threat and with more uncertainty (Piff et al. 2012). There is persistence to caste and class; the ones who are at the top of the hierarchy do not want to lose their preferential treatments (Weber 1978).

There are several similar features between class and the caste system. Both promote inequalities and discrimination against those who are at the bottom of the hierarchy. These phenomena and the feature of social networking are of considerable importance to this study.

2.6.2. The Concept of Corruption

Corruption is a phenomenon which is widely observed in developed and developing countries and has become a global challenge because of its various effects on

different social stratifications. On the other hand, Marx put importance on the history of societies and the *history of class struggles* (Bose 1965).

societies. Before turning to an analysis of corruption as a global challenge, this section examines some of the determinants and consequences of corruption.

The most common definition of corruption used worldwide is “the misuse of public resources for private gain” (United Nations Offices for Drug Control and Crime Prevention 1999: 3; The World Bank 1997). Whereas the objective of good governance is to serve the public, corruption serves the narrow interests of family and friends as well as self-interests. Corruption encourages acts and decisions to be made outside of office chambers; therefore, corruption creates challenges for policy makers and other development actors wishing to create fairness and equity in resource distribution (Estifania 2005). Corruption ranges from involvement of public servants in the act of bribery, to moral decay, to tangible resources transfer and doing favors in return for a job done. Corruption and its measurements are complex issues from theoretical perspective because of the difficulty of collecting data. Not only is data difficult to obtain, it is often unreliable in the sense that the scale of corruption cannot be measured at any point in time (Lindsey 2008; Andvig et al. 2001). Research on corruption is difficult because many times the causes of corruption are difficult to separate from its consequences and also because the perpetrators seek to keep their transactions secret (Rowley and Schneider 2004; Rose-Ackerman 2006; Johansson and Lext 2013). Corruption is seen as complex which is tied to numerous other forms of social interaction such as gifts giving, kin ties, patronage (Rothstein and Torsello 2013); but it is grounded on the very simple concept of personal gain. Various efforts are made to tackle corruption through law enforcement, public awareness programmes, and organizational restructuring in various countries. Despite such measures, corruption typically does not disappear rather it takes new forms in response to changing social conditions (Girling 1997; Andvig et al. 2001). Changes in the political and economic environments give rise to new patterns of corruption; one of the example is China where some new trends of corruption had been observed in the recent years. In the country, instead of illegal cash, capital corruption has prevailed as corrupt officials snatch state assets for personal collection of fortunes (Dittmer and Liu 2006).

There are various approaches to analysing corruption in the fields of economics, political science, sociology, and anthropology (Tamina 2015). The sociological approach

to addressing corruption, is to identify it as a social-problem. Social problems are associated with behaviours which hinder the functioning of society by block the fulfilling of needs and goals of a society (Aluko 2002). The same is true with corruption; when corruption is institutionalized it penetrates into the value-system of a society. It becomes a part and parcel of the culture and later shows up as a particular behaviour (Aluko 2002). Institutionalized corruption becomes a permanent feature of society, a kind of social norm. Those born into a culture of corruption, live with it and most probably die in it. To bring any change in such a social norm takes time and is a long term effort (Lindner 2014).

2.6.2.1. Causes of corruption

Corruption has many faces; in some place it is the problem of a country's political and legal system and elsewhere it is the outcome of economic and structural policies. It can also be defined in terms of culture where institutions have a role to play (Seleim and Bontis 2009; Andvig et al. 2001). It is difficult to understand why corruption is more widespread in some countries than others and to measure its relative levels in different countries (Treisman 2000). But it is important to understand it because corruption tends to inhibit development and adversely impacts the poor.

Apart from the widely used definition of corruption as the misuse of public resources for personal gain, another widely used definition is the transaction between private and public sector actors where shared goods are illegitimately labelled as personal belongings (Heidenheimer and Johnston 2002; Andvig et al. 2001). Rose-Ackerman (2006) emphasized the significance of the private and public interface or agent-client relationship. She described various ways corruption can occur and bribes can be given or taken. But the motives behind the different approaches are the same: personal gain (Rose-Ackerman 2006). Colin Nye's (1967) classical definition of corruption labels it as a type of *behaviour* used solely not for personal gain but also for *status gain* (Nye 1967). According to Mushtaq H. Khan (1996), corruption is related to the behaviour of an actor in order to seek personal interest such as wealth, power or status (Khan 1996: 3).

Political stability affects levels of corruption; “*corruption is rooted in political deficiencies*” (MacDonald and Majeed 2011: 10). Samuel P. Huntington emphasized the degree of political stability and its role in corruption. In the United States and Great Britain, both politically stable countries where political leaders and citizens share a general common vision about maintaining a degree of basic welfare in society, there are strong political institutions, effective bureaucracies, well-organized political parties and a high degree of public participation (Huntington 1971). Many countries in Asia, Africa and Latin America, he argued, are politically instable because of changes brought about by urbanizations, industrialization, declining illiteracy rates, mass media expansion, and extended political consciousness. These changes he contended created problems for new political associations which in turn resulted in political instability. According to Huntington (1971), political instability is linked to corruption.

Wouter Ebben and Albert de Vaal (2009) argued that corruption is a part of the institutional setting and affects the economic growth of a country by affecting labour inputs and provision of public goods. In a case where institutions are not fully developed or weak, however, corruption can contribute to growth due to bribe bidding competition among entrepreneurs. Entrepreneurs may attempt to influence decision-making processes by paying bribes. More efficient entrepreneurs can afford higher bribes. When a project is assigned to the most efficient firm facilitated by corruption this brings about economic benefits (Ebben and de Vaal 2009). On the other hand, corruption can effect on the economic growth through various channels. Corruption increases the private business investment because of the payments made in the form of bribe. Corruption also undermines competition among entrepreneurs through bribery and /or patronage, when potential competitors are excluded from public procurement bidding process (OECD 2013). The lack of competition creates rents, and affects the decisions taken by the government in order to determine the firms to get the projects; this in turn increases the scope of corruption (OECD 2013). Entrepreneurship is considered as the main driver of economic efficiency and innovation has to follow more regulations than established business. And this innovation is affected by corruption when profitability of investments is reduced and transaction costs become higher (OECD 2013). Corruption can affect the growth in some other indirect ways such as by affecting sustainable development, equity,

personal health and safety status. Two variables namely, life expectancy and school enrolment are used by Dreher and Herzfeld in the construction of Human Development Indicator to understand the economic costs of corruption when social services are plagued by corruption and inefficiency (Dreher and Herzfeld 2005).

In explaining the causes of corruption, the history and culture of a country are important. Historical patterns and customs shape institutions. Old and established practices may come to be viewed as corrupt overtime. They may be difficult to abandon because of their sticky nature (MacDonald and Majeed 2011; Knack and Keefer 1995; Lambsdorff 2011). Corruption can become business as usual and highly socially acceptable. The mechanisms of giving and taking bribes become familiar. With the passage of time, political stability levels may also change and institutions may become weaker than they were in the past (MacDonald and Majeed 2011).

2.6.2.2. *Consequences of corruption*

Several theoretical arguments and practical examples point out the positive and negative aspects of corruption. Both positive and negative outcomes are possible. Systematic analysis of corruption and its impacts is necessary.

Studies by P. Mauro (1995), S.J. Wei (1997), Johann Graf Lambsdorff (1999a), V. Tanzi and H. Davoodi (1997) and Wouter Ebben and Vaal de Albert (2009) mention the destructive effects of corruption on domestic investments, international trade, productivity and quality of public investment projects (Mauro 1995; Wei 1997; Lambsdorff 1999; Tanzi and Davoodi 1997; Ebben and de Vaal 2009). Corruption is a factor in lowering sociopolitical stability by creating uncertainty and lowering economic growth (Ebben and de Vaal 2009; Mo 2001). There is a simple logic in the argument that corruption lowers economic growth: corruption allocates resources into bribes rather than into productivity and this hampers economic growth. Tanzi and Davoodi (1997) point out ways in which corruption leads to higher costs for the economy such as the need for higher public investments and the resulting lower government revenues and lower quality of public infrastructure (Tanzi and Davoodi 1997; Andvig et al. 2001). Brunetti, Kisunko and Weder did not find a very significant influence of corruption on economic growth;

they argue that corruption is associated with investments but not directly related with economic growth (Brunetti et al 1997; Andvig et al. 2001).

In contradiction to this, there are some beneficial outcomes of corruption which rests on the so-called “grease the wheels” hypothesis (Meon and Sekkat 2005). Bribes can speed up bureaucratic decisions and help in enhancing growth. History of Europe and the United States evidenced that corruption helped development by allowing entrepreneurs to grow out of bribes (Meon and Sekkat 2005). Lui (1985) showed that corruption also efficiently lessen the time spend in queues. Bribes can be paid to bureaucrats as an incentive to speed up the process (Lui 1985).

In studying institutions, it is essential to understand that the “web of formal institutions, informal institutions and distortions determine the way an economy functions” (Ebben and de Vaal 2009: 3). To understand the effects of corruption in a particular society, analysis of institutional framework needs to be taken into account (Ebben and de Vaal 2009). Different institutional settings lead to different outcomes of the effects of corruption on economy (Ebben and de Vaal 2009).

Jan Teorell (2007) argued that corruption is an institution in itself rather than an illegal or prohibited behaviour. Institutional considerations of corruption highlight social conflicts. There are horizontal conflicts between different sectors of society who lose or gain from corruption (Teorell 2007). Corruption is harmful to those who are not well-connected individuals in society, who are of course mostly poor people.

Corruption leads to poor tax administration, where tax collections are not done efficiently. The beneficiaries are the well-offs groups of society (Teorell 2007). Bribery in public services hits the poor the most in two ways by depriving them from public services and because relatively speaking they need to pay more to get the services than do richer individuals (Teorell 2007; Wei 2000). In most of the countries this scenario induces inequality and the gap between rich and poor is widened (Teorell 2007). In this kind of environment, it is the poor who suffer the most. They must pay bribes to get services (Umeh et al. 2013).

Despite all the knowledge that exists about corruption and its causes and consequences, there is still little known about how corruption plays out at different levels

and in different places. Corruption is also difficult to measure. This is one of the reasons for the lack of success in fighting against corruption (Andvig et al. 2001).

2.7. Working Hypotheses

The United Nations identifies several pillars of sustainable water management: legal instruments, institutional structures and capacity development, an integrated approach, exchange of information and joint monitoring and assessment, a participatory approach, benefits and costs-sharing, and financial aspects (UN Water 2008). There is a need for strong and efficient water governance that builds on these pillars. There are different factors responsible for inefficient water governance. The factors vary by place and are influenced by local political, social and economic situations. One of the major goals of water governance is poverty reduction, which can be achieved by supplying safe water at all levels of society, and especially to the poor. According to the UNDP (2004), sustainable development is not possible without poverty eradication. This includes providing adequate water to all (UNDP 2004b). This is also one of the Millennium Development Goals (MDGs)¹⁴.

Box 1: Millennium Development Goals

In 2000, the United Nations General Assembly adopted the Millennium Declaration which contains an integrated and comprehensive overview of the global situation and challenges in terms of poverty, crime, corruption, armed conflicts and natural environment deterioration. The Declaration contains potential strategies for action that are designed to meet the goals of peace, security and disarmament, development and poverty eradication: the millennium development goals, protecting our common environment, human rights, democracy and good governance, protecting the vulnerable, meeting the special needs of Africa, strengthening the United Nations. The document outlined concrete and specific development goals to be achieved by 2015 through specific objectives and these objectives were elaborated in the Millennium

¹⁴ Through MDGs International Community have committed to halve the number of people globally without access to water and sanitation by the year 2015.

Development Goals (MDGs) which was introduced as the road map for the implementation of the Declaration. MDGs contained eight goals and initially 18 targets and 48 indicators were laid out in order to harmonize reporting on the Millennium Declaration. (see Appendix I)

Source: (United Nations 2012d; United Nations 2001).

Similar is the case of Delhi, three main pillars representing the elements necessary for sustainable water management are technology, financial resource for infrastructure development and political/social (institutional, including the caste system and corruption). Rapid urban transition has contributed to the deterioration of water resources as seen by the pollution of water resources and the poor quality of water. Delhi's River Yamuna, for example, has been declared a dead river because of its high load of sewage and pollutants¹⁵ (Haberman 2006; Bansal 2004). The conventional methods of water treatment are not fully reliable for complete removal of impurities. As a result, clean and sufficient amounts of water are not supplied to citizens, resulting in the city's current water crisis. Water quality also has a great impact on household income because those who consume contaminated water face health issues or must buy safe bottled water, which is expensive in Delhi.

Several economic factors hinder expanded access to water. One is the under-financing of water infrastructure. Poor water infrastructure affects efficient and equitable water allocation, which is needed to meet the MDGs, and results in inefficient water governance. The water pricing structure in Delhi is not based on economic principles but on socio-political considerations. Water pricing is decided on by politicians and councilors (Haider 2016). In the Indian context people have a strong belief that water is a divine gift (Asthana 2009); one must not pay for a gift. As many voters hold these beliefs, politicians are reluctant to hike the water price. Therefore, the costs recovered are not enough to cover new capital investments for improvements (Gupta et al. 2012).

¹⁵ Ketki, Angre, 'Yamuna: a river that's all but dead.' NDTV. Published on 15th March 2013. Available at: <http://www.ndtv.com/delhi-news/yamuna-a-river-thats-all-but-dead-516345>. Accessed March 17 2016.

This dissertation examines how informal institutions make problems for water governance and the provision of adequate levels of clean and safe water to Delhi inhabitants. This dissertation examines the general hypothesis:

Water governance performance in Delhi is path-dependent. The behaviour of actors is strongly influenced by age-old informal institutions which are deeply rooted in the system. As a result of this path-dependence, the water sector and society are affected by non-uniform water distribution, higher prices for the poorer segments of the population, and deteriorated quality of water sources.

The decisions taken in the past, influence the present and future. The performance of the government, authorities and informal institutions are closely related. Water governance performance and the water crisis afflicting the city are affected by institutions such as corruption and the ancient caste system. This dissertation examines these informal institutions. The social dimension of water governance addresses attaining equity in access to safe and affordable water and enhancing the livelihood and reducing the vulnerability of poor people to water-related diseases.

The distribution of Delhi's drinking water supply is highly non-uniform. Those living in illegal colonies and belonging to the weakest sections of society are the most impacted. This group of society in Delhi is discriminated and has trouble accessing public services. They typically either have to pay more to illegal private vendors or they must walk miles every day to get water. In this regard the first specific hypothesis examined in this study is:

Hypothesis 1: Water governance performance deteriorated because of the high level of inequality in the water distribution system. This inequality came about because of the concept of the caste system in Indian society which symbolizes inequality and discrimination for a specific population.

Corruption is addressed as one of the phenomenon hindering the promotion of good governance. It is both a cause and consequence of weak governance structures.

Maintenance of the water sector involves planning, policymaking, regulatory enforcement and budget allocations. Each and every stage is vulnerable to corruption. To what extent corruption exists in Delhi will be looked at in depth by examining a second hypothesis:

Hypothesis 2: Wide spread corruption in the country is one of the factors which explains why water governance has not performed effectively in Delhi.

Although it is difficult to determine if inequality is causing corruption or if corruption is causing inequality in water distribution, the dissertation assumes that inequality causes corruption, which in turn enhances the chances for inequality. In Delhi, the ones who are deprived of water services use illegal means to get water. In the water supply sector when officials are not able to supply water, corruption works as a grease in the wheel but this comes at a heavy price to those who are poor.

Corruption is an important variable to look at in Delhi's water sector not only because of its relationship with inequality but also because of the way it has emerged and persists in the entire system of the country.

Conclusion

The study started out investigating the role of informal institutions in influencing water governance performance in Delhi. There is evidence of a strong influence of social and cultural norms on Indian political and administrative structures. Water crisis can be seen as crisis of governance. The study follows the approach of historical institutionalism and path-dependence. The dependent variable has been conceptualized as 'water governance performance in Delhi' in relation to the long lasting water problems of the city. The theoretical framework of historical institutionalism is drawn upon to develop two main hypotheses in relation to ineffective water governance performance. The caste system impacts negatively on water distribution when water is not distributed uniformly to Delhi's population. Secondly, country's widespread corruption leads to inefficiencies

in water governance. The dissertation also aims to provide insights about the cause/s of adoption of new water policy in Delhi by the Aam Aadmi party in 2015.

3. Concepts of Governance: Water Governance and Its Assessment

The term governance is a very old term, but it has been recently revived, and has become an attractive concept in the social sciences and in public discourses (Lee 2003; Jäger and Köhler 2007; Castree et al. 2009). Myungsuk Lee (2003). “In general, governance refers to changes in the role, structure and operation process of the government, or the way social problems are resolved” (Lee 2003: 3). Governance is defined as “a way of defining rights and responsibilities of members who face a certain common problem, public or private, and want to resolve them jointly” (Lee 2003:5). Governance characterizes both global and local arrangements, and is used in reference to both formal and informal norms and understandings (Heinrich and Lynn 2000). Despite the direct claims made by the concept of governance, it lacks a clear definition (Heinrich and Lynn 2000). In the broadest sense, governance refers to a term used to signify that there are many different kinds of actors involved in the process of making and implementing decisions. It includes actions by government, businesses and civil society.

Fundamental concepts and terminologies associated with governance include public sector governance, democracy, democratic governance, capacity development, decentralization, civil society, ethics, human security, and accountability. These terms need to be defined, not in a static manner, but in a general way, and their understanding may differ in different places and cultures (United Nations Economic and Social Council 2006). This chapter discusses the concepts of governance, good governance, and particularly, good water governance. The latter part of this chapter is devoted to the assessment of water governance. Building blocks of good governance are investigated: transparency, accountability and stakeholders’ participation. The chapter aims to inform the reader why these can be considered as performance indicators of water governance. This chapter lays the basis for the succeeding chapters, where different components of good governance related with other societal components in the case of Delhi are investigated.

3.1. Understanding Governance and its Relationship with Institutions

There is a need to understand governance and its processes which include making institutions and rules more effective and efficient in order to understand the dynamics of changes in social, political, technological and ecological processes and their implications in the process of human development. This includes areas such as poverty reduction and social justice as ineffective institutions harm the poor the most (Leach et al 2007: 1; United Nations 2012a).

According to Kaufmann et al. (2009) governance refers to the traditions and institutions by which authority in a country is exercised. Governance is a process where selection and replacement of government takes place. It is also a process to monitor the capacity of government to implement effective policies, respect for citizens and social and economic interaction among institutions (Kaufmann et al. 2009: 7).

According to the United Nations Development Program, governance is the concept of organizing administrators to shift from bureaucratic practices to administrative practices. The UNDP defined governance as, “the exercise of economic, political and administrative authority to manage a country’s affairs at all levels” (UNDP 1997; United Nations Economic and Social Council 2006: 3; Hill 2013). The concept of governance constitutes institutions, processes and mechanisms through which citizens and groups express their interests, perform their legal rights, meet their commitments and resolve their differences so that the rules can be generated where the actors and their needs and demands are included without discrimination (United Nations 2012a: 3). Governance is broader than government because it incorporates both states and non-state actors and also the public and private sectors.

The quality of governance depends on how well the rules which constitute institutions (policy making) and procedures (decision making) of a political regime are handled by various actors. This basic dimension helps determine how resources will be distributed (Barbour and Wright 2013).

Governance includes the making of rules, laws and goals. The other aspect of governance is the implementation of those rules and regulations. Rules guide public

affairs and steer and coordinate social systems (Sowman and Wynberg 2014: 26; Hyden and Court 2002). Effective governance is the ability to generate not only rules but also to achieve goals by implementing those rules effectively. It also means having the ability to manage short-term and long term challenges faced by a country.

In addition, governance is defined by Lynn et al. (2001) as “regimes of laws, rules, judicial decisions, and administrative practices that constrain, prescribe, and enable the provision of publicly supported good and services” (Lynn et al. 2001: 7). Governance is political by nature; participants negotiate on various interests and consequently there are winners and losers. In a way governance is a platform where various actors interact to resolve common public problems under the constraints of both formal and informal institutions (Lee 2003). Whereas governance in the past was “controlling and directing multiproduct, multinational operations” now it refers to regime of rules, which ensures freedom of entry into the market, access to information, and the sanctity of contracts – that is rules for ensuring the credibility of commitments and the protection and enforcement of property rights” (Lynn et al. 2001: 5).

Governance allows us to analyze the complex structures and relationships of various actors and the rules which are needed to manage today’s world. Traditional approaches taken by government through top down structures of command and control no longer always suffice. Governance promotes the participation of actors from various levels, but still constitutionally higher states have the power not only to steer networks but also to change the rules of the game. Government thus, still plays a crucial role in setting legislation and regulations on which the fundamental system of a nation relies (Rhodes 2007; Hill 2013: 18).

Informal rules are deeply rooted in the system of any country and could serve as an important part of a successful development trajectory where they promote relation-based governance (OECD 2007: 86). In Asia, more priority is given to informal institutions over formal rules; therefore, their effects on governance should not be neglected (Högberg 2009: 1). In Asian countries, formal institutions are affected by the relatively large impact of informal institutions and the importance of family and other close relations (Högberg 2009). This dissertation argues that governance is the

management and enforcement of informal and formal rules; these rules affect the functionality of governance. In India informal institutions cannot be neglected; their importance and influence on governance cannot be underestimated.

Institutions and governance are interlinked as institutions are the rules which govern the behaviour of actors (North 1993; Hill 2013: 18). According to Elinor Ostrom (2007), institutions are defined as rules, regulations, policies and property rights which are related with the rights on the use of natural resources such as water underneath the property owned by someone (Hill 2013; Ostrom 2007). Gretchen Helmke and Steven Levitsky argued that institutions are responsible for creating social interactions among actors, which is the way actors behave (Helmke and Levitsky 2003). For development of a nation both formal and informal institutions are important and more important is the compatibility between them as this is desired for a successful development. People should be able to understand formal institutions and behave accordingly; it is also important that they are willing to accept and support formal rules (Pikit and Kouba 2013: 9). In Southeast Asia informal rules and personal-relation based businesses are the major instruments for growth. A closer look at those countries shows that informal institutions are often closely linked to patronage and corruption (Varkkey 2015). Close ties between big business and politicians have influenced inclusive economic development (Gomez 2002). Therefore, while informal institutions may contribute to economic development they can also have negative and long term impacts on the economy (OECD 2007). Depending on the national context, the importance of formal and informal institutions and their influence on governance differs. In Asian countries it is usually informal institutions that are given more weight than formal ones; management does not only depend on legal settings but also on trust and informal contracts (Högberg 2009).

3.2. Concept of Good Governance

The UNDP's Human Development Report 2003 emphasized the concept of good governance as an essential prerequisite for human development. Good governance depends highly on public participation to make it sure that the poor are given political, social and economic priorities especially in the allocation of development resources (Xie

2009; Transparency International 2013). Good governance is effective and equitable and also promotes the rule of law and transparency in decision making processes. Good governance suggests the government should also be accountable to its citizens and fulfill its duties (United Nations and Asian Development Bank 2007: 31). Thus, good governance is a process under which the decisions affecting public affairs should be implemented in a way that policy goals are achieved (United Nations and Asian Development Bank 2007). Good governance gives surety to poor and marginalized groups that they are included in the process of decision-making through participation and can contribute to the processes of development, which may affect their lives (United Nations and Asian Development Bank 2007; Soksreng 2007). One of the very important tasks of good governance is to give surety to the people that they will have adequate access to basic services (United Nations and Asian Development Bank 2007: 32).¹⁶

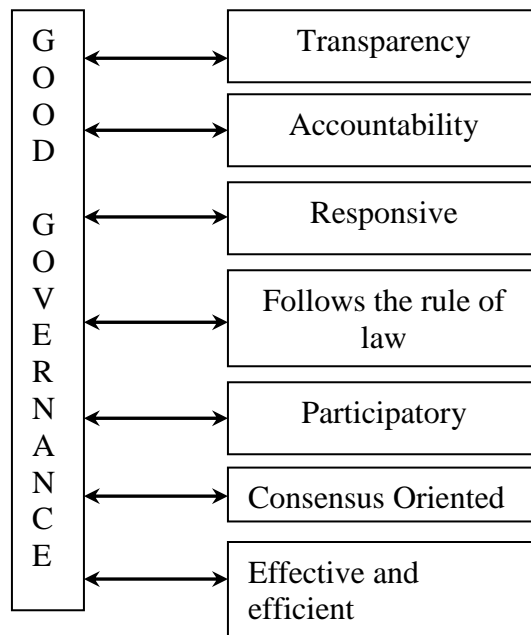
Good governance matters for a great deal of economic, social and environmental outcomes (Steiner et al. 2003). The quality of governance may be measured by analyzing a set of principles, the building blocks of good governance. These building blocks are rule of law, transparency, responsiveness, participation, equity, effectiveness and efficiency, accountability and strategic vision in the exercise of political, economic and administrative authority (UNDP 2004a). These are the conditions necessary to have good governance and their absence may lead a country into political and social risks, institutional failures and also effect the capacity of governance to cope with problems (Rogers and Hall 2003). Poor governance is also a hurdle to development because of the essential role of good governance in poverty reduction (Rogers and Hall 2003: 11).

In the 1990s, international donor agencies and particularly the World Bank began promoting a simplified approach to governance focused on improving public sector management. This was to be done through better service delivery, establishing the rule of law, and eliminating corruption (Punyaratabandhu 2004; Grindle 2010). There were also growing calls for adding political liberalization and human rights to the understanding of good governance (Gisselquist 2012). In the mid-1990s, international donors, such as the

¹⁶ This is the main task in this dissertation to analyze water governance, a kind of governance and to look how everyone has access to it. In several developing countries good governance is simply a concept but on the ground level there is nothing like ideal governance exists. Absence of such an important driver makes the life especially for the poor much more difficult and complicated.

OECD and UNDP, expanded the concept of good governance by adding transparency, accountability and participation into it. In the 2000s, concepts like predictability were also linked to good governance. This term was introduced after the financial crisis of 1990 in relation to calls for stable and improved financial frameworks. There is no doubt that in the future new elements will be added to the term good governance and old ones will be dropped (Punyaratabandhu 2004: 3).

Figure 4: Building Blocks of Good Governance



Source: Author's depiction.

3.2.1. Why promote Good Governance?

Political regimes, institutional capacities, and the rule of law impact development opportunities. In various countries in Asia, the Middle East and Africa, such as, Ghana, Somalia, Syria, Yemen, Afghanistan and Pakistan, there is an urgent need to promote peace; human rights; gender equality; to improve the provision of basic services in education, health care, water and electricity; and to end poverty, which is the key for development (Federal Ministry for European and International Affairs and Austrian Development Agency 2011). Good governance gives people the right to raise their voices

and give their opinions in decision making processes whether or not they are affected. Promoting good governance is not, however, only talking about elimination of poverty and provision of basic human rights. The causes of poverty and hindrances to poverty reduction must be examined and overcome (Irish Aid 2009).

“Corruption is both a cause and symptom of poor governance” because it undermines the investments and affects the development (Department for International Development 2006: 28); in turn both corruption and poor governance are the major hurdle in poverty reduction where poor are imposed to pay heavy bribes who already have fewer resources (Addae-Korankye 2014). Corruption impacts especially in developing countries in several ways, by diverting resources to other groups of society leaving the poor deprived from them (Kanbur and Lustig 2001; Chetwynd et al. 2003; UNDP 2008). In short good governance has an important role to play in providing inclusiveness to poor groups of society by their participation. It has influence on economic development, resource allocation and distribution and delivery of basic services (Irish Aid 2009).

3.2.2. Importance of Urban Governance

Research on cities on a global scale is increasing because more and more of the world’s population is moving into cities placing growing burdens on urban governance (Lall 2013). This rapid growth trend has been noticed in the cities of developing countries especially China and India where population is already very high. This kind of movement of population in developing countries is creating many resource challenges for cities.

Similar to effective governance, good urban governance requires transparency, accountability, and participation. The United Nations Human Settlements Program defines urban governance as:

the sum of many ways individuals and institutions, public and private, plan and manage the common affairs of the city. It is a continuing process through which conflicting or diverse interests may be accommodated and cooperative action can be taken. It includes formal institutions as well as informal arrangements and the social capital of citizens (United Nations Human Settlements Programme, UN-HABITAT 2002: 14; Lange 2009: 17).

On the other hand, “government refers to a political unit in order to implement policy making”, whereas governance points out both political and administrative functions (Lange 2009: 17). This difference gives a sense of clarity between government and governance. Including various stakeholders in decision making processes is good for the development of a city but is a difficult task because cities are inhabited by different social groups. Cities are major contributors to the economic development of a country and help in sustaining local businesses (Zhang 2011). In terms of competition among cities for global business, authorities in cities are responsible for creating infrastructure, taxes and regulations. In several developing countries urban governance is challenging because of the migration of people from rural areas into cities. Typically, the social and economic gap widens with large influxes of migrants contributing to urban inequality (Hildebrand et al 2013; United Nations 2015; United Cities and Local Governments 2012). Urban governance is considered to be good when the share of economic growth is more equitable and the concept of social inclusion is added by increasing local ownership in development projects (Lange 2009: 22). United Nations Habitat identified five principles for counting urban governance as ‘good’, namely, effectiveness, equity, accountability, participation and security¹⁷ (Lange 2009; UN-Habitat 2006). These five principles of good urban governance are linked to the principles of freedom given by Amartya Sen: “effectiveness for economic facilities, equity for social opportunities,

¹⁷ Economic security is discussed here in terms of financing housing for the poor through different schemes and programmes and development of innovative financing approaches. In several African and Asian Countries Slum-Upgrading programmes were established and started by UN-Habitat beginning in 2004. Equal treatment for all citizens and genders in a city is a big challenge. Often basic services such as water and sanitation are not provided to the poor. Women and girls are at high risk due to lack of sanitation services and having to pay more than the others. Providing a secure life to citizens is the responsibility of urban governance. For this purpose, in 1996, UN-Habitat launched a program called Safer Cities Program to prevent urban violence. Security in terms of access to land and housing is also needed for the integration of the poor into society (UN-Habitat 2006).

participation for political freedom, accountability for transparency guarantees and security for protective security” (UN-Habitat 2006; Sen 2001).

The major challenges that urban governance has to deal with are to manage water equitably, collection and treatment of wastewater and protection of water sources (surface and groundwater).

3.3. Understanding Water Governance

Rapid economic development and changes in the consumption patterns of the huge global population is increasing the pressure on water resources (UN 2012; UN Water 2009). Demand for water in other sectors such as energy and agriculture is also alarming because the demand of these two sectors is increasing with economic development and population growth (UN 2012). Water distribution in the world is uneven (Gupta 2011); some countries or regions are depending upon surface and groundwater sources whereas some regions are relying on seasonal rainfall. Even in the same country, some regions face acute shortages in water supply, whereas some regions have plentiful water supply (Batchelor 2007).

Water plays an important role in sustainable development and poverty reduction (WHO 2008). For many decades, water resources in urban areas in the world especially in developing countries have been exploited dramatically. Water is polluted, surface water resources have been degraded and groundwater resources have been exploited; this is having serious impacts on economic and social development. These challenges have also been transported into the political and natural environmental systems of those countries. Due to those imbalances over 780 million people lack access to improved sources of drinking water and over 2.4 billion lack access to basic sanitation (UNICEF and World Health Organization 2012: 2). These problems are man-made and arised from failure in water governance (Batchelor 2007; UNDP 2007).

3.3.1. A key to Achieving the Millennium Development Goals

At the United Nations Millennium Summit in September 2000, MDGs were adopted by 189 heads of state. Clear targets were set for tackling sustainable development challenges faced by developing countries (UNDP 2004b: 2) (see Appendix I for MDG).

Among the eight goals of the Millennium Development Goals, one was to reduce the number of population without proper sanitation and access to drinking water by half by the year 2015.¹⁸ At the Johannesburg World Summit for Sustainable Development in 2002, it was recognized that proper sanitation and safe drinking water are fundamental to sustainable development and poverty reduction (UNDP 2004b). Knowing the importance of water in achieving sustainable development and knowing the growing challenges and problems facing developing countries and their urban areas, water and water governance are gaining greater attention globally. It is estimated by the International Food Policy Research Institute that globally, the consumption of water will increase at least 50 percent by 2025, which may seriously affect the demand for water for agriculture on which most of the population in developing countries rely for their livelihoods (Rosegrant et al. 2002). Agriculture and growth in industries will also pose threats to water quality and will increase water pollution (UNDP 2004b). With this scenario a great responsibility is put on water governance to manage water and water resources and achieve the targets stated in the MDGs.

3.3.2. Water Governance for Poverty Reduction

Economic growth in nations like India and China has been dramatic. According to the United Nations, in India the rate of poverty reduction was on average 40% in 2005 even though poverty remains very high because of the high population growth rate of the country (United Nations 2010b). Therefore, meeting the MDGs in this area will not be possible without providing sufficient water to industries and agriculture because

¹⁸MDGs do not only talk about safe drinking water and proper sanitation but they have a close connection with other related targets such as promoting primary education by providing water and sanitation in schools especially for girls in order to promote gender equality and women empowerment. Safe drinking water and sanitation also targets improving health, reducing child mortality and creating a sustainable environment (UNDP 2004b: 2).

agriculture is also one of the major professions of millions, “water is an important factor of production in a variety of industries crucial to economic development and poverty reduction” (UNDP 2004b: 18). People lose their productivity when they must spend significant amounts of time in collection of water and when they experience waterborne diseases. Developing countries suffer economically because of water problems (UNDP 2004b). It is estimated that the Indian economy lost some 73 million working days a year due to water related diseases. In 2002 alone Madagascar lost five million working days due to poor sanitation that contaminated the water supply (UNDP 2004b: 19).

3.3.3. Promoting Equality

Women around the world in both urban and rural regions are hit the most from water scarcity. There is a traditional aspect behind this; women are the ones who take care of securing water for households for washing, cooking and cleaning. They are the ones who spend hours fetching water from afar (Aureli 2004). During the time they travel to get water they face physical torture in the form of contamination from water or waste or physical attack from men or animals. Collection of water from distant places is an extra burden on women who also have other responsibilities such as caring for children. The lack of sanitation and the time spent on collecting water keep young girls away from their education (UNDP 2004b). The target of MDGs in providing equality to men and women cannot be achieved if they do not have adequate access to water and sanitation.

3.3.4. Safeguarding Human and Environmental Health

Almost half of the people in developing countries are suffering from one or more diseases associated with inadequate and contaminated water and poor sanitation facilities (Bartram et al 2005); more than five million people, mainly children, die due to waterborne diseases each year in developing countries (UNDP 2004b). An additional one million die with malaria which spreads due to unhygienic conditions created with the non-availability of water or polluted water (UNDP 2004b). In most of the developing countries a significant group of society, and especially poor people, live with unhygienic conditions. Lack of sanitation is an everyday problem and there is no proper sewage system in place (Tear Fund 2007). These are the people who are relying increasingly on

groundwater, which is sometimes contaminated with human waste and other kinds of contaminants. Without access to safe and clean drinking water, young children suffer from water-borne diseases, which can be minimized by providing them clean water. Proper water management not only is essential for human health but equally important for the health of the environment. The major threat to the environment is from human activities, which result in pollutants entering water resources, over fishing, big infrastructure projects, channelizing rivers and land conversion. We are threatening the balance between water resources and environmental sustainability (UNDP 2004b). Evidence of this imbalance includes flooding in many parts of the world and changes in weather patterns due to climate change. Thus, water and its proper management is very important.

3.4. Water Governance: Meaning and Approaches to its Analysis

The most commonly used definition of water governance is “a 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; essentially, governance systems determine who gets what water, when and how and who has the right to water and related services and their benefits” (Rogers and Hall 2003; Jacobson et al. 2013; Batchelor 2007).

Four dimensions of good water governance are:

Social Dimension: The social dimension points to how societies view and address the questions of water distribution, questions of fairness, and support for those who are under privileged. It is a matter of equity and inequity. Water is distributed unevenly in time and space and even among various socio-economic groups. There are also differences in water distribution between urban and rural settlements. Uneven distribution of water has direct impacts on people’s health, their social relations and also on their financial stability. It is estimated by the UN that in North America and Japan daily water

consumption is 600 liters per capita and in European countries it is 250 – 350 liters per capita. Whereas in Sub-Sahara Africa the consumption of water per day per capita is only 10 – 20 liters (UN Water 2006).

Economic Dimension: Many countries have agendas to end poverty but without appropriate provision of water this goal cannot be achieved because economic growth depends highly on water (Fodgen 2009). It is recognized that good governance and per capita income are positively correlated (Kaufmann and Kraay 2002). The gap between rich and poor widens when water is not sufficiently provided to the poor.

Political Dimension: This dimension of water governance focuses on participation of stakeholders in decision-making processes and not only those who are politically strong. This dimension talks about equal rights and opportunities for everyone; marginalized groups are rarely recognized as legitimate stakeholders in decision making, including in the water sector. They are the ones who lack the ability or chance to raise their voices and capacities to promote their interests related to water (UN Water 2006). The political dimension of water governance should give every citizen equal opportunities and rights to speak, share their interests and take part actively in all kinds of political activities related with water.

Environmental Dimension: This dimension emphasizes “sustainable use of water and related ecosystem services” (Jacobson et al. 2013). Several water resources both surface and underground have been polluted due to high pollution loads because of urbanization and industrialization. Poor water quality also affects marine life, which is needed to maintain the quality of ecosystems. Marginalized groups and their livelihood opportunities depend directly upon natural resources including water.

Working Definition of Water Governance

These different dimensions make water management highly complicated. Effective and efficient water governance means managing the entire water supply sector

in a sustainable, socially equitable and economically sound way. On the basis of the discussion above, a working definition of water governance is framed:

Box 2: Socio-Political Aspect of Water Governance: Working Definition

Water governance is the process of decisions taken to manage water among various stakeholders from all levels of society. Good water governance is transparent to everyone (from politicians to the poor who are often neglected) provides everyone with equal rights to raise their voice and distributes resources fairly, equitably, adequately, and in a way which safeguards health and livelihoods (not only in terms of quantity but also quality).

3.5. Analytical framework for water governance performance

3.5.1. Water Governance Performance

Various indicators can be used to measure the performance of water governance. The ones selected for this study are:

Physical Dimension. According to the United Nations (2014), still 768 million people in the world mainly in developing countries do not have access to drinking water (safe) (United Nations 2014a). The physical dimension of water governance symbolizes the gap between daily demand for water and the amount of water which is supplied by the responsible authorities. An adequate drinking water supply should be the priority of any water authority, if that is not met it indicates poor performance.

Chemical Dimension. Here the focus is on water quality. It is estimated that globally 1600 children die every day from diseases linked to consumption of unsafe water and roughly about 884 million people are suffering from the effects of unsafe water in the form of diseases (The Economic and Social Council 2014: 2). Not only quantity but also quality of water is the responsibility of water authorities. Safe and clean water should reach citizens for water governance to be considered effective.

Economic Dimension. Water is an irreplaceable resource. In cases where authorities fail supply adequate amounts of water people find other ways to get it--from private water vendors, tankers or bottled water which affects their household income. Most of the people who are not connected with the water pipe network live in poor urban areas. They end up paying more than those who can afford to pay and are connected to the official water pipeline network. It is the responsibility of water authorities to provide water economically, so that the economic burden on the poor is minimized.

3.5.2. Measuring Performance

There are direct and indirect methods to measure the performance of water governance. Direct measures point towards the results which have been achieved in a particular period of time after a project/program/scheme is initiated (Jacobson et al. 2013). Many governments aim to provide clean and safe drinking water for their citizens. Whether or not this is achieved can be observed over a period of time. Indirect measures are related with the efficiency of a policy or plan, which has been generated to achieve certain goals. A policy or program may look good on paper but many factors may hinder its implementation, including overlapping laws and rules, low institutional capacity, a poor legislative framework and so on. Identification of such factors and the problems they create is done through a process of evaluation of effectiveness (Jacobson et al. 2013: 50).

The factors examined in this case study are:

- Legislation for water allocation.
- Legislation for water quality
- Coordination mechanisms among local governments
- Land-Use Planning Control
- Groundwater regulation

Direct methods are used to examine the effectiveness of water governance. In the case study indirect methods were applied to analyse the responsible factors in more depth.

3.6. Water Governance Assessment Framework

This section draws on concepts introduced and discussed above to develop a framework for assessing water governance. In terms of the social and political dimensions of water governance, which is critical to water security and to the long-term sustainability of the earth's water systems, actors, institutions and governance principles must be considered.

3.6.1. Objective of Water Governance Assessment

Water crises in most of parts of the world, and especially in developing countries, is in part tied to water governance. Water governance is multi-dimensional making it important to assess where loopholes exist and where reforms are needed. “However, assessments that are well planned can form an important stepping-stone in this long-term process as tool for dialogue and priority setting” (Jacobson et al. 2013: 18).

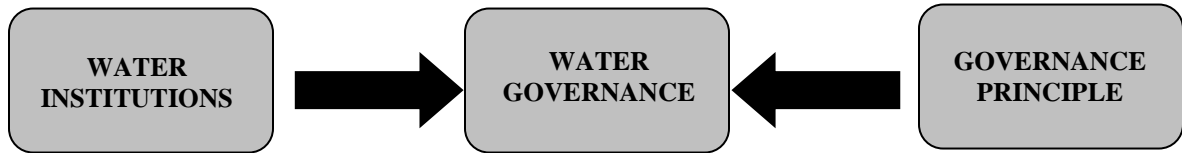
Assessments of water governance can unlock the factors contributing to difficulties in the implementation of laws and the achieving of policy goals.

The intervening variables analyzed in this study include transparency, participation of various stakeholders in decisions making process and the accountability of both citizens and authorities in managing and conserving water. These variables are considered as intervening variables as their effect is not direct on water governance performance but rather they act upon other variables.

For this dissertation, a detailed qualitative investigation and household surveys in 7 different locations in Delhi were conducted. The survey provides information about household income, the share of income spent on water, how water is obtained when it is not provided by authorities, levels of trust in authorities and their water management programmes. Survey results were analyzed and a set of indicators for each variable was developed. A limitation of this survey was the difficulty of talking openly to householders about their caste and their involvement in any corrupt or illegal activity to get water. Analysis of caste and corruption is described in the methodology section.

3.6.2. Components of Water Governance Assessment

Figure 5: Different Components of Water Governance Assessment



Source: Adapted from User’s Guide on Water Governance Assessment (Jacobson et al. 2013).

3.6.2.1. Water Institutions

Maria R. Saleth (2004), described institutions as the “configuration of legal, policy and organizational rules and practices which are under a specified structure embedded in a well-specified environment”; institutions have an internal structure and nature (Saleth 2004: 3). Institutions do not only depend on their various components, they are characterized by cultural history and the socio-economic and political structure and system of the country in which they were formed (North 1991). Saleth (2004) differentiated between internal and external components of institutions; internal components refer to the legal aspects and external components refer to social and traditional aspects. In a similar manner, water institutions are also comprised of water laws, water policy and water organizations (Saleth 2004). Water law addresses rights to water. Water policy is concerned with issues like pricing and cost recovery. Water organizations have different roles at different layers of government including in departments (Saleth 2004; Sehring 2009). It is essential to understand who is involved and who does what. When there are too many organizations and overlapping responsibilities, coordination problems, overlapping of duties and lack of clarity of associated duties can occur.

“Since ancient times, water has been more than a mere resource in all cultures” (Sehring 2009: 36). In many cultures and religions, water has a spiritual value that defines its rules for usage. Water usage is determined by the awareness of the population rather than the sanctions imposed by formal rules (Sehring 2009).

Water institutions are defined as formal and informal rules and norms – including their underlying cognitive systems as well as the organizational structures that set and enforce them-that regulate control of an access to water resources, hence their usage, distribution and status. Consequently, reforming water institutions not only means changing formal rules or structures or informal arrangements. It also affects values, traditions, attitudes and symbolic meanings associated with water (Sehring 2009: 36).

It is important to know how policies were created and whether the principles of good governance are followed (Water Partnership Program 2010). The major purpose of a policy is the creation of an enabling environment for a sector’s development. Policies follow certain objectives and mechanisms (African Development Bank 2008).¹⁹ A sound and harmonized legislation²⁰ is crucial for policy implementation. It is also necessary for determining institutional jurisdiction, water rights, regulation and conflict resolution (Water Partnership Program 2010: 14). The purpose of including legislation into governance assessment is to analyse the degree to which legislation supports policy (Water Partnership Program 2010).

A very important aspect of water institutions is the ‘right to water’, which comes under the category of water law and also has a great influence on the water distribution system. This important aspect is defined by John Scanlon, Angela Cassar and Noemi Nemes as access to sufficient water. The term ‘access’ also includes economic accessibility meaning affordability and ‘sufficiency’ in terms of both quality and quantity of water relative to daily basic human needs (Scanlon et al. 2004: 2).

In the past, the right to water as a basic human right was not clearly defined in international law; rather it was simply interpreted as a component of other fundamental human rights such as the right to life. Access to water and sanitation as basic human rights has gained attention on a global level because of the large share of the global population without adequate access to either. An estimated one billion are living in

¹⁹ In regard with the objectives followed by the sector policy one is its focus on improvements in access to water for poor and marginalized group in the community to attain MDGs. While mechanisms are focused on participation of various the stakeholders in the decision making process or distribution of finance within the sector (African Development Bank 2008).

²⁰ “Legislation is the mechanism for incorporating policy into national political and legal frameworks, setting water quality standards, protecting individual and communal water rights, managing conflict resolution” (African Development Bank 2008:18).

informal settlements in developing countries without access to safe drinking water. This contributes to reduced life expectancies and additional burdens, especially for women. The poor living conditions in such settlements leads to discrimination and denies people a life of dignity (Björklund and Sjödin 2010: 3). The impact of poor sanitary conditions and unsafe water is also significant on children who contract water borne diseases such as diarrhea. Their education also suffers because they spend hours a day to collect water (UN, OHCHR, UN-Habitat, WHO 2010).

According to the United Nations Committee on Economic, Social and Cultural Rights (2003) there is a legal basis to the human right to water; “the human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses”. Water is essential to life and it is linked with other fundamental human rights such as right to adequate food, right to health, right to gain a living by work, right to take part in cultural life, right to education, right to housing and right to adequate standard of living; these fundamental rights demonstrate the necessity of water in life without which these rights cannot be fully achieved (Scanlon et al. 2004).

Before September 2010, the right to water was not explicitly recognized as a human right in international treaties although there were various international, national, regional regulatory moves in this direction (UN, OHCHR, UN-Habitat, WHO 2010). The United Nations Human Rights Council confirmed in its first United Nations Human Rights resolution, Resolution A/HRC/15/L.14 (the UN Resolution) that the right to water and sanitation is legally binding:

“the human right to safe drinking water and sanitation is derived from the right to an adequate standard of living and inextricably related to the right to the highest attainable standard of physical and mental health, as well as the right to life and human dignity” (United Nations 2010a: 2).

But there are several reasons beyond the large number of people in the world without access to water that enforced water as a basic human right linked to sustainable development and its social and environmental pillars. Sustainable development requires the participation of all groups in society. Poverty must be alleviated to keep the environment safe and clean and in order to sustain a healthy life (Scanlon et al. 2004: 23).

The astringent dynamics of social and environmental elements of sustainable development lead to poverty exacerbation as true environmental and social justice are needed to reduce poverty. These astringent dynamics address uncertain climatic conditions, rapidly growing population, unequal water distribution, pollution of water resources and rising per capita water consumption leads to poverty exacerbation. Altogether these issues point towards the importance of inclusion of water as a basic human right (Scanlon et al. 2004).

Table 2: Timeline for Expression of Right to Water as Non-Legally Binding Declaration to Legally Binding upon States	
Year	Declaration
1977	Mar del Plata United Nations Water Conference
1979	Convention of the Elimination of All Forms of Discrimination Against Women (CEDAW)
1989	Convention of the Rights of the Child
1992	International Conference on Water and Sustainable Development: Dublin Conference
1992	United Nations Conference on Environment and Development: Rio Summit
1994	United Nations International Conference on Population and Development
1999	United Nations General Assembly Resolution A/Res/54/175 “The Right to Development”
2002	World Summit on Sustainable Development
2002	General Comment No.15. The Right to Water
2005	Draft Guidelines for the Realization of the Right to Drinking Water and Sanitation
2006	Human Rights Council Decision 2/104
2006	Convention of the Rights of Persons with Disabilities
2007	Report of the United Nations High Commissioner for Human Rights on the Scope and Content of the Relevant Human Rights Obligations Related to Equitable Access to Safe Drinking Water and Sanitation under International Human Rights Instruments
2008	Human Rights Council Resolution 7/22

2009	Human Rights Council Resolution 12/8
2010	United Nations General Assembly Resolution A/RES/64/292
2010	Human Rights Council Resolution A/RES/15/9
2011	Human Rights Council Resolution A/HRC/RES/16/2

Source: (Scanlon et al. 2004; UN-Water Decade Programme on Advocacy and Communication (UNW-DPAC) 2012).

Table 2 shows how the right to water has been linked to other rights. It took decades for the international community to take a decision to define the right to water as a basic human right. Water was taken for granted and its relationship with other basic rights such as the right to property is still practiced in many countries including India where the land owner has complete rights on the water beneath his/her property. It may take many more years for acceptance and implementation of the right to water to be advanced as old practices are difficult to change.

3.6.2.2. Governance Principles

Levels of transparency, accountability and participation can be used to analyse corruption in the water sector. Transparency is key to good governance and democracy. It entails participation of stakeholders and community involvement. Transparency is essential to sustainable water management (International Federation of Accountants 2013; Weissee and Steiner 2006). There are various steps linked to water governance assessment, such as cycle budgeting, central planning, program formulation, project procurement, project implementation, and project operation and analysis. Transparency plays an important role in the acceptance of any project by the public and its successful implementation (African Development Bank 2008). Accountability is yet another component of good governance and depends heavily on transparency where “there is an obligation or willingness to accept the responsibilities for one’s actions” (Maas 2011; African Development Bank 2008). Transparency is important for good governance and can help make service providers accountable to their consumers.

Accountability is an indicator for the openness of any particular government. Accountability can be achieved through independent oversight of the activities of government. Accountability is tied to clear processes and procedures and public access to information about who is responsible for what. There needs to be a clear understanding of the roles and responsibilities of various actors, especially legal authorities (Stefanick 2013). Enhancing transparency and accountability criteria and expanding the participation of stakeholders are important for corruption reduction. Engagement of a diverse set of actors with different interests brings new ideas into decision making processes and broadens knowledge and understanding. This is useful for strengthening proposed outcomes and actions (Maas 2011: 49).

Transparency, accountability and participation are interrelated. Transparency is a prerequisite for accountability and participation (Institute of Development Studies 2010; Bonzon 2014). There is a relationship between the information provided to the people, their awareness and their participation in decision-making process and their demands for accountability. If people lack access to information, they will not raise their voices (Jacobson et al. 2013: 12). Transparency and accountability go hand in hand. If citizens are informed about services but not aware about the mechanisms to make those in power accountable for the quality of service provision, services may not be provided. This in turn may lead to distrust of institutions and authorities (Jacobson et al. 2013). Due to lack of transparency and low accountability, governance may be weak and there are likely to be more chances for corruption to flourish. Transparency is a prerequisite for lower corruption levels (Jacobson et al. 2013). As a result of weak governance, the global water crisis is described as a 'crisis of governance' (African Development Bank 2008).

The format and language of information provision is also important. Non-expert groups will be impacted by their ability/inability to read and understand information they are provided with. Accessibility to information is of importance because not everyone has internet access. How far and how fast requested information is provided impacts transparency in the system (Jacobson et al. 2013).

Conclusion

Together, the literature review and the conceptual framework provide the foundations and criteria for assessing water governance in the case of Delhi. These assessment criteria are used to locate holes in water governance in Delhi.

The study looks at the social and political dimensions of water governance. Decisions taken in the past have established certain patterns. Old paths remain influential. The next chapters will examine the household level to understand Delhi's inhabitants' opinions about water governance and to assess how much they are affected by the non-availability of water.

Social and cultural values have contributed to the emergence of corruption in the water sector in India. These two components are individually explored in the succeeding chapters. Some directions relevant to achieving the social goals associated with good water governance will also be explored.

In the following chapter, the research design explains the analysis of selected sites, the use of the case study methodology, and the reason for the focus on processes of urbanization, population growth and different divisions within the city. The following chapter will also discuss data selection techniques and methodology applied to analyse the dependent variable in the dissertation.

4. Methodological Framework

Delhi is the capital of India and is one of the fastest growing metropolis in the world with the population of 25 million (United Nations 2014b). The city is highly populous with population density of 11297 per sq. km (square kilometer) (Society for Participatory Research in Asia 2014). Delhi Assembly has 70 assembly constituencies, 11 districts and 33 sub divisions. Delhi has the area of 1483 sq. km of which 1113.65 is urban and the remaining belongs to the rural area (Government of NCT of Delhi 2012). Delhi has become one of the fastest growing states in India, in monetary terms of the volume of all the goods and services produced within its boundaries by achieving 17% growth in 2012-13 with GSDP (Gross State Domestic Product) of Rs. 3.66 lakh crores (1 lakh = 100 000 and 1 crores = 100 000 00). 85.8% of Delhi's GDP was from the service sector, 13.6% from industry, and only 0.6% from agriculture. Delhi is not only the political hub of the second largest growing country after China; it is also considered as an educational, tourism and cultural hub (Society for Participatory Research in Asia 2014).

Delhi has around 33.40 lakh households; consists of various kinds of settlements including big bungalows, medium sized houses and slums. The different kinds of housing structures and the vastly different assets of the population in Delhi symbolize the economic differences of the city's population. Ownership and access to goods and assets is an indicator of well-being. Out of 33.40 lakh households, 21.97 lakh households are considered good for living, 10.50 lakh households are considered to have livable conditions and the rest are not suitable to live (Society for Participatory Research in Asia 2014: 6). The population of Delhi can be divided into different groups: very rich, rich, nearly rich, upper middle class, middle class, lower middle class, working class and poor;²¹ where more than half of the lower middle class lives in one-room houses compared with 40 per cent of the households in the high income group living in houses

²¹ Income Categories in India (Annual Income in Indian Rupees): (very rich = greater than 10,000,01) (Rich = 5,000,001 – 10,000,000) (Nearly Rich = 2,000,001 – 5,000,000) (Upper Middle Class = 1,000,001 – 2,000,000) (Middle Class = 500,001 – 1,000,000) (Lower Middle Class = 200,001 – 500,000) (Working Class = 91,000 – 200,000) (Poor = less than 90,000) (Bellappa 2013: 50)

with 3 or more rooms (Govt. of National Capital Territory of Delhi and Institute of Human Development 2013).

Delhi has not only income disparities, but differences in access to basic services such as water, electricity and sanitation. Among Delhi households, only 78% have receive a piped water supply, 15% have a water source near their house but not inside and the rest (7%) have to travel far to collect water. 75% of households get treated tap water and the remaining 25% must rely on untreated water from rivers, lakes or groundwater boring (Society for Participatory Research in Asia 2014; Govt. of National Capital Territory of Delhi and Institute of Human Development 2013). There is gap in services in access and quality of water between rich and poor settlements in Delhi (Society for Participatory Research in Asia 2014; Govt. of National Capital Territory of Delhi and Institute of Human Development 2013). In poor areas, the piped water supply was highly irregular; therefore, the gap of water services was filled by supplying water through tankers owned by the DJB. The DJB has a limited number of water tankers and limited filling stations; they are inefficient in responding to the demand for water (Bansal 2012). About 13 per cent of the households in Delhi did not receive water every day from authorities, they had water disruptions on some days, which is why Delhi has become one of the worst performing megacities in regard with 24 x 7 water supply (Narain and Pandey 2012). The inadequate water supply from Delhi water authorities has led to the emergence of private water providers: bottled water companies, private tankers, and water vendors. In 2005-06 there were an estimated 2,000 private tankers operating in Delhi (Narain and Pandey 2012). Moreover, water supplied by DJB has quality issues, a reason for the success of the bottled water business in Delhi (Bansal 2012). In the short term, these businesses could be seen as solving the water shortage and quality problems, but their activities only help those who were able to afford their services. In the long term the situation will got worse especially if these water providers start charging heavily or extracting groundwater at excessive rates, adversely affecting ecological systems. The average water consumption per household in Delhi from a private tanker is about 500 litres per day; residents buying water from a private tanker spend around Rs. 1,500 per month per family every summer (Narain and Pandey 2012). This is a very good business for tanker owners but for a family it is a huge economic burden.

4.1. The Districts of Delhi

There are 11 different districts in Delhi: Central Delhi, East Delhi, Shahadra, New Delhi, North Delhi, North-East Delhi, North-West Delhi, South Delhi, South-West Delhi, South-East Delhi and West Delhi. Four are studied in detail in this dissertation. Covering the entire city was not financially feasible or from a time perspective possible. The thesis utilizes an explanatory single case study research design and sheds light on the water governance by focusing on seven different localities within four adopted districts, the central, southern, New Delhi and western district of the city.

Four selected districts of Delhi are:

(1) Central District: Central Delhi is one of the oldest parts of the city, and represents a complex mixture of settlement types sprawling over the area of 25 sq. km. According to the Delhi Economic Survey 2014-15, population of central district was 582320 in the year 2011. This is the district with the highest rate of urbanization and the highest percentage of industrial development and employment of Delhi (Government of NCT of Delhi 2014-15). It is the central commercial area of the city with big 5-star hotels and expensive and international style restaurants and coffee shops. This part of the city is also a home to those living in very congested conditions with narrow lanes full of shops and street vendors. This area is called old Delhi and has old and aging infrastructure problems. This is also an area with slums²² which are under the regulation of the city government. Here residents are poor but there is provision of water infrastructure.

(2) South District: South district of Delhi has urban population of 2719736 and rural population of 12193 (Government of NCT of Delhi 2014-15). In terms of its location at the tail end of the water distribution network of DJB this district is disadvantaged in terms of water availability. DJB gave its argument that during transmissions from the sources in the North around 52% water is lost through leakages in the pipelines, that is

²² According to Census 2011, slums are the areas officially notified under various Acts or recognized as public authorities which are highly compact, congested with an unhygienic environment, inadequate infrastructure and lack of proper sanitation and drinking water facilities (Australia India Institute and The Nossal Institute for Global Health 2011).

why south zone of Delhi face water scarcity (Narain and Pandey 2012). This zone also represents a mixture of settlement types from high to lower middle class to very poor. The very poor live in slums. Due to its location and its continuous water supply problems, groundwater is utilized to meet daily needs. Therefore, groundwater in the south zone of Delhi is experiencing depletion and contamination problems.

(3) West District: The west zone in Delhi like the South district of the city has a mix of housing settlements. It has the population of 2543243 spread over the area of 130 Sq. Km (Government of NCT of Delhi 2014-15). This area is home to many influential political leaders and government officials but also to poor professionals such as street show performers and magicians who live in the famous Kathputli colony. A slum area in Dwarka (see Figure 6) was also covered in the fieldwork to gain an understanding of the water supply situation in a slum and to learn the perceptions and opinions of people living there, as they are considered as the most marginalized group of the society. Generally, slums have no provision of public services. In Delhi, the water supply situation differs in a slum from an unauthorized colony; slum dwellers are economically an extremely weak section in the society whereas the population living in an unauthorized colony is comparatively better off; they can afford services even at somewhat higher costs even though they are still poor.

(4) New Delhi District: The New Delhi District is a highly urbanized area with a population of 142004 (Government of NCT of Delhi 2014-15). The area is comprised of some of the most important locations and sites in Delhi such as Parliament Street and Chanakyapuri, a diplomatic enclave of Delhi where many embassies are located. Some of the best and most expensive hotels are situated in this district. One of the most famous shopping and commercial centers, Connaught Place, is another attraction in this district.

To understand inequality in water distribution and its relationship with the informal institution of class, it is necessary to look closely into diverse localities within the selected districts.

4.2. Selection of Studied Localities

Seven different localities were selected to conduct household survey. The locations chosen are made up of different kinds of settlements and social status groups. They also have different water supply situations, ranging from as low as 29 lpcd in Mehrauli area to 509 lpcd in Delhi Cantonment (Narain and Pandey 2012). The site selection was based on literature review and the information related to demography, household income and access to public services was collected. Some sites were selected based on personal observation and preliminary information about the water supply situation such as for how many hours water is available, how much one must pay for water, the quality of the water collected from close relations with residences in those areas and belonging to different groups including a shop keeper, students, university professors and housewives.

In each site, a comprehensive survey was carried out based on household interviews. The households were selected to include individuals from different socio-economic groups and living in various kinds of housing settlements, both authorized and unauthorized. These selected localities are representative of many other regions in the city which are grappling with similar problems. Similar features here indicate the closely located areas with different housing settlements with varied provision of public services. Taking into account these differences in class and income inequality, water distribution was analysed. The locations of the studied localities in Delhi are shown in figure 6 where a clear indication about water inequality issue is displayed. In total, seven localities were selected (see Table 3).

1. New Friends Colony
2. Okhla
3. Old Delhi
4. Connaught Place
5. Ranjeet Nagar
6. Nangloi Jat
7. Dwarka Slum

1. New Friends Colony (NFC) is a posh neighborhood in South Delhi where inhabitants afford an exclusive life style. It consists of big bungalows mainly occupied by the business class of the city. The area has a Cineplex, a five-star hotel and several markets with international chain restaurants. NFC is an area located by the people of high socio-economic status where various facilities such as 24-hour electricity supply, municipal waste collection are available (Suri 1994). This area is a well-planned and well maintained residential area in south Delhi (Government of India 2010). NFC is one of the unique areas in Delhi in terms of having large green areas and open spaces and a 24-hour supply of water.²³

2. Okhla is occupied by the middle and lower classes and has a population of 191880 (Abidi and Abbas 2011). Some upper class people also live here for security reasons. The density of population in this locality is very high. Property prices are also high and because of congestion, the tendency of vertical expansion of buildings is high as there is no space available for horizontal expansion. The small localities in Okhla such as Zakir Nagar are rusting and in slum like conditions. These areas are deprived of urban basic services such as decent transport, public parks, garbage collection, supply of potable water and population density is growing. Due to non-supply/unavailability of water, inhabitants in the locality are forced to purchase water. Only 56% have access to tap water. For this group, 2 hours of water supply is considered a luxury. The rest do not even have this much water made available (Institute of Objective Studies, New Delhi India 2015). Only 88% have sanitation services inside houses (Institute of Objective

²³ Source: Information provided on website for renting houses in NFC, www.grabhouse.com.

Studies, New Delhi, India 2015). Bank services, post services, public library services are highly unsatisfactory. Small colonies in the area are expanding in a haphazard manner without urban planning schemes (Institute of Objective Studies, New Delhi, India 2015).

3. Old Delhi is an area of the lower and middle class where a majority of the population are Muslims. This locality is highly congested with very narrow and rather busy streets full of intense commercial activities. Families in Old Delhi consist of small entrepreneurs having their own small scale factories on the ground floor and their homes on the first floor of houses. Young people usually drop out of schools early and join factories. These localities are neglected, without proper provision of basic urban facilities, and have a growing population density. People in Old Delhi complain about irregular garbage collection. In the rainy season piles of garbage flow into the drains choking them. This is a great health concern for the locality. The DJB supplies water for 2 hours in the morning and 2 hours in evening in old Delhi but there are also days which are dry and without any water supply (Institute of Objective Studies, New Delhi, India 2015). Locals have installed public taps in different pockets that supply water from bore wells. If these public taps do not work which happens occasionally, people borrow water from nearby restaurants who get the water by placing water bottle orders with private water suppliers (Pushkaran 2015).

4. Connaught Place (CP) is one of the city's largest and most important commercial and business districts and also includes a residential area for central ministers and officials. In history, Delhi's modern elite and wealthy Indians could only afford houses in the surrounding nearby area called Rajpath. Connaught place is surrounded with the most expensive shops and restaurants. Initially it was designed for residential and commercial purposes but now it is a fully commercial area which does not have any water shortages. At a distance of around 1 km from Connaught Place, Gole Market is a middle class area where water supply is a big issue. People store water in water storage tanks or purchase water when they run out of stored water.

5. Ranjeet Nagar is a sub district of Patel Nagar which is a large area with a population of 1262158 (Census of India 2011a). Ranjeet Nagar is an upper middle class and lower middle class area with different housing structures and facilities. Some streets are wide; others are really narrow and busy with commercial activities. Urban services, such as collection of garbage and water supply, are comparatively better in the upper middle class areas than elsewhere. In other parts of the sub-district, people rely on bottled water in cases of shortage or no supply. Sometimes the situation was so bad that people stole water from others.²⁴ Women even have to wake up in the night to fill tanks when water is available.

6. Nangloi Jat had 205,596 inhabitants in 2011 (Census 2011). The majority of the population consists of jats, a dominant agrarian caste and yadavs, a caste primarily involved in cultivation. Most of the agricultural land has been taken for settlement purpose or for industrial development. According to the Comptroller and Auditor General of India, wealthy inhabitants of Nangloi Jat receive more than 200 lpcd of water. Nangloi Jat is the residential area of various influential people such as political leaders.

7. Dwarka Slum is a large slum in Delhi. A large number of people in Delhi live in slums especially in the west zone because of the availability of more open space. The zone constituting about 33 per cent of the total slum clusters in Delhi (Ishtiyaq and Kumar 2010; Planning Commission 2011b). Delhi has a significant number of slums; nearly 1,058 are notified and related data is maintained by the state government; 2,075 are non-notified slums²⁵ (Agarwal and Panda 2013). The slum in Dwarka taken for this study is crowded and families are living in poverty. Typically, a family of 4-6 members lives in single room. Most of the male members of a family work as laborers in construction or as rickshaw pullers. The female members work as housemaids. Children also work as rag pickers and sell their findings to recycling retailers. Living conditions are pathetic. They have almost no access to services, including water. People living in

²⁴ Information was taken during field work.

²⁵ The city development plan for Delhi, 2006 outlines the approach of the government towards areas notified as Slums under the Slum Areas Act 1956. The strategy has been three pronged (i) Clearance/Relocation; (ii) In situ up-gradation; and (iii) Environmental Improvement Schemes (Planning Commission 2011b: 155).

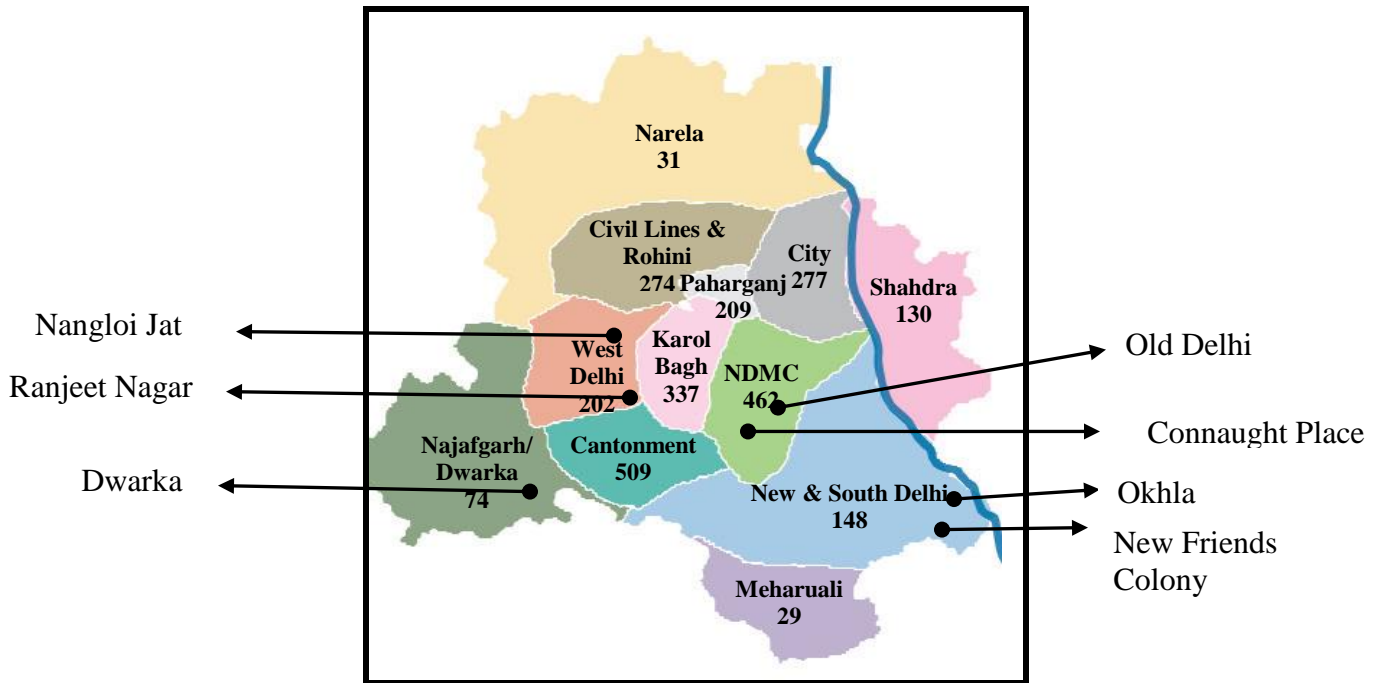
this slum usually rely on community taps or get water from afar. The water they can get is insufficient to meet daily needs and thus they live in unhygienic conditions.

These regions are characterized by their closely situated locations. Yet, they represent very different kinds of settlements inhabited by citizens of different financial status. The selection was done to explore the argument of inequality in Delhi. Two closely located areas with big differences in their economic status show disparities in access to basic urban services especially water supply. New Friends Colony and Okhla are geographically neighboring areas but the access to water services in both is very different. Bungalows in New Friends Colony are privileged with uninterrupted water supply whereas in Okhla not every household has a water connection.

Table 3: Summary of Selected Districts and Localities in Delhi.		
Selected Districts in Delhi	Selected Localities in different Districts	Specific Locality Related Information
South District	New Friends Colony	Area of big Bungalows occupied by rich and business class of Delhi. Urban services are satisfactory. No sign of water tanker suppliers is found in these localities.
	Okhla Village	Highly populated and congested areas. Provision to urban services is highly ineffective. Locality is mostly occupied by Muslim population.
West District	Ranjeet Nagar	Area of upper and lower middle class with different housing structures and facilities inside. Urban services in the areas of upper middle class are comparatively better than the rest such as collection of garbage and water supply.
	Nangloi Jat	Wealthy and influential people are inhabitants. Water supply is more than 200 lpcd.
	Slum Area in Dwarka	Highly congested and low lying area occupied by very poor and the most marginalized group of society. Basic amenities are a great concern and struggle for the people in this slum.
New Delhi	Connaught Place	Highly commercialized surrounded with the poshest areas of Delhi where elites are living. No problem associated with water supply is noticed.
Central District	Old Delhi	Highly congested and crowded areas with major Muslim inhabitants. Water supply is a daily issue.

Source: Selected by the Author.

Figure 6: Selected Localities in Megacity Delhi.



(Selected localities in the map highlighted by author)

Source: (Narain and Pandey 2012: 85). Sunita Narain and S V Suresh Babu 2005, 'The Political economy of defecation', Down to Earth, Vol 13, No 23 April 30, Society for Environmental Communications, New Delhi.

4.3. Data Collection Framework

The research involved deep analysis of various kinds of secondary data from numerous sources to obtain considerable information about the water situation and urbanization disparities within the city. The data provided good insights into the issues related with authorities that are responsible for water management such as non-uniform water distribution, reported scams, appointment procedures and lack of professional training of authorized staff members. The collection of primary data included interviews with experts such as government officials, politically active people, academia and officials from non-government organizations with expertise on the issue of water. In sum 30 interviews were conducted over the time span from March 2013 to April 2015. A total of 423 household surveys were conducted in selected localities between December 2013 and January 2014.

4.3.1. Archival Research

General information on water issues and other related issues such as urban planning, inequality, human development and corruption was collected from numerous institutions based in Delhi and Berlin. The institutions which were contacted about water distribution and supply-demand gaps are: Delhi Jal Board (DJB), The Energy Research Institute (TERI), Center of Science and Environment (CSE), Water Integrity Network (WIN), Transparency International, National Institute of Urban Affairs and Delhi Development Authority (DDA). To gain an overview about corruption in the water sector and for the mapping and measurement of corruption, Water Integrity Network, Transparency International India and Focus on the Global South were contacted. The information related to each community was retrieved from the National Institute of Human Development in Delhi. Newspaper articles in the Times of India, Hindustan Times and Economic Times²⁶ were collected to remain informed about any related development. Several videos of stakeholders' meetings and workshops on YouTube related to the issue of water supply management in Delhi were also viewed (Appendix IV).

4.3.2. Primary Data Sources

Primary data was collected from unstructured interviews with experts who also helped in selection of studied areas in the city. Interviews were focused on the roots of the problem and the challenges faced by government officials in dealing with water problems and by citizens in trying to cope with their water scarce situation. The interviewees also asked for suggestions for improving the situation. Qualitative data was retrieved from household surveys to measure intervening variables and to conclude on other aspects as well. Photographs of various locations are included for better representation.

²⁶ Times of India, Hindustan Times and Economic Times are the most reputed and reliable newspapers in India.

4.3.2.1. Interviews

Interviews were very useful for investigating perceptions, including about migrants and the influence of social networking on water service provision. The interviews provided useful insights, which were not documented elsewhere. The author found most of the interview partners through snowballing. People from government, such as in the Ministry of Water Resources and DJB agreed to be interviewed, but other officials were reluctant to be interviewed. This made it difficult to get some information. Interviews provided insights regarding the influence of history on water governance in Delhi which is argued in the entire study. The process of interviews involved semi-structured questions with individuals. The questions asked included: In your opinion why do only some areas in Delhi have water problems and not the entire city? If Delhi is a tough city, why do so many people from other areas migrate into it? Is the emergence of corruption different in India from the rest of the world? How can the inefficiency of governance be differentiated from corruption? Does democracy make a contribution to the development of India in reality? If yes, how and if not why not?

Total 30 interviews were undertaken for this research; from which 2 were taken in Cologne, 1 in France, 4 in Berlin and 23 in Delhi, 6 via email, 9 by skype, 11 by telephone and 4 in person. Interviews conducted by email were done in the following way: questions were sent to the interviewee and he/she responded to those questions by replying to the email. Skype and telephone interviews lasted approximately 30 minutes and sometimes even more. Sometimes the same questions that were asked in the written form were also asked in the conversation over phone or skype. The interviewees were involved directly or indirectly with water management in Delhi and other related issues such as urban planning, human development and local politics.

Interviewees included:

- Senior government officials, Delhi Jal Board, Police Department (3).
- Academia (9)
- Officials from non-government organizations (1)
- Other professionals (8)

The selection of interviewees was primarily done by ‘adopting a purposive sampling technique.’²⁷ Interviewees were selected because of the positions they occupy in different organizations and the knowledge they hold about the urban water sector and urban development in Delhi. The issue of urban planning of Delhi and its connectivity with water was intensely discussed with the interviewees. During the selection of interviewees, it was realized that they belong to very diverse groups and have a diverse basis of knowledge. They were involved in different aspects of water management but also knew about integrity aspects, human rights and social justice linked with water in Delhi. Interviews were conducted to cover all aspects talked about in the dissertation such as the issue of corruption, the caste system, identity politics, economic growth, the welfare of society and its link to human development, and cultural norms and their connection with the water sector.

All the interviewees and institutions who asked for confidentiality were given it. In cases where someone did not want to have his or her identity revealed in the dissertation, it was kept hidden.

There were several benefits achieved through interviews. First of all, insights were gained at a depth and level of detail that was not possible to gain about such complex issues from simply reading the literature. Interviews provided validity to the research project. They also revealed to the author the importance of the research project given the interest the interviewees showed in providing information.

4.3.2.2. *Household Surveys*

Household surveys included several kinds of settlements including planned and authorized colonies, unauthorized colonies, planned quarters and urban villages. In total 7 different localities were selected from four different districts of the city and 423 houses were interviewed.

²⁷ Purposive sampling techniques are primarily used in qualitative studies in order to select individuals, group of individuals or institutions based on specific purpose of the study to collect the information they can provide which cannot be retrieved from other sources (Teddlie and Yu 2007).

The criteria used for the selection of the city areas for surveys were chosen keeping in mind the major arguments of the dissertation in order to show the disparities in water availability in different regions of the city. The surveys were conducted with the help of master students from The Energy and Resources Institute (TERI), Delhi. The selection was based on deep analysis of Delhi Master Plans and maps. The selection of areas were chosen in a way that two closely located colonies having very different supply of water; in such a situation water authorities cannot easily argue that the area is far from a treatment plant location or that most of the water is wasted during transmission. The social status of inhabitants of those areas and their position in the social hierarchy was closely observed. Household survey recipients were not asked the sensitive question of caste but they were asked about their profession, usually a good indication of their caste/social group. The indicators such as amount or hours of water supplied in a day and its quality standards were also monitored to analyse the performance of water authorities for those who get water from the government.

Table 4: Data Collection Techniques and Sources.		
Primary Sources	Archival Research	Media Sources
1. Interviews with the Key informants 2. Household Survey	<p>Water supply Status within different parts of the City Delhi Jal Board Centre of Science and Environment The Energy and Resource Institute (TERI)</p> <p>Settlement Types in the city National Institute of Urban Affairs Delhi Development Authority Municipal Corporation of Delhi Delhi Master Plan</p> <p>Research Work Journals, Books and published articles</p> <p>Corruption in Water Sector Water Integrity Network (WIN) Focus on Global South Transparency International</p> <p>Caste System in Delhi National Institute of Human Development</p>	1. The Times of India. 2. Economic Times 3. You Tube Videos

Source: Author's Table.

4.4. Methodological Approach

Qualitative methods are used to analyse the collected data from official reports, government documents, archive material, and interviews including household surveys and compiled in the form of tables, graphs, diagrams and pictures to support the arguments made in the study.

The social dimension of good water governance was investigated in relation to the availability of water to all the citizens throughout the city. Additionally, people's awareness and perception of lack of availability of water was examined to get a better understanding of the root causes of the water crisis in the city.

No other resource can replace water; for this reason, a section asking about the ways households use to get water (legally and illegally) was included in the questionnaire. It was necessary in cases where authorities are not providing water to determine from where and how water is coming into houses. Another very interesting and influential factor included in the questionnaire was caste/class. This was done to check the fairness of the water authorities in providing water to citizens. It was assumed that an unfair attitude on the part of water authorities would result in illegal activities to get water.

The analysis of the independent variables of corruption and the caste system was really challenging because nobody wanted to talk about them. Corruption flourishes in a non-transparent environment and under secrecy. To identify the actors in the hidden process is very challenging.

There are three different kinds of indicators for corruption mentioned by UNDP:

1. Perception-based indicators and experience-based indicators
2. Indicators based on a single data source and composite indicators
3. Proxy indicators

Perception based indicators have been used the most frequently as tools. “They rely on the subjective opinions and perceptions of levels of corruption in a given country among experts and citizens.” Experience based indicators are based on personal experiences and are related with giving bribes or other kinds of corrupt activities (UNDP and Global Integrity 2008: 8).

Composite indicators are generated by various third-party data sources. These indicators are on a global scale the most widely used tools because of their “near-global coverage”, which help in international business decisions (UNDP and Global Integrity 2008: 8).

Finally, the proxy indicators are used because corruption cannot be observed empirically. “Proxy indicators seek instead to assess corruption through indirect measures by aggregating many voices and signals of corruption or by measuring the opposite such as anti-corruption, good governance and public accountability mechanisms” (UNDP and Global Integrity 2008: 9).

In this dissertation, the proxy indicator method is utilized to analyze the different building blocks of good governance such as transparency, accountability and participation. These proxies give impressions about the presence of corruption in the water supply chain in the city. To test transparency, accountability and participation of citizens in decision-making processes a small part of the questionnaire was devoted to measuring these terms. Both citizens and government officials are involved in corrupt activities. To get more information about these activities, the water sector value-chain of Delhi was analyzed. The reason for doing a value-chain analysis is to understand the root of the problem within the sector and not only in the water distribution/supply system.

By analyzing corruption, it is possible to find ways to improve water governance and hence to improve the water supply situation. The findings of the study should lead to the development of methodologies and tools to enhance transparency, accountability and participation.

Class factor is associated with income of the household. And to determine this factor, a range of household income was included in the interview.

Household as well as institutional responses were studied to draw conclusions about methods for coping with corruption and caste division. Changes cannot happen overnight but steps to make the situation better can be taken. Enhanced participation of citizens and a more accountable and transparent system could be interventions to rectify problems. Various recommendation and suggestions are presented and the actions of the new Delhi government are considered.

Conclusion

The thesis describes and analyses developments in Delhi in terms of urbanization, population growth, and depletion of resources. It looks at old and existing informal institutions and their influence on water governance today. This is done with the help of primary and secondary data sources and using the approaches of historical institutionalism and path-dependence.

This chapter has outlined the research design where most of the emphasis was on the data collection techniques and the methods applied to analyse the overall situation in Delhi. The chapter also described the methodology applied to operationalize selected variables. The following chapter provides a detailed outline of the influence of historical events around water and civilization because society and water have a close relationship.

5. Overview of Water, Culture and Politics in India

“The history of water management is nothing less than the history of humankind in its attempts to eke out a living and, whenever possible, satisfy its desire. For human beings water was not merely a substance than sustained life. It was above all an elemental ingredient in the way people conceived of the world and a principal component in the expression of their thoughts and emotions” (Hassan 2011: 5).

Water plays an essential role in structuring ideology and society (Oestigaard 2009). This relationship is different in different places and in different cultures. Religion is an important element of Indian culture and greatly influences it. Water plays an important role in all of India’s religions (Sharma 2004). This chapter explores the relationship of water and culture, influence of culture on the Indian politics and its impacts on the water management.

This chapter provides an understanding of how and why water creates identities and how cultural values are formed on the basis of water. Understanding how cultural values, uses and practices are affected by and affect water management can help in informing policies and decisions. The consideration of cultural activities can help in framing management decisions and in achieving compliance with relevant legal mandates (State of California, Natural Resources Agency and Department of Water Resources 2013).

The idea of this chapter is to unwrap the relationship between Indian society and politics around water. It describes the foundation of formal and informal Indian politics. The chapter first elaborates on the concepts of caste and class in Delhi and how people are discriminated against in terms of the provision of basic services. The chapter unwraps the layers of Indian diversity in terms of culture and ethnicity. It describes key characteristics of Indian society and the way formal and informal politics function.

The chapter will look for answers to the questions of:

- How is water important to Indians other than as an important element for survival?

- Why does water have political importance in India?
- How do the society and the state relate in India?
- How do water, society and politics in India interrelate?

5.1. The Indian Caste System and Social Inequality

The caste system evolved from pre-industrial divisions in society. It exists in addition to the inequality of the urban-rural divide. According to Louis Dumont (1980: 21), “the caste system divides the whole society into a large number of hereditary groups, distinguished from one another and connected together by three characteristics: separation in matters of marriage and contact, whether direct or indirect; division of labour, each group having in theory or by tradition, a profession from which their members can depart only within certain limits, and finally hierarchy, which ranks the groups as relatively superior or inferior to one another”. The caste system is really nothing but a form of social inequality, which establishes differences among different groups of people.

“Social inequality in society presents itself in varied forms; the major forms being class, power, status, race and gender. The forms of inequality are however, based on certain social bases and some of the key social bases are wealth, power, status, prestige, physical characteristics such as gender and race” (Xaxa 2010:79; Béteille 2003).

The concept of institutionalised inequality is linked to the caste system and religious divisions among India’s diversity of religions (Oommen 2010). Basically the caste system was started in order to put an identity on different groups in different regions of India. Both religious theories and biological theories have addressd the caste system. According to social theory, the caste system was started after the arrival of Aryans in 1500 BC who were comparatively fair in skin color. Before the arrival of Aryans, the Indian communities were already divided into groups, such as Negrito, Mongoloid, Austroloid and Dravidian. Among them the Dravidians were the superior and the largest group in India. They were the main group in contact with Aryans (Pruthi 2004). Aryans also typically organize themselves into groups such as Kshatria, Brahmans, Vaisia on the basis of their occupation (Pruthi 2004). At that time, in the

hierarchy of this division, skin color was an important factor for making classifications (Pruthi 2004). With the passage of time, the main factors influencing the classification of individuals into different groups have changed but the identity-forming element of caste still persists today.

The Indian caste system is linked to Hinduism, which is estimated to have started anywhere between 3000 B.C to 1000B.C (Freitas 2006). The caste system remains an important element of Indian society (Freitas 2006). The caste system divides people into four groups called *varnas*. On the top of this hierarchy is the Brahmins (the scholars and teachers), followed by the Kashatriyas (rules and warriors), the Vaishyas (traders and merchants) and finally at the bottom are the Shudras (artisans and labourers). A fifth group, called Untouchables, falls outside of this hierarchy and refers to those who are involved in the occupation of scavenging (Rao and Ban 2007). These four groups are further divided into thousands of jatis.²⁸ These groups have a hierarchy among them and a person borne into a varna is not allowed to move from one caste to another. An individual can be expelled from one caste but cannot join another. Caste identity cannot be altered (Grinsell 2010). Another rule of the caste system is that one cannot marry outside its caste (Rao 2010). Apart from this division of groups, people are also divided in their beliefs and thinking. The ones at the lowest levels, the Untouchables are traditionally discriminated against by the upper castes who tend to keep a physical distance from them. Under this belief system, lower caste people are polluted and thus will destroy their spirituality (Grinsell 2010).

There are multiple meanings of the term ‘culture’ in different disciplines and in different contexts. Huntington and Harrison (2000: xv) define culture as “the values, attitudes, beliefs, orientations and underlying assumptions prevalent among people in a society”. They suggest culture influences greatly the behaviour of people. Specific habitual behaviours form, including those linked to the caste culture. Caste-related beliefs and discrimination are rooted in cultural and religious values and have had a great

²⁸ Similar to varnas, jatis also address divisions but they are innumerable. For example, in one region population is divided and subdivided and sub-subdivided into hundreds of different jatis. The division of jatis is similar in the manner of ranking to varnas but they are not as tidy or rigid as the ranking order of the varnas. Jati system is much more flexible and dynamic system compared to the system of varnas (Shinde 2005).

influence on almost every sector and continue to affect social, economic and political development. Mancur Olson (1982) argued that a reason why some countries are richer than others is the quality of the institutions of those countries, he also mentioned that the caste system is the root cause for the stagnation in India. Kaivan Munshi and Mark R. Rosenzweig (2005) and Vijayendra Rao and Radu Ban (2007) wrote about the inequality and resource discrimination in India. Some see the caste system as being about inequality and deprivation from resources while others point out that caste networks help in reducing stress on a certain group (Munshi and Rosenzweig 2005).

views of caste differ markedly: from those who see it as a religious system to those who view it as merely social or economic; from those who admire the spiritual foundations of a sacerdotal hierarchy to those who look from below and see the tyranny of Brahmins; from those who view it as the Indian equivalent of community to those who see it as the primary impediment to community. But an extraordinary range of commentators from James Mill to Herbert Risley, from Hegel to Weber, from G.S. Ghurye to M.N. Srinivas, from E.V. Ramaswamy Naicker to B.R. Ambedkar, from Gandhi to Nehru among many others who will populate the text that follows, accept that caste is somehow fundamental to Indian civilization, Indian culture and Indian tradition (Dirks 2001: 5).

In ancient India, society was governed by moral law, not by codified law. Laws in ancient India were developed from religious beliefs, social values and social systems. The caste system is one of the “most rigid social systems” (Vincent 2011: 8). The Constitution of India guarantees equal rights to all citizens and legally abolished discrimination on the basis of caste and religion (Dayanand 2004). Nevertheless, customs are difficult to change. Although acceptance of the equality of people is growing, change of patterns is hard.

The caste system is not only a social category; it is also an economical and occupational category which persists in modern Indian society as an ‘institutionalized system’ (Chaudhry 2013). The system restricted marginalized people’s access to the means and resources needed for upward mobility. The caste system has brought social exclusion and discrimination for those whose status is lower and who have to struggle against discrimination (Chaudhry 2013). Social exclusion of members of the lower caste and discrimination against them in education, politics and obtaining employment based

on the caste system has taken many forms (Bhattacharyya et al. 2010). Berreman (1967) concluded that “caste status and economic advantage go together in India” (Berreman 1967:402; Robson and Kjønsstad 2001: 62). Today, it is assumed in society that those who are better off economically have a better status in society. This works to the disadvantage of the poor who are not treated well.

5.1.1. Influence of India’s Caste based Social Diversity on its Political System

Education has been seen as a weapon to be used in abolishing India’s caste system. As society in Indian cities has become more educated and modern, shifts have occurred in the caste system in terms of social relationships and social activities but it did not disappear (Singh 2013; Siddaramu 2013). The People of various castes eat together and work together (Kobayashi-Hillary 2004); but their mindset has not changed; they still believe that backward communities are not equal. Policy makers and decision makers are also influenced by this basic mindset.²⁹ In India caste cannot be separated from politics and elections are fought on the basis of caste where political parties mobilise caste support (Siddaramu 2013; Shah 2004).

Caste and politics have a long interrelationship in Delhi; although there is an interest on the part of some political and economic elites to sweep over India’s caste society, the reality is that the caste system still exists in practice (Kumar 2013: 83). The caste system has been at the root of Indian traditions for centuries. In contemporary times as India looks forward to one day being counted as a developed nation, the caste system is seen as a major threat to the country’s growth and its modernity; “when thinking of India, it is hard not to think of caste” (Dirks 2001: 3).

The caste system has a strong influence on the Indian political system and elections (Ahmed and Naseem 2011). Caste based politics can be seen in many Indian states and has strong roots (Ahmed and Naseem 2011). Politicians and political parties take advantage of social differences to win supporters and voters. In rural areas castes remain an obvious element of society. It is easy to differentiate people of different castes

²⁹ Information obtained from an employee of a non-profit independent institute in Delhi on 8th August 2014.

because of their professions. In urban areas it is harder to judge but class differences still remain obvious, for example, by the housing structures and the assets owned by the individuals such as the kind of car they use .

Caste and politics share a give and take relationship where caste helps political parties to win their elections; and the citizens in turn expect that politicians will use their political power to help caste members in various manners including to achieve higher social, economic, educational and occupational status in society (Chaudhry 2013: 62; Ahmed and Naseem 2011: 5).

5.1.2. Quota System as an Outcome of the Caste System

Quota reservations were adopted to make it possible for those in the lower castes to rise up in status in India. The most important aim of this system was to boost opportunities for improved social and dignified position of the underprivileged communities and allow them equal opportunities in the Indian society. The reservation/quota system in India was introduced in 1918 (Das 2000). When the reservation policy came into effect, lower caste people who were mainly of a Hindu religious background were provided with opportunities for education and a set quota of government jobs was reserved for them. The aim of the reservation policy is to provide opportunities to Schedule Castes (SCs) and Schedule Tribes (STs) to enhance their representation in the “State Legislatures, the executive appendage of the Union and States, the labor force, schools, colleges and other public institutions” (Jangir 2013: 126). Schedule Castes and Schedule Tribes are those communities who are recognized by the Indian Constitution for special support to overcome the discrimination they have been experiencing for centuries. Schedule castes mainly belong to the group who were historically considered as ‘untouchables’ (Larsen 2011). Whereas schedule tribes are the tribal communities who live in remote and inaccessible hilly or forested areas of the country. The Indian Constitution has made special provisions to protect them from social injustice and exploitation (Sujatha 1999). This quota system was intended to give lower caste people protection and power in the political system.

The quota policy in India had resulted in several conflicts and has flaws. There are no reservations (quotas) for the Muslim community even though Muslims are considered as a minority in India (Najiullah 2011). Furthermore, the system has been criticized for providing benefits on the basis of caste even though poor people exist in all groups of the caste system. Reservation should be on the basis of wealth or income and not on the basis of caste. One of the major aims of the policy was to abolish poverty, but several well-off individuals from lower classes have benefited from the policy while poorer members of other castes have failed to get any benefits (Jangir 2013).

The quota reserve may also have contributed to the caste consciousness among citizens although this viewpoint is also challenged in the literature (Paswan and Jaideva 2003). The entire system of reservation is based on the caste system (Gill 2003). If there was no caste system and related discrimination, there would be no need for a reservation policy. The quota system allowed the entrance of lower class people into Indian politics, but this has enhanced caste consciousness in the country.

Initially, the reservation system was only to be implemented for 10 years. It was thought that this would be sufficient time for uplifting of SC and ST communities. But no steps have been taken to change the policy because of political concerns (Jangir 2013); about 33% of those voting are in the SC and ST communities. No government is in favor of losing those votes by abolishing the reservation for these communities (Jangir 2013).

5.2. Relationship between Water and Indian Culture

History does not only tell about solutions to past problems but also tells us why we opted for such a solution and guides us in assessing long term strategies (Hassan 2011). From ancient times until today, water has a unique place in societies and religions. Water is not only needed for ecosystem functionalities but it is a naturally embedded element in people's identities, cultures, worldviews and religious perceptions related to this world and to the hereafter; therefore, it is important to understand the relationship between water and culture for planning and future development (Oestigaard 2009). Civilizations typically started in the valleys along rivers. There has not been much written about how water creates identities and social values or how these identities and values are

impacted by changes in the water environment. Human activities are based on daily, seasonal and annual availability of water. Traditions are made and creation of values and norms are based on those activities (Oestigaard 2009). These values and traditions have a strong influence on how people behave and their overall attitudes. “Culture as a concept needs to be understood as dynamic and not monolithic. Communities and their cultures are not set in stone but are based on living people; cultures change and can be diverse within a community. Every segment of society – including water scientists, managers, and engineers – has its own cultural engagements with water. It is thus important to regard cultural considerations not as an ‘extra’ factor that needs to be taken into account in decision-making on water allocations, but rather as an integral part of any such decisions. Just as engineering and scientific cultures are represented in such decisions, those of local people need to be included as well” (Johnston and Hiwasaki 2012: 409).

Similar to other regions in the world, civilization developed in India around rivers. In Indian culture water plays an important role in myths and religious rituals because of its physical and aesthetic properties. Attitudes and actions towards water are also influenced by religious activities as water is used in several different manners (Oestigaard 2009: 18). Even after thousands of years, water has not lost its importance in the performance of daily religious rituals and the purification of the body. Water resources such as the Ganga river and the Yamuna river are considered divine and are believed to have the ability to purify humans who bathe in them (Sharma 2005). Bathing in holy rivers is very popular due to the belief that it removes past sins and dipping worship items in water is also considered to be of a great spiritual value. Morning and evening prayers with a handful of water are a part of daily life for Indians (Rodda 2004). Because water is important for life and even considered to be divine, societies and cultures traditionally developed techniques to conserve and manage it. Former generations realized and gave due consideration to the right to the use of water by all creatures, including birds and animals (Rodda 2004).

In the past open wells were very common; their use was very much related to the Indian culture tradition of the caste system which revolves around the concepts of purity and impurity. In this social system of division, Brahmans who are considered to be the purest because of their occupational involvement in ritual and religious activities, had

control over water resources. The pure status of Brahmans is believed to be reduced if they come into contact with impure things or actors; therefore, lower caste people were not allowed to take water from the same water resource where Brahmans took their water (Fawcett and Joshi 2001). Spiritual inequality transformed into water related social inequality. In the law book or Dhramasastras the roles and duties played by the lowest caste Sudras were clearly defined. The Sudras are responsible for undertaking polluted tasks as it is believed they are the most suitable for carrying out these undesirable activities based on their inherited status (Fawcett and Joshi 2001: 4). The Dhramasastras regard water as a medium to purify and rid pollution caused by Sudras touching a well (Fawcett and Joshi 2001). Lower caste people were always socially excluded and discriminated against. They were kept away from water resources in order to keep them pure. The caste system and discrimination in access to water have a very long and old relationship.

5.3. Various forms of the Caste System

In order to understand inequality one has to go back in history to understand how various kinds of inequality arose (Flannery and Marcus 2012). Levels of equality are not only about economic status and income distribution; they affect access to resources, education and health facilities; social acceptance; and opportunities in life because inequalities are linked to each other (Sheahan 1999). In India due to commercialization of education, well off people have better opportunities to upgrade their status as a result of their access to education. Occupation, life style, wealth, and income distinguish people within the same society; inequality is rooted largely in these social differences (Keister and Southgate 2012).

Individuals and groups may face social exclusion and multiple disadvantages on the basis of their social identity (Kabeer 2006). Social exclusion can lead to unemployment, lack of political voice and poor social relationships (Khan 2009). The term 'social exclusion' was used by French socialist governments in the 1980s to refer to marginalized people especially those who have no access to the social insurance system

(Percy-Smith 2000). The forms that social exclusion takes as well as its consequences differ in different contexts (Percy-Smith 2000).

Amartya Sen (2001) described social exclusion in different countries of Asia. He argued that the success of eastern Asian countries is partly because of their 'ability to avoid' social exclusion especially in some basic services such as education which is important in fueling the progress of any country. While Eastern Asian countries have suffered greater social exclusion problems due to the financial crisis, the provision of basic services has not been affected. This differentiates eastern, from western and southern Asian countries (Sen 2000).

According to the Commission of the European Union, social exclusion is the outcome of poverty which influences people's lives and results in feelings of exclusion from society because of limited or lacking access to housing, education, health and services (Percy-Smith 2000; European Commission 2010). Amartya Sen argues that social exclusion is related to the capability of a certain group to participate in social activities and retain self-respect: "social exclusion is a part of capability deprivation as well as instrumentally a cause of diverse capability failure" (Sen 2000: 5).

Social exclusion as a result of globalization and economic growth is a rather new development in comparison to the ancient concept of the caste system. Uneven economic growth brings financial disparities and widens the status gap among individuals who are divided into groups (Malik 2013). In the Indian context there is still a rather strong caste consciousness and discrimination against people who belong to other groups.

Social exclusion and inequality are closely linked and interrelated. Horizontal inequality and social exclusion are multi-dimensional and take social, economic and political forms (Khan 2009). Discrimination is an unfair treatment of an individual, a group or a people based on particular characteristics, such as age, gender, disabilities, or sexual orientation (ADB Factsheet 2011). Discrimination and inequality are interconnected and reinforcing. Inequalities among groups make one group more powerful than the other, often making it possible to dominate and discriminate against others. Discrimination exacerbate inequalities. The uneven distribution of opportunities for lower groups is also linked to their difficulties in mobilizing (Dhesi 1998).

Chronic poverty occurs when a group faces social exclusion and inequality, whether in terms of resource distribution or opportunities for education, remains in poverty for extended periods of time (Thorat and Mahamallik 2007). “In India, exclusion revolves around social processes and institutions that exclude, discriminate, isolate and deprive some groups on the basis of caste” (Thorat and Mahamallik 2007: 4; Dhesi 1998).

5.4. Features of the Indian Society

This section explores the day-to-day life of Indians, in relation to work, marriage, the education of children, relationships and politics. These features inform the Indian mindset and behaviour towards nature, values such as honesty, and behaviour towards the opposite gender. Indian society is influenced by ancient religions, traditions and culture as well as from influences brought by other cultures, from the Islamic rulers to the British colonizers (Misra 2009; Coomaraswamy 1983). A broad set of cultural values and traditions have shaped the institutional structure and fabric of Indian society (Misra 2009: 255).

I do not want my house to be walled in on all sides and my windows to be stuffed. I want the cultures of all lands to be blown about my house as freely as possible. But I refuse to be blown off my feet by any – Mahatma Gandhi (Pingle and Varshney 2014: 353).

These words from Gandhi defined Indian people. Despite globalization, Indians tend to follow their own culture regardless of where they live. Culture is a strong element in their lives (Ganeri 2013).

Hinduism is the dominant religion of India with 82% of the country’s population being Hindu. Hinduism is ingrained throughout the country (Overgaard 2010; Kumar 2004). It is one of the oldest religions in the world (Overgaard 2010). Hinduism is also diverse and follows different traditions in different locations of the country. A uniting aspect of the religion is the law book of Dharma. Dharma sets out rules of behaviour corresponding to a person’s placement in the caste system (Overgaard 2010). According

to Dharma, the birth of a person into a lower or upper caste is connected with their deeds from the previous life and the same will lead to their rebirth after the present life into a caste as determined by their deeds in the present life (Overgaard 2010: 9). Lower caste people also tend to believe that rebirth will be into a better state and this means into a higher caste.

In Indian society personal relations are more important than formal rules (Overgaard 2010). Depending on the situation, the same rule can be applied differently at different people depending upon the need of time and personal relations; there is discrimination in enforcement of law (Overgaard 2010). For example, poor people in India are mistreated by police whereas with rich people police maintain a certain standard of decency (Vadackumchery 1998). To get the things done in India good connections, contacts, and references are key (Gesteland and Gesteland 2010: 35).

India has a communitarian culture; Indians tend to respect and listen to the opinion of their family and friends. Keeping social harmony is important making it is hard for Indians to say 'no' (Overgaard 2010). In Indian culture, an individual is responsible to look after the interests of the larger community. A person is judged on the basis of his treatment and relations with his community. For Indians social relations and bonds are hard to separate from business agreements. Good business deals are based on good relations because of their diffuseness (Overgaard 2010). Diffuseness in India is also connected to religion.

The ancient caste system is now closely associated with social status (Overgaard 2010). Although the Indian Constitution defines hatred as a crime on the basis of caste, caste thinking has not been completely abolished from the thinking of people and society. Indians are status and caste conscious people. In a modern city like Delhi, people remain class conscious.

5.5. Formal Indian Political Structure

Indian political structure is two sided. One side reflects the rule of law, the administrative structure and the roles, responsibilities and functions of the executive and

legislature as defined by the Constitution (Abbas et al. 2011). Another side is informal, as highly influenced by the religious and cultural beliefs of the society (Narayanan 2015). India is the biggest democracy in the world but its democracy discriminates. It is those who have power and resources who can enter politics; common men who do not have enough resources cannot easily enter politics nor have their interests heard.³⁰

5.5.1. The Constitution

After independence in 1947, one of the major aims of the Indian leaders was to make a modern and a secular state in which all citizens are treated equally. Under the Constitution, there are six fundamental rights which are meant for promoting the ideal of a political democracy rather than an authoritarian rule in the country. There are six fundamental rights provided in the Indian Constitution (1) right to equality provides equality to all the individuals before the law, equality of opportunity in public employment, abolition of untouchability (2) right to freedom gives all the citizens freedom to speech and expression, protection of life and liberty, right to elementary education (3) right against exploitation prohibits human trafficking and forced labour, protection employment of children below the age of 14 years in factories or mines (4) right to freedom of religion gives freedom to choose profession and religion (5) cultural and educational rights protects the rights of minorities regarding their language and culture, and (6) right to constitutional remedies is the right to move the Supreme Court for guaranteed enforcing of fundamental rights (Laxmikanth 2011). India chose a federal structure and parliamentary system in which both central and state governments have assigned roles (Chakrabarty 2008). The central government is responsible for defense, atomic energy, foreign affairs, railways, shipping, post and currency whereas the states have responsibility for the administration of justice, public health, education, agriculture, forests and local government; some other functions such as economic issues, social planning, trade and commerce, industrial monopolies and trade unions are shared between the two governments (Verma 2000: 91).

³⁰ Information obtained from an employee of an Academic Institute in Delhi on 20th July 2014.

5.5.2. The Parliament

The Indian parliament is composed of two houses: the Lok Sabha and the Raj Sabha (Verma 2000). The Lok Sabha is the primary house in the parliament and responsible for ensuring that the government is accountable for its functions; it also acts as a legislative assembly and as a representative assembly, where members of parliament represent their constituencies (Verma 2000). The Raj Sabha is the second chamber in the Indian parliament and has the right to debate legislation and ask the Lok Sabha for further review before giving its consent (Verma 2000: 92). The major functions of Parliament are assuring the accountability of the government and the processing of legislation. Drafts of bills are presented either to the Lok Sabha or the Raj Sabha for debate and later are referred to the committee of the parliament for amendment. A bill cannot become a law in the parliament without the consent of the president (Verma 2000; Ghosh 2012). One of the main difficulties in the functioning of the Indian parliament is that it is closely related with other key institutions. Performance of legislators in the Indian parliament is greatly influenced by the political parties to which they belong. The political parties influence the overall performance of parliament by selecting and recruiting candidates with criminal background (Kapur and Mehta 2006: 11).

5.5.3. Democracy and (its) Deficiencies in India

After achieving independence from colonial rule, India introduced a democratic system of rule beginning on 26th January 1950, and achieved remarkable successes in the second half of the twentieth century even though it failed in many ways as well (Rudolph and Rudolph 2002; Blarel 2012; Dreze and Sen 2002). In recent times India has suffered from many challenges including overpopulation, poverty, a wide gap between rich and poor, corruption, illiteracy, religious issues, terrorism, lack of good governance, caste related violence, rights for women and children, and rights to education. (Dhupdale 2014).

The role of democratic institutions is to provide opportunities for democratic ideals that depend on democratic practice.

Box 3: Definitions of Rights and Basic Rights of Individuals

Definition of Rights: “The character of the state is known from the rights it recognizes at any given period of time. Rights are not independent of society but inherent in it. They are correlative with duties and functions. The rights of individuals, or Associations in a society should be harmonious with the State’s interests. Rights are not a matter of written record. Musty parchments will give them greater sanctity but will not ensure greater realization. It is the proud spirit of citizens less than the letter of law that is their real safeguard.”

Basic Rights of Individuals: The basic law of the country – the Constitution of the Republic identifies liberty, freedom of speech and expression, and freedom of assembly and public meeting as fundamental rights. Among the political rights, the right to franchise is important for the vibrancy of democracy. Religious rights include the right to profess, preach and practice a religion of one’s choice. The right to work includes a right to reasonable wages and hours of work. There are also civil rights such as the right of passage of religious processions accompanied by music in front of a mosque.

Source: (Reddy 2007: 62).

Concerns about the effectiveness of democracy have been increasing for a long time. India had shown better performance compared to various other developed countries such as Switzerland in terms of giving the right to vote to women; after independence in 1947 India declared equal rights to voting including for women (Dreze and Sen 2002). The Indian electoral system is an impressive system where each and every individual has the right to vote despite gender, wealth, caste or religion. But the system is poorly implemented. Many voters are not well informed and are not able to differentiate between the many political parties and their agendas and future strategies; mainly the poor and marginalized are not invited to the programmes or workshops where people are informed on issues (Parekh 2011). Elections do not make a country democratic if people even through their votes do not have the power to replace the government or hold it accountable (Parekh 2011). “Democracy in a package; it is not identical with periodic elections” (Reddy 2007: 70). “In India elections have come to dominate the public imagination so heavily that they are often equated with democracy” (Parekh 2011: 4). Even the lower caste enjoys equality with the higher caste because they do voting together which they do not do in their normal every day relations. On the other hand,

rising inequality in the country has led to great disparities in the supply of goods to marginalized groups in society. India is one of the world's most unequal societies (Hasan 2014). Although democracy assures every individual various freedoms and India was among the first countries to include laws against untouchability, a large section of the Hindu population denies access to temples of worship to lower caste people. India has many protective laws in the Constitution, "but the spirit of democracy lies in its practice and not in tokenism of legislation" (Reddy 2007: 70). As a poverty-stricken country riddled with inequality India has developed democratic institutions but not yet fully democratic practices (Dreze and Sen 2002). "Democratic practice in India has often been deeply compromised by a variety of social limitations inherited from the past" (Dreze and Sen 2002: 8)

Another example is India's judicial system which guarantees impartiality, secularism and equality before the law. But, in practice, the functioning of the judiciary is paralyzed by a backlog of millions of pending cases. It takes years for legal proceedings to be completed and legal protections remain ineffective especially for the poor (Dreze and Sen 2002).

Corruption undermines democratic institutions. Institutions cannot perform their role adequately if political leaders, judges, police officers, civil servants and many others use their power and position for personal gain. It was reported in 1997 by the Election Commission that there were 40 MPs (Member of Parliament) and 700 MLAs (Member of Lower Assembly) in the Indian Parliament and Assemblies with criminal records, which certainly undermines the effectiveness of democratic institutions (Reddy 2007; Ganguly et al 2007; Dhupdale 2014). Corruption is rampant in local elections. Up-front costs of electoral campaigns make it difficult for poor candidates to participate. Honest persons motivated by social concerns find it difficult to participate in local elections. Corruption also impacts the distribution of commissions which are given to workers to avoid legal inspection of the services of the local government. These commission are given from public funds which are supposed to be used for the public welfare (Dreze and Sen 2002). Corruption occurs at each and every step of the Indian working system (Sondhi 2000; Quah 2008). It is now a deep part of the culture and has entered into the nation's value system and behaviour; corruption is institutionalized in society (Aluko 2002).

“Democracy and human rights go hand in hand” (Reddy 2007: 61). But due to dishonesty, inefficiency, and authoritarianism, violations of human rights exist. The police should be a service oriented organization which works for public protection and to control crime and the mafia. But the police in India may themselves be involved in illegal activities and corruption (Reddy 2007). “Unfortunately, the protection of human rights in India has been a much neglected field of public activism” (Dreze and Sen 2002). In India, “human rights violations have a strong class dimension” (Dreze and Sen, 2002: 24). Whereas a well-educated or a middle class person does not need to have much fear from the police, an underprivileged person often lives in terror. These class differentials in India make it more difficult to bring human rights issues within the scope of mainstream politics because the ones who have to bear with the situations have little voice. Even those who raise their voice on behalf of the poor, such as civil rights groups, many do not have totally honest objectives (Reddy 2007; Dreze and Sen 2002).

5.6. Informal Politics in India

Informal politics is a pattern of behaviour, “which is not in accordance with prescribed regulations and is neither officially recognized nor controlled” (Petithomme 2011: 1).

India is perhaps the only great historical civilization that has maintained its cultural integrity without identifying itself with a particular political center. In contrast to the great historical empires, the unity of India owed itself not to the authority of a given political system but to the wide diffusion of the cultural symbols, the spiritual values, and the structure of roles and functions characteristic of a continuous civilization. The essential identity of India has not been political but cultural. There is always a secular component to India’s culture and it was through a constant interplay between the political and the cultural, the secular and the spiritual, that the system was able to adapt itself to changing situations. The basic identities by which Indians have felt themselves to be Indian are not political but cultural (Kothari 1994: 256).

Informal politics are embedded in socio-cultural institutions. Culture has a strong influence on politics in India. It is a way of life.

5.6.1. Indian Political Culture

Political culture refers to basic ideas, beliefs, values and orientations towards politics (Ishiyama 2011: 89). People's behaviour, their mindset and their beliefs and ideas strongly influence the 'psychological dimension' of a political system (Mukherjee 1991: 45). Particular behaviours are not necessarily added into the political system consciously but can nevertheless implicitly influence political goals and agendas, and the overall political structure and political processes. This psychological dimension of a political system is its political culture (Mukherjee 1991: 45). As the culture of the country is based on the caste system, so is the political culture. India follows a form of 'identity politics' based on caste and religion (Jha 2012; Chapaikar 2013). In the overall culture of politics in India, power and position play a very important and influential role.

5.6.2. Indian Political Parties

Political parties have a great influence on public discourse and a direct impact on public policy. They both support and oppose policies. They contribute to public discourses but also have an interest in acquiring power and controlling the use of public funds. In most countries, it is difficult to separate politics from political parties (Lok Satta Party 2009: 3).³¹ "Modern democratic system cannot operate without the role of political parties" (Johari 2004: 200). In a mixed society, a number of organized groups work openly or secretly with political parties and provide them with the resources and followers they need for their election campaigns. In return they seek from political parties 'leadership and direction' (Johari 2004). A major aim of groups is to put their interests in front of political parties and to get political parties to work according to their interests and to provide them with preferential treatment (Johari 2004). Other factors responsible for shaping the workings of a political party include the state, society, history traditions, culture and the economy (Suri 2005: 7). The party system in India is a multi-party system which is "culturally and socially diverse" reflecting the diversity of the culture and traditions of India (Suri 2005: 8).

³¹Source: Lok Satta Party, *New Politics for a New Generation. Political Parties and Indian Democracy*. http://www.loksatta.org/cms/index.php?option=com_content&view=article&id=107&Itemid=109. Accessed 13 January 2016.

“[T]he political parties in India are coalitional³² rather than consensual” (Sarangi 2001: 128). The workings of the same party in different states of the country tend to be entirely different. They have their own strategies at the state level, which decides their bargaining power at the national level. Political parties are also different in the way they relate to the people. In the time of consensual politics, Indian political parties were not tied to a single section of society, or caste or religion. They were equally devoted to and motivated to assist all people; they used to have a nationalist view and did not only try to appeal to a specific section of society (Sarangi 2001: 2). In India, citizens have the choice to vote for the political party which they see as best able to represent their caste/religion and political parties are influenced by caste and religion in their electoral strategy. The difficulty for a political party with this kind of “caste bias” is to convince other groups outside of their caste to vote for them (Acharya et al. 2015). The whole idea of the political system representing entire population or society is replaced by a segmented political system where political parties are associated with one or a few sections of society (Sarangi 2001). In this kind of politics, each political party is identified with their group of society on the basis of caste and religion. In a system defined by identity politics new political parties such as the Bahujan Samaj Party and Samajwadi Party, defend specific castes (Sarangi 2001). Due to this segmented political system one party was started losing its votes from the section of society who may belongs to other caste or religion and do not support them. Electoral support to various political parties is divided by different groups who can see political parties as defenders (Mooij 2005).

In cities such as Delhi which are divided into various wards and each ward has a representative, caste-oriented politicians thrive. It has been observed that areas from which political leaders come tend to be most developed and with the least problems of water and electricity; they give preference to the regions they belong to (Haider 2016).

This kind of political culture in India based on identity politics and among the political parties has led to corruption throughout the system. Various activities which are

³² In countries such as India, France, Italy and many more multi-party systems are found. In these countries not a single party is strong enough in power to obtain electoral majority and they are temporary combined in groups to pursue specific objectives through joint actions (Pandey 2010).

out of the Indian laws are implemented in the name of caste and religion; on the other hand, the survival of the parties actually depends on those factors (Sarangi 2001).

In the time of globalization, Indian political parties have followed the slogan, “think globally and act locally” (Sarangi 2001: 133). They talk a lot about the economic growth of the country and its international reputation and show their concern for the common men and their problems of poverty, employment and health but for them these are the essential factors to play electoral game and it is only a strategy for success in elections (Sarangi 2001). Although new transportation technologies have shortened distances, Indian political parties with their intentions to win elections on religion and caste grounds have divided the population into smaller worlds by playing the game of identity politics (Sarangi 2001).

5.6.3. Summarizing Indian Political Parties and Their Ideologies

India has the largest number of political parties in the world; in 2009 it had 7 national parties, 40 state parties and 980 registered unrecognized parties (Laxmikanth 2010). The main political parties in India are divided into national parties and state/regional parties which are identified by their own symbols and are registered under the Election Commission of India. This dissertation only considers some of the major national parties as summarized in Table 5. Conflicts of ideologies between the centre ruling party and regional parties are common, a responsible factor for unfair distribution of resources between the states. This is one of the reasons that Muslim residential areas in Delhi suffer from ideology conflict of various political parties and remain one of the least developed areas in terms of basic services and infrastructure (Institute of Objective Studies, New Delhi India 2015).

Table 5: National Parties in India and their different Ideologies.	
Name of the Political Party	Ideology
The Indian National Congress	<p>-The party was formed in 1885 with a strong social and ideological base. It represented people from different social backgrounds and ideologies. The social policy of Congress was in favor of a financially and socially unprivileged section of society. This is the only party which has successfully built a support base from the national to the village level.</p> <p>-The main agenda of the Congress Party is in promoting secularism nationwide.</p> <p>-The way the party was formed with a diverse group of people with diverse identities with often contradictory interests, led to splits within the party.</p>
Bhartiya Janta Party (BJP)	<p>The rise of BJP in the 1980s, was based on the idea of India as a Hindu rather than secular state and marked the beginning of a societal voting pattern in the country. The primary concern of Hindu Nationalism as a doctrine was to promote unity among Hindus rather than unity among all religions nationwide. They are highly motivated and concerned to diminish the influence of the Muslim minority in India.</p>
The Communist Party of India (CPI)	<p>CPI has firm goals to establish socialism and communism in the country. One of the objectives of the party is to have full independence and freedom. The party argues that India still is influenced by Western development without showing adequate concern for its own challenges. The Party is also focused on elimination of feudalism and equal distribution of land between peasants and other agriculture workers.</p>
Aam Aadmi Party	<p>This political party was formed on 26th November 2012, with no political backing and very limited resources. One of the main objectives of AAP is to unearth corruption from the Indian system by implementing Jan Lok Bill. AAP has challenged the traditional political culture in India for the first time since independence. The party does not follow any ideology. They work for the common and everyday problems of common men in India and will borrow the ideology which will bring the solution to the problems of a common man.</p>

Source: (Swamy 2004; DiSilvio 2007; Malik and Malim 2014; Kumar 1990; Dhillon and Vohra 2014).

5.7. Informal Politics in the Water Supply Sector of Delhi

There are large numbers of migrants from rural to urban areas in developing countries as well as from developing countries to developed countries due to economic,

social, political or environmental reasons. “Migration is considered as the movement of people from one administrative area to another, which may be on temporary or permanent basis. The change in the usual place of residence can take place either permanent or semi-permanent or temporary basis” (Yadav and Shekhar 2015: 2). The rate of migration to Delhi is even higher than for other metropolitan cities experiencing high rates of migration such as Mumbai. The decadal growth rate of urban population in Delhi was 26.69 per cent in 2001-2011 whereas in the same decade in Mumbai the urban population growth rate was 12.1 per cent. Nationwide the urban growth rate was estimated as 31.8 per cent; one of the major reasons for the high urban population growth rate in Delhi is the high rate of migration from neighbouring states (see Table 6) (Kumar 2013). More than two-fifths of the migrants to Delhi during 2001 were from UP; followed by Bihar and Haryana with 14 per cent and 10 per cent, respectively (Economic Survey of Delhi 2014-15).

Table 6: Urban Population Growth in India’s Big Cities (%)			
Region	1981-91	1991-2001	2001-2011
All India	36.5	31.3	31.8
Delhi	46.9	52.6	26.69
Mumbai	33.7	30.2	12.1
Kolkata	19.9	21.1	6.8
Chennai	26.4	19.8	32.56
Bangalore	41.4	39.1	47.56
Hyderabad	39.3	29.2	34.96

Source: (Kumar 2013: 13). Data from Census of India 1981-91, 1991-2001, 2001-2011.

Population growth has brought several challenges to the city. With the growth in population of the city, the number of unauthorized colonies has increased from 110 in 1962 to 1939 in June 2014 (Sengupta 2007; Delhi Urban Art Commission 2014). About half of the population of Delhi lives in residential settlements without access to safe drinking water and electricity (Delhi Urban Art Commission 2014). Those without water live adjacent to areas of the city where water is supplied around the clock (Singh 2001: 26). These tend to be the areas where people are well off in terms of their earnings. It is primarily migrants who live in the unauthorized colonies in Delhi; they are officially not

connected to the water pipeline network and it takes them hours to get water for daily life (Truelove 2007). For some living in these unauthorized colonies, it has been possible to install booster pumps or to store water in underground or rooftop tanks (Datta 2012). The situation is unbearable during the summer months from May until June when temperatures can climb to above 40 degrees Celsius (Jolly 2010).

Delhi's water supply is confronted by diverse and complex problems such as an aging infrastructure, industrial activities, negligence in maintenance, mismanagement, climatic conditions of the city and its highly polluted water sources. Various religious practices contribute to the water pollution. For example, in Hindu religion, cremation in the Yamuna River and on its banks contribute to the high pollution levels. Every day more than 100 cremations are performed; along with traditional cremations, there are thousands more who cannot bear the costs of cremation, and who simply throw dead bodies into the Yamuna (Misra 2010). Further, every year thousands of corpses of cattle, which are sacred to Hindus, are put into the river (Misra 2010). Industrial activities are another severe problem; untreated effluents are diverted into the Yamuna and raise pollution levels. Moreover, the high water demands of industries are often given priority over the drinking water needs of struggling people.

Uneven distribution, losses in transmission and distribution, unmetered and unauthorized use of water are some of the problems stemming from the mismanagement. There is much politics involved in water management and this is associated with the city's social, economic, cultural and political diversity. The DJB has provided different amounts of water to different groups of population which are different in terms of socio-economic levels and in terms of their housing types and locations. At a first glance, politics may not be so visible but politics has a significant influence on water distribution in the city and who does and does not obtain access to it (Truelove 2007). The DJB has an eligibility criterion for obtaining an official water connection on the basis of the status of locality. Due to this institutionalized mechanism of discrimination through a process about three-fourths of the population of Delhi remains systematically outside the pipeline network.

Political influence on the water sector in Delhi is linked to the migrants, a major voting block. During every election, politicians make promises to provide basic services but the most common outcome of these promises is that nothing happens after the elections. Because politicians want to have the surety to win the next elections on the similar grounds of issues like providing basic services to the citizens. If the issues are resolved politicians have to find new election strategy to win the elections.

in emerging and developing countries, formal institutions such as laws, regulations and legally enforced property rights are usually poorly established. Informal institutions based on trust, solidarity and social capital – such as family, kinship structures, traditions, civil and social norms often substitute for, compete with or complement formal institutions. In fact, informal institutions are of high importance and can help or hinder the development process (OECD 2007: 9).

India's traditional caste system is a big hurdle to solving the water problem in Delhi because traditionally only the lowest caste people, who are usually the poorest in terms of economic status, are deprived from resources (Peacock 2008). Dr. P. Singh argued that over time caste and political inequalities decreased, economic, educational and occupational inequality increased. "An individual's position is determined less and less by caste status and inherited property more and more by his own ability to accumulate property and other forms of wealth, his level of education and occupational status" (Singh 1976: 161). Similar is the case of Delhi, where class has taken over caste but not the concept that the lowest class people are discriminated against in terms of resource distribution. The lowest economic class does not have adequate access to resources. They suffer from stratification, a form of institutionalized inequality. Distribution of water to the colonies inhabited by the lower middle class or lower class is very limited. The amount of water distributed to Mehrauli and Sangam Vihar, two south Delhi residential colonies occupied by members of the lower middle and lower classes of society, was as low as 30 liters per capita per day (lpcd). In comparison, areas such as Lodhi Road, Karol Bagh which are very high profile and posh areas of Delhi, received ten times more water: 337 lpcd of water supply (Narain and Pandey 2012: 85). Blaming the caste system for the water problem in Delhi does not prove that it is the actual cause of the problem. Swami

Vivekananda, who was a spiritual leader and a philosopher in India, was not in favor of blaming caste for degeneration in India. He said that the caste system is a social institution which should not be abolished but readjusted with time. He also said that “in religion there is no caste, and do not blame religion or caste but the men who carry this institution” (Chaudhary 2005: 105). He pointed out other causes such as poverty and other human behaviour such as laziness towards work, selfishness and hatred towards each other as evils for the development of organizations and the society not merely the caste system (Chaudhary 2005: 105).

It is argued in this dissertation that what had been claimed by Swami Vivekananda is not completely true; hatred and selfishness are linked to the caste system; the caste system breeds discrimination. The issues of inequality, hatred, selfishness and poverty can also be found in other countries where the caste system does not exist. The caste system enhances the chances of falling into or staying in poverty for lower caste/class people.

Those who do not have access to the official water supply in Delhi or do not get sufficient water from authorities, often use illegal means to fulfill their daily water needs. People go beyond the law to get water. This can take various forms such as illegal groundwater boring or an illegal tap water connection made with the help of a plumber. There also has been a rise in illegal private water suppliers through tankers, which are called the ‘tanker mafia’. Some measures, such as groundwater extraction, also threaten long-term sustainability. In several areas of the city such as South and South West District, ground water is declining by a rate of as high as 1.7 to 2 meters/year (Sharma 2014). Citizens of the city have also lost faith in the authorities. At times citizens who can afford to do so paid bribes in order to get faster services rather than paying their official water bills. Illegal and corrupt acts help to make resources accessible; they work as grease in the wheels (UN Water 2009; Kaufmann and Shang-Jin 2000). Petty corruption in the case of water service provision in Delhi is a result of the combined effects of there being ample opportunities, officials with low salaries, and a low probability of detection and punishment for corrupt behaviour due to political or trade union pressure. Corruption in India has become an accepted form of social behaviour (Sondhi 2000). It takes years before corruption cases are decided in the country’s over crowded judicial system. The

combined effect of judicial delays and poor evidence makes corruption a low-risk activity in India (Sondhi 2000; Quah 2011).

The existence of corruption results in a situation where the poorest members of society are forced to pay more to get water than those who can better afford it. There are rebate schemes for the poor who are then entitled to pay less or nothing for the water they use but the precondition has been to have a legal water connection. Subsidies have thus been diverted to those who have official connections, and that is primarily the upper middle class and the rich.

The informal institutions of corruption and the caste system influence strongly who does and does not get regular access to water. The next chapters of the dissertation will be focused on the dimension of inequality and illegality from the angle of informal institutions and their influence on the water supply sector.

Conclusion

The above discussion supports the view that water management in general in India is highly influenced by the societal pattern of the country. Caste-related beliefs and discrimination are rooted in the Indian cultural and religious values and have had a great influence on almost every sector and still continued to affect social, economic and political development. The caste system is considered as an important element of the Indian society and also the root cause of the stagnation in India.

Despite of abolishment of the caste system from the Constitution, India's caste system influenced the political system of the country significantly because customs are difficult to change. In order to uplift lower caste people quota system was introduced in the country to boost opportunities for underprivileged communities and giving them equal opportunities in the society.

Water has remained an important element whenever the caste system and religion are discussed. Lower caste people were always socially excluded and discriminated to have access to water and the social inequality had become water related social inequality.

Another interesting feature of the Indian society which is highlighted in this study is to give importance to personal relations than the formal rules. These personal relationships are again influenced by the caste system where people from similar caste prefer to be united rather than people from distinct caste. Despite of existence of laws and regulations in every sector to run the country, informal laws and institutions are the main driving forces. Even citizens support those political parties who belong to the same caste or who has similar religious ideologies. This kind of political culture in India based on identity politics led to corruption throughout the system.

In Delhi, the concept of caste had taken over by class where lower class people are discriminated in terms of resource distribution. The ones who do not have access to adequate water in Delhi often use illegal means to fulfill their water needs. Use of personal connections on the basis of religion and caste identity is the beginning of corruption in India which has found in almost all the sectors of the country.

Residents of Delhi who belong to lower class and live in low lying areas of the city are considered as the potential customers who are paying more than the rich and upper class of the city. In the next chapter, a vision on the measures such as the population characteristics of the city and their settlement divisions are analysed as well as the access to water to different groups of the population has been identified.

6. Urbanization Pattern and Water Situation in Delhi

Water management in big cities has become a real challenge for urban managers especially in developing countries. There are many problems in terms of adequate access to water and in terms of the efficiency of urban local government. As a result, significantly urban population experience water service delivery problem (United Nations 2013: 74). In urban areas of developing countries, growing rate of urbanization is faster due to high rate of migration and the authorities do not get sufficient time to plan the cities in order to provide urban services to these additional inhabitants. Rapidly growing populations are placing growing pressures on resources and creating challenges for authorities who must cope with the situation. This chapter discusses population growth, pattern of settlements and urban planning and its relation with water management in Delhi. The chapter gives an outline of the process of urbanization and the challenges Delhi has in meeting drinking water needs. Here the discussion is about different classes of people living, the different kinds of settlements they live in, and the status of water provision as a public service to different communities.

The chapter first discusses the general urban water situation in many megacities on a global scale. In these cities, drinking water management has become a crucial issue from a social as well as a political perspective. Water problems are not restricted to poor and developing countries; therefore, the general analysis is not restricted to developing countries. The chapter briefly discusses urban water management more generally in India and then turns to the specific case of Delhi. Based on data collected from different sources and calculations made, the chapter outlines the nature of Delhi's water management problems. The chapter further introduces the factors which have contributed to the water situation in Delhi. We will see that Delhi has a unique kind of water scarcity which is very much related with its pattern of urbanization and the different kinds of settlements the city has. This chapter looks at these patterns and issues related with water distribution in different localities in the city.

6.1. Introduction

Globally, more and more people are settling down in urban areas; 54 per cent of world's population is residing in cities (Sorensen and Okata 2011; United Nations 2014b). By 2050, 66 per cent of the world's population is projected to be urban (United Nations 2014b). According to the United Nations, a city is called a megacity when the population is over 10 million people. In the past, this figure was eight million (United Nations 2014b). In the year 1950 there were two megacities in the world: New York and Tokyo. In 1975 Mexico joined the list. In 2007, the number of cities with more than ten million population increased to 19 of which 15 were in developing countries and by 2014, it was 28. It is estimated that between 2011 and 2050, the world population will grow from 7 to 9.3 billion and the population in cities will grow from 3.6 to 6.3 billion, while the number of people living in rural areas will decline because most of the population will be absorbed by the cities (Van Leeuwen and Sjerps 2015). Megacities provide many opportunities especially in terms of employment (Sorensen and Okata 2011; Li et al. 2015). But as megacities continue to grow, sustainable development challenges are increasingly concentrated within them. This is particularly the case in lower-middle income countries where the pace of urbanization is faster and beyond the planning and management capacities of authorities (United Nations 2014b). Water crisis is an urgent security issue of concern for many cities with huge populations, Shanghai, Beijing and Tianjin have a combined population of over 57 million and shortage of water is a primary problem.³³ The discussion about the importance of megacities and cities as higher percentage of world population is moving into them, water management in these regions has become a topic of great concern as it leads to other aspects of human and environmental security and development.

³³ Source: Rich, 'Are China's Cities Headed for a Water Crisis, Collective Responsibility', Published 14th April 2015. <http://www.coresponsibility.com/china-urban-water-disaster/>. Accessed 13 January 2016.

6.1.1 *Water Management and Megacities*

The availability of adequate clean water is a prerequisite for the health, economic development and social well-being of any society. Globally water resources are threatened; growing population in urban areas leading to groundwater depletion as the demand is increasing and surface water sources are polluted (Van Leeuwen and Sjerps 2015). The United Nations estimates that in 2025 around 2 billion people will have an absolute water shortage and two third of the world population will be affected by water scarcity (Van Leeuwen and Sjerps 2015; United Nations 2012b). As more and more people are heading towards cities, water shortages and water scarcity can ensue (EEA 2012; Van Leeuwen and Sjerps 2015). Since water is important for human and natural systems, megacities must address the issues of growth and sustainability (Li et al. 2015). Water challenges in megacities are complex and diverse. Megacities experience the complexity of social, environmental and economic implications in terms of their water issues across local, regional, national and global scales.

Urban population growth rate differs among megacities. Typically when the growth rate is higher there are tremendous stresses on water infrastructure which in turn create a variety of environmental challenges, human health issues and social equity challenges. Water management challenges of a megacity are affected by two different levels of governance; one is the urban local level of the city itself and the second is the global level which follows technological norms to resolve urban water problems (Li et al. 2015). At the local level the practice which is commonly observed in developing countries that industrialization caused rapid urban expansion and occurrence of haphazard pattern of housing and settlements; the global norms of water management which are based on engineering and big technological solutions (Li et al. 2015; Soviana and Puspa 2009). In order to accommodate their growing populations, cities must seek additional water sources and extend or upgrade their infrastructure. Building new water infrastructure and acquiring new water sources needs financial investments as well as time and in many cases megacity's growth surpasses its management capacities (Li et al. 2015).

In the developed world, water management has been given a higher priority due to its importance to development. In Japan which was destroyed in World War II, a huge investment was made in the urban infrastructure including the water supply. This helped the country grow economically (Biswas 2009, c2006). In developing and poor countries, large number of people either get the access to water from private water suppliers at higher costs or use unreliable sources. Mostly, small children and women are the most hit by the situation when they carry water from far or wait for hours in queues. Children use their time to fetch water rather than going to school. Children are more vulnerable to diseases as cities pose more health problems associated with water where a large part of the water pollution in large cities comes from urban surfaces (Niemczynowicz 1996). “Consequently, in a more balanced perception megacities possess a so-called *double-headed face*” (Kraas 2007: 13).

Despite the various challenges associated with megacities, they continue growing. One of the reasons is the perception of migrants from rural areas, which makes a great difference between their life in a village and in a city.³⁴ People from rural areas come to the cities with the perception that cities provide better economic status, employment opportunities, various other facilities like education and health and prosperous and glorious future. In their perspective urban life is more comfortable and easy going than the rural life (Singh 1996).

Sustainable water management in megacities is not an easy task, it means totality of a megacity which includes technical, social, economic, legal, institutional and environmental dimensions. The water management of megacities gets more complex as it is not always the case that one city experience only one kind of water problem; multiple water problems need multiple solutions (Li et al. 2015; Varis et al. 2006). For example, in Mumbai in India the city has to deal with both the challenges of drinking water management and also with storm water management. The complexity of water management in megacities limits engineering and financial approaches for solving the issues of their governance and institutional structures, the pattern of development megacities follow and the notion that the water problems of megacities have less to do

³⁴ Information taken from Interview with Prof. Preet Ruhtagi and Dr. Tanuka Tendow at Institute of Human Development on 8th August 2014.

with physical water scarcity and more with management. In this regard the relevant issues with megacities address the issue of urban governance, institutional structures and the development pattern which includes the combination of high population density, poverty and limited resources (Li et al. 2015; National Academy of Engineering 1999).

Most megacities face the challenge of having fragmented institutional structures where multiple and multilevel institutions need intense coordination if there is to be effective planning in the city. In most cases urban planning occurs at the local level; an appropriate regional institution can allow for an integrated spatial strategy and the development of effective coordination and investments among multiple municipalities (Li et al. 2015; Hall and Pain 2006; Thornley and Newman 2011). This role is extremely challenging when it is associated with megacities where there is need for large-scale water planning, water supply, waste management, and pollution control (Gleick 2000). Several megacities have established Metropolitan Development Authorities (MDA) to manage their urban issues. But these authorities may suffer from limited political and administrative power in decision making. This is the case with for example Dhaka and Karachi (Richardson 1989). Establishment of an MDA is not necessary when other agencies can perform the same duties. In the case of Jakarta responsibilities are shared among government municipalities (Li et al. 2015).

Megacities not only differ in their political structures and level of stability with respect to development such as transportation facilities, provision to education and health and their global connectivity; they are also different in the way they have developed historically. And hence they have cultural differences. Each megacity is different in their cultural and ethnic context and struggling in to keep cultural legacies in a time of modernity and globalization. For example, in Dhaka, the water management system was based on surface water and was constructed about 100 years ago. With the growing population and increasing water demand and technological innovations, groundwater is contributing to more than 80 per cent of city's water demand. As a result, the groundwater table in the city has gone down by 20-30 meters. Similar is the case with Beijing which developed with the concept of 'Feng Shui', which means harmony between people and nature. In Beijing, huge investments were made for large water projects but the water problems were not resolved due to various reasons. Most of the

rivers in the vicinity of Beijing remain dry for a large part of the year and Beijing's Yongding River has been dry for decades. Over exploitation of groundwater has caused degradation of water quality, huge amount of wastewater is discharged into water sources causing high loads of surface and groundwater pollution. Technological solutions have yet to bring about harmony with nature. Beijing's resource-intensive and technologically costly development pattern has destroyed the thousands of years of natural harmony. The city is facing serious environmental damages (Li et al. 2015). Niemczynowicz (1996) argues that there is a misconception that advanced engineering and technology is the only possible solution for megacities struggling with water problems. Instead he argues, water problems result when there is a mismatch between problems and water management solutions (Li et al. 2015; Niemczynowicz 1996).

As every city has unique political and governance features including in relation to cultural traditions and water problems, there is no universal best solution which will work for all megacities in the world. Finding ways to better connect the many factors influencing water quality can serve as a useful guiding objective for management. According to the World Bank (1998), water management is not all about supplying water to citizens. There are various causes for problems, such as inappropriate policies, inappropriate governance and management, poor infrastructure, poor institutions, poor service, customer dissatisfaction, poor revenues, no customer focus and poor finances. Many of these factors are inter connected with each other (World Bank 1999; Nallathiga 2008a). For example, a situation of poor financial stability will lead to poor institutions. This in turn, will affect the ability to perform upgrading of infrastructure and improving services to consumers. When consumers are not satisfied with services they will not pay for them. This will ultimately affect the government's financial stability (Nallathiga 2008a; World Bank 1999). To achieve sustainability in the water sector, the roles of finance, technology, institutions, water quality, customer satisfaction and service delivery need to be considered.

6.1.2. Urban Water Supply Pattern in Megacities of Southeast Asia Including India

Urban communities of Southeast Asian countries face a shocking picture with regard to their water supply services. In many cities in Southeast Asia, only about 50% of the urban population has access to a stable water supply. Timely availability and adequate quality and quantity is another issue. Intermittent water supply, high water losses through leakages, and low coverage of urban areas with supplied water are other challenges to be addressed (McIntosh 2014). According to WHO and UNICEF, various countries such as China, Sri Lanka and Pakistan including India are not able to provide complete coverage of urban water supply and sanitation. For example, in China urban water is provided to 94% of its population but only 68% are connected to a sewage collection system. India was able to provide water to 92% of its population but the sewerage was possible to only 73% of the population in 2000 (WHO and UNICEF 2000). In terms of providing sewerage facilities, Southeast Asian countries are lacking. This results in a significant increase in pollution and contamination of water resources. The deteriorated quality of water resources has a direct impact on the quantity of raw water, which can be used to augment water supplied to citizens (Singh 2008). In many parts of these countries groundwater is also used to cover the water supply but due to urbanization and paving of the land groundwater recharging is not adequate.

Table 7: Country-Wise Access to Water within South Asian Countries.		
Country	Access to Water Supply (%)	GDP per Capita (US\$)
Philippines	87	3805
Sri Lanka	83	3279
China	75	3617
India	89	2248
Pakistan	88	1834
Bangladesh	97	1483

Source: (Nallathiga 2008a: 4; Infrastructure Development Finance Company, Indian Institute of Management and Indian Institute of Technology 2004).

In the case of most of the Southeast Asian megacities such as Dhaka, Beijing, Mumbai, Delhi, Kolkata, Jakarta, Shanghai and Karachi have different kinds of water problems such as water pollution, access to adequate water supply, deteriorated water quality, declining groundwater table, irregular and inefficient water supply. In relation with their different water problems there is one common aspect that the most suffered with water problem are the urban poor in these cities who pay more and bear with health issues. The case of Karachi and its urban water problem is an authentic example of such a case in Southeast Asia. Karachi is Pakistan's the most populated city with a population density of 18 million inhabitants and with the largest industrial centre of Pakistan. More than 50% of the city's population is living in informal settlements where water supply is irregular and insufficient. Some areas in the city receive more water than others. In areas where water is not sufficiently supplied by authorities, private tankers provide water at relatively higher costs. They get their water through illegal means. Other illegal suppliers obtain water connections to the public networks through fraudulent means. Theft of water is very common; around 113,000m³ of water is stolen every day from main pipelines, causing water shortages (Engel et al. 2011). Authorities create artificial water scarcity in low income areas by diverting water to business areas who sell water to the poor at higher costs. The poor of the city either buy water at higher costs or pay bribes for an official connection. Wastewater treatment in the city is also unsatisfactory; only 22% of the municipal wastewater is treated and more than 40% of the entire population is not connected with the sewerage system (Engel et al. 2011). There is also no separation system in place for municipal wastewater and industrial effluent; both flow directly into open drains and then into natural water bodies. The case of Karachi also shows weaknesses in its administrative structures. Although a comprehensive national policy and institutional framework for environmental management exists on paper, it is not implemented in reality (Engel et al. 2011).

According to the Ministry of Urban Development, the percentage of the Indian population living in urban areas increased from 27.8 percent in 2001 to 31.16 percent in 2011. This increase in the urban population outpaced the growth in the rural population which was 12% during the same period (National Institute of Urban Affairs 2015; Nayak 2013: 16). It is estimated that the share of the urban population will cross the 40%

threshold by the year 2030 with over 200 million being added. Some Indian states already are within this range including Maharashtra, Gujrat and Tamil Nadu. They are projected to have an urban population share of 50% by 2020 (National Institute of Urban Affairs 2015).

Table 8: Urban Situation in India: 1901 – 2011.			
Year	Urban Population (Million)	Percentage of Urban Population	Urban Annual Exponential Growth Rate
1901	26	10.8	-
1911	26	10.3	0.03
1921	28	11.2	0.79
1931	34	12.0	1.75
1941	44	13.9	2.77
1951	62	17.3	3.47
1961	79	18.0	2.34
1971	109	19.9	3.23
1981	159	23.3	3.79
1991	217	25.7	3.11
2001	285	27.8	2.74
2011	377	31.2	2.76

Source: (Kumar 2015).

Majority of the Indian population lives in rural areas but still the country has significant population living in urban settlements. India's urban settlements are classified into six categories according to their population density and contributing in the entire urban population of the country (Table 9). Most of the population in India is settled in and around class I cities which is why they are the most populated cities of the country. As the population in class I cities is growing their share of the urban population is also increased from 51.42 per cent to the total urban population in 1961 to 68.7 per cent in 2001. On the other hand, the urban population in classes II, III and class VI cities have declined and hence their contribution in the total urban population of the country is also reduced; for example, the share of class IV cities decreased from 12.77 per cent of total urban population in 1961 to 6.84 per cent in 2001 (Tripathi 2013: 5). This increase and decrease of urban population in various kinds of cities of India show the movement of people from one region to another.

Table 9: Urban Settlement Classification.	
Class	Population Range
I	Above 1,00,000
II	50,000 to 99,999
III	20,000 to 49,999
IV	10,000 to 19,999
V	5,000 to 9,999
VI	Less than 5,000

Source: (National Institute of Urban Affairs 2016).

Despite of various risks and challenges associated with urbanization its correlation with economic prosperity is considered as a positive trend where more opportunities for employment and higher education are created. Urbanization in India is under pressure due to the combination of (i) an inadequate policy focus from the government on both cities and rural areas; lack of gainful employment in rural areas is the primary reason for migration of people from rural to urban areas (ii) inefficient local governments who is not effective to provide affordable housing to the citizens, (iii) urban government is not able to provide basic amenities such as drinking water, drainage and sewerage and there are always gaps in service delivery due to inadequate investments which should be provided by central or state governments; and (iv) serious environmental problems such as air pollution associated with urban areas has put tremendous pressure on urban governments (National Institute of Urban Affairs 2015; Singh 1996). Urban water supply is one of the critical components of urban service delivery where Indian cities and towns are struggling. The urban water supply sector in India is going through inadequate maintenance and operation which have led to intermittent water supply, inadequate service coverage for the urban population, inequitable access to water and environmentally unsustainable use of water. A considerable portion of waste water goes untreated into water sources (Infrastructure Development Finance Company 2011). The problems of the urban water supply sector can be linked to the poor management and insufficient capacities of urban local bodies (ULBs), political influence in hiking water tariffs in order to recover overall operation costs, a weak monitoring system to evaluate urban water sector performance, and lack of benchmarking. This leads in the end to poor quality in the water supply services of the utilities. The overall urban water supply

situation in India highlights the governance failure of urban water governance of the country (Infrastructure Development Finance Company 2011).

India has 7935 towns including 3894 census towns. According to the Census of India 2011 census towns are the places which satisfy the criteria: (i) a minimum population of 5,000 (ii) at least 75 per cent of the male main working population engaged in non-agricultural pursuits; and (iii) a density of population of at least 400 persons per sq. km (Census of India 2011b). They are often not counted in measurements of urban services. About a quarter of the urban population live in slums. Slums are also not counted by the Ministry of Urban Development in terms of the provision of basic services such as housing, water, sanitation and sewerage (Sugam and Ghosh 2013). Urban India is facing huge challenges in terms of quality of life in slums and low-lying areas and in provision of basic amenities. There is considerable exploitation of the poor. The urban poor in India's cities end up paying more than the rich people (i) because of their inability to get official water connections (ii) the efforts and time poor people invest to collect water from far. Their effort and time can be utilized elsewhere where they can economically support themselves; and (iii) because of the fact that poor people do not have an official water connection, many are depending upon private players who sell water illegally at higher costs (Sugam and Ghosh 2013). According to the Ministry of Urban Development only 72% of the urban population in India have water within their premises and only 32% of the urban population receives treated water (Sugam and Ghosh 2013).

Table 10: Urban Water Supply in Selected Indian Cities.					
City	Water Coverage	Water Availability	Consumption (lpcd)	Unaccounted Water	Metered Connections (%)
Kolkata	79.0	8.3	130.0	35.0	0.1
Mumbai	100.0	4.0	191.0	13.0	75.0
Chennai	89.3	5.0	87.0	17.0	3.5
Ahmedabad	74.5	2.0	171.0	-	3.0
Amritsar	75.7	11.0	86.0	57.0	4.0
Bangalore	92.9	4.5	74.0	45.0	95.5
Bhopal	83.4	1.5	72.0	-	-
Chandigarh	100.0	12.0	147.0	39.0	79.0
Coimbatore	76.1	3.0	109.0	41.0	100.0
Indore	77.3	0.8	87.0	-	0.1
Jamshedpur	74.4	6.0	203.0	13.0	0.9
Nagpur	91.5	5.0	100.0	52.0	40.0
Rajkot	98.1	0.3	101.0	23.0	0.4

Source: (Nag and Garg 2013).

In Indian cities service coverage is not the only issue. At least in some cities such as Mumbai there is 100 per cent coverage of the city with water pipe lines. There is however only intermittent water supply. Moreover, there is insufficient pressure and unpredictable service. These factors affect the financial stability of Indian households. No major city in India has 24 hours of water supply; 4 to 5 hours of supply of water per day is the norm. Indian cities also have trouble in providing good quality water because there has been insufficient and delayed investment in urban water treatment facilities (The National Bureau of Asian Research 2013). The Government of India has accepted the WHO guidelines for water quality but is unable to meet them. Most of the rivers of the country are polluted with high industrial and municipal waste load (Central Pollution Control Board 2015). The water from these sources are not fit for bathing in some stretches. Water treatment facilities are not maintained properly and therefore the quality of the water after treatment is not always of a high standard (Kaur et al 2012).

Box 4: Bengaluru: City Staring at Water Crisis

The Hindu - October 18, 2015

Bangalore is a big city in the South of India which is struggling to quench the thirst of its citizens. The city is dealing with the inefficiency of the existing system in place to manage water and simultaneously to handle its population growth. It is estimated that by the year 2021 the city will have a water shortage of around 1,000 million litres per day (MLD). Currently the city is getting only around 1,400 MLD from the Cauvery river; this deficit is estimated to increase by 2,311 MLD in the next 15 years (Bangalore Political Action Committee (BPAC) (City staring at water crisis: report', The Hindu. Published 18th October 2015. The BPAC warns about the worsening situation but gives hope with calls to act against the crisis. Some of their suggestions include to reduce transmission losses in the pipelines. One project introduced to reduce the Unaccounted Flow of Water (UFW) is scheduled to be completed by 2017 and is expected to reduce water losses from 48 per cent to 16 percent. The committee also puts an emphasis on recycling water through treatment plants, rainwater harvesting and a restoring of the water sources of the city. Combined these measures could add up 500 MLD into the system. The chief executive officer of BPAC, Mr. Revathy Ashok, furthermore said that there is a need to enforce existing laws in order to promote sustainable water management.

Source: Mohit M. Rao, 'City staring at water crisis: report', The Hindu. Published 18th October 2015. <http://www.thehindu.com/news/cities/bangalore/city-staring-at-water-crisis-report/article7775626.ece>. Accessed 5 January 2016.

The current urban water supply situation is partly related to gross neglect on the part of the water authorities in Indian cities, including in Delhi.

6.2. Case Study: Delhi

It is useful to briefly compare Delhi to European cities. European cities are hubs of business activities, economic growth and job prosperity. Quality of life and environmental protection are on the agenda of policy makers and decisions makers tend to act with a view to fulfilling common goals for their citizens (EEA Report 2009). Living standards are maintained where there is full provision of basic amenities for all.

Amartya Sen defined a good quality of life as a healthy, pleasant and safe life where people live peacefully and freely and do what they want to do. This is the general

standard maintained in European cities (EEA Report 2009; Nussbaum and Sen 1995). People live in a social environment where both rich and poor use public transport (EEA Report 2009). In Delhi the social differences among people are extremely transparent. Depending upon the assets an individual owns, such as housing in a high-class area or middle class area or having a car, refrigerator, air conditioner or mobile phone society judges his or her status. A person living in a lower class area having a scooter and radio is considered to belong to the lower class (Inoguchi 2005). Depending upon their economic status people are provided with services and resources are distributed accordingly. Disparity in resource distribution in Delhi is widening the gap between ‘haves’ and ‘haves not’. As the gap between rich and poor grows, the life of a common man is getting tougher (Jagmohan 2005).

Water problems can arise due to several factors such as conflicts over water resources between regions, contamination and pollution of water resources, depletion of water resources, changes in consumption patterns, weak and inefficient institutional structures, problems in execution of policies, or natural disasters. The most prevalent factors vary from rural to urban areas. In urban areas, population growth and urbanization rates place major strains on natural resources. To understand the water problems of Delhi it is necessary to understand Delhi’s growth and urban settlement patterns, the characteristics of its population and its economic activities, infrastructure, and water resources. Delhi does not have only rapid population growth and high rate of urbanization, there is also a problem in the execution of the policies because still in Delhi there are about 100,000 industries, which are responsible for water pollution (surface and groundwater) and are also responsible for more water consumption.³⁵

6.2.1. Accelerated Population Growth in Delhi

“Growth of population is the most fundamental process with which all other demographic attributes are associated” (Mahesh and Shivalingappa 2012: 2) such as population density, and the distribution pattern and composition of the population. Several decades ago most of the world’s largest urban agglomerations were found in

³⁵ Information obtained from an employee at TERI University on 4th March 2013.

developed countries but now they are more in developing countries. India has a high rate of urbanization (United Nations 2014b). The total area of Delhi is 1483 sq. kms of which 685.34 sq. kms is urban and the rest is counted as rural. According to Delhi government, population of Delhi on 1st March 2001 was 13.85 million which had grown to 16.75 million after ten years on 1st March 2011 a decennial increase in 20.96% of population as compared with the national population growth rate of 17.64% over the decade (Government of NCT of Delhi 2012).

Table 11: Decennial Population Growth in National Capital Territory of Delhi.			
Year	Delhi Population		
	Urban	Rural	Total
1901	214115	191704	405819
1911	237944	175907	413851
1921	304220	184032	488252
1931	447442	188804	636246
1941	695686	2222253	917939
1951	1437134	306938	1744072
1961	2359408	299204	2658612
1971	3647023	418675	4065698
1981	5768200	452206	6220406
1991	8471625	949019	9420644
2001	12905780	944727	13850507
2011	16368899	419042	16787941

Source: (Government of NCT of Delhi 2012).

At present Delhi is the second largest megacity in the world after Tokyo with an agglomeration of 25 million inhabitants. It is projected that the population will rise to 36 million by the year 2030 (United Nations 2014b).

Box 5: Delhi World's Second Most Populous Megacity
(September 13, 2013 Times of India)
Delhi is one of the fastest and urbanizing cities with a population of 22.7 million including its extended suburban areas as of the year 2011. These suburban areas include Noida, Greater Noida, Gurgaon, Ghaziabad and Faridabad and the entire region is called National Capital Region (NCR). It is the second most populous

cities in the world after Tokyo. Until 1950, Delhi with its 1.4 million population was not counted in the top 30 big cities. Kolkata is another megacity in the East of India and leading in the race of the world's top 30 most populated cities. Kolkata ranks 10th. Due to demographic transition over the decades the world's most populated cities which were the part of industrialized countries had been moved to developing countries such as India. In the year 1950, 19 of the most populated 30 cities were in industrialized countries; by 2011 this number had lowered to eight. One of the reasons in shifting of megacities from industrialized countries to developing countries such as India is already high population rate of the country whereas the population in developed countries is declining. Internal migration in developing countries also plays a crucial role when people from rural areas migrate towards cities in search of better jobs and better life. It is projected that Africa will add another 1.3 billion people between 2011 and 2015 which is higher than Asia. Whereas Europe and North America are not expected to grow. Some of the urban experts had pointed out that megacities in India have become saturated and their growth rate had gone down. One of the reasons they pointed out is that the cities have become exclusionary and discourage migrants especially poor and low skilled workers. The cities which are growing in the country is primarily because of their higher population growth rates in comparison to the cities in developed countries.

Source: Madhavi Rajadhyaksha, 'Delhi world's second most populous mega-city', The Times of India. Published 13th September 2013. <http://timesofindia.indiatimes.com/india/Delhi-worlds-second-most-populous-mega-city/articleshow/22529248.cms> . Assessed 5 January 2016.

Compared with other metropolitan cities of India with high migration rates like Mumbai, the rates of migration to Delhi are even higher, everyday hundreds of migrants come to the city. Why does Delhi a higher migration rate compared with other regions in India? (Kumar 2013). The major reason is employment but there are several other pull and push factors such as the geographical location of Delhi which is closely situated to poor states such as Bihar (30% migrants in 2013) and Uttar Pradesh (46.50% migrants in 2013). Educational opportunities are also a pulling factor for migrants into Delhi (Kumar 2013; Govt. of National Capital Territory of Delhi and Institute of Human Development 2013).

Table 12: Migrants in Delhi.			
Description	1981	1991	2001
Total Migrants	2989121	3723462	6014458
Males (%)	54.7	53.8	55.5
Females (%)	45.3	46.2	44.5
Reasons for Migration (%)			
Work/employment	27.8	29.1	33.4
Business	-	4.4	0.7
Education	2.3	1.4	1.4
Marriage	14.3	19	15.3
Moved with Household	41.4	38.3	33.7
Others³⁶	14.2	7.8	13.4

Source: (Government of NCT of Delhi 2012).

6.2.2. Population Characteristics in Delhi

Delhi is called a city of migrants because of the people who come to this city in search of better life opportunities in the form of employment and education. “Almost 40 percent of city’s population is constituted of the migrants who accounts for 3-3.5 million migrant voters in the city” (Kumar 2013: 12). The rate of growth in the population of Delhi is higher than the national average. It is estimated that almost 665 people come to this city every day from neighbouring states (Kumar 2013: 12). After independence in 1947 and the partition of India and Pakistan, thousands of migrants from Pakistan also came to Delhi and stayed there. Migrants come to Delhi from different parts of the country, which is why Delhi has become the home of people practising different religions, languages and cultures. Delhi has not only social differences but also class variations. The city is home to the country’s richest people as well as to poor migrants from UP and Bihar, many of whom are homeless and must spend their nights in the streets and sleeping on roads (Kumar 2013). This is a city of big malls and flyovers and industrialists as well as of a significant number of slums and beggars. A lower literacy rate is an indicator of backwardness. In Delhi more than 80% of the people are literate, a much higher level than the national average of 65%. This shows the modernity and open

³⁶ Others include poverty, discrimination, natural disasters.

mindedness of the city's population. Delhi also has a significant lower class population of around 3 million. Delhi has 3435999 houses, out of which 66% are considered good for living, 31% are considered in liveable conditions and 3% are in bad condition (Society for Participatory Research in Asia 2014).

Table 13: Population Characteristics in Delhi.				
Item	1981	1991	2001	2011
No. of Households	1211784	1860748	2554149	3435999
Male Population	3440081	5155512	7607234	8987326
Female Population	2780325	4265132	6243273	7800615
Literacy	61.54	75.29	81.67	86.2
Literacy Rate (Male)	68.40%	82.01%	87.33%	90.9%
Literacy Rate (Female)	53.07%	66.99%	74.71%	80.8%
Schedule Caste Population	1121643	1794836	2343255	2812309

Source: (Government of NCT of Delhi 2012).

In terms of religious distribution, the majority of the city's population is Hindu constituting 82% in the year 2001 followed by Muslims (11.7%), Sikhs (4.01%) and Christians (0.94%).

Table 14: Population Percentage by Religion.							
Year	Hindu	Sikhs	Muslims	Jains	Christians	Buddhists	Others
1961	84.05	7.67	5.85	1.11	1.10	0.21	0.01
1971	83.82	7.16	6.47	1.24	1.08	0.21	0.02
1981	83.60	6.33	7.75	1.19	0.99	0.11	0.03
1991	83.67	4.84	9.44	1.00	0.88	0.15	0.02
2001	82.00	4.01	11.72	1.12	0.94	0.17	0.03

Source: (Government of NCT of Delhi 2012).

6.2.3. Income and Employment in Delhi

Delhi is among the top 40 cities worldwide in terms of wealth ranking. The Gross State Domestic Product (GSDP) of the city increased three-and-a-half times from Rs. 10,030 billion in 2005-05 to Rs. 36,570 billion in 2012-13 at current prices (Govt. of National Capital Territory of Delhi and Institute of Human Development 2013). The per

capita income of Delhi at current prices reached the level of Rs. 212219 in 2013-14 as compared to Rs. 185421 in 2012-13 and 161446 in 2011-12 (Government of NCT of Delhi 2014-15). The per capita income of Delhi is the highest in the country (Government of NCT of Delhi 2014-15). Overall economic growth of the city relies on three different sectors. The primary sector consists of agriculture, livestock, forestry, fishing, mining and quarrying. The secondary sector comprising of manufacturing, electricity, gas, water supply and construction. Growth due to these two sectors in Delhi is decreasing. The key driver for Delhi's economic growth is the tertiary sector which consists of trade, hotels, restaurants, transport, communications, financial and insurance services, real estate, public administration and other social and personnel services (Government of NCT of Delhi 2014-15).

6.2.4. Income Disparities in Delhi

The high rate of economic activities and higher literacy rate in Delhi show that it is not a poor city even though it has a large number of poor people living within it. Almost 6% of Delhi's population is living below the poverty line (Singh et al. 2009). According to the standard prescribed by Planning Commission their per month income was estimated at Rs. 410.38 for rural and Rs. 612.91 for urban areas in Delhi (Government of NCT of Delhi 2014-15). As per the general phenomenon of urbanized areas, the percentage of persons engaged in agriculture sector is very low. In Delhi many workers are employed in the service and industrial sectors. Beyond this employment is divided into organized and unorganized sectors where there are acute earning differentials between formal and informal workers along with huge disparities in their standards of living (Govt. of National Capital Territory of Delhi and Institute of Human Development 2013). Based on 59th round of the National Sample Survey in 2003, a family living in Delhi owns 2.4 times more assets than the average Indian and is six times less in debt. On average every family in Delhi owns assets of Rs. 7,42,000 whereas the national average is Rs. 3,07,000 (Singh et al. 2009). On the other hand, one third of total households have assets valuing less than Rs. 50,000 which reflects a sharp contrast between the rich and poor of the city and a large difference in their living standards (Singh et al. 2009). Delhi's 18 per cent of population is very rich whereas 48 per cent is

counted as middle class. Among the middle class 28 per cent belongs to the upper middle class and the rest is lower middle class; on the other hand, 6 per cent of people in Delhi are very poor and another 28 per cent are poor; altogether 34 per cent of the city's population is poor (Singh et al. 2009). Delhi's population living below poverty line is increased by 87 per cent that is from 1.55 million in 1999-2000 to 2.29 million in 2004-05 (Government of NCT of Delhi 2008-2009; Ahmad and Choi 2011).

Delhi has two faces; one which accommodates rich people such as high class, upper middle class and lower middle class and another accommodates the city's poor which includes poor and very poor population of the city. The city is divided between many different levels of rich and poor on the basis of their incomes and hence shows the economic and social gap. The kind of division Delhi has is directly or indirectly responsible for generating uncontrolled urban settlements and hosting several negative consequences in terms of economic, social and political outcomes, all of which are interlinked (Ahmad and Choi 2011).

6.2.5. Urbanization Patterns in Delhi

Land use in Delhi has developed in a haphazard manner. In many parts of the city it is normal to find mixed land use from middle class houses to factories, restaurants, grocery shops. Every kind of settlement has different needs and requirements making for a complex urban system. The entire environment of housing and planning in Delhi is diverse in terms of planning, quality of life and the quality of services provided.

Figure 7: Highly congested Streets of Delhi with various kinds of traffic together.



Source: Author's photos, December 2013.

The urban water situation in Delhi has a close relationship with the way the city has been occupied and urbanized with different kinds of structures.³⁷ Urbanization is a key indicator for economic development and can be a positive factor in overall development³⁸. Indian culture is diverse in terms of language and religion. Migrants give Delhi its many cultural and religious faces.

Migrants contribute to the disparities in the social life and the kinds of settlements in the the city. The city is divided into different kinds of housing structures and colonies such as planned areas, unauthorized colonies, resettlement colonies, urban and rural villages and slums. In 2002, an economic survey in the city identified eight different kinds of settlements of which six were informal (Ishtiyag and Kumar 2011).³⁹

³⁷ Cities had been acknowledged from perspectives of policy makers and economists as the source of economic growth and development when they contribute significantly in nation's economy. On the other hand, they have the image of highly populated and urbanized areas, congested and polluted roads full of traffic, growing slums with poor population, high rate of crime and shortages of basic urban services. Life in a city is very fast where everyone has their own objectives and concerns (Singh and Shukla 2005: 1).

³⁸ Declared by Eleventh Five-Year Plan.

³⁹ Formal settlements are those, which come up in a planned manner by the government authorities or housing societies. Various kinds of physical, social and economic aspects are considered in the process of

There are many ethical issues associated with the housing settlements. Should unauthorized colonies be provided services? Does providing such services encourage more and bigger unauthorized colonies? Should unauthorized colonies be discouraged by ensuring they are given no services as the settlements have adverse impacts on urban planning. These are social and administrative issues with ethical implications. A humane response would suggest that even those living in unauthorized colonies, deserve basic services on humanitarian grounds. Somehow, a delicate trade-off needs to be reached between these two approaches.⁴⁰

A large number of people in Delhi live outside the planned areas of the city (see Table 15) and hence, many people have to struggle for basic services.

planning so that the living conditions are comfortable and other kinds of public services are also provided. Informal settlements are those kinds of areas, which have been developed outside the government's plan and urban planning of the area either on private land or on government land. Informal settlements develop in a haphazard manner and could be permanent or temporary. Access to public services in those settlements is also limited such as water and sanitation situation, supply of electricity and municipal waste and wastewater collection facilities. Compared with planned areas informal settlements are much denser and overcrowded (Ishtiyaq and Kumar 2011: 37).

⁴⁰ Information obtained from one of the employee at the Ministry of Water Resources on 23rd June 2014.

Table 15: Different Kinds of Settlements in Delhi.				
S. No	Settlement Type	Estimated Population in 2000 (in lakhs)⁴¹	Percentage of Total Estimated Population	Characteristics of these Settlements
1.	JJ ⁴² Clusters	20.72	14.8	Its more than two decades no more slums in Delhi are notified and they are growing and expanding continuously in Delhi. They are built illegally without permission. Therefore, they are most vulnerable to demolitions and do not have any clear rights to basic services.
2.	Slum Designated Areas (SDA)	26.64	19.1	SDAs in Delhi represent slums in Delhi and in order to be considered a SDA, a settlement must be notified under the 1956 Slum Areas Act. Once notified, an SDA is guaranteed basic services. No settlement in Delhi has been identified as an SDA since 1994.
3.	Unauthorized Colonies	7.40	5.3	These colonies are built on illegally subdivided agricultural land developed in violation of the Master Plans. These colonies are characterized as semi-legal. Due to a large population living in these colonies, government introduced a policy framework to regularize these colonies and bring them into legal status.
4.	JJ Resettlement Colonies	17.76	12.7	These are the colonies occupied by eviction from JJ clusters. The ones who are found eligible are allotted with land in resettlement colonies. According to the policy for these settlements they are eligible for basic services but these colonies remain outside the boundary of planned areas and receive basic services years after their resettlement.
5.	Regularized Unauthorized Colonies	17.76	12.7	These are unauthorized colonies which had been regularized under government scheme. The parameters under which they are regularized are not clear as there are no set standards.

⁴¹ 1 lakh = 100,000

⁴² JJ = Jhuggi Jhopri

6.	Rural Villages	7.40	5.3	They are characterized by agricultural activity usually located on the periphery of Delhi. There are 227 rural villages at the moment in Delhi. Ownership of land in these villages is only by way of possession and is not recoded in land revenue records.
7.	Urban Villages	8.88	6.4	Time to time upgrading of rural villages as urban villages is notified under 507 of the Delhi Municipal Corporation Act 1957. Once the village is declared as urban village, Area development Plan and Building Bye-Laws are adaptable.
8.	Planned Colonies	33.08	23.7	Planned colonies are referred as approved colonies by the government and included in the development areas of the Master Plan of Delhi. These housing units are compiled with the infrastructure such as water pipes and sewerage systems.
	Total	139.64	100	

Source: (Centre for Policy Research 2015).

Other than various kinds of settlements (Table 15), Delhi has mixed housing structures based on their construction material and appearance reflecting financial status of the family. These housing structures can be categorised as *pucca*, *semi pucca* and *kutchha* houses (Figure 8). In Delhi 99.10% of families live in pucca houses, 0.68% in semi-pucca and 0.22% live in kutchha houses (Govt. of NCT Delhi 2014).

Box 6: Concepts and Definitions of Different Settlement Structures in Delhi.

House: Every structure, tent, shelter is a house irrespective of its use. It may be used for residential or non-residential purpose or both or even may be vacant.

Household: A group of person's normally living together and taking food from kitchen constitute a household.

Pucca House: A pucca structure was one having walls and roof made of cement, concrete, oven burnt bricks, hollow cement/ash bricks, stone, stone blocks, jack boards, iron, zinc or other metal sheets, timber, tiles, slate, corrugated iron, asbestos, cement sheet constituted the list of pucca materials.

Kutcha House: A structure made of walls and roofs made of unburnt bricks, bamboo, mud, grass, leaves, reeds, thatch is regarded as kutcha structure.

Slum: A slum is a compact area with a collection of poorly built tenements, mostly of temporary nature, crowded together usually with inadequate sanitary and drinking water facilities in unhygienic conditions. The slum dwellings are commonly known as *jhuggi jhopri* in Delhi.

Source: (Govt. of NCT Delhi 2014).

Figure 8: Various Housing Structures Reflecting Income Disparities in Delhi

Kutcha (raw)



Pucca (Hardened)



Semi Pucca



Source: Author's photos, December 2013.

In the on-going process of urbanization, Delhi faces challenges in providing land and resources at affordable prices. Due to changed consumption patterns, consumption of electricity has increased. Around three fourths of the lowest income households in Delhi possess assets like an electric fan and a television.

Income Group	Scooter	Cycle/ Rickshaw	Car	Cable TV	AC	Refrigerator	Laptop/ Desktop
Lowest	18.0	25.0	2.9	58.1	2.9	35.6	4.4
Low	35.1	25.9	7.1	77.6	7.1	59.0	7.1
Lower Middle	49.9	22.0	14.7	85.9	16.6	76.3	14.8
Middle	62.3	14.4	35.7	91.6	39.0	88.6	24.7
High	55.0	7.2	59.2	95.5	72.8	96.2	18.6

Source: (Govt. of National Capital Territory of Delhi and Institute of Human Development 2013).

The overnight growth of people in the city has resulted in demand for basic services such as drinking water and housing and leading to challenges for proper sanitation, adequate housing, efficient transport and clean and safe drinking water. While migrants are sometimes considered as a burden on the resources of the city according to *a UNESCO report on social inclusion of internal migrants in India* published in **October 2013** migrants are contributing to the GDP of cities by providing cheap labour in manufacturing services. This is also the case for Delhi. For example, in Delhi, GDP was increased when migrants began to provide cheap labour in manufacturing services. Per capita income of the region is now the third largest in the country. Yet, those who are living in slums see little of this wealth (Gupta 2004; Kothari 1994).

6.3. Delhi and its Water

Delhi is the first city in India to have come up with a City Development Plan back in 1962. Still, it lags in its water management infrastructure. Every summer people in Delhi struggle to get an adequate water supply service from responsible authorities and as a result groundwater is over exploited. The main water source of the city is the Yamuna River, which has essentially become a sewer. Massive amounts of investments have been made on cleaning it but the Yamuna is still polluted due to various reasons such as large amounts of freshwater has been withdrawl from the river but without sufficient amonut of freshwater flow into it (Uberoi 2003). Additionally, the growing population in Delhi had enhanced the problem of resource management which extends far beyond its municipal

limits. The increasing urban population in Delhi has led to massive demands for basic infrastructure.

Development of a piped water system in Delhi was started in 1892. In 1843 Delhi had 607 wells of which 52 provided sweet water. Today 80 per cent of these wells are closed because the water is contaminated. In 1921, a raw water pumping station was established in the city at Wazirabad. Water is carried to Chandrawal for treatment. The plant was designed to serve the population of 3 lakhs. Today Delhi depends on the Yamuna River for its daily water requirements. Delhi Jal Board is the sole government body in Delhi and is responsible for the production and distribution of potable water. It was constituted on April 6, 1998 through the Act of Delhi Legislative Assembly (Narain and Pandey 2012).

6.3.1. Overview of Water Problems in Delhi

For more than one decade people in Delhi have experienced severe water problems. Studies by the UNDP, Pacific Institute, and Overseas Development Institute mention that water scarcity is often due to its improper management and not simply by nature; both authorities and to some extent citizens share a role in the problem (UNDP 2004b; Cooley et al 2013; Plummer and Slaymaker 2007) .⁴³ Therefore, there is now a major focus on water governance.

Water scarcity can be caused by natural forces can be man-made, or can be caused by a combination of both (see Table 17).

⁴³ UNDP in one of its report on Water Governance on Poverty reduction (2004), has emphasized the improvement on water governance aspects after recognizing that water governance has more influence on water problems in the world rather than finance and appropriate use of technologies which also play significant role (UNDP 2004b). Pacific Institute in their report on Global Water Governance in the 21st Century agreed on the emphasize on local/ regional water governance because water is perceived as a local issue, but it has further given an importance to global water governance because water scarcity is a global challenge which has several faces (Cooley et al. 2013). Overseas Development Institute again mentioned that water crisis in the world is the crisis of governance but it gave a clear overview about the different actors involved in the water governance and their engagement, which is of high importance such as engaging civil society and citizens in the planning and decision making process. This non-fragmented structure will bring effective results (Plummer and Slaymaker 2007).

Table 17: Different Causes lead to different water scarcities.		
Causes Regime	Natural	Man-Made
Permanent	Aridity	Desertification
Temporary	Drought	Artificial Water Shortage

Source: (Tsakiris 2007: 1).

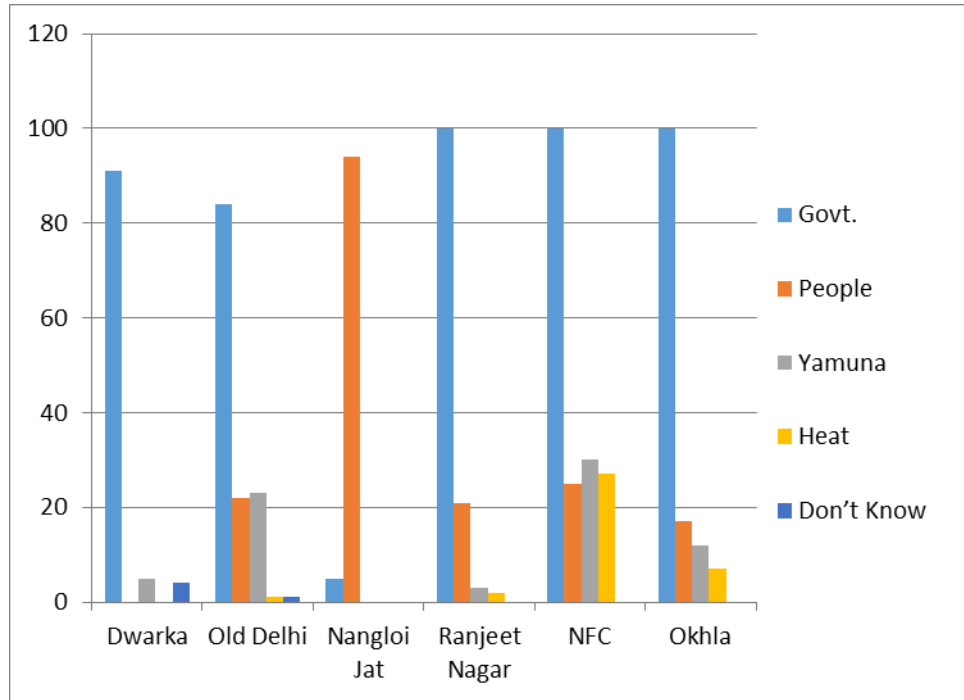
Climatic conditions of Delhi are monsoon-influenced. The city experiences extreme weather conditions. The climatic conditions of Delhi are not water scarce in nature. There have been no signs of drought and almost every year during the monsoon season some parts of the city face flooding. Delhi does not naturally face water scarcity.

Delhi is situated on the banks of the Yamuna River. In some parts of the city the river's water flow has dwindled due to human activities. Yamuna river in many parts of Delhi is filled with mud and sand and artificially converted into land and this land is used for roads and housing construction, which has minimized the volume of water available for the city. In this way when the main water source of Delhi has diminished in volume and population size and its water demand is increased, Delhi became dependent on neighbouring states for its water need

During the household survey conducted for this research project, the opinion of the interviewees was collected on the factors they consider to be responsible for the water problem in Delhi.

Figure 9: Opinion of Interviewees regarding Water Problem in Delhi.

Survey Question: In your opinion who was responsible for water crisis in the city?



Source: Household survey by the author, 2013-14.

According to the fieldwork, most of the interviewees mentioned that the water problem in Delhi was due to inefficient water governance. Only in the Nangloi Jat area did residents have different opinions on the issue. They considered that the problem was more due to residents of the area. This colony is highly populated with political leaders and they have great influence on water management. “Water is a socio-political issue and it is also an economic resource besides being fundamental to life, livelihood and ecology. The politics is the main driving force to address water issues in Delhi which also influences the decisions of its management authorities.”⁴⁴

Stating that ‘*water crisis is a crisis of governance*’ in case of Delhi is a matter of opinion but this view was sufficiently accepted by the majority of those surveyed. It is also noteworthy that when the Aam Aadmi Party (AAP) won the Delhi elections in February 2015 one of their promises was to resolve the water problem of the city.

⁴⁴ Information obtained from a government official in Delhi on 19th June 2014.

6.3.2. Water Sources in Delhi

For years Delhi has had a very conflicting situation with its water. There have been interstate conflicts because Delhi gets about 86% of its water from the river Yamuna as surface water and the flow of this river is diverted through canals among Haryana, Punjab and Delhi.⁴⁵ The major purpose of water distribution to Haryana and Punjab is irrigation. Despite various agreements and meetings of the Upper Yamuna River Board⁴⁶ there were conflicts regarding the sharing of the river's water. One of the reasons for this conflict is adoption of the Green Revolution strategy by Prime Minister Ms. Indira Gandhi to make India from a starving nation to an exporter of food by producing high-yield varieties of grains. Through this strategy Ms. Indira Gandhi and her party, the Indian National Congress had been considered as a very powerful political force in the country. The production of grain to fight hunger within the country was a driving goal of the Green Revolution. For this purpose, the prime minister liberalized electricity for farmers in rural areas so that they can fetch unlimited water to cultivate their fields. The ensuing patterns of the Green Revolution such as the excessive use of fertilizers is still existing in India which impact adversely on water sources and the Green Revolution produced muted and complex economic inequality within rural north India which is one of the reasons behind high rate of internal migration (Jain 2013, Pritchard 2014). Today due to the changing life styles of people in cities like Delhi, the demand for water has increased. Neighbouring states which are more agriculture based are not in favor of increasing the share of water for Delhi. This political situation has had a direct impact on the city's access to water resources. In the Indian Constitution, the management of water resources is under the responsibility of states; therefore, the National Capital Territory of Delhi has few water resources under its direct control. It does not directly control surface water (see Table 18).

⁴⁵ Haryana and Punjab are the agriculture based neighbouring states of Delhi and facing the problem of Original Green Revolution because of depletion of groundwater resources in their states (Ministry of Agriculture 2013-14).

⁴⁶ UYRB is a subordinate office of Union Ministry of Water Resources, Government of India. The main function of UYRB is to act a regulatory body for the allocation of available flows among different states and also for monitoring the return flows, over viewing plans for catchment area treatment, watershed management rehabilitation of affected population and conservation of the environment of inter-state projects (Source: Ministry of Water Resources, River Development and Ganga Rejuvenation, Government of India. <http://uyrb.nic.in/>. Accessed 13 January 2016).

Table 18 gives information about the different water resources Delhi has access to and how much water they can provide to the city.

Table 18: Sources of Water Supply of Delhi.		
	Source	Quantity
Surface Water	Upper Yamuna River Board	404 mgd
	Bhakra-Bias Management Board	267 mgd
	Ganga River	269 mgd
Groundwater	Yamuna River Ranney Wells	22mgd
	Tube wells across Delhi	41 mgd

Source: (Singh and Shukla 2005: 35).

1 Million gallons per day = 3.785 Million litres per day.

1003 Million gallons per day = 3,796.4 Million litres per day (Table 18)

1 Million litres per day = 1 000 000 litres per day

3,796.4 Million litres per day = 152 litres per day per capita (25 million population)

Another indicator of man-made water scarcity in Delhi is the amount of wastewater generated. Delhi generates approximately 3,743 million liters per day of wastewater. Due to a large gap between generation and treatment of wastewater in Delhi, wastewater is discharged into the Yamuna river (Upadhyay and Rai 2013). Effective collection of wastewater can be used to control the pollution of the major water source of the city to improve water supply.

If water were to be distributed equally among the 25 million people living in Delhi, every individual in Delhi should get 152 liters per capita per day,⁴⁷ which is more than the average regional consumption in Paris, France (Suez Environment 2012). This is another indicator, which shows that water shortage for citizens of Delhi is not a problem created by nature; it is somehow created within the city itself by poor water governance.

⁴⁷ According to the study, human kind needs only 2 liters of drinking water per day for the survival (Fry AI 2005).

6.4. Water Supply Scenario in Delhi before AAP

Delhi largely depends on the river Yamuna for its daily water needs (Narain and Pandey 2012). Water supply and wastewater treatment capacity in Delhi is being increased and almost every five-year plan takes into account growing demand of water from growing population of the city. Despite of effective five-year plans, national water policy and several other laws and acts in place, water supply in Delhi remained a matter of concern due to various reasons such as raw water scarcity, transmission and distribution losses, uneven distribution of water, water supply with less pressure, poor water quality, non-recharge of groundwater and increase in the gap between water supply costs and the collected revenues (The Energy and Resource Institute 2010b).

Fast growth of urban population in Delhi is likely to be affected in various ways where the citizens face decreasing water supply, inadequate sewer system, and health and sanitation facilities and so on. Urban population in Delhi has massive increase in demand towards basic infrastructure such as housing and where authorities lack in providing and as a result rapid expansion of illegal or unplanned and unserved settlements had occurred where people live with unhealthy and overcrowded conditions.

In Delhi, shortage of water did not mean insufficient water for its citizens. In fact, Delhi gets 191 liters per capita per day of water supply, higher than many other cities in the world; the major concern in Delhi was proper access to water supply (Bansal 2012). The water problem in Delhi lies in non-uniform and inadequate water distribution which is as low as 29 litres per capita per day (lpcd) in some areas such as Mehrauli, which is below the Bureau of Indian standards (BIS)⁴⁸; in other areas such as Cantonment it is more than 500 lpcd (Narain and Pandey 2012: 84).

According to the Economic Survey of Delhi 2008-09, the city needs 3,859 million litres of water every day if 259 litre per capita per day (lpcd) is supplied as per norms.

⁴⁸Bureau of Indian Standards was established with the objective of harmonious development of standardization activity in India. Under the bureau of Indian Standards Act, 1986, Bureau establishes Indian Standards in relation to any article or process and amends revises or cancels the standards so established as may be necessary, by a process of consultation involving consumers, manufactures, Government and regulatory bodies, technologists, scientists and testing laboratories through duly constituted committees. (Source: Bureau of Indian Standards, The National Standards Body of India. http://www.bis.org.in/bis_overview.asp. Accessed 17 January 2016.)

Delhi has a very high rate of water loss, there is around 52 per cent loss during transmission. One of the reasons are the many water leaks in the pipe network. Delhi has an old and ineffective water infrastructure which has not been upgraded. Delhi has large volume of non-revenue water which is supplied to the consumers but the costs are not recovered and the main reason for this is the inaccurate water supply accounting by DJB:

- Out of total 17.15 lakh water connections on April 2009, 3.52 lakhs were unmetered.
- Out of 13.59 lakh metered connections, around 5.00 lakh meters were defective or non-functional.

(The Energy and Resource Institute 2010b)

With this large supply-demand gap and lack of 100 per cent coverage of the city's population with the official pipeline network, groundwater is extracted to fill the gap. Officially, only 12 per cent of the city's water supply is met by groundwater but the scale of withdrawal is huge (Narain and Pandey 2012). The Central Ground Water Board (CGWB) assessed the potential of groundwater to be 280 million cubic meters in 2008 as compared with 428.07 million cubic meters in 1983, which shows reduction in groundwater potential due to high rate of extraction (The Energy and Resource Institute 2010b). Decreasing groundwater level in Delhi has become a matter of serious concern. For example, in some places such as Alipur and Kanjhawala blocks water table have declined to 2-6m, in Najafgarh block by 10m and in Mehrauli by 30m (The Energy and Resource Institute 2010b). Massive groundwater extraction has led to deteriorated water quality in many parts of the city and it is found to be unfit for human consumption. Degraded groundwater quality is also the result of bad management of municipal waste in the city. Not only groundwater quality is a matter of concern in Delhi but also the water supplied by DJB contained the amounts of bacteria which are unfit for human consumption.

Table 19: Zone Wise Bacteriological Report of DJB's Tap Water.			
Zone	Samples Taken	Samples Found Unfit	Percentage
Narela Zone	10	10	100
Civil Line Zone	26	15	57.69
Karol Bagh	10	7	70
Shahdra	4	2	50
Sadar Paharganj Zone	32	28	87.05
Central Zone	6	2	33.3
South Zone	28	17	60.71

Source: Kumar Vikram, 'Waterloo road: MCD study finds that 70% of water in Delhi is unfit for consumption as liquid from drains is getting mixed with drinking water', Mail Online India. Published 6th June 2012. <http://www.dailymail.co.uk/indiahome/indianews/article-2155484/Study-finds-70-water-Delhi-unfit-consumption.html>. Accessed 22 October 2015.

According to DJB, 135 urban villages, 560 unauthorized colonies and 820 JJ clusters have been provided with piped water supply (Narain and Pandey 2012). Despite this almost 25 per cent of city's population was lacking with the access to water and the rest 75 per cent were provided with inequitable water supply.

Table 20: Inequitable Water distribution in Delhi.	
Locality	Water Supplied (lpcd)
Narela	31
Civil Lines and Rohini	274
City	277
Pahar Ganj	201
West Delhi	202
Karol Bagh	337
NDMC	462
Shahdara	130
Najafgarh/Dwarka	74
Cantonment	509
New and South Delhi	148
Mehrauli	29

Source: (Narain and Pandey 2012: 85).

More coverage of water supply that is 75 per cent did not help people in Delhi to get water because of highly intermittent supply and very low pressure. This situation in the city facilitated entry of private operators in city's provision to water. In middle and high income groups water tankers and bottled water business is popular in Delhi whereas

in lower income groups water is supplied through push-carts or tricycles. For example, in Sangam Vihar in South Delhi which is a crowded maze of modest single and double storied brick homes occupied by about one million of population. Sangam Vihar is the largest unauthorized urban settlement in Asia.⁴⁹ Sangam Vihar is not connected with DJB water network and the needs of the population in this colony were met by water tankers, or from borewells dug by individuals, private contractors and the mafia (Water Privatization-Commercialization Resistance Committee 2012).

Figure 10: People Filling Water from a Government Tanker in Delhi.



Source: 'Crack down on the tanker mafia in the capital', Mail Online India, Published 18th June 2012. <http://www.dailymail.co.uk/indiahome/indianews/article-2161190/Crack-tanker-mafia-capital.html>. Accessed 18 January 2016.

Almost half population (mainly migrants) of the city is living in unauthorised areas, which are outside the planning framework. These houses are also called unconnected houses, which do not receive water from the authorities through pipes. Those areas are dependent on stand poles, water tankers or boreholes for their day-to-day

⁴⁹ Source: Sai Manish, 'Black Market for Water Expands in Delhi', The New York Times, Published 18th September 2013. http://india.blogs.nytimes.com/2013/09/18/black-market-for-water-expands-in-delhi/?_r=0. Accessed 18 January 2016.

water use.⁵⁰ DJB also gave the service of providing water through tankers but it was unable to cover all the population and left people depend upon private water tanker suppliers who are charging heavily for this service. Almost all private water tanker suppliers fill their tanks by extracting groundwater and supplying water without prior treatment (Narain and Pandey 2012).

6.5. Status of Water Supply in Surveyed Colonies

In Okhla area, Zakir Nagar colony has very different scenario. Many houses have hand pumps and whenever they need water they fetch it or turn on their pumps to fill their tanks. Many households have two taps; one may be an illegal municipality water connection and another is connected with boring. In the time when there is no municipality water supply, water can be fetch with the help of pump in another tap. Many houses also occupy illegal water connections where they have very irregular and inadequate supply; but they cannot complain about it. Sabzi Mandi area in Okhla is depending upon tanker supply. In Gole Market locality in CP, water comes mostly for 2 hours a day but in a specific time from 1PM – 3PM but none of the households interviewed had water tap inside their house; they were relying on community taps. As mentioned in Chapter 3, CP is one of the posh area in Delhi occupied with very rich and politically strong population but on the other side it also has slum kind of settlements and this population did not receive water as majorly the water is diverted to other rich areas. In Old Delhi, most of the households get water supply for 4 hours daily, 2 hours in the morning and 2 hours in the evening. The ones who have 24 hours water they have boring in their houses. In Dwarka, people get water not on daily basis but once in 3-4 days for around 2 hours. Most of the population in the locality was fetching water from far or depending on boring wells to fill their daily water needs.

⁵⁰ Information taken from the Interview with Prof.Usha P. Raghupathi at National Institute of Urban Affairs in Delhi, India on 22th May2013.

Figure 11: Two Taps are common in many Households; one is from municipality (could be illegal) and another is from bore well.



Source: Author's photo, December 2013.

In Ranjeet Nagar, during the survey people gave mixed statements. In some lanes water came for hardly 2 hours per day but in some lanes the situation was worse and water came only once in 3-4 days for 2-4 hours. People rely on private tankers or use bottled water for drinking purposes. People also rely on their neighbours and borrow water or fetch it from far. Many households have booster pumps connected to overhead tanks.

Table 21 presents the water supply situation which Delhi had before AAP came into power. The household survey conducted for this study suggests the data here is more or less accurate.

Table 21: Urban Water Supply Description of the Surveyed Colonies							
District	South District		West District			New Delhi	Central District
Name of Locality	New Friends Colony	Okhla	Ranjeet Nagar	Nangloi Jat	Dwarka Slum	Connaught Place	Old Delhi
Total Number of Surveyed Houses	48	140	45	61	45	30	54
Water Connection inside House	48	43	45	61	7	0	31
	100%	31%	100%	100%	16%	0%	57%
Number of Hours they get water	4-5hrs/day	1-2hrs/day	2-3hrs/1-2days	4-5hrs/day	1-2hrs/2-3days	-	4-5hrs/day
Water Quality* (good, bad, manageable)	Manageable	Manageable	Good	Manageable	Bad	Manageable	Good
Monthly Income spent on water	20-25%	0-10%	10%	-	0-5%	10%	Less than 10%

Source: Compiled from Household Survey, 2013-14.

*Water quality at different locations in Delhi also has relation with the perception of people. May be for the ones the quality is good for others the same quality is manageable. In the table the highest percentage of water quality rating has been used.

6.6. Additional Issues Contributing to Water Problems in Delhi

It is clear that the kind of water scarcity Delhi has is largely man-made and the water authorities are in part responsible. The job of the water authorities has been made more challenging by the rapidly growing population, the city's old and ineffective infrastructure and bad management facilities. Other factors also play a role as well. An overview of existing technical facilities which are needed to supply water and to treat the

huge amount of waste water produced in the city and related economic aspects are analysed as both play a crucial role in sustainable water management.

6.6.1. Existing Technology

A major challenge for water engineers is to develop technologies which can secure water for people. Given the ever-growing importance of water quality, it is essential to implement sound and upgraded technologies which are also financially affordable especially in a country like India which is still a developing country and has large poor population.

The increasing demand for fresh water with the increase in population in Delhi has had an enormous effect on groundwater resources and the eco-system of the city. The supply-demand gap could be minimized with the help of wastewater treatment technologies in the city (Delhi Jal Board 2015). As the demand for water is high, the amount of wastewater in the city is also high. When wastewater is treated it can be used for other purposes such as washing and cleaning and withdrawal of groundwater can be minimized. Moreover, if wastewater is collected in an efficient manner discharge into surface water resources can be prevented. This would help to keep surface water resources pollution free and to enhance environmental benefits.

The generation of sewage in Delhi is 680 Million Gallon per Day (MGD) (Aarshi 2013). DJB is responsible for sewage but is only able to collect about half of this amount; the rest of the volume is discharged directly into river Yamuna (Comptroller and Auditor General of India 2013: 15). The waste water which is not treated has tremendous adverse effects on public health and the environment in the city.⁵¹ This is clearly an issue for water governance as the state should be providing clean and safe water to its citizens. Due to the high pollution load in the main water supply source of the city, treatment technologies and the reuse of wastewater need to be considered as a potential option in water stress scenarios (Jamwal and Mittal 2010).

⁵¹ Every year in Delhi after monsoon season from the month of July till November, there is outbreak of deadly Dengue fever due to wastewater in the streets, which becomes the home of hundreds of mosquitoes responsible for this fever. The most of the cases in the city are reported from the areas not connected with city's sewerage collection system such as unauthorized areas.

There are in total 17 sewage treatment plants (STPs) used to treat domestic wastewater in Delhi. These STPs are based on Conventional Activated Sludge Process (ASP), Extended Aeration (AE), Physical, Chemical and Biological Removal Treatment (BIOFORE) and Oxidation Pond Treatment Process.

According to a study conducted by Indian Institute of Science Bangalore and Indian Institute of Technology Delhi, the water quality from these plants were not satisfactory for human consumption. All of the STP plants in Delhi were working on primary and secondary treatment of sewage. Tertiary treatment is needed for water reuse (Jamwal and Mittal 2010). According to the Comptroller and Auditor General of India's Audit Report of 2013, sewage management in Delhi is inefficient primarily because of non-collection of all the wastewater but also because of the delay in work sanctioned and its completion and the underutilization of the capacity of the plants. This audit report and the study conducted by the above-mentioned institutes did not talk about technology failure. They recommended the extension of the same technology and from the management side there were faults in operation of the plants. Financial management was also a problem. Thus, Delhi's water problems are not so much in the existing technology as in the failure to collect all the wastewater generated and its direct release into water bodies. It would then be possible to have greater recycling/re-use of this water after treatment.⁵² This is important for Delhi to achieve the goals of its Master Plan Delhi (MPD) – 2021, which emphasizes recycling and reuse of water.⁵³

6.6.2. *Economic Aspects*

According to Shah (2007:3), “[p]ricing water is a contentious issue because it is seen by many anti-poor excluding large parts of the population from a basic need. Although social considerations are a very important part in debate about water pricing it should not be forgotten that the production and distribution of high quality water is a very expensive undertaking that has to be paid for by someone. Properly designed water

⁵² Information obtained from an employee at TERI University Delhi on 4th March 2013.

⁵³ Delhi's Master Plan 2021 has several objectives on the agenda such as environment as a whole, protection of water bodies, transportation, shelter and employment, equitable supply of water in all the areas of the city, urban planning of the city, social infrastructure, physical infrastructure (Delhi Development Authority 2007).

charges serve two purposes: they assure financial sustainability of the utility and regulate demand. Sound finances are an essential prerequisite for sufficient investment in water infrastructure and service delivery”.

Delhi’s water situation had worsened over time; many people have water only 2-4 hours in a day. Lack of maintenance of the water infrastructure has led to a deterioration of the situation. There are many broken pipelines due to lack of financial resources available to the authorities (Whittington 2003). Revenues collected from the supplied water were not enough to pay for an upgrade of the infrastructure. This contributes to a significant amount of loss of water during transmission.

Table 22: Showing Revenue Losses						
Year	Average Production (MGD)	Quantity to be Billed as per norms (MGD)	Average Quantity Billed (MGD)	Billed Amount in crores per year	Average Tariff per MG (crores)	Revenue loss due to short billing (crores)
2009-10	800	640	264.24	971.39	3.68	1382.80
2010-11	835	668	293.94	926.17	3.15	1178.29
2011-12	818	654.40	306	1217.36	3.98	1389.81
Total – 3950.90 (crores)						

Source: (Supreme Audit Institutions of India 2013: 16).

The finance needed to upgrade the infrastructure in Delhi comes from revenues paid by customers or from the State. According to the political situation in India water cannot be given a higher price because decisions on water tariffs are highly political and sensitive. Although DJB is responsible for water management, any change or hike in the water tariffs by the DJB needs prior approval from the State Government. The major obstacle to increasing the water price is the perception of people about water that it is essential to human life and has to be supplied at a subsidised rate. This is the reason political parties are always reluctant to hike the water price because of fear of loss of

electoral support from the people (Padwal 2005). Therefore, the DJB cannot work according to economic criteria alone but is also forced to follow political considerations and hence charges less than the operational costs of water. As a result there has been no significant increase in revenues.⁵⁴ Moreover, only 75% of the population is connected to the water pipeline network and not all of them have working meters. This too is linked to the financial situation.⁵⁵

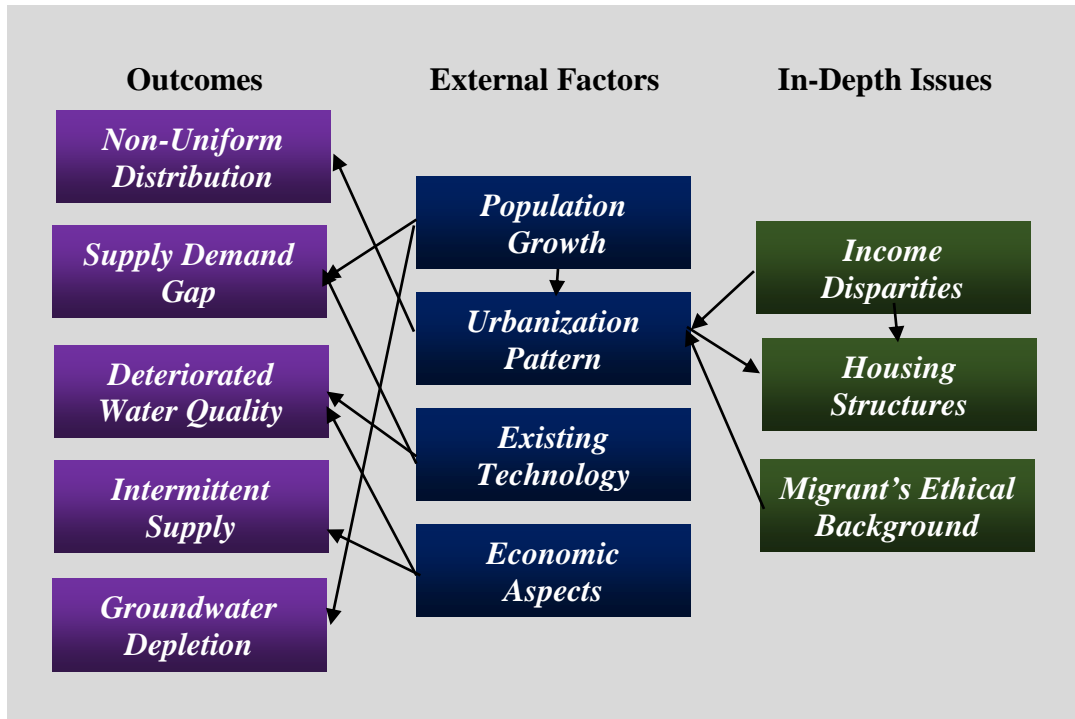
Especially in areas of Delhi where there are mixed settlements, where not every household is connected to piped water and where significant amount of water is lost in transmission, revenues from water charges are low. Tariffs in Delhi are prone to '*political capture*' and are not set on '*economic principles*'.⁵⁶

⁵⁴ Information obtained from an employee at TERI University, Delhi on 4th March 2013.

⁵⁵ Information taken from the Interview with Prof. Arun Kansal at TERI University Delhi on 18th October 2013.

⁵⁶ There are some more reasons for non-revenue water in Delhi which will be talked about in other chapter focused on corruption; they have a great influence on the collection of water charges and those reasons come under the category of illegal activities or corrupt activities.

Figure 12: Interconnected Issues of Delhi's Water Problem.



Source: Author.

Conclusion

Water scarcity in Delhi causes many problems for its citizens and for future sustainability of the city. The entire situation is complicated by the large influx of migrants into unplanned and unauthorized settlements even though they contribute to the growth of the economy. Water scarcity has to be managed or the city will lose its value for employment, higher education, and most importantly, the quality of life and health of citizens.

There has been much discussion about the root causes of Delhi's failure to provide adequate water to all. Various factors have been analysed, such as technology and finance and their influence on water management. While these clearly are problems, the major reasons for the water problem in Delhi lies within informal institutions. In the

next chapters, various informal institutions (3Cs) and their influence on water governance are analyzed to better understand their emergence, persistence and scale of influence.

7. Measuring and Assessing Delhi's Water Governance Performance

This chapter focuses on Delhi's serious domestic water supply problems due to ineffective water governance. In order to show that 'water crisis is a crisis of governance', it is necessary to evaluate Delhi's performance in water management. How the water sector in Delhi has been governed and the functionality of its water governance are explored in depth. The main purpose of this chapter is to make an assessment and try to figure out the actual problems and constraints in water governance and to learn which organs of water governance are the weakest in terms of functionality. It is important to know where changes or reforms are needed in the system.

The water authority's performance is measured from the perspectives of physical, chemical and economical dimensions. The assessment of the quality of water governance relies on three important pillar institutions: water laws, water policies and water organizations. Finally, this chapter presents a summary of the assessment of water governance in Delhi.

7.1. Water Governance Performance in Delhi

The urban water supply and sewage collection services in the city are provided by the Delhi Jal Board (DJB) (Tiwari 2007; The Energy and Resource Institute 2010a). The DJB is a statutory body which came into power with the Delhi Water Board Act 1998 passed by the Indian Parliament (The Energy and Resource Institute 2010a). DJB has a number of responsibilities in the water sector, including installing and maintaining water infrastructure for the city (Tiwari 2007). The water sector in Delhi is under mixed control; it is governed by the Indian Central government which is responsible for water administration for the entire nation, the local government and the State legislatures. In some cases, the DJB is not able to take major decisions on its own without the approval from the State assembly (Tiwari 2007). For example, DJB cannot take the decisions on water tariffs in Delhi, approval from Central government is necessary (The Energy and Resource Institute 2010a). There are several laws and acts in place, namely, the Delhi

Municipal Corporation Act 1957, the Delhi Jal Board Act 1998 and the Water Prevention and Control of Pollution Amendment Act 1974. These laws govern the management of the water supply in different wards of the city, control and monitor surface water pollution and water quality. There is also a Ground Water Extraction Act.⁵⁷

There has been progress in terms of the development of new water sources and in the installation of waste water treatment facilities. These facilities augment the supply of water to meet increasing demand (Singh and Shukla 2005: 37). Despite the legislative framework and available technical facilities, water is still not provided to everyone in the city. Behind this is the ignorance towards institutional capacity building and the failure to promote mechanisms for accountability enhancement (Singh and Shukla 2005).

Delhi's water supply situation is directly connected with the lack of adequate urban planning in the city. 40% of the city is developed on unauthorized land.⁵⁸ Delhi has a complicated mixture of housing settlements, which are occupied by the people from every level of society. The housing settlements reflect the economic conditions of their inhabitants (Dupont 2004). "The variety in types of settlements and housing reflects directly the composition of the population that shows a mixture or rather a juxtaposition of different socio-economic groups" (Dupont 2004: 167). Many parts of the city developed in a haphazard manner without any support from urban authorities for cheap housing.

7.1.1. The Physical Dimension: Supply-Demand Gap and Intermittent Supply

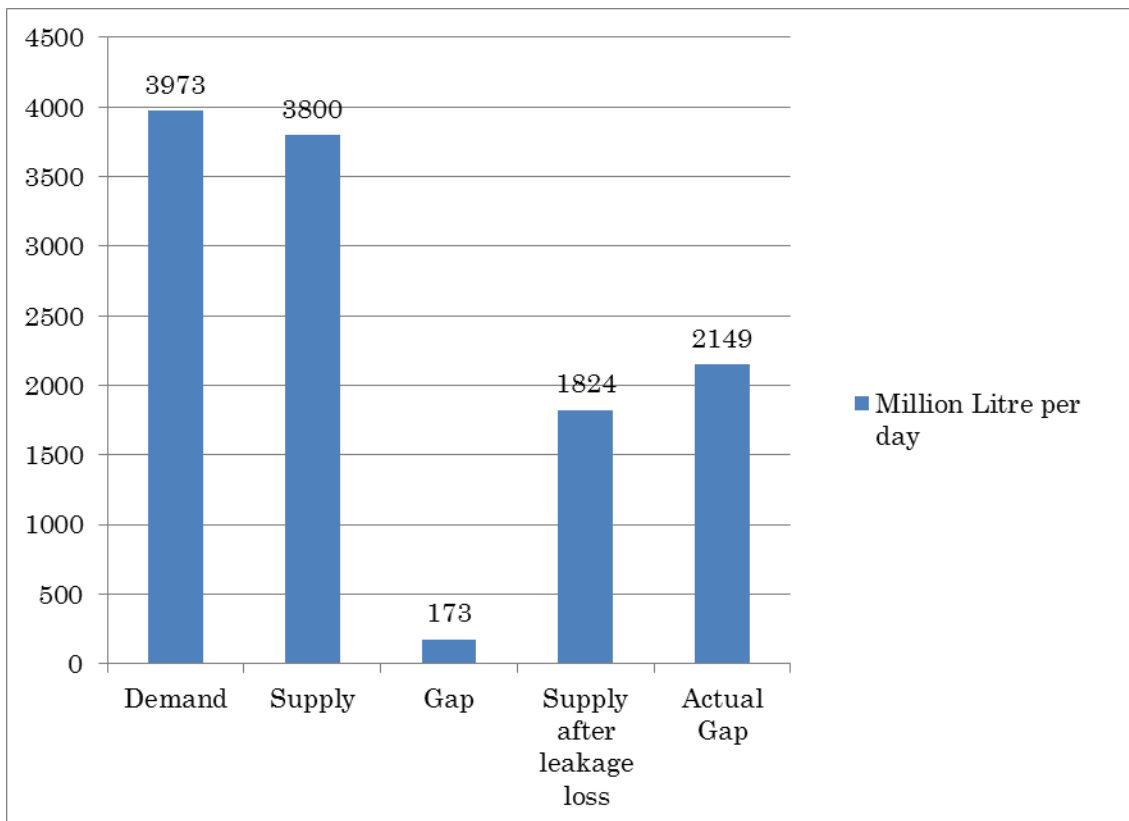
In essentially every report and every project in Delhi, there is mention of the rapidly growing population of the National Capital Territory (NCT), Delhi. The NCT does not include the neighbouring satellite towns, such as Gurgaon, Noida and Faridabad

⁵⁷ Water abstraction rights are not very well defined in the city, therefore; the extraction of groundwater in several areas mainly occupied with informal sector abstract groundwater for their daily needs. This practice has brought a significant impact on groundwater table of those areas in Delhi (Tiwari 2007).

⁵⁸ Information taken from Interview with Prof.Usha Raghupathi at National Institute of Urban Affairs on 22nd May 2013.

(Schrenk 2013: 1).⁵⁹ Large number of people in Delhi means there is a large demand for water. The authorities have not met this demand because of the large water supply-demand gap. Many people in the city of 25 million can tell stories about their hardships in getting water. In some areas there is no fixed time of water supply; people have to wake up in the middle of the night to fill their buckets.⁶⁰

Figure 13: Showing Water Supply-Demand Gap.



Source: (Narain and Pandey 2012: 80).

According to CSE, there is a big gap between supply and demand of water in the city, an indicator of poor water governance performance.

In addition to this supply-demand gap, the water supply is intermittent and unreliable. The houses connected to the water pipeline network or the ones who are

⁵⁹ Gurgaon, Noida and Faridabad are the neighbouring satellite towns to Delhi, highly developed and hub for international business. The idea to develop these neighbouring cities is to minimize the load of huge population on Delhi and its resources.

⁶⁰ Information obtained from one of the household interviewee during fieldwork in December 2013.

depending on community taps in the streets (public standpoints), get water only one to four hours a day with a great uncertainty in the water pressure. In 1994, Delhi had about 1.09 million water connections; after 10 years in 2004, the number of connections had increased by 3 percent whereas the population in the city had grown by 50 percent (Narain and Pandey 2012). The water supply network of the city covers only about 75% of the population; the rest of the citizens are dependent on private vendors for their water supply (Government of NCT of Delhi 2014-15). In 2005-06, the 9,000 km long network of pipelines served about 14 million people through 1.45 million water connections, and provided water on an average of 4-5 hours a day (Narain and Pandey 2012: 84).

The network is estimated to be 40 to 50 years old and prone to water losses through leakage (Government of NCT of Delhi 2014-15; Asthana 2009). According to the Centre of Science and Environment (CSE), Delhi received 3,800 MLD of water at the rate of 241 liters per capita per day (lpcd). Due to loss of water during transmission because of leakages in the pipeline network this amount dropped to 115 lpcd. DJB estimates loss of water through the network in Delhi to be about 40% of the total water supplied (Narain and Pandey 2012: 84). This is a large amount compared with cities in other developing countries. In 2011, according to DJB the water supply network was extended to 12,000km (Narain and Pandey 2012) and in the next years was further extended to 14,000km (Government of NCT of Delhi 2014-15). The system also operated 10,781 community taps in slums and unauthorized areas used by the poor, an estimated 30 per cent of the city's population most of whom live in unauthorized colonies, urban villages and slums (Narain and Pandey 2012: 84). Laying down pipes was not an effective solution; water supply remained inadequate. "About 13 per cent of the households in Delhi did not receive water every day" (Narain and Pandey 2012: 84).

The fieldwork showed that another problem was the intermittent and insufficient supply of water. A DJB tanker may come or may not. Water in the tap may come or may not flow. Water amounts are also uneven meaning people do not know how much water they will be able to obtain from day to day. Often supply is insufficient to meet needs. To fill this gap of supply-demand, some citizens turned to groundwater. The DJB claimed that only 12% of the total demand was met with groundwater but the level of extraction

of groundwater appears to be far greater than this percentage given by DJB, considering the significantly sinking groundwater table (Narain and Pandey 2012).

Figure 14: People Storing Water – An Evidence of Intermittent Water Supply.



Source: Author's photos, December 2013.

In March 2004, the DJB owned over 3961 tube wells and 14 ranney wells located near or on the Yamuna riverbed (Government of NCT of Delhi 2014-15). Additionally, about 449 deep bore hand pumps had been dug. In 2005-06, the government proposed to install 84 additional tube wells, re-bore 221 and install 560 deep bore hand pumps (Narain and Pandey 2012). In the year 2005-06, the number of private tube wells legally registered with the authority in charge is around 100,000; different sources estimate the actual number of private tube wells to be between 200000 and 360000 (Maria 2006: 463).⁶¹

The rate of urbanization in Delhi has brought changes not only to the quantity of water resources but also their quality; groundwater quality has deteriorated in Delhi due to over extraction. Heavy metals have been found in the groundwater as well (Singh 2004)(see Box 7).

⁶¹ An increasing in the number of groundwater extraction techniques in Delhi have grown which was an indication of increase in percentage in the use of groundwater in the city. There are also a number of private tube wells and hand pumps in the city which are illegal and unregulated; there is no information available in regard to these. The groundwater table has been sinking at an increasing rate.

**Box 7: Groundwater Quality in Delhi
(India Today March 6, 2013)**

Delhi's groundwater table is falling dramatically and entered in a danger zone where water quality is not suitable for consumption. In the year 1983 the groundwater in the city was available just a little below 33 feet. By 2011 it has gone down by 132 feet. The data revealed by the Central Groundwater Board of the Ministry of Water Resources shows that the sharpest fall in the groundwater table of Delhi have noticed in the decade of 2002-2011.

The groundwater table across Delhi's 1,484 sq. km has declined between 6 and 66 feet.

The worst hit areas of this crisis are South Delhi and some parts of Southwest Delhi covering around 26 sq. Km where the groundwater table has gone down by 70 feet since 2003. Mr. Sushil Gupta, chairman of the Central Groundwater Board said that groundwater situation in Delhi has become scary due to high rate of urbanization. In the business as usual scenario the city may face permanent water crisis. One of the main reasons associated with groundwater table depletion in Delhi is the lack of enforcement of laws on withdrawal of groundwater.

Delhi does not have only declining groundwater table another issue is the quality of the groundwater. Delhi's groundwater contains high load of heavy metal such as lead, cadmium and chromium. Negligence towards wastewater collection and its seeping into groundwater is the result of deteriorated groundwater quality in Delhi which is found at shallow depths ranging between 10 feet to 82 feet.

Source: Dinesh C. Sharma, 'Delhi fears water shortage as groundwater level hits dangerous low', India Today, published March 6 2013. <http://indiatoday.intoday.in/story/unregulated-withdrawal-of-groundwater-delhi-brings-levels-to-danger-zone-india-today/1/256627.html>. Accessed 25th December 2015.

7.1.2. The Chemical Dimension: Water Quality Issues

In 2007, the University School of Environmental Management conducted a study on drinking water quality, the causes of water quality damage, and the consequences for those consuming the water supplied by the DJB. They collected more than 30 drinking water samples from different locations in Delhi. The study only examined physico-chemical parameters. It found that there was a high range of heavy metals in the drinking water samples. The sulphate content in the samples varied from 11.5 ppm to 177 ppm (Bisht et al. 2007: 2). From the tested samples, there was a range of nitrate concentration

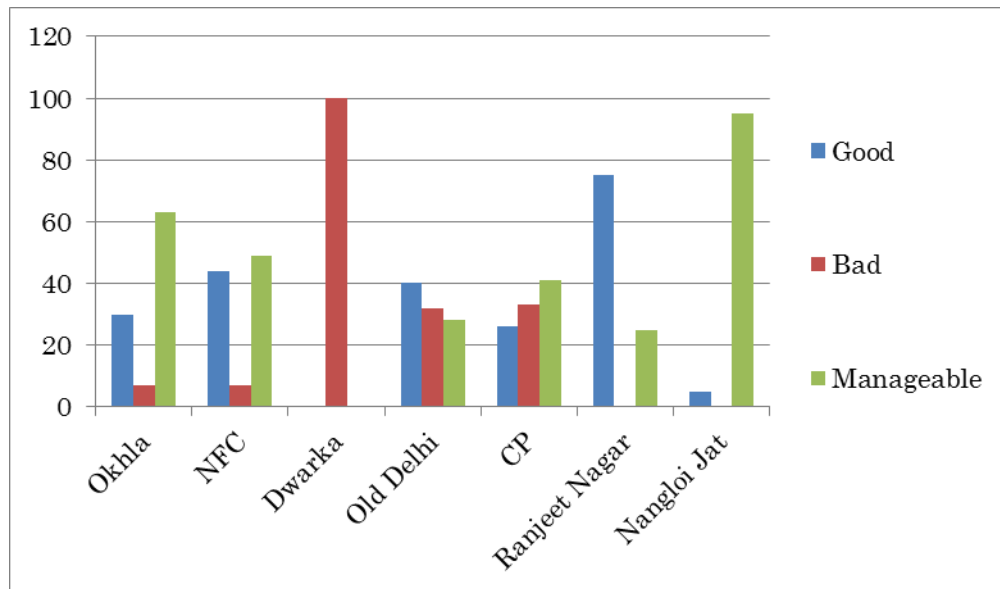
from 1.3 – 196.9 ppm; the six samples exceeded the permissible limits of 1000 ppm set by the Bureau of Indian Standards (BIS) (Bisht et al. 2007: 2). Nitrate is found to be one of the causes behind blue baby disease in infants, which is caused by bacterial reduction of nitrate into nitrite in the stomach. The reason for there being such a high concentration of nitrate in the drinking water may be due to leaching of organic material from biodegradable products into the water resources. In some of the samples fluoride was also found to be very high. When fluoride combines with hydrochloric acid, it leads to the formation of hydrogen fluoride which is highly corrosive in nature. Lead was also one of the heavy metals found in the samples in the range of 0.20 – 22.18 ppb (Bisht et al. 2007: 2). The presence of lead in drinking water may be due to lead water pipelines. Lead can cause anaemia and may also affect the kidneys, gastrointestinal tract, joints and reproductive system. It can lead to acute or chronic damage to the nervous system. According to International Standards (IS), mercury should not exceed 0.001 ppm. Mercury levels in the drinking water of Delhi exceeded this standard (Bisht et al. 2007: 2). Mercury has serious health effects and can cause psychological changes and spontaneous abortions. Continuous exposure to mercury may lead to brain damage. The increased level of mercury in Delhi's drinking water might be due to the material utilized for water supply pipelines. Other metals such as Aluminum and its compounds and Selenium are also found at more than the permissible limits set by IS for drinking water in India (Bisht et al. 2007: 2). Clearly, the quality of drinking water was not suitable for human consumption for the above-mentioned reasons.

Another indicator of bad water quality is the rapidly growing mineral water business in the city. Providing safe water to citizens is the responsibility of the State and not private companies. The government's weak performance has been an open gateway for Indian and multinational companies to grow and establish an industry in the water business. It is a low to no investment business which can be started by anyone and has the potential of a lot of profit. The bottled water business does not need any license,

certification or any quality approval from laboratories. Plastic bottles used to start water business can be provided on whole sale with only a small amount of investment.⁶²

Figure 15: Opinion of water users about Water Quality.

Survey question: How do you find the water quality? Ask for color or any smell?



Source: Household survey by the author, 2013-14.

In the fieldwork, the quality of drinking water was also taken into account. Three different categories were added: good, bad and manageable. Only physical parameters, which include easily perceivable aspects such as turbidity, color, odor, appearance of the water, were identified in the fieldwork as a priority area of concern. It is not simple to say that water is good or water is bad. Therefore, some codes had been provided to people to judge their perception over water quality in Delhi.

With respect to these physical parameters, water quality assessment indicators list is divided into the following categories:

⁶² Source: Leena Dhankar, 'A business with 100% profit guarantee', Hindustan Times, published May 14 2013. <http://www.hindustantimes.com/gurgaon/chunk-ht-ui-gurgaonsurvey-gurgaonfirst/a-business-with-100-profit-guarantee/article1-1057322.aspx>. Accessed 26 December 2014.

Table 23: Water Quality Indicators		
Category 1	Good	Consumers were satisfied with the water quality.
Category 2	Manageable	People do not trust water quality to consume it for drinking. Water is used for other purposes such as washing and cleaning.
Category 3	Bad	Water quality is not good at all; it is smelly sometimes.

Source: Author.

The survey showed that some people in different areas were satisfied with the water quality, especially in Ranjeet Nagar, Old Delhi and NFC. Ranjeet Nagar is occupied mostly by government employees. Old Delhi is a highly congested locality; one of the main focused areas of politicians because of large numbers of voters and NFC is one of the posh colonies occupied by the business class.

Another matter of concern for the citizens in Delhi was the quality of groundwater, as many regions in the city utilize groundwater for drinking purposes. The major causes of the pollution in the groundwater of Delhi are industrial wastes which were injected directly into groundwater with or without prior treatment (Government of NCT of Delhi 2014-15). Another major problem was the municipal waste in Delhi; when landfill sites in the city are not managed with engineering techniques; there is often no lining at the bottom so that the leachate⁶³ cannot perpetuate into the groundwater (Srivastava et al. 2015). In the months of heavy rainfall in Delhi leachate reaches up dangerous levels. Sewage is also responsible for deteriorated groundwater quality, a problem for those who have no other available water sources. For example, in Bhalaswa JJ colony, situated next to Delhi's largest open landfill site groundwater pollution is very high and in the absence of any other option, the population of this area uses groundwater as drinking water (Water Privatization-Commercialization Resistance Committee 2012).

⁶³ "Leachate is a heavily contaminated and likely hazardous liquid that is produced as a result of water infiltration through solid wastes generated industrially and domestically. Leachate can migrate away from landfill; it may cause serious pollution to the groundwater as well as adjacent surface water" (Aziz et al 2013: 36).

Figure 16: Municipal Waste outside a Community in West Delhi.



Source: Author's photo, December 2013.

More than 25% of the population is not connected with the water pipeline and sewer networks (Narain and Pandey 2012). The wastewater generation in the city was 670 million gallon per day (MGD) and only around 394 MGD was treated because large numbers of houses are not connected with sewers (Government of NCT of Delhi 2014-15). As a result, the uncollected wastewater penetrates into the ground, contaminating the groundwater and polluting the surface water through open channels in hindi called as *nallahs*. Another issue is the aging water infrastructure, which is another cause of bad water quality. There are times when sewer water contaminates drinking water water, because underground infrastructure is broken or choked (Planning Commission 2011a). The DJB has assured that they test the water supplied to consumers but the consumers in most of areas remain dissatisfied with the water quality they receive. For example, in Patel Nagar in West Delhi, people filed complaints to DJB with respect to water quality.⁶⁴ In regard with groundwater consumption a large number of unplanned settlements, slums

⁶⁴Source: Complaint Board, National Consumer Complaint Forum. www.complaintboard.in. Accessed 28 January 2016.

and unauthorized colonies, employ shallow hand pumps to get water for daily needs which is unfit for drinking purpose (Dutta 2006).

Figure 17: A household taking tap water provided by the DJB.



Source: Author's photo, December 2013.

The intermittent supply of water is also associated with water quality, due to bacterial growth in the pipelines when there is no supply of water. Continuous water supply lowers the risk of in-pipe contamination which may result from intermittent water supply (Satapathy 2014: 3).

7.1.3. The Economic Dimension: Entry of Alternate Suppliers

The private water suppliers in Delhi do good business due to the uneven, intermittent and unreliable supply of water from the water authorities (Bansal 2012). Water tankers and bottled water are very commonly seen in the upper and the lower middle class areas, whereas in the lower income groups rickshaws and tricycles carry water where pipelines remain dry. Whenever the DJB was not able to meet daily water requirements, people turned to these alternate resources. Private operators use groundwater without any costs involved because the boring wells they use are illegal. They extract groundwater without license (Bansal 2012) but then charge consumers

heavily, especially in summer. Bottled water companies claim that they are treating water and it is safe for consumption which is a case only with some international brands.

In Delhi, in the case of a lower-income man of having a family of 4-5 persons spending more than 25% of his income on water; these private players were growing in Delhi and doing a good business.⁶⁵ The following table describes the costs involved in buying water from these private players (see Table 24).

Table 24: Costs for Water When Water is not Supplied by Authorities.			
Mode of provision	Source of Water	Average consumption per household	Rate
Private water Tankers	Private Tube wells	500 liters/day	Rs 100 per 1,000litre
Private pipeline water providers	Private Tube wells	500-875 liters/day	Rs 200 per month per household for 500 liters
Push-cart operators	Public Stand posts	40 liters/day	Rs 6-8 for transporting 25 liters
Bottled Water	Private Tube wells	18 liters/day	Rs 35-40 for 20 liters

Source: (Narain and Pandey 2012: 86; National Institute of Urban Affairs 2003: 3).

The majority of middle and high-income groups rely on bottled water, not because of water shortages but because of the poor quality of water in Delhi. People use bottled water for drinking because they do not trust the water supplied by the DJB; for other household activities, such as washing and rinsing they use piped water. The DJB provides water to areas where there are no pipelines selling bottled water at reduced costs but the amount provided is not sufficient to cover all areas. The DJB provides less water than is demanded. The DJB had around 250 tankers but would needed about 750 tankers to work effectively also at times of emergency and to minimize the supply-demand gap. There are almost 18,349 points to where the DJB needs to supply water every day (Bansal 2012: 11). In addition, to fill the gap, several private owners provide water

⁶⁵ Information from an interview with Prof.Usha Raghupati at National Institute of Urban Affairs on 22nd May 2013.

through tankers. In a few years the number of private tankers grew to 2000 or more (Bansal 2012).

On the occasion of private functions, namely, in marriages and in religious ceremonies such as when a child is born or when someone dies and even in one of the very famous festival called Holi in India higher water demand is seen, therefore, water tankers from DJB can be booked 15 days in advance.⁶⁶ The price of the DJB tanker depends on the distance of the house from DJB water storage area. It is not possible to buy water from the DJB on short notice; an advance booking is essential (Mitra et al. 2007). This leaves many people without water if they have not made a booking (Mitra et al. 2007). In contrast, private water tankers do not need any booking, and provide water on short notice. As they are found over the entire city, they do not charge according to the distance covered, but to the quantity of the water they are delivering (Mitra et al. 2007). This lead the relatively poor of the city into economic difficulties.⁶⁷

Along three dimensions of water supply namely, physical, chemical and economic Delhi performs poorly. There are problems with sewage collection, pollution of surface and groundwater sources, and underground water infrastructure.

Table 25: Performance Indicators of Water Sector Performance in Delhi.	
<u>The Physical Dimension</u> Supply-Demand Gap	<ul style="list-style-type: none"> -Supply-demand gap in the water supply sector of Delhi is nearly 50% (see Figure 13). - Intermittent and unreliable water supply leads to the use of water storage tanks in almost each house in Delhi. - A consequence is exploitation of groundwater in the city.
<u>The Chemical Dimension</u> Water Quality Aspect	<ul style="list-style-type: none"> - There is a high level of heavy metals such as sulphate, nitrate, lead and mercury in drinking water samples. - There is a growing mineral water business in the city. - The quality of groundwater used by many regions in the city is problematic - The major causes of groundwater pollution are industrial and

⁶⁶ Holi is one of the biggest festivals of Hindus which is played with colors and colorful water.

⁶⁷ During the fieldwork it was also identified that several people did not answer about their spending income on water because either they fetch water from afar or they have an illegal water connection or they have done underground boring to get water. The ones who fetch from afar cannot afford to pay for water and their level of awareness about the quality of water is not up to date. Therefore, they rely on unsafe resources.

	<p>municipal waste.</p> <ul style="list-style-type: none"> - None of the landfill sites in Delhi are managed with engineering techniques such as lining at the bottom to prevent leachate⁶⁸ penetration into the groundwater.
<p><u>The Economic Dimension</u> <u>Entry of Private Players</u></p>	<ul style="list-style-type: none"> - Water tankers and bottled water suppliers are very commonly seen in upper and lower middle class areas, whereas in lower income groups rickshaws and tricycles carry water where to areas where pipelines remain dry. - These private water providers charge more than DJB; this is not easily affordable for the poor. - Due to the entry of private players in Delhi’s water market not everyone is able to pay for water.⁶⁹

Source: Author.

7.2. Delhi Water Governance Assessment

In 2012, the 12th Five Year plan was approved by the Union cabinet with the major objective of economic growth through improving education, sanitation and health facilities (Planning Commission, Govt. of India 2013). The plan also called for improvements in basic amenities like electricity, roads, housing and water. The plan aims to achieve inclusive economic growth in a sustainable manner. This is a response to the deteriorating situation of the environment across the country. The new development strategy aims to keep the objectives of development and environmental protection at pace (Planning Commission, Govt. of India 2013). The plan addresses the conservation and protection of natural resources especially water and places higher attention on the protection of surface water resources from pollution, protection of ground water from misuse and exploitation, maintaining the standards of water quality by reducing the use of fertilizers in agriculture, efficiency in drinking water supply and revising the water pricing policy (Government of India 2011).

The reasons that so much attention was given to the water sector were obvious; the growing population which is also changing its lifestyle requires more water, putting

⁶⁸ “Leachate is a heavily contaminated and likely hazardous liquid that is produced as a result of water infiltration through solid wastes generated industrially and domestically. Leachate can migrate away from landfill; it may cause serious pollution to the groundwater and well as adjacent surface water” (Aziz et al 2013: 36).

⁶⁹ One interviewee is spending Rs.2500-3000 per month on water in the Dwarka colony in west Delhi.

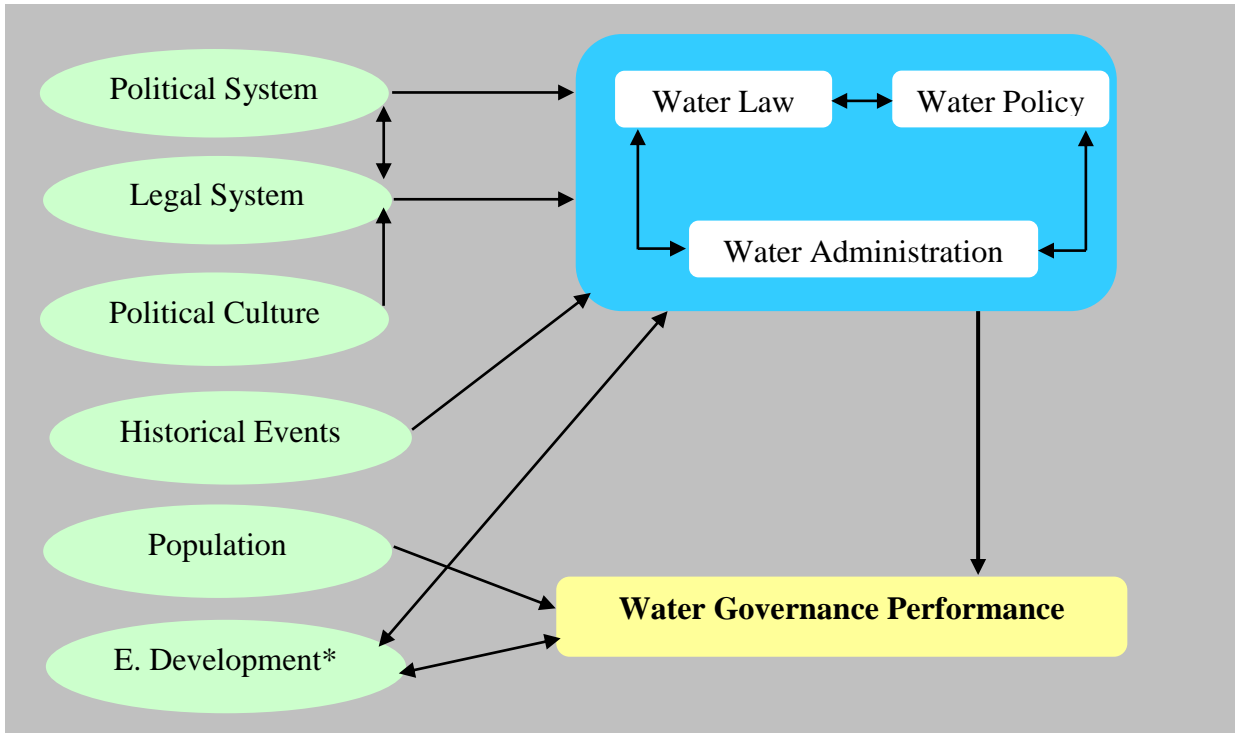
strains on the water resources of the country. The gap between demand and supply was already visible in some parts of the city; it is expected to grow more.

To achieve these goals within the set timeframe of the plan water governance must be improved; it was recommended to make an assessment of Delhi's water governance.

7.2.1. The Assessment of Water Institutions

The analysis of Delhi water governance is based on legislation and the institutional setting; the reason is the close relationship between these factors. It is also necessary to examine the relevant actors and their roles, responsibilities and relationships. The context will create a process from which to understand how a certain law/policy emerged or was shaped. Most water laws and policies were developed in the time of surplus water; they are becoming increasingly ineffective in addressing the water challenges that the country is facing today (Saleth 2004). But those laws are now deeply rooted in the country and in the behaviour of the people (Saleth 2004).

Figure 18: Interrelationships of several factors directly or indirectly affecting Water Governance Performance in Delhi



Source: Own Draft after Saleh and Dinar (Saleth 2004).

*Abbreviation: E. Development – Economic Development

7.2.1.1. Features of Water Legislation in India

It is important to examine the legal framework and how laws are implemented to understand how the water sector is governed (Jacobson et al. 2013: 9). Water laws have to deal with issues such as ownership, access to, and control of water; water quality; and environmental and health implications (Cullet 2009). In India, the water law addresses issues about the divisions of power over interstate or transboundary water resources and among different tiers of government (national, state, and local), and public and private actors (Environmental Law Research Society 2012: 9). Development of water law and legislation is very much influenced by history, the constitutional framework, socio-economic conditions, political arrangements and the physical settings (Saleth 2004). Water laws have developed with time, and in particular, were changed after

independence; most of the significant changes happened after colonization and particularly as a result of the Indian Constitution. The biggest changes in water law were (i) in 1970s pollution of water was recognized by the water law as a serious issue (ii) social and human dimension of water was included; and (iii) limitations on the use of groundwater management to landowner was recognized even though it is not very effectively regulated yet (Cullet 2009).

There are several issues associated with the country's water laws, which makes water management sector a subject of great importance; at the same time, water management in India is one of the relatively neglected subjects of discussion.

In India, many different institutions and laws impact water governance. Various types of laws and judicial decisions as well as customary norms govern the water sector, including

- Legislation or Acts (Laws)
- Decisions of the Supreme Court of India, High Courts, District Courts and nyay panchayats⁷⁰
- Common law or laws which were developed in the time of colonization
- Customary norms, which are well established in the country and are in use.

These laws and institutions address matters of irrigation, drinking water and groundwater (Cullet 2009). Many different laws exist for different water bodies and different water users making the entire sector highly complex.⁷¹

In addition to formal laws and norms there are multiple customary and religious norms at the local level that stem from the cultural and traditional history of India where water plays a vital role. Water laws developed differently according to religious beliefs. Water and religion are inextricably woven into the pattern of Indian life. "From the birth of a child, to pre-marriage rituals and death, water has deep spiritual and cultural

⁷⁰ Nyay Panchayat is considered as a rural court where heads of the village make their decisions.

⁷¹ Information taken from Prof.Cullet at the Center for Policy Research in New Delhi on 17th August 2014.

meanings” (Asthana 2009: 133). In Islam and the Hindu religion⁷² (the most dominant religions in India) water plays an important role in daily religious activities. “These customary or religious norms that are not necessarily always in conformity with the formal legal framework have often survived long after the adoption of laws displacing them because the latter were not necessarily enforced in each and every village” (Cullet 2009: 33).

Since the nineteenth century, water law in India has been influenced by economic development priorities and due to this greater importance was given to different economic sectors including navigation, construction and maintenance of embankments, fisheries and irrigation (Cullet 2009). After Independence in 1947, poverty, unemployment, illiteracy and malnutrition were uncontrolled. The national leader, Jawaharlal Nehru, invested huge sums in heavy industries, as he saw this as the straight forward way to overcome poverty, unemployment, malnutrition and illiteracy. As a result, the First Five Year Plan (1951- 56) and the Second Five Year Plan (1956 – 61) were focused on rapid industrialization (Sahu 2009: 81). Towards the late 1960s, food security and the problems of poverty and illiteracy gained more attention. In 1971, the Indian State first came forward with promises to provide public goods to everyone. Until the 1980s several programmes and schemes continued in the areas of poverty reduction and social welfare services under different governments (Sahu 2009: 82). During this era, the role of the State in India took a pro-active turn in welfare policies. But in the 1990s, the Indian States took a ‘u’ turn, and privatisation was encouraged. Participation of the private sector in terms of financing, management and partnerships in implementation of water supply schemes was encouraged. This was the case with the National Water policy of 2002 (Sahu 2009: 82).

Industrialization in India has a great impact on water allocation. The main goal of industrialization was to increase per capita income. Industries put a tremendous amount of pressure on water resources not only in terms of their consumption but also in terms of the pollution they cause. Industrialization has also moved the population from rural to

⁷² Islamic water law tradition is seen as an indivisible, non-marketable gift of God for which humans are custodians who must share equitably according to principles of priority of use. Hindu water law also reflects institutionalized social customs.

urban areas and transformed urban areas into big/megacities. In the past irrigation was prioritized over drinking water when the country was in need of food production.

The green revolution had a great impact on groundwater use. To fight against hunger, electricity was liberalized in rural India so that farmers could fetch as much groundwater as needed to cultivate their fields. This law had a great impact on the behaviour of citizens on their views about their rights to groundwater. With respect to providing farmers with rights to groundwater, British tradition was followed. Under British common law principle, “groundwater is considered as part and parcel of land” (Environmental Law Research Society 2012: 40). This law gives full authority to the landowner to extract uncontrolled groundwater. This law came into effect before independence but still continues to determine rights to groundwater. The rule came into effect when there was more need to cultivate crops but the knowledge about groundwater hydrology was limited. The over-extraction and contamination of groundwater that this contributes to goes against the right to pollution-free water. The rule only takes care of the landowners and their rights to water but does not consider those without land (Environmental Law Research Society 2012: 40). The unlimited extraction of groundwater and the high use of surface water for irrigation has resulted in conflict between neighbouring states, such as between Haryana and Delhi. Delhi is dependent on Haryana’s sharing of surface water but due to Haryana’s dependence on agriculture the Haryana government has refused to increase the share for Delhi. Haryana has argued that agriculture is the most important and primary occupation in the country, whereas Delhi is commercial and people should limit their consumption (Joy et al. 2014). As per the Indian constitution, state governments are responsible for the regulation and control of groundwater. The first major state government effort to preserve groundwater happened in 1970 in the form of the Model Bill, which was revised in 1992, 1996 and 2005.

Another feature of Indian water law is the inter-sectoral allocation which has several dimensions, including urban-rural water allocation and water allocation among different sectors such as domestic, irrigation and industrial. The order of priority for allocating water in states is not set by national law. State governments can adopt different priority orders (Environmental Law Research Society 2012: 13); the priority order is just a paper promise because it can be altered (Cullet 2009).

When industrialization began in India, there was no awareness of environmental protection and conservation including preserving water resources. Water resources, which were already under threat from religious activities became more vulnerable due to industrialization and negligence. Water pollution in India is so bad that 70% of available water is contaminated (Infrastructure Development Finance Company 2011). Most of this pollution is the result of industrial pollution especially in urban areas. The importance of environment and water protection came into focus in 1974 when the Prevention and Control Act, 1974⁷³ and Environmental Protection Act 1986⁷⁴ came into effect (Nayak 2012). Although OECD countries promoted the polluter pays principle in the 1970s, India took a long time to introduce this law (Grossman 2007). The judiciary in India recognized the polluter pays principle in 1995. The Supreme Court held that “The Polluter Pays Principle means that absolute liability of harm to the environment extends not only to compensate the victims of pollution but also to the cost of restoring environmental degradation. Remediation of damaged environment is part of the process of sustainable development” (Venkat 2011: 226).

Despite, the many changes which happened in the country after independence, the conceptual framework of the water law in India has remained largely unchanged. “As a

⁷³ The water (Prevention and Control of Pollution Act 1974 is the first enactment by the parliament in the direction of protecting broad environmental problems. This is also the first specific and comprehensive legislation institutionalising simultaneously the regulatory agencies for controlling water pollution. This Act provides prevention and control of water pollution and maintaining and restoring its wholesomeness. The Act also assigns powers and functions to the related Boards to achieve the major purpose of the Act and also coordinates the activities of the State Pollution Control Boards and Pollution Control Committees. The Act was last amended in 2003 Ministry of Environment and Forests: Source: Ministry of Environment, Forest and Climate Change, Government of India, Water Pollution. <http://www.moef.nic.in/division/water-pollution>. Accessed 13 January 2016.

⁷⁴ Terms like Environment, environmental pollutants, environmental pollution and hazardous substance are defined under EPA 1986.

- (a) “Environment includes water, air and land and the interrelationship, which exists among and between them and human beings, other living creature, plants, microorganisms and property.”
- (b) “Environmental Pollutant means any solid, liquid or gaseous substances present in such concentration as may be or tend to injurious to environment.”
- (c) “Environmental Pollution means the presence in the environment of any environmental pollutants.”
- (d) “Hazardous Substance means any substance or preparation which by reason of its chemical or physico-chemical properties or handling is liable to cause harm to human beings, other living creatures, plants, micro-organisms, property of the environment” Ministry of Environment and Forests 1986: Source: The Environment (Protection) Act (1986), Ministry of Environment and Forests, Department of Environment, Forests and Wildlife, Government of India, New Delhi. Available at http://www.moef.nic.in/sites/default/files/eprotect_act_1986.pdf. Accessed 31 January 2016.

result, water law failed for a long time to address some of the issues that are at the centre of a modern water law regime like the human right to water” (Cullet 2009: 34).

Under Section 9 Sub-section (1) of the water law, there is a penalty for misuse of water sources. There are restrictions on water resource pollution, but it is hard to catch those who are responsible for polluting water. The DJB provided water meters and connections to legal, authorized areas and colonies; the rest of the city highly depends on tankers and illegal connections.⁷⁵ Under the Delhi Jal Board Act 1998, schedule four, there are several categories identified for which penalties can be levied if a complaint is made or during monitoring if someone is caught engaged in illegal activities.⁷⁶

7.2.1.2 *Meaning of Right to Water*

The Indian Constitution does not recognize the right to water as a basic human right. Instead, the right to water can be derived from the fundamental right to life under Article 21 of the Constitution (Cullet and Gupta 2009; Environmental Law Research Society 2012): “no person shall be deprived of his life or personal liberty except according to procedure established by law” (Government of India 2007: 10).

The constitution guarantees every citizen fundamental rights to equality, life and personal liberty (Our Rights, Our Voice). In India, a fundamental right to water evolved through judicial interpretation, not through legislative action. To date there is no law or policy which establishes a fundamental right for every citizen of the country to water (Cullet 2013). The ‘right to water’, can only be obtained on a case-by-case basis in court (Kumar and Furlong 2012: 6). But court judgments do not constitute law or policy; they only provide directions for making policy or law. Considering water’s vital role in the survival of life, the Supreme Court ruled that preservation of water sources is of high importance; the court has applied the ‘precautionary principle’ to protect water sources specifically from industrial pollution (Narain 2007: 5). India’s National Rural Drinking Water Programme 2010 emphasizes basic needs to water rather than water as a fundamental right (Cullet 2013). The Constitution does not put any restrictions on

⁷⁵ Information obtained from an employee of a think tank in Delhi on 25th August 2014.

⁷⁶ Source: Delhi Jal Board. The list of all the penalties is available at: http://delhijalboard.nic.in/djbdocs/about_us/fourthshedule.htm. Accessed 31 January 2016.

citizens use of wells, tanks or bathing ghats. In principle “the State is the owner of natural resources but it is not duty bound by any law to provide drinking water to the citizens”. The State has the authority over water resources but it is not bound by any law to take responsibility for providing drinking water to the citizens (Kumar and Furlong 2012: 6).

7.2.2. Water Sector Policy

The overall purpose of the policy is to serve as the means for establishing and maintaining the enabling environment necessary for sector development. In creating the enabling environment, from the governance perspective, involving relevant stakeholders in the policy making process is as important as the definition of policy objectives and mechanism itself (African Development Bank 2008: 16).

India is diverse in its geographical features. It experiences droughts and floods and other severe climatic conditions. Demand and management of water under such conditions is also different. Therefore, the States in India are allowed to make amendments to the National Water Policy according to their climatic conditions and needs and requirements; Delhi has adopted the National Water Policy to manage its water.

India’s first National Policy on water was introduced in 1987 and later revised in 2002 and 2012. The major changes of 2002 were the incorporation of Integrated Water Resources Management (IWRM) and a paradigm shift towards private sector participation and emphasis on water as an economic good (Asthana and Shukla 2014). The policy also recognized the importance of water for a healthy ecosystem and effective planning (Siddiquie 2008). It emphasized the development of strategies to manage water in a way that socio-economic aspects are included and the needs of the State are also fulfilled (Siddiquie 2008). The National Water Policy 2002 calls water a ‘basic human’ need rather than ‘right’ (Environmental Law Research Society 2012: 18). The policy 2002 failed to reflect on the issues and concerns related to social justice including environmental needs (Asthana and Shukla 2014). The policy also lacks attention to concerns over transparency, accountability and participation in planning and decision making (Asthana and Shukla 2014). India now operates under National Water Policy

(NWP) 2012. The National Water Policy recognizes access to safe and clean drinking water as a right to life not as a right of human beings (Environmental Law Research Society 2012). The policy added some more features like participation of community. The Policy stressed demand management rather than supply side management and also added the idea of different pricing structures for different water users (Asthana and Shukla 2014). IWRM was also recommended by the Policy (Asthana and Shukla 2014). There is no recognition of water as a fundamental right despite the fact the India voted in favor of the United Nations General Assembly Resolution on the Right to Water in 2010 (Varghese 2012). The policy is more focused on technological options like desalination plants rather than recycling and reuse of water which in turn could reduce the costs involved in more technology oriented projects and solve the problem of wastewater (Asthana and Shukla 2014).

Another main feature of urban water management is the pricing structure, which is not based on economic principles but on socio-political considerations; the costs recovered are not enough for making new capital investments for improvements (Gupta et al. 2012). Currently, water pricing in Indian cities is deficient. First of all, the price of urban water is low in relation to the costs involved in the process of supplying water. This places financial burdens on water supplying entities (Gupta et al. 2012; Mathur and Thakur 2006). Secondly underpricing leads to poor services (Gupta et al. 2012). In Delhi, most households faced limited hours of supply of water and face high costs for installing household pumps, water tanks for storage and other equipment. Third, is the question of who pays for subsidies; “[m]uch of the evidence points out that poor pay more, often two or three times and the price subsidy is meant for rich” (Mathur and Thakur 2006: 8).

In the case of Delhi, water tariffs do not reflect the actual costs involved in the supply of water and as a result, the DJB suffered from losses and was not able to upgrade the water infrastructure of the city (The Energy and Resource Institute 2010a). In Delhi, huge subsidies were given to consumers through tariffs, which were meant for the poor. But in Delhi the poor live in slums or unauthorized colonies and are usually not connected with the system. As a result, subsidies go to middle or high-income consumers (Mathur and Thakur 2006). Other problems which have been identified in Delhi are inadequate metering for the consumers and low efficiency in collection of revenues by

the revenue department of the DJB (The Energy and Resource Institute 2010a; Centre for Civil Society 2007).

7.2.3. Organizations

Delhi has three layers of governance: the central, state/provincial and local; altogether there are 118 departments governing and managing the city of Delhi (Singh and Shukla 2005): 31). There are three boards involved in the planning of the city: National Capital Region Planning Board (NCRPB), Delhi Metropolitan Council (DMC) and Delhi Development Authority (DDA). There are also a number of other service providers such as Municipal Corporation of Delhi (MCD), New Delhi Municipal Corporation (NDMC), Delhi Cantonment Board (DCB), Delhi Jal Board are also there for different services (Singh and Shukla 2005: 31). In regard with the water supply management, DJB is the sole agency at the local level responsible in Delhi. It is responsible for the production and distribution of water after treating raw water collected from various sources and distributing it in the city; collection and treatment of wastewater generated in the city comes also under the authority of DJB (Siddharth and Mohan 2011: 4). In the whole organizational framework of the water sector, there are several other actors involved who play different roles at different levels of government. The Ministry of Water Resources (MoWR) has evolved from the Ministry of Agriculture. The Central Water Commission (CWC), the Groundwater Board and the National Water Development Agency, which are under MoWR, provide technical support to research institutes, universities and management institutes. The planning Commission is responsible for project approvals at the national level and also approves financial allocation for different water projects for the entire country. There are several other agencies working and influencing the water sector of the city in one way or the other, such as the ones working for urban development (Saleth 2004: 24). The priority of one official or agency may not be the same for another holding the same decision making position leading to delays because matters remain pending and take more than expected time (Singh 2008). With respect to the drinking water supply in Delhi, the Central and State government has a dominant role; political arrangements limit the operational

independence of managers to a great extent (Singh 2008). Some donor agencies such as the World Bank, play an important role in different projects. With urbanization and growing population there is a wide threat to water sources; therefore, pollution control boards are highly significant. They operate under the Ministry of Environment (Saleth 2004). A major problem with the organizational framework in Delhi is that the organizations are not bound to one operation or one department. The strength and power of government bodies which have been created through parliament acts, such as the DDA, MCD and National Capital Region Planning Board (NCPRB) make horizontal and vertical linkages difficult, confusing and conflicting. One body is responsible for several functions and performs several different duties; this makes the decision making process complicated rather than informative (Singh and Shukla 2005: 31). The result of these kinds of complexities in the governance structure create difficulties in promoting sustainable development and achieving of MDGs.

Lack of coordination due to the fragmentation of the water sector is a frequent topic of discussion, but nobody wants to take responsibility. The fragmentation is influenced by the caste system/caste politics.⁷⁷

⁷⁷ Information obtained from an employee of an Academic Institute in Delhi on 5th August 2013.

Table 26: Complexity of Governance Institutional Share in Responsibilities.		
Issues	Concerned Agencies	Result
Housing-provision of services plots for housing to accommodate growth	<ul style="list-style-type: none"> - Delhi Development Authority (DDA) - Municipal Corporation of Delhi (MCD) - Department of Land Development (DoLD) - Ministry of Urban Development (MoUD) - Delhi Jal Board (DJB) - Delhi Vidyut Board (DVB) - New Delhi Municipal Corporation (NDMC) 	Leads to lack of proper housing structures in Delhi, and illegal/unauthorized settlements without proper facilities.
Environmental Problems	<ul style="list-style-type: none"> - Central Pollution Control Board (CPCB) - Delhi Pollution Control Board (DPCB) - Delhi Jal Board (DJB) - Municipal Corporation of Delhi (MCD) - New Delhi Municipal Corporation (NDMC) - Delhi Transport Corporation (DTC) 	Results in water, air, and noise pollution and concomitant effects on the health of citizens in Delhi and environmental health.
Habitat Improvement for urban poor	<ul style="list-style-type: none"> - New Delhi Municipal Corporation (NDMC) - Municipal Corporation of Delhi (MCD) - Delhi development Authority (DDA) - Ministry of Urban Development (MoUD) - Department of Urban Development (DoUD) 	The main objective is upgrading slums of the city by providing housing and starting resettlement programs but the objectives are far from reached.

Source: (Singh and Shukla 2005: 31).

Several different opinions exist as to how to deal with the water problems of Delhi such as hiking tariffs, complete privatization of the water sector in Delhi, compulsory rain water harvesting and so on. The most influential actors are national and state government officials and politicians. Local government plays a crucial role in the

decision making as they have this positive political image to work as a mediator between citizens and higher authorities on the issues of access and quality of services.

Table 27: Stakeholders in Delhi Water Sector.		
Stakeholder	Resources	Influence
Govt. of India	<ul style="list-style-type: none"> ▪ Has the power approve or withdraw reforms or proposals. 	High
Delhi Government	<ul style="list-style-type: none"> ▪ Responsible for giving approval to reforms in the water sector. ▪ Without its approval no decisions can be taken. 	High
Local Government: Municipality	<ul style="list-style-type: none"> ▪ Presence is important for participatory mechanisms. 	High
Delhi Jal Board	<ul style="list-style-type: none"> ▪ Has the ability to influence policy makers and impose the decision with govt. approval. 	Medium
NGOs and Media.	<ul style="list-style-type: none"> ▪ Size and availability of resources of the media and NGOs are crucial to challenge decisions of the government authorities. ▪ Disseminate information. ▪ Can sway public opinion. 	Medium
Private Players.	<ul style="list-style-type: none"> ▪ Can provide technical and managerial support. 	Low
International Donors	<ul style="list-style-type: none"> ▪ Technically and financially strong. ▪ Lend Credibility. 	Medium

Source: (Singh 2007: 36).

Conclusion: Water Governance Assessment in Delhi

This study of ‘water governance’ in Delhi has demonstrated that the performance of the water authorities was highly inefficient along physical, chemical and economic dimensions. The existence of several different laws and acts results in a high level of complexity. Many laws are not clear about ownership, access to, and control of water. It is essential to review and revise the legal and policy framework and to strengthen the compatibility of various water laws and in order to achieve the goals prescribed in the National Water Policy. The National Water Policy placed priority on drinking water and the marginalized groups in society but its objectives were not fulfilled due to confused and outdated laws, which are still in existence and highly influential over the behaviour of actors. Existence of old laws and the lack of compatibility among them enhances the chances of corruption in the water sector of Delhi.

Institutional arrangements suffer from overlaps, fragmentation and conflicts between and among related stakeholders. It is important to clarify the functions and responsibilities of different agencies involved in water management sector. One thing, which is clear from the mapping of stakeholders in Delhi's water sector is that the powerful politicians have the authority and influence to allocate water. This adversely affects the interests of poor and disadvantageous groups. There are fights about power and interest among different stakeholders; those who have more influence because of their caste, class, economic status or some other kind of personal relations, typically win the game.

A very important point to mention is that water institutions in Delhi were highly influenced by the social pattern of the country and the cultural values of its people. The influence of informal institutions on water institutions was high compared with formal laws; as a result, the entire water sector suffered from inefficiencies.

8. Influence of Caste, Class and Corruption (3Cs) on Delhi's Urban Water Supply

At first it is difficult to identify whether social inequality is responsible for corruption or it is corruption which causes inequality in the urban water supply system of Delhi. This chapter analyzes both perspectives. The chapter explains underperformance of water governance in Delhi and turns to the causes of inequality and corruption for answers. Inequality is found in the world by nature and is also man-made. In this chapter, I talk about man-made inequality and its implications in today's modern and educated society. The main objective of the chapter is to look at the root causes of discrimination and inequality. This is done in relation to India's caste system where the poor are deprived of natural resources from which to live. Their adaptive capacity is linked to their limited financial resources, low level of awareness towards laws intended to improve their situation, their failure to obey those laws, and inadequate understanding of the risks associated with lack of access to water. It further analyses several policies and programmes implemented by the government to lower the degree of inequality in the country.

The chapter further aims to investigate the emergence of corruption and to uncover its root causes not only in the water sector but also in general in India. The chapter examines the causes and consequences of corruption in order to explain how and why corruption occurs which in turn helps to improve the effectiveness of prevention interventions. The chapter includes some of the very significant factors behind the emergence of corruption in the water sector in Delhi and how corruption affects the entire water sector. It then considers the building blocks of good governance: the existence of transparency, accountability and participation makes the overall system less prone to corruption.

8.1. Inequality and Corruption

There is a relationship between economic inequality and corruption. There are two basic approaches to looking at this relationship. One is the view that economic

inequality is one of the factors behind corruption. The second views corruption in terms of its effects on inequality (Begović 2006).

Inequality as a factor linked to corruption. According to Eric M. Uslaner (2008) “Economic inequality provides a fertile breeding ground for corruption – and in turn, it leads to further inequalities” (p. 28). Uslaner notes that the roots of corruption lie in the unequal distribution of resources in a society. Inequality promotes corruption in many different ways – inequality hinders property rights and leads to reduction in growth because inequality empowers the rich to pull down political and legal institutions created for the benefit of society, using them for their own benefits (Uslaner 2008). For example, corrupt courts favor the rich and this in turn leads the rich to pursue socially harmful acts knowing that they will not be held accountable (Uslaner 2008; Glaeser et al 2003; You 2005). Rich groups, firms or individuals may pay bribes or use their connections to influence laws or to buy favorable interpretations of the law. “In an unequal world, people of the dominant group may not see cheating those with fewer resources as immoral” (Uslaner 2008; Gambetta 1993; Mauro 1998; Scott 1972). This makes ordinary citizens consider that the system is against them and a sense of despair for the future is developed which in turn ruins the moralistic teachings of treating others in a good manner. Inequality creates an environment of distrust where ordinary citizens do not see fairness in the decisions of courts and the actions of police and find themselves victimized and in turn their faith in the legal system is undermined (Uslaner 2010). “People at the bottom of the economic ladder will have little choice but to play the same game even as they may resent the advantages of the well-off” (Uslaner 2008; Gambetta 2002). Once faith in the legal system is lost, citizens also lose fear for the laws which are created to fight against crime and corruption. Therefore, this again leads to the conditions conducive to rampant corruption. As corruption becomes rampant, it becomes deeply rooted in a society (Mauro 2002).

Inequality as a consequence of corruption. Corruption tends to enlarge already existing inequalities by facilitating unequal distribution of wealth and asset ownership, minimizing the progressiveness of the tax system and lowering economic growth (You and Khagram 2005).

Corruption can affect income inequality through various channels including overall growth. It can result in a lesser focus by government on investing in social programs, education, inequalities and asset ownership (Gupta et al. 2002). Corruption makes poverty reduction difficult as it leads to unequal income distribution where the poor remain at the margin of this distribution. “Corruption excludes poor people from public services and perpetuates poverty” (OECD 2014). Corruption in public services results in higher tariff costs and this burden is mainly borne by the poor or they are completely excluded from basic services if they cannot afford to pay bribes. Payments made as bribes or payments made as higher tariffs directly impacts on the economic character of the poor, impoverishing them even further. Unclear and biased ‘rules of the game’ are an added risk for the poor who are not well connected. Corruption promotes biased tax systems and affects income distribution and poverty reduction as it impacts human capital formation and the distribution of human capital (Gupta et al. 1998). For example, the higher the level of corruption the lower the tax revenue and the lower the resources available for public funding to enhance the provision of basic services, including education and health. When government resources such as taxes or service fees go in the pockets of officials, there are fewer resources and funding available for other uses. The potential gain from projects are typically not fully achieved when there is corruption (Gupta et al. 2002; Olken and Pande 2012; Voskanyan 2000). For example, the Indonesian government initiated an anti-poverty program to distribute rice to poor households. On examination, it was found that 18 percent of the rice was lost from the program. It was estimated that without corruption the program would have been cost effective and much more beneficial for the overall targeted beneficiaries but due to corruption it was not (Olken and Pande 2012).

8.2. Conceptualizing Water Inequality through Examining Social Differences

In the caste system sharing of water among different castes especially with lower castes or untouchables is prohibited because lower caste people are considered impure and they can make water contaminated. That is why untouchables in rural India live in the outskirts of villages and also far from water resources (Bros and Couttenier 2011).

Lower caste individuals were protected by the law (Bros and Couttenier 2011); after independence in 1947, the Constitution defined untouchability as a crime.

Article 17: Abolition of Untouchability.

Untouchability is abolished and its practice in any form is forbidden. The enforcement of any disability arising out of 'Untouchability' shall be an offence punishable in accordance with law (Government of India 2007).

Nevertheless, laws cannot easily change old customs. The caste system and its rules are thousands of years old and continue to have a very strong psychological impact on people (Coulmas 2005). Lower caste people have no water rights and are socially boycotted (Narula 1999). The outcomes associated with caste and water are not only limited to inadequate access to water. Children may have to spend hours to fetch water and may be unable to get an education. Consumption of water from unreliable sources also impacts heavily on their health and in turn results in economic stress for lower caste people (Water Aid 2001). Therefore, the "water problem is [considered as] a caste problem" in India (Baviskar and Mathew 2008: 280).

The Indian Constitution contains many powerful commitments to social reform and abolishment of the existing social inequalities, which are associated with the Hindu caste system. Article 15 prohibits discrimination on the basis of religion, race, caste, sex or place of birth. Article 17 abolishes untouchability and makes the enforcement of any disability arising from it an offence punishable in accordance with the law (Government of India 2007).

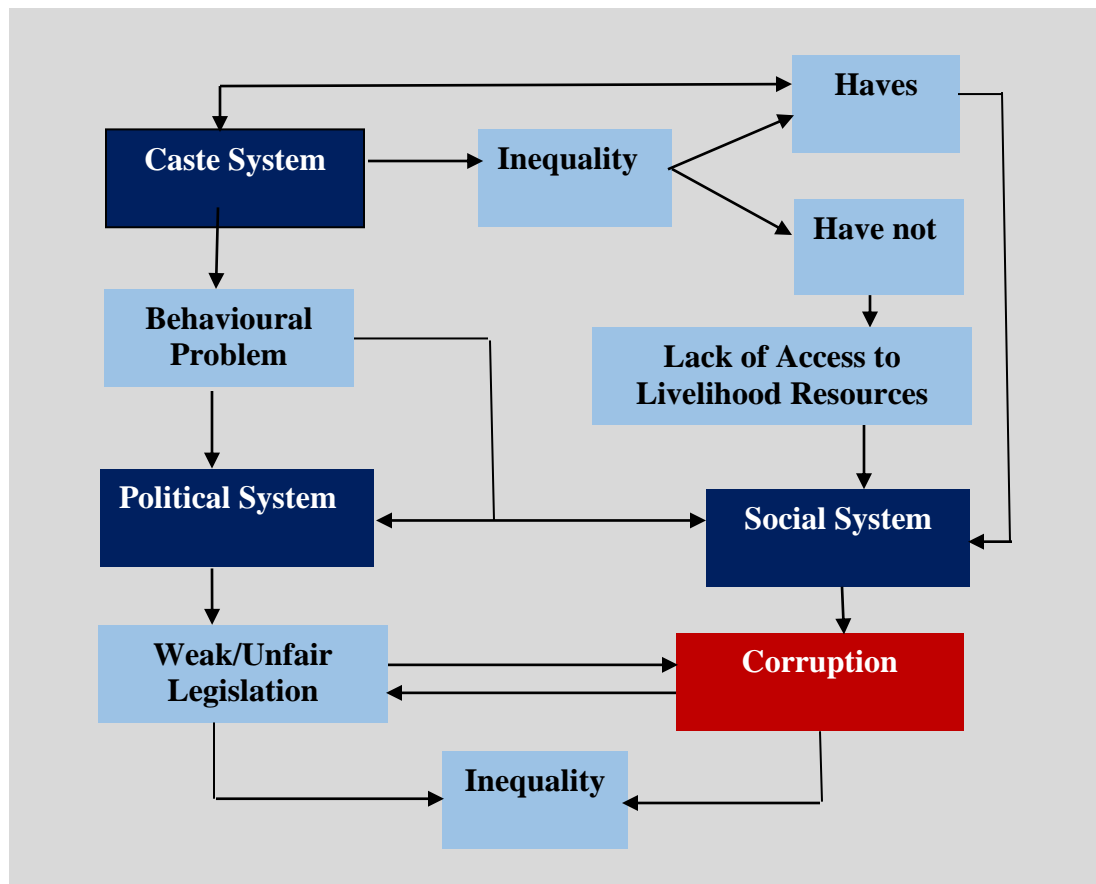
Article 15(4) provides that:

nothing in this article shall prevent the State from making any special provision for the advancement of any socially and educationally backward classes of citizens or for the Scheduled Castes and the Scheduled Tribes (Government of India 2007: 7; Grinsell 2010: 207).

Delhi is characterized by an uneven and inadequate supply of water, a far from uniform distribution of water to different parts of the city, and high levels of inequality in the water distribution network (Narain and Pandey 2012). An important aspect to

consider is who suffers from this disparity in water distribution. Access to water in unauthorized colonies and slums is poor compared with other settlements such as authorized colonies and higher and upper-middle class areas (Haider 2016). Those who are not connected to the official pipeline network are those in the lower-middle class and live in unauthorized colonies or in slums (Govt. of National Capital Territory of Delhi and Institute of Human Development 2013). Different regions in Delhi have different supplies of water depending upon the types of colony they have. The poorest parts of the population are more adversely affected by the injustice in the water supply (Singh and Shukla 2005; Narain and Pandey 2012; Ishtiyag and Kumar 2011). Inequality in water distribution in Delhi is an indication of the existence of caste discrimination.

Figure 19: Influence of Caste System on Corruption Emergence.



Source: Author.

8.3. Internal Migration and Class Change in Delhi

“Urbanization is a process which has been an integral part of human civilization and which continues unabated in every country of the world. Accelerated population growth in the post-second world war era especially in the third world, has precipitated an equally accelerated urbanization process that effects population management and the quality of life of the urban population. The role of urbanization is ambivalent given that the process can either enhance effective population management and improve quality of life or erode these. The paradox of urbanization is that every ‘first-world city’ today has within it a ‘third-world city’ in which unemployment, overcrowding, disease, malnutrition and high infant mortality are common” (Habitat (UNCHS) 1994: 1). Overcrowding in cities is the result of internal migration from neighbouring states; migrants bring their own identities of religion, caste, culture, language, ideas and knowledge and influence the original and traditional social system of the city (Habitat (UNCHS) 1994). Urbanization in Delhi does not only bring the challenges of a third-world city such as overcrowding, disease, malnutrition, unemployment but also the issues associated with migrants who are coming from other states with different cultural backgrounds. The ones who came after the partition of India and Pakistan in 1947 and settled in Delhi tend to belong to the upper class or middle class but the ones who migrated in recent years in search of better opportunities mainly belong to the poorest economic class (Kumar 2013). This kind of rapid migration has changed the class character of Delhi, which was earlier a city of rich people (Kumar 2013). The city is now divided into upper, middle and lower classes where a large population belongs to Dalit migrants and a sizeable Muslim population which are located in specific colonies such as old Delhi, Okhla, and Zafrabad (Kumar 2013). The city is characterized by numerous social and political boundaries. Not only caste and religion are indicators of the economic status of migrants but also their kind of settlements is a very strong indicator.

Housing is not cheap in Delhi; costs are different in different areas and depending upon their financial situation, migrants settle down in the city. The poorest have no choice but to live in slums (Kumar 2013). Migrants tend to live in colonies or separate neighbourhoods with individuals who share their caste, religion, language, and culture.

For example, Chitranjan Park area in South Delhi is famous for the Bengali Community, New Friends Colony for Sikhs and Okhla (Zakir Nagar) for Muslims.⁷⁸ Most of the political parties such as the Congress Party, Bhartiya Janta Party (BJP), and Aam Aadmi Party (AAP) target the marginalized groups (40 percent) living in unauthorized colonies during election campaigns and make them promises to provide them shelter and other basic amenities (Kumar 2013). If one party is not able to fulfil their promise during their period of rule they are blamed by the opposition, which then has more chances to win in the next election. This has become a trend in the politics of Delhi. Compared with rural areas where caste is the dominating factor, in the politics of Delhi it is class and economic status which plays an important role in voting decisions (Kumar 2013). There is also a caste dimension to this categorization of economic status or class. This kind of categorization has left Delhi with two urban realities.

8.3.1. Delhi's Upper, Middle and Lower Classes

Disparities in the livelihood opportunities of the population in Delhi are apparent when on the eve of New Year or Diwali night rich people spend thousands and the poor on the other hand in the same night sleep on the roads (Jagmohan 2005: 122). Public service delivery to the poor in Delhi are extremely unsatisfactory and non-reliable whereas higher income and better-informed users have better services (Chand 2006). Connaught Place and New Friends Colony, fieldwork sites, are elegant areas of the city. Connaught place in Central Delhi is the world's 6th most expensive commercial area.⁷⁹ This is the area of big bungalows where magistrates, justices and other politicians and the business class are living. Similar is the New Friends Colony in south Delhi which has clean roads and public parks for fresh air. People living in those areas are not familiar with the problems of poor people in Delhi living across the road in another colony. Said one of the student involved in the fieldwork for this study: "During this survey work I

⁷⁸ Author knows about these areas from participatory observation and from the survey.

⁷⁹ Source: Press Trust of India, 'Connaught Place 6th most expensive office location in world', The Indian Express. Published 30th December 2014. <http://indianexpress.com/article/cities/delhi/connaught-place-6th-most-expensive-office-location-in-world/>. Accessed 17 January 2016.

have learnt a lot about the problems of poor people of Delhi how do they struggle just for water, earlier I was not aware of it.”⁸⁰

Within the boundaries of elegant and planned areas of Delhi the required infrastructure, namely, water, sewerage, electricity, paved lanes as well as standard public services are sufficiently provided. There were no signs of water problems. There were no hand pumps, community taps or water tankers coming in the morning or evening for water supply.⁸¹

The economic and social development of any nation depends very much on the quality of human resources, and the quality of human resources is highly associated with the quality of education and health services provided to the people (Ghuman and Mehta 2005). There are differences in access to education and health services for different classes in Delhi. Under the Right to Education Act (2010) every child in India has the right to have free primary school education. The basis for this act is the widely held belief that “education holds the key to economic growth, national integration, modernization and social transformation” (Mahajan and Goyal 2005: 3). Delhi has different types of schools, ranging from government to private schools. People tend to choose schools depending upon their economic situation (class); for example, lower middle class and poor people typically send their children to government schools. The reason is that government schools are free of costs. Despite this fact, the number of students attending government schools is declining. This is because of a sense of pride in education parents willingly spend Rs. 300 – 500 per month to educate their children in a private English medium school and also because some poor parents prefer to send their children to work rather than to school; they are not interested in education (Mahajan and Goyal 2005). Private schools provide more facilities than government schools where there is no infrastructure available, and especially no sanitation facilities. But private schools are expensive in Delhi and the lower middle class cannot afford them. In simple words, Delhi has had a ‘commercialization of education’ associated with class. Several low-income parents have taken the decision to send their children to expensive schools and always have a burden on their earnings and livelihood (Mallica 2005).

⁸⁰ One of the students involved in the fieldwork.

⁸¹ Information taken from participatory observation during the survey.

Medical facilities in the city are also an issue. In India health care facilities are affected by class inequalities. Disadvantaged groups have low accessibility to reliable and effective medical care due to corruption (Ghuman and Mehta 2005: 2). Despite an annual growth rate of an average of 6% in India since the mid-eighties, expenditure on health is on an average 1% of the total government expenditure which is not sufficient for the huge population (Ghuman and Mehta 2005). It is not only that the investment from the government in the health sector is disappointing, the health services provided to economically better off groups of society are better. This combination of disparities and inefficient funding in the health sector has negatively affected marginalized groups the most (Ghuman and Mehta 2005). The mushrooming of private sector hospitals and clinics has widened the gap of disparities between the rich and the poor. Private sector facilities provide health services at significantly higher costs, which cannot be borne by the poor in the city. Government services in hospitals are neither sufficient in number nor efficient in service (Ghuman and Mehta 2005).

Another issue associated with inequality is the lack of awareness and lack of information among the lower class even though there is a quota system under which both private schools and private hospitals are obliged to serve a certain number of poor people without any costs (Banerjee et al. 2012). This issue is associated with corruption and the negligence of the authorities, for example when monitoring does not function efficiently and reserved seats and services are given to those who pay bribes. To make use of a facility, personal contacts are important.⁸²

⁸² Information taken from participatory observation.

Figure 20: Contrasting areas in Delhi showing living of poor and rich.



Source: Author's photos taken in a slum near Gole Market Central Delhi (left) and New Friends Colony in South Delhi (right); December 2014.

Disparities also exist in relation to the access to water. There is not an adequate water supply to a large population of lower class and poor people. Poorer households use a variety of options to get water, such as purchasing from private vendors, underground boring (which may give them contaminated water), or fetching water from afar (Truelove 2007).

The adequate and satisfactory quality of public services is a strong weapon to fight against economic inequality when citizens can utilize their energy and resources to empower themselves economically. Damaged public services result in more unequal societies (Oxfam Working Paper 2014); despite this fact, in Delhi many services are neither adequately nor equally provided to the poor. Why are there such injustices when the Indian Constitution gives its citizens right to equality? The concept of equality was introduced by article 14 of the Indian Constitution. It guarantees every individual equal status and equal opportunities. The law cannot deny any person equality within the territory of India (Kaushik 2012).

Article 14: Right to Equality.

The State shall not deny to any person equality before the law or the equal protection of the laws within the territory of India (Government of India 2007: 6).

8.3.2 Social Injustice Reflected through Class Distinction in Delhi

“Social justice concerns about the distribution of burdens and benefits throughout the society as it results from the major social institutions” (Miller 1979, c1976: 22). Social justice deals with matters such as equality in terms of the living standard of citizens in a country and a person’s rights under the legal system (Miller 1979, c1976). Social justice is about distributing economic and social resources equally in society for the benefit of the people and creating a more equitable distribution of power whereas social injustice brings inequalities in the society in terms of status and income among different groups (Hunsaker and Hanzl 2003).

The issues of inequality and social injustice are associated with water and water governance and quality of life; ethics and values in water governance are significant ingredients for a fair treatment of humankind (Llamas et al. 2009)⁸³. UNESCO and the Commission on the Ethics of Science and Technology (COMEST) among others have pointed out that awareness about ethics in water management would improve the decisions of the sector. Here the meaning of ‘ethics’ is “the discipline dealing with what is good and bad with moral duty and obligation” (Groenfeldt 2013: 4). In the water sector, ethics have an importance especially when it comes to equity in availability and applicability, which is stated by The Universal Declaration on Human Rights (UDHR): “one individual cannot have access to as much water as they like to the detriment of others” (UNESCO 2011: 18)⁸⁴. Equity and human development are the two most

⁸³ The issue of water ethics is a recent topic of attention. Water has become a market good rather than simply a common good. In several countries poor people are not getting enough water for their daily consumption. This is a moral and ethical issue (Barraque 2004).

⁸⁴ UDHR aims to set standards with due regard to human dignity, human rights and freedom, the foundations for the common future of humans (UN). See: Article 3 on Human dignity and human rights,

important aspects tied to water justice because human development cannot be achieved without equity in water distribution (Yashwantrao Chavan Academy of Development Administration 2012).

“Historically, the relationship between water and poverty has deep spatial roots, that is to say the place where poor live often has difficult access to drinking water in some phase of providing of this service” (Duran 2009: 4). That is why the United Nations stated that water governance cannot reduce poverty alone but poverty will not be reduced without improved water management (UNDP 2004b). Poverty and social injustice go hand in hand where poor and marginalized people lack an adequate standard of living, as seen by their poor housing, inadequate quality of food and nutrition, poor health services, and limited availability of resources or education (United Nations 2012c).

Discussions on poverty often focus on rural areas, but poverty is also apparent in urban and well-developed cities. The case of megacity Delhi is an example which is experiencing urban poverty associated with the country’s low level of income generation and distribution. The National Institute of Urban Affairs (NIUA) found that more than 50% of the Gross Domestic Product (GDP) of India is contributed by its urban areas, which contain one third of the population of the country. Still, despite the growth in India’s GDP there is still substantial urban poverty. In the major cities of India about 35% of the urban population is living in slums, 68% of whom are women and children (Loughhead and Mittal 2000: 1).

Most of the anti-poverty programmes in India are focused on rural poverty. The ratio of urban to rural poverty is 1:3.5 whereas the ratio of funding for poverty alleviation programmes is 1:35; this scenario has brought big changes in rural areas so that the number of poor has been reduced by 68 million between the years 1973 and 1988. Over the same period, urban poverty increased by 23 million (Loughhead and Mittal 2000). The percentage of rural poor declined from 56.4% to 39.1%, the percentage of urban poverty has also come down but not that much, from 49.2% to 40.1% (Loughhead and Mittal 2000: 2). The urban poor in Delhi are highly dependent on public bodies to

Article 10 on equality, justice and equity, Article 14 on Social responsibility and health and Article 17 on protection of the environment, biosphere and biodiversity (Liu 2011).

provide services because they have less control over their immediate environment than in rural areas (Loughhead and Mittal 2000).

8.4. An Overview on Corruption in India

According to Transparency International, corruption is the abuse of entrusted power for private gain. Corruption can be classified as petty, grand and political⁸⁵ depending upon the amount of money lost and the sector where it occurs.

According to ADB, “corruption involves behaviour on the part of officials in the public and private sectors, in which they improperly and unlawfully enrich themselves and/or those close to them, or induce others to do so, by misusing the position in which they are placed” (ADB 1998: 9).

Corruption has been part and parcel of life in India for a long time (Arora 2011). In India corruption is the root cause of many problems; the gap in demand and supply along with population pressure has strengthened the regime of corruption in India.⁸⁶

Similar to several other countries, corruption in India is widespread. Fifty percent of the people in India have paid bribes or peddled to get the services or job done in a public office (Abdulraheem 2009). Corruption in India is found everywhere in government offices, politics, the private sector, the media, the judiciary, and the police and even in religious institutions. This makes it highly difficult to root it out. As had been argued by Paolo Mauro: “one reason why rooting out corruption is so difficult may be that when corruption is widespread, it just does not make sense for individuals to attempt to fight it, even if everybody would be better off if corruption were eliminated” (Mauro 2004: 2). In India industrialists pay bribes to politicians for personal favors and politicians buy their votes from poor people by paying bribes during elections (Abdulraheem 2009). It is a cycle of services and favors among several actors and citizens. Corruption exists throughout India from the cities to the villages. Especially in

⁸⁵ According to Transparency International, petty corruption refers to everyday abuse of entrusted power by low and mid-level officials when they interact with citizens. Grand corruption includes high-level government officials where large amounts of money are involved. Political corruption is manipulation of policies, institutions and rules and allocating resources by political decision makers.

⁸⁶ Information obtained from an employee of a non-political and non-governmental organization in India on 11th August 2014.

government offices it is the norm to pay bribes to get work done. In the worst cases, even after a bribe is paid the work is not done and the case is transferred from one department to the next. Individuals may have to pay bribes again and again. Low quality material is used; theft of materials are common practices in offices (Abdulraheem 2009). If someone in the country raises their voice against corruption it is often ignored by the government. As many politicians are also corrupt and they belong to corrupt political parties, their efforts against corruption are inadequate (Abdulraheem 2009). A survey of six metro cities of India found 98 per cent of the public are convinced that politicians and ministers are corrupt and 85 per cent believe that corruption is on the increase in the country (Pavarala and Malik 2010). Normally citizens prefer to pay bribes rather than go to the court or the police for justice because the police are also corrupt and cannot be expected to help. For ordinary citizens corruption is often grudgingly accepted as it is better than harassment and delay in services (Arora 2011); it is said that “corruption in India has wings not wheels” (Abdulraheem 2009: 356). Paying bribes is considered as normal in routine transactions. More recently political scandals and financial scams have revealed a more complex dimension of corruption in India which is leading towards higher costs of goods and making living expensive in the country (Pavarala and Malik 2010).

In the Indian political system there is a lack of attention to common goals and nationally-oriented programmes; rather self-interested politics prevails. Influential and powerful people create a sense that there is a scarcity of resources; they do this for personal gain. Common people react with a willingness to pay more for essential resources like water (Sharma and Sharma 2004).

The way corruption emerged and spread in India, is different at different levels. For instance at the highest levels corruption distorts competition and can deny the public access to competitive markets. At the lower levels corruption increases transaction costs and excludes those who cannot pay. This also adversely affects central revenue collection and overall costs (OECD 2014; Khan 1999: 2).

The roots of corruption can include several interdependent factors, such as policies, bureaucratic traditions, political development and social and cultural history (Narayanasamy et al. 2000: 42). Poverty is a cause of corruption because poverty brings

powerlessness, which allows the powerful to do corrupt practices against poor (Narayanasamy et al. 2000). Why is India so poor? On one hand Indian economic growth is recognized globally but on the other hand 21.3 per cent of the total population in 2011 had a poverty headcount ratio of \$1.90 per day.⁸⁷ It might be corruption which is causing poverty in India. This is especially the case in urban regions where migrants from rural parts of the country come to urban areas because of the failure of rural programmes due to corruption (Mohanty 2010). India's poor economic structure which leads the entire system into corruption and a large number of people live below poverty line in the country and low salaries of officials compel them to resort to corruption.⁸⁸

Corruption is the outcome of greed, materialism, the desire to succeed, failure of reinforcement of laws, and traditional and religious values (Pavarala and Malik 2010). In India many believed that corruption is the outcome of changing life styles, economic growth and consumerism in the country which entice politicians and citizens into illegal tasks (Pavarala and Malik 2010: 8). This study argues that corruption is very much a phenomenon of the attitude of people and this attitude is very much influenced by the religion and culture of India. This is because "India has relationship-based culture and society moves on the basis of that. The primary mechanism for getting things done is highly developed skill for working through social networks, often based on extended family relationships. The country functions through parliamentary system but the main real power comes in action through a web of personal and family relations" (Hooker 2008: 7). In today's life in India corruption has become a part of the system without which the system cannot function; corruption works as '*grease in the wheels*' (Narayanasamy et al. 2000: 44).

8.5. Corruption Mechanisms in Delhi's Water Sector

According to one interviewee: Some people in Delhi who do not have official water supply but have personal connections in the government departments or with

⁸⁷ Source: The World Bank, 'Poverty and Equity, Country Dashboard, India'. <http://povertydata.worldbank.org/poverty/country/IND>. Accessed 17 January 2016.

⁸⁸ Low wages in India is a social problem which takes the form of bribe. Information obtained from an Indian government official on 19th June 2014.

political leaders to get water connections/meters in their houses and take the benefits on individual basis. The other option is paying bribe to the field men who can fix an illegal water connection in the night when there are less chances to get caught.⁸⁹ These mechanisms highlight only a part of the overall situation; the overall water sector value chain and particular points along the chain are vulnerable to corruption.

In Delhi five different stages are identified along the value chain of the water sector as hot spots for corruption occurrence.

8.5.1. Policymaking and Regulation

At the policy level corrupt practices may occur when politicians and officials involved influence the focus of policy by manipulating investment priorities to set up opportunities for future rent seeking (Plummer 2012). Politicians take regulators and other stakeholders in confidence to determine the standards and regulations involved in the policy or to allow projects to ignore the established standards or procedures prescribed in the policies. Often this increases the costs of the entire project because funds are not invested in the project itself but rather are used to support rent-seeking (Plummer 2012: 134).

Delhi adopted India's first National Water policy (NWP) in the year 1987.⁹⁰ One very basic drawback of the policy was that it does not place more emphasis on community participation and community level water management projects. It focuses on large-scale structures and big engineering projects, a tendency that links to the colonial history of water management in India. In these projects huge amounts of money are involved and public involvement is avoided. The process of making of a national water policy/state water policy is not formalized in India and it is in the hands of the executive.

This means they can do whatever participation process they so decide. For instance, of the last national water policy only a few meetings with selected stakeholders [were

⁸⁹ Information obtained from an employee of a think tank in Delhi on 25th August 2014.

⁹⁰ The need for a National Water Policy of India to manage water resources in the country was recognized by the Ministry of Water Resources in the year 1987. Source: Central Ground Water Board, Ministry of Water Resources, River Development and Ganga Rejuvenation, Government of India. http://cgwb.gov.in/documents/nwp_1987.pdf. Accessed 17 January 2016.

held].⁹¹ “Indian policymaking process is highly technocratic and participation of all the stakeholders or public opinion makes this process highly complicated because not all of the stakeholders are technically sound in their level of understanding”.⁹²

A close look at the NWP 2012, shows missing elements. The emphasis on water as a fundamental human right is not included strongly enough although providing water for human needs is a priority in the policy. Clear standards about the quality and quantity of water for human consumption to be provided are not given. This lessens the chances that everyone will have access to water (Varghese 2012: 1). The NWP 2012 lists priorities which are different from those mentioned in previous drafts in 1987 and 2002, which prioritized drinking water, irrigation, and hydropower. In contrast, NWP 2012 facilitates flexibility in allocating water for industrial use even at the cost of agriculture. This change in priorities will bring confusion in the decision making process and allow political parties to intervene with their political interests from which industries rather than domestic sector or agriculture will benefit (Ramesh 2013: 4).

8.5.2. Planning, Budgeting and Transfers

When large amounts of public sector funds and donations from international donors are involved there are more chances for grand corruption to occur involving a small number of officials (Plummer 2012: 138). It is difficult to trace the allocation of budget in the water sector. One reason for this is the extreme lack of transparency. In this dissertation, the risk of corruption by involved stakeholders is analyzed by looking at past projects and the amount of money involved as well as the outcomes of those projects, that is whether the project has accomplished its goals or not.

One interesting case to look at is a project which was launched in 1993 with the objective to clean the Yamuna river and restore the quality to desired bathing class. The project was funded by the Japanese Government and is one of the largest river conservation projects in India. The entire project was planned to be implemented in two phases: the Yamuna Action Plan (YAP)-I and the Yamuna Action Plan (YAP)-II. They

⁹¹ Information obtained from an employee at a Research Centre in Delhi on 18th August 2014.

⁹² Information obtained from one of the employee at the Ministry of Water Resources on 23rd June 2014.

planned to cover 21 different towns. An amount of Rs.6759 million, which is equivalent to USD 141 million (exchange rate in March 2003, 1USD= Rs.48) was provided as a soft loan from the Japan Bank for International Cooperation (JBIC) (Nallathiga 2008b: 4; Nema 2007: 10). Even after this huge investment and planning the project was rated as underachieved because there was no improvement in the water quality of the river, even though this was the main focus of the project. There were several direct and indirect factors responsible. One was improper management such as Sewage Treatment Plants (STP) running on under-utilized capacity so that sewage flowed directly into the river (Nema 2007: 11). This was identified at the beginning of the project as the reason for pollution of the river. Clearly, collection of sewage should have been a focus of the government in this case rather than the introduction of expensive technologies to clean the river.

This does not give any proof of the existence of corruption particularly in this project but when the amount of the investments made and the results of the project are compared, one can suspect there was corruption involved.

8.5.3. Tendering and Procurement

Procurement includes purchase of a variety of goods and services, which are needed in government organizations and offices; the process requires public-private interaction. This is the reason that procurement processes are a 'well-documented' area of corruption in almost all sectors, including water. Corruption may occur with the wrong selection of contracts for services by falsifying needs with unnecessary or bigger than planned services are added, the selection of service providers on personal grounds, the delay in the delivery of supplies could affect profit margins, or the manipulation of invoices (Plummer 2012: 142). Procurement procedures are complicated and thus can be manipulated in a variety of ways, the detection of which is not easy. One of the reasons that buyers or decision approvers are not concerned about protecting their own money is that they are spending government money (Pope 2000: 205).

In Delhi, the entire procurement process includes several stages such as – internal consensus about procurement standards (specifications), identification of potential

contractors, and awarding of contracts and post-procurement evaluation of contracts (Chakraborty 2011: 17). In an ideal situation tendering processes for good/services are based on equal treatment, non-discrimination, mutual recognition and transparency. The process of tendering is done through auctions in which it is highly important to design them in an optimal manner and to fulfill the objectives of efficiency and maximization of public revenue which means to minimize the costs including in the procurement process (Chakraborty 2011: 20). In the process of auctioning bids are submitted and through a process of transparency the one who submits the highest bid is declared as the winner. The entire process happens in a secretive environment. “Tendering and procurement procedures in Delhi water sector are extremely non-transparent procedures and work on the basis of personal contacts and on monetary grounds without taking into account the eligibility of the bidder company”.⁹³

One example is when DJB was caught in a case of fraud involving thousands of dollars in the procurement process for ordering water meters (see Box 8).

⁹³ Information obtained from an employee of a think tank in Delhi on 25th August 2014.

Box 8: Corruption Risk Example**CBI initiates inquiries into DJB corruption Case
(November 15, 2013 New Delhi. The Hindu)**

The Central Bureau of Investigation (CBI) started to set up inquiries of corruption on DJB in some of private-public-partnership projects undertaken for water distribution systems and procurement of water meters. The estimated costs of the projects were hundreds of crores. The CBI has investigated to find out about the tendering procedures followed by DJB.

The projects which had been taken for investigation are water distribution management systems in Nangloi, Malviya Nagar and Mehrauli. Under the PPP model, the operation and maintenance of these units were awarded to a European company. CBI had suspected over the tender documents where the projects has given to some European private company. But DJB denied all the charges that the formal tendering procedure had been followed and the tender was awarded on the bases of the prescribed guidelines.

The CBI initiated another separate inquiry on some of the DJB officials, the private company involved and some other for corruption charges in Nangloi command network project which is estimated to be of worth Rs. 652 crore. The other two projects Malviya Nagar and Mehrauli will also be investigated for similar charges of corruption by CBI.

Another investigation which had been made by CBI against DJB was in the procurement of water meters. DJB was investigated over the charges that they supplied faulty meters which were procured through private companies.

Some NGOs including Water Works Alliance and Citizen Front for Water Democracy (CGWD) had earlier also found some of the cases of corruption against DJB and private companies under PPP. “We had also approached the Chief Vigilance Commission seeking a probe into the matter,” said S.A.Naqvi of the CFWD.

Source: Staff Reporter, CBI initiates inquiries into DJB corruption case, The Hindu. Published 15th November 2013. <http://www.thehindu.com/news/cities/Delhi/cbi-initiates-inquiries-into-djb-corruption-case/article5354231.ece> . Accessed 5 January 2016.

8.5.4. Construction and Operations

Once it is decided who has won a bid and a contract is awarded, it is essential to monitor because corruption may occur until the final project work is done. Corruption may be involved in the construction of infrastructure or may involve lower quality standards in the final project. Alternatively, it may be that an area is not provided with services (Plummer 2012: 148). There are various other kinds of possible problems, such as fraudulent invoicing, fake documentation, poor quality of work or material used to increase the profit and lower the costs involved in construction. Sometimes the poor

quality of work is visible. However, when a project is, for example, underground, such as with underground pipelines, it is hard to detect whether quality standards have been fulfilled. Fake documentation is also a problem; water quality standards may be falsely recorded and tests may be skipped. Quality of Delhi water is not good for human consumption but on papers it is proved that water quality is tested in laboratories and is safe for consumption.⁹⁴

8.5.5. Payments and Access

This is the stage where households or communities are directly involved in corruption and act as bribe givers to get access to water or water infrastructure, including water connections and meters, and to cope with water scarcity. This type of petty corruption is significant because many small transactions gradually lead to big sums of money for a household. Illegal connections involving households involve not only one-time payments, they also have to bear the costs of leakage or other faults in the system. These problems emerge as a result of corruption and the paying of bribes to get access to water (Plummer 2012: 161).

In Delhi, such payments are usually found in cases of false meter readings. Households give bribes to official to change the meter reading so that they have to pay less for the amount of water they have used. In Delhi, cost of water connection in a household is less than the water connection used for commercial purpose. Bribes are also given to get the connection under the name of a household and the connection is used for commercial purposes. In unauthorized colonies or illegal colonies where water connections are not officially provided by the authorities due to their illegal settlement status, unofficial connection is again a common practice which can be availed of easily by paying bribes and using some personal and unofficial relations. Most of such kinds of illegal connections are made during night when chances to be caught are less.⁹⁵

⁹⁴ Information obtained from a non-government organization in Berlin on 27th September 2013.

⁹⁵ Information obtained during household survey.

In 2014 an average household in Delhi paid around Rs. 270 in bribes, with the maximum amount of Rs. 5000 for bringing the water bill down and a minimum of Rs. 300 to get a water tanker (Centre for Media Studies-Transparency 2015: 20).

The tanker mafia is another parallel industry in Delhi which is supplying water.⁹⁶ Tanker water suppliers in Delhi are the outcome of the artificially created supply-demand gap in the city.⁹⁷ “Artificial water crisis in Delhi is the beginning of corruption”.⁹⁸ The DJB also provides water through its tankers in several parts of the city. Due to shortages of tankers some private tanker owners sell water without the permission of DJB. Households thus also pay to these private suppliers. In the past few years their numbers have increased rapidly with the growing demand for water. Their efficiency in supplying water made this business very profitable. An interesting fact about these private tankers is that they never have a shortage of water unlike the DJB (Bansal 2012: 11). It is difficult to trace them because many of them do not have a particular shop or address; they operate through telephones. They usually do the delivery at night to avoid police surveillance. It has been reported that private tankers even fill their tankers from DJB’s booster pumping stations. This would not be possible without the assistance of someone from the DJB itself (Bansal 2012: 12). In the business of private tanker suppliers, transactions in the form of bribes normally occurs among tanker owners, DJB employees and the police (Bansal 2012). These service providers were not only illegal in providing water without permission but also exploited groundwater, which is against the orders passed by the Lt. Governor of Delhi.⁹⁹ Nevertheless, private tankers have worked in the city supplying water for years.

⁹⁶ In the time of Ms. Shiela Dixit as Chief Minister of Delhi, she mentioned in one of her speech and showed the possibility to legalize these tanker water suppliers in Delhi as they have positive impact towards access to water. It is similar to the case when informal institutions bring positive results but rather short-term. In a way there is hidden encouragement of expansion in illegal colonies in Delhi which are spoiling the entire urban planning of the city (Information taken from Interviewee – Anonymous on 23rd June 2014 from Ministry of Water Resources via email.)

⁹⁷ Already described in chapter six of the dissertation.

⁹⁸ Information obtained from an employee of a think tank in Delhi on 25th August 2014.

⁹⁹ The order is as follows: In the whole of the National Capital Territory of Delhi, no person, group, authority, association or institution shall draw ground water through bore-well or tube-well (both new as well as existing and drawing ground water without permission of Central Ground Water Authority) for domestic, commercial, agricultural and or industrial uses without the prior permission of the “Competent Authority” that is to say, the Delhi Jal Board or the New Delhi Municipal Council as the case may be (International Environmental Law Research Centre 2010; Delhi Government 2010).

Table 28: Summarizing the Corruption Risks Associated with Water Sector in Delhi	
Value-Chain Step	Risks of Corruption
Policymaking and Regulation	<ul style="list-style-type: none"> • Policy making process is not formalized, is in the hands of the execution board and they can follow whatever participation process they decide upon.¹⁰⁰ • No clear description about quality and quantity standards of water. • Interference of politicians, which is in favor of industrial use of water. • Absence of comprehensive legal framework. • Existence of several non-compatible rules and regulations.
Planning, Budgeting and Transfers	<ul style="list-style-type: none"> • Lack of planning. • Misuse of budget. • Wrong fund allocations. • Lack of integration of other related aspects.
Tendering and Procurement	<ul style="list-style-type: none"> • False invoicing. • Tailor made documentation. • Lower quality work/equipment. • Lack of transparency in bidding process.
Construction and Operations	<ul style="list-style-type: none"> • Fake documentation. • Lower quality work.
Payments and Access	<ul style="list-style-type: none"> • Bribery to get access to water. • False meter readings. • Illegal water connections. • Illegal private water suppliers.

Source: Author.

8.6. Driving Forces for Corruption in the Study Area

It is not obvious if it corruption that is responsible for ineffective water governance or if it is ineffective water governance, which creates the environment for corruption. What makes a governance ineffective depends on various factors.

The components of good governance are characterized on the basis of a very thin line between transparent/non-transparent systems, accountable/non-accountable practices

¹⁰⁰ Information obtained from an employee at a Research Centre in Delhi on 18th August 2014.

and participatory/non-participatory approaches in the case study. During the research, some clues were collected which hinted at the existence of corruption.

8.6.1. Measuring Transparency

Transparency is a rather new concept for the government of India. Transparency has been a subject of discussion since independence but has not received much attention. The biggest step bringing about change to the old way of doing government business was the Right to Information Act (RTI),¹⁰¹ which was passed in 2002 and finally brought into effect in 2005 (Srivastava 2010; CUTS International 2010).

Under the Right to Information Act, environmentalist and NGOs in Delhi have asked the Delhi Government to provide water-related information. Unfortunately the municipality has not always been able to provide the information asked for. Due to a lack of monitoring, mismanagement and ineffective data collection. It was a mystery as to where the water in Delhi was exactly going and who was providing it to consumers. The information associated with water quantity in Delhi was revealed by Mr. Arvind Kejriwal, an activist in 2007 who is now the Chief Minister of Delhi. The information was delivered in one of his speeches that is based on the statistics given by a consultant of The World Bank. The study was conducted by Price Water House Coopers. The details of the speech are:

“Total water production in Delhi is about 680million gallons per day for the population of 15 million which means 230 liters or water per capita per day and round about 11 buckets of water for each person in Delhi per day. When asked about the DJB that if this is the scenario then why not everyone has water in Delhi, the DJB mentioned that water in Delhi is lost during transmission through leakages in the pipelines and this leakage is as high as 50%. Even after 50% of losses citizens should get 5 or 6 buckets of water everyday which is also not happening in Delhi and where this lost water is going nobody in the DJB has an answer. There was big debate that if 340 million gallons of water is lost and will be on Delhi streets Delhi will start flooding but the DJB mentioned that the leakages are underground that means that the groundwater table should rise with

¹⁰¹ Existence of Right to Information Act (RTI) gives an indication in itself that the system is not transparent and information is not easily and freely available.

this much of water everyday which is also not the case in Delhi; in several regions water table has gone down significantly.”¹⁰²

With respect to these figures and the study conducted, the DJB was asked to provide information about the input and output of water in Delhi under the Right to Information Act. According to The Independent People's Tribunal on the World Bank Group in India¹⁰³ the

“DJB was questioned over the production and distribution of water in the city because Delhi does not have its own water production; water comes from other states. Delhi has six water inputs from where water can enter into the city but none of the input points has a bulk water meter, which can give an entry of how much water is coming into the city. So nobody actually knows how much water in Delhi is coming. The bulk water meters at the input and output of water treatment plants are not working from last five years, therefore, no record of water coming to those treatment plants and the water treated at those treatment plants. Another very interesting point to mention is when the DJB was asked about the water distribution in different areas of the city and the figures they simply mentioned that we do not have bulk water meters for those measurements as well. These issues were later on confirmed with the Chairperson of the DJB and he mentioned that all of the figures given about different zones and water situation are on the basis of the assumption of the DJB there is no engineering and technology is involved.”¹⁰⁴

Water authorities in Delhi maintain no information about leakages and water lost. There is a lack of transparency in the work of the authorities (Panickar 2007: 6). This type of non-transparent environment fosters corruption in the system. Measuring transparency is about evaluating governance processes and the level and validity of the information related to those processes.

¹⁰² Source: ‘Delhi Water Privatisation Plan Part I and Part II’. YouTube. Uploaded 28th December 2007. <http://www.youtube.com/watch?v=4ZbCmL12Q80>. Accessed 17 January 2016.

¹⁰³ ‘The Independent People's Tribunal on the World Bank Group in India’, is an unbiased forum for people in India who have faced the impacts of the projects and policies supported and promoted by the World Bank Group. This is the forum where several groups express their grievances and propose various alternatives because they believe that the policies and projects promoted and funded by the World Bank Group are responsible for environmental degradation and violation of human rights. www.worldbanktribunal.org. Accessed March 23 2016.

¹⁰⁴ Source: ‘Delhi Water Privatisation Plan Part I and Part II’. YouTube. Uploaded 28th December 2007. <http://www.youtube.com/watch?v=4ZbCmL12Q80>. Accessed 17 January 2016.

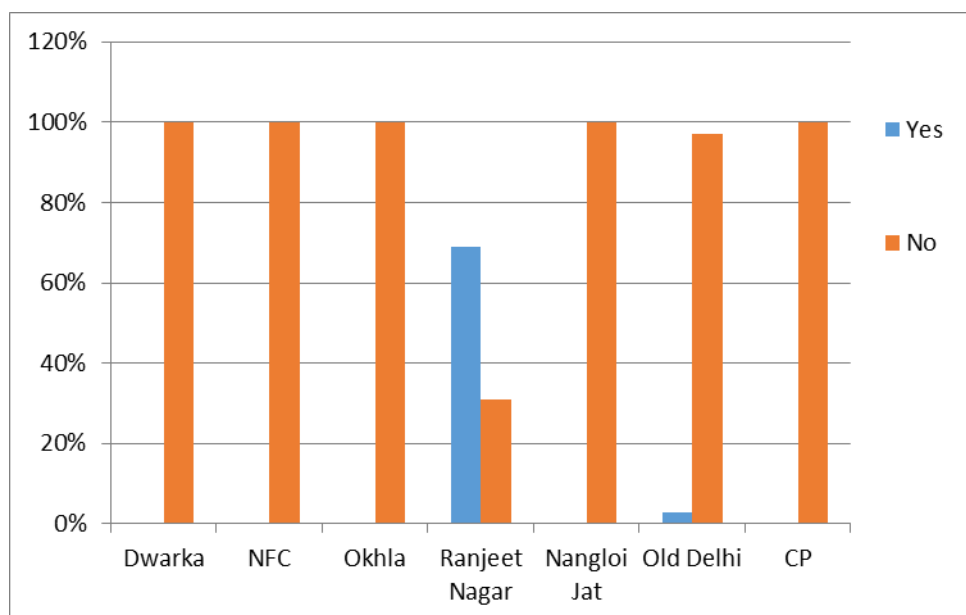
For this dissertation, the Master Plans for Delhi's Development and Annual Economic reports were also investigated. According to the Delhi government's Economic Survey of 2012-13, the DJB was using an old system for measuring the quantity of raw water coming into Delhi and being distributed at several water treatment plants. Due to this old existing system DJB was not able to access the exact amount of water they have and also the amount of water lost (The Energy and Resource Institute 2010b).

Therefore; in December 2012 DJB started a program to install bulk water meters at all water treatment plants; about 282 bulk meters were installed (Government of NCT of Delhi 2012-13: 7). This program took about 5 years to come into operation, which is a long period of time when dealing with water, a daily need. In the meantime, other actors started supplying water and citizens sought other solutions to address this daily problem.

The governmental institutional structure of Delhi is complex due to the lack of clarity in responsibilities of various authorities and their large number of departments. Delhi is managed by 118 different departments and different sectors perform various duties. The overall development and urban planning of the city is managed and authorized by the National Capital Region Planning Board (NCRPB), the Delhi Metropolitan Council (DMC) and the Delhi Development Authority (DDA) and one service provider the Municipal Corporation of Delhi (MCD). These administrative bodies were created through the same parliamentary act which made their horizontal and vertical linkages difficult, confusing and complicated (Singh and Shukla 2005: 31). "Whenever we have problem of water supply in our home we try to register our complaint in municipality but it is very difficult to get a hearing without an agent" (open part of the household questionnaire).

Figure 21: Information Provided to Household About Developments/Schemes.

Survey Question: Are you informed about any development in your area from authorities for water problem?)



Source: Household survey by the author, 2013-14.

In relation to the transparency of the system and the availability of information about functionality of water authorities, people were asked targeted questions during the household survey. The survey showed that in all of the residential colonies, households were not informed by the authorities of any kind of development they have planned in those areas to manage water or water related projects. Only Ranjeet Nagar's households were much more informed than households in other areas. This is presumably because of the relatively large number of individuals from this area who work in government offices.

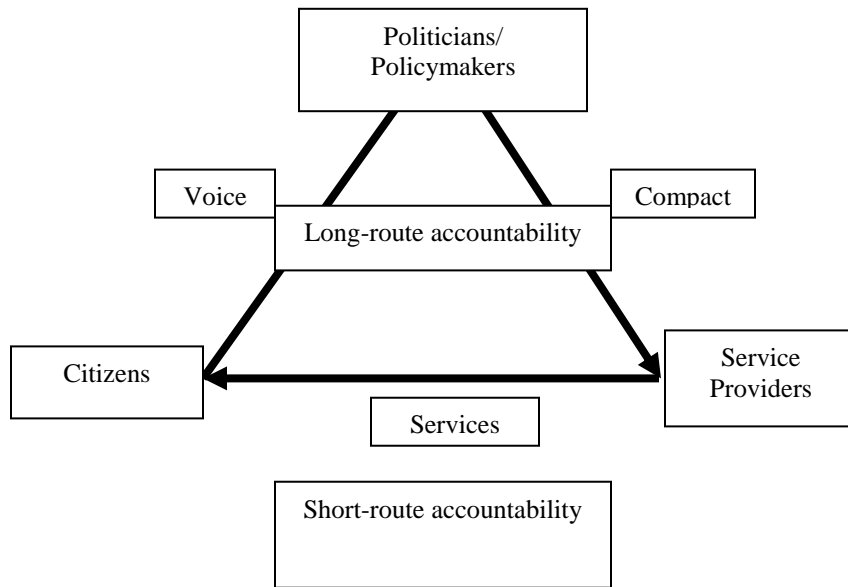
8.6.2. Measuring Accountability

Accountability is about being clear about responsibilities for performances. Who is responsible for what? Who is answerable to whom? It is also related to the ability of citizens to question authorities about the low performance of their service providers and to demand higher quality services. Accountability depends heavily on transparency and

trustworthiness, which is another principle of good water governance and an essential organ to high quality service provision at a low cost (Water Partnership Program 2010: 23). In particular in Delhi and its water sector, accountability is obscured (Haider 2016). The sector relies on a ‘horizontal accountability’ mechanism where there is no scope of direct contact of the citizens to the higher authorities and no monitoring of their performance. Even after the 74th Amendment to the Indian Constitution¹⁰⁵, municipal bodies have limited powers to decide expenditures and selection of staff and must heavily rely on the central government. The local urban bodies are not fully empowered and independent in decision making process where they can provide information to the citizens on development schemes (Water and Sanitation Program 2005: 7). The existing system in Delhi’s water sector leads to a long route of accountability. Elected representatives are accountable to higher tiers of government. They act as mediators between services providers and citizens and respond towards citizens’ needs and concerns. They listen public concerns and demands and relay them to the service providers (Haider 2016; Water and Sanitation Program 2005: 17). The key function of the DJB is to fulfill customer needs and satisfaction but these functions were overlooked by the political interests which interfered in techno-economic decisions of the DJB (Infrastructure Development Finance Company 2011: 2; Water and Sanitation Program 2005: 7). Citizens only have the chance to get accountability from the agencies through elections.

¹⁰⁵ The Indian Constitution divides the responsibility of water resources management between National Government and the States. It was the first time when third tier of urban government was introduced to constitute Urban Local Bodies (ULBs) in different forms such as Nagar Panchayats, Municipal Councils or Municipal Corporations depending upon the size and population of urban area (Tiwari 2007: 6).

Figure 22: Various Routes of Accountability.



Source: (Water and Sanitation Program 2005: 18).

8.6.3. *Measuring Participation*

Participation implies that all stakeholders including marginalized and resource-poor groups are meaningfully involved in the process of decision making (Haider 2016). The meaningful public participation depends highly upon the level of knowledge and understanding of stakeholders on the issues discussed. In Delhi and in general in India citizens of low-income households are poorly educated, which undermines their ability to understand the bureaucratic processes of various issues including water management. The lack of knowledge and awareness on matters where ordinary citizens could demand but are not and the way they should proceed their demands. They end up with protests or writing to the press. While this may solve the problem on an individual basis it does not address the systematic nature of the problems (Paul 2003: 8; Haider 2016). In various parts of India, movements and protests have emerged against the lack of functionality of the government. The famous Anti-Price-Rise movement which was originated in Maharashtra with the voice of women in particular to protest against sharply increasing prices of consumer good including food and clothing. The movement was against the

government activity on price control on goods including wholesalers and black marketers (Majumdar 2005).

The data from the field work suggested the ability of ordinary citizens to understand the governing system in the country and their level of awareness was limited. The more aware they are the higher the chance that they will be able to raise their voice and participate in decision making processes or even to elect a representative from their community to promote their interests by participating in decision making processes on their behalf.

Awareness is very influential in terms of participation in decision-making processes. Information can include knowledge about the causes of water problems, knowledge about the decisions taken by the government and awareness related with schemes and programs. But from government's perspective there are some negative effects of the citizen's participation due to which participation is avoided. Some of the explanations are involvement of higher costs and the time consumption (Irvin and Stansbury 2004). Financial resources and time is invested in order to first educate citizens about the complexity of the problem. Time and financial investments can be avoided if a single administrator technically and politically trained and experienced enough to recognize the complexity of the problem and make a decision (Irvin and Stansbury 2004).

Despite the absence of public participation in general due to various reasons, full participation from other stakeholders was identified in NWP 2012.¹⁰⁶

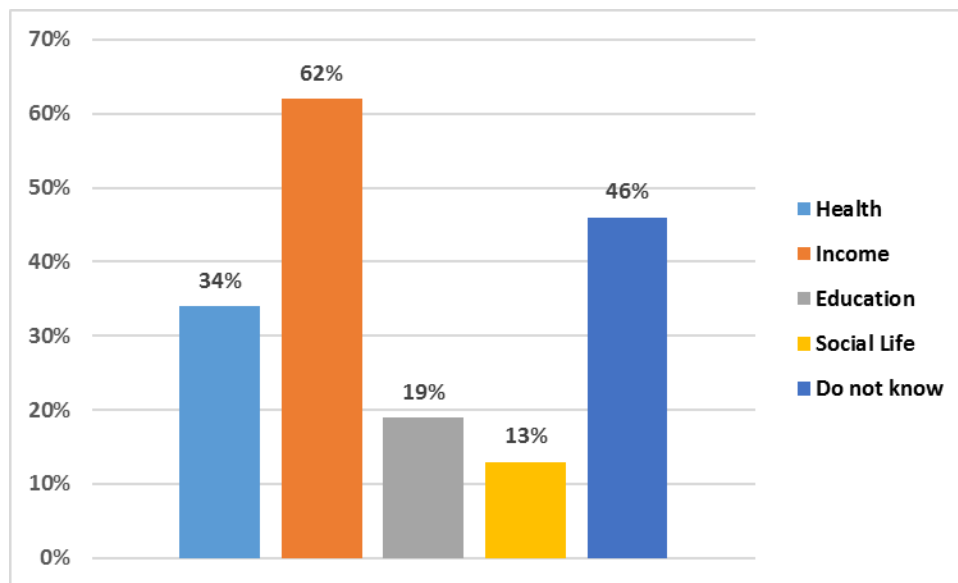
¹⁰⁶ Information obtained from one of the employee at the Ministry of Water Resources on 23rd June 2014. The official said that NWP 2012 was formulated after a series of consultation meetings with different stakeholders as follows: i) Honourable Members of Parliamentary Standing Committee on Water Resources, Consultative Committee for Ministry of Water Resources and Parliamentary Forum on Water Conservation and Management on 28th July 2010. ii) With Academia, Experts and professionals on 26th October 2010. iii) With Non-Government organizations on 11th and 12th January 2011. iv) With representatives of the Corporate Sector on 21st March, 2011. v) With representatives of Panchayati Raj Institutions in 2011 several times at different locations in the country.

Considering the recommendations and feedback received during various consultation meetings, the Drafting Committee identified basic concerns in the water resources sector and adopted basic principles, which should be followed to address those concerns in its draft policy recommendations.

Figure 23: Level of Awareness of People of Different Problems arising from Water.

Survey Question: Are you aware of the other related problems of this water scarcity?

- i) Such as on your health, ii) On your income, iii) On your children's education, iv) On your social life



Source: Household survey by the author, 2013-14.

According to Figure 23 only 34% of households experienced health issues with inadequate or poor quality water. The rest of the households may have experienced the same problem but they were not able to understand that health issues are related with water problems.¹⁰⁷

“My child is sick because he does not eat properly” (open part of the household questionnaire). 62% of survey respondents mentioned being affected in terms of their income stability due to water problem. In one residential colony in Old Delhi (Dhobi Colony means the colony for laundry professionals), it was a big question for them on their income and they have big business loss if they do not have adequate water.

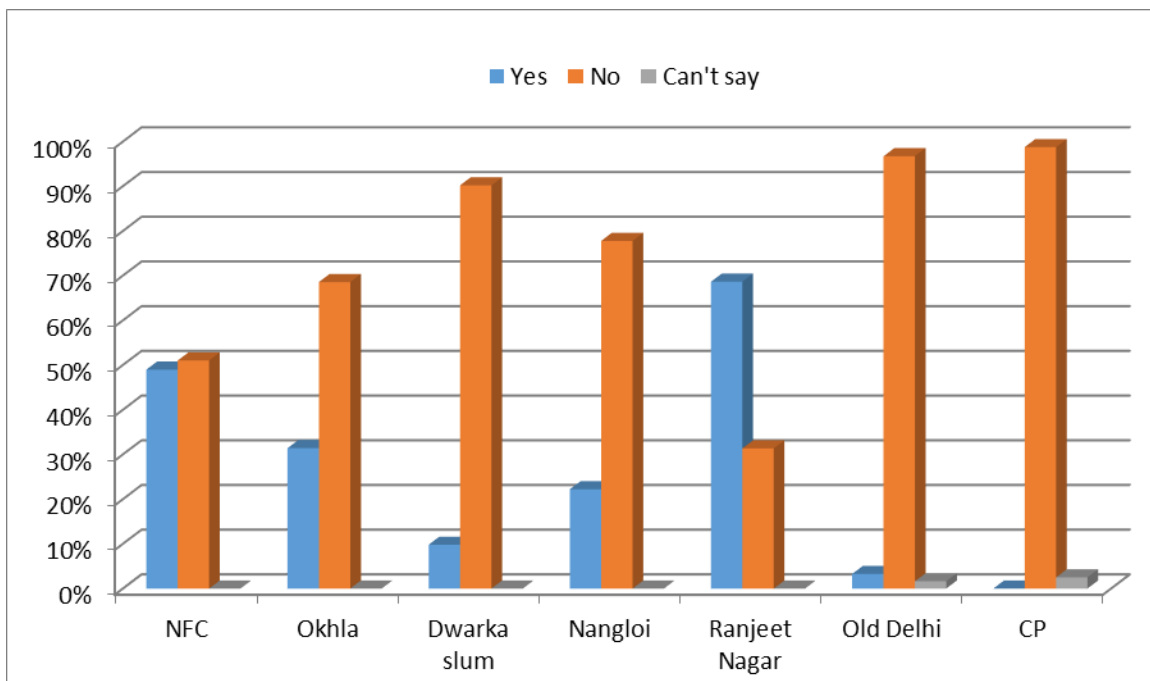
“Everyone pays for water in the city, it is not only me who is paying” (open part of the household questionnaire).

¹⁰⁷ During the survey only about those diseases was asked which are caused by insufficient water, unhygienic conditions due to lack of water and drinking contaminated water. For example, abdominal pain, diarrhea, dysentery, typhoid fever.

The gap between the classes and lack of awareness keep information about water pricing under cover, which is one of the reasons that poor people do not notice the water price differentiation between them and rich people. The household survey conducted in Delhi validated that water pricing is complex with some indirect effects including health and education which are not easily understood by every individual.

Figure 24: Participation of People in Society/Community Meetings.

Survey Question: Do you participate in any kind of meeting related with the water problem in your area?



Source: Household survey by the author, 2013-14.

In the surveyed residential colonies, only in the case of the NFC and Ranjeet Nagar areas was the percentage of community participation in society and community meetings higher than in other residential colonies. This is due to the existence of Social Welfare Associations (SWA) in these colonies, which organize monthly meetings and make discussions and raise awareness on various issues including water (Haider 2016)¹⁰⁸.

¹⁰⁸ Information obtained from open part of the discussion during the household survey.

8.7. Investigating Adaptive Capacity of Citizens and Management Capacity of Authorities

In various international and national debates and conventions, sustainable development has become a central agenda item; the MDGs are based on the concept of sustainable development. Sustainable development cannot be achieved if societies do not have the ability to sustain or “the capacity to adapt”. Adaptive capacity refers to their ability to cope, adjustment and response to the lack of physical natural resource (Millar 2002: 12; Ohlsson 1999). Both India as a whole and Delhi as a megacity have a huge potential to make use of their social infrastructure which refers to the human resources which can be utilized for productive work. Participation of individuals can be enhanced to reduce corruption by providing people with basic facilities (Central Vigilance Commission 2010). The government cannot tackle corruption effectively alone; the contributions and participation of citizens is necessary. Citizen’s empowerment is one of the tools which can be used to work towards corruption free governance (United Nations Human Settlements Programme and Transparency International 2004). For this reason, the adaptive capacity of people in Delhi was investigated. For this, education level, awareness level towards environment and their health and management capacity of the Delhi government were investigated. Factors such as level of education, level of knowledge and awareness of existing problems will determine the opportunities to reduce associated risks. The factor of financial resources is investigated to identify the variety of options citizens use to get water. Depending upon differences in people’s economic status and level of awareness and understanding, they are likely to have different opinions about the kind of risks from inadequate water they have and make choices for mitigation accordingly.

To resolve the issues of ancient caste discrimination, water distribution and pollution in a country of low political will, it is essential to understand the management capacity of the government. The main reason behind conducting this analysis is to investigate the level of knowledge of the government itself on the issue of corruption.

8.7.1. Available Financial Resources

Most of the people choose a wide variety of options to adapt and to minimize the risks in the absence of adequate water supply from authorities. The variety of options depends upon their financial capability. Those who own a house in Delhi in an unauthorized colony are financially more stable and according to the law of right to property and right to water they have full liberty regarding the use of the land and water beneath them; they can take the option of underground boring or make an illegal water connection from municipality by paying a bribe. Those who have limited financial resources have a more limited variety of options. They may have to depend on a community tap or a hand pump which brings up contaminated water. Therefore, the options entirely depend upon the financial constraints of individual households.¹⁰⁹

According to the field survey, it was found that the majority of people who are living in low lying areas or unauthorised and informal settlements earn an average no more than 10000 INR (\$ 150) per month. Many have a family which they have to support with this amount. In many households more than one earning member is there to supplement household income. Their expenses relative to their earnings decide their living standard.

¹⁰⁹ Information obtained from various open parts of the household survey in Delhi.

Table 29: Percentage of People living Below Poverty Line in Delhi and in India.			
SNo.	Years	India	Delhi
1	1973-74	54.88	49.61
2	1977-78	51.32	33.23
3.	1983	44.48	26.22
4	1987-88	38.26	12.41
5	1993-94	35.97	14.69
6.	1999-2000	26.10	8.23
7.	2004-2005	27.50	14.70

Source: (Government of NCT of Delhi 2012-13: 277).

Table 29 shows that the rate of poverty is lower in Delhi compared with the poverty rate in the country. For a country experiencing economic growth, however, there is still a significant number of people living in poverty in the urban areas of Delhi. They are vulnerable to the effects of water crisis and weak in adaptive capacity due to their lack of financial resources.

8.7.2. Level of Education

The level of education of the respondents has been interpreted as an indicator of their likely ability to understand the overall problems they face, their capacity to work towards the mitigation of these problems, to raise awareness about these problems, and to help them in preventing risks associated with the problems of obtaining clean water.

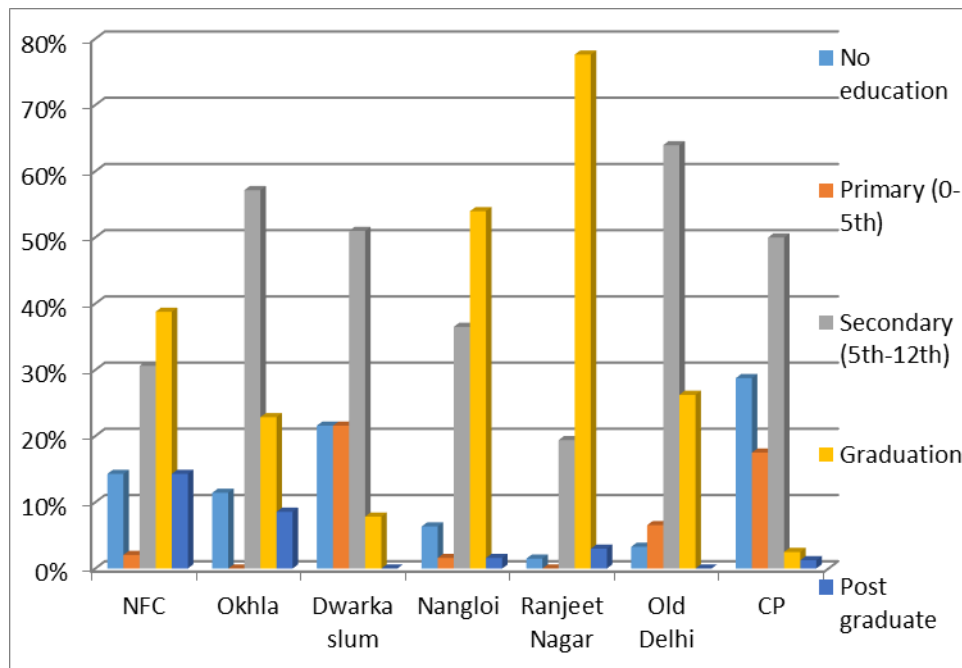
In most of the areas surveyed, the highest level of education of survey respondents was up to secondary school level, which can be done in any government school, free of costs. In Ranjeet Nagar most of the population has graduated from the University which is tertiary level schooling. This area is mostly inhabited by government workers such as clerks or low post bureaucrats. In NFC, in contrast, the education level is not very high; most of the people living here run their own family businesses like hospitality, real estate and manufacturing industries such as automobile parts, electronic appliances, steel suppliers and several have settled their business of restaurants abroad.¹¹⁰

¹¹⁰ Information collected from participatory observation.

Here most of the respondents' highest level of education is only secondary school education and not university education. They tend to perform labour jobs or very low profile jobs. Despite the fact that Delhi has a significant population of highly educated and professional individuals, many in the city come from a low educated group of people.

Figure 25: Education Level of Respondents during Survey.

Survey Question: What is your level of education?)



Source: Household survey by the author, 2013-14.

The fieldwork results indicate that due to lower level of education of some of the citizens in Delhi, their adaptive capacity towards water problems and related risks is low because of their low level of understanding the entire situation. The situation which includes political intentions, government system and their own social structure. Improving education facilities and motivating people to get educated could empower people and help them understand how to become more involved in improving their adaptive capacity not only towards water problems but also various other issues such as social exclusion they experience.

8.7.3. Level of Knowledge and Awareness

The level of knowledge and awareness of people towards corruption cannot be simply correlated to level of education or their economic status. Well educate people are also involved in wrong doings. The level of knowledge of society can, however, be taken as an indicator of adaptive capacity and the ability to address issues like water problems. Community participation in stakeholders' meetings and development programs is highly emphasized by the United Nations and some other international agencies and nongovernmental organizations so that society can be prepared to minimize risks and become a major proponent of sustainable development (Gray et al. 2012). If a community does not have control of a situation which affects them, they can at least control the key decisions like which political party to vote and giving preference to the education of their children as these key decisions affect their lives.

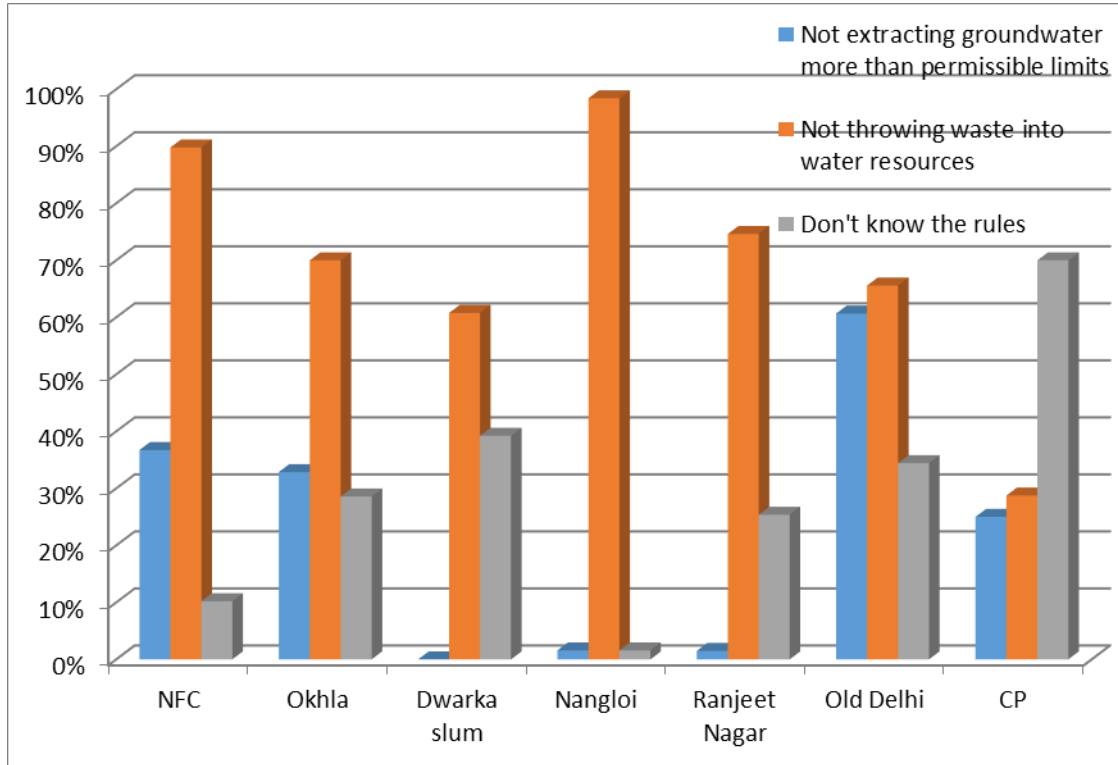
In some areas such as Nangloi Jat where the response is highest in terms of people claiming to make efforts at keeping the water clean, this is probably not so much because of their participation levels in stakeholders' meetings but from their cultural values as the women in this colony are very religious.¹¹¹ They are, however not well informed about other restrictions and often extract more groundwater than permissible under statutory limits. They are not well prepared for instances of water shortage and are not protecting their groundwater resource reserves.¹¹²

¹¹¹ Information taken during the fieldwork of the area by observing daily activities of the residents.

¹¹² Information taken during fieldwork.

Figure 26: Level of Awareness about Water Resources Protection of Respondents during Survey.

Survey Question: How far they obey the rules concerned with water?)



Source: Household survey by the author, 2013-14.

During the visits NFC was found to have clean roads and no wastewater flowing openly on the streets. This suggests there is less fear of waterborne diseases and the spread of mosquitoes especially in post-monsoon season, which has been a big issue in Delhi (Kumar et al. 2015).

Figure 26 suggests that the percentage of people in Dwarka slum who do not throw waste in water bodies is also lower than in other areas like NFC and Nangloi Jat. This may be due to the fact that the most of the residents are rag pickers in these slum areas. They collect solid waste and sell it to recycling retailers.¹¹³

¹¹³ Divya Trivedi, 'Own up your waste managers'. The Hindu. Published 22 December 2012. Accessed 2 April 2016. Available online at <http://www.thehindu.com/todays-paper/tp-miscellaneous/own-up-your-waste-managers/article4227776.ece>.

8.8. Management Capacity of Government

After Independence, some of the major issues discussed among Indian leaders were inequality and the caste system. Starting in 1951 and for every succeeding 5 years a new five-year plan was launched by the Indian government. One of the major objectives of all of these five year plans has been economic growth through urban development. Various urban development policies and programmes have been executed under the five years plans. Other goals have included a reduction in urban poverty, an increase in urban land so that more and more urban population can be accommodated in legal colonies rather than unauthorized areas, the delivery of basic public services, and especially water, sanitation and electricity (Tripathi 2013).

The action plans suggest the government has a vision and has designed policies in favour of marginalized groups of society and aimed at their empowerment. In this sense, India is far ahead of the International Legal Framework, which talks about equal human rights. The right of equality and freedom has been recognized since the 1990s. Yet, on the ground, these policies are not comprehensively implemented¹¹⁴ Kuznets (1955), Jin (2007) and ZHU et al. (2007) argue that in the process of increasing economic growth the level of urban poverty will be reduced but urban inequality will be widened. In Delhi there are higher level of inequality than in rural areas of the country. One of the reasons for this is the low scope of opportunities for unskilled workers and the ineffectiveness of redistribution and reservation policies designed by the government. For example reservation policy in India is completely in favor of low caste people but not in the favor of low class and poor people. At this time, it is not possible for the Indian government to withdraw its reservation policy completely so instead amendments are constituted.¹¹⁵

In order to deal with the corruption in the country, different strategies have been adopted for different sectors. Corruption is found in almost all sectors in India. It occurs through multiple channels and leave many adverse effects. India has a well-developed legal and institutional framework to deal with corruption (Table 30).

¹¹⁴ Information obtained from an employee of a Resaerch Centre in Delhi on 18th August 2014.

¹¹⁵ Information obtained from an employee of a non-profit independent institute in Delhi on 8th August 2014.

Table 30: Different Channels to Fight Corruption in India		
Legal Framework	Institutional Framework	Civil Society
1988 Prevention of Corruption Act criminalises corruption in public and private sectors.	Supreme Court	Transparency International India
2002 Prevention of Money Laundering Act.	The Central Vigilance Commission (CVC)	The Centre for Media Studies (CMS)
2005 Right to Information (RTI) Act	The Central Bureau of Investigation (CBI)	Parivartan
Public Interest Disclosure Resolution (PIDR) to protect whistle-blowers.	The Office of the Comptroller and Auditor General (CAG)	
In terms of International norms; ADB-OECD Anti-Corruption Action Plan in 2001, UN Convention against Corruption (UNCAC) and the UN Convention against Transnational Organised Crime.	The Chief Information Commission (CIC)	
	E-Governance	

Source: (Chene 2009).

Yet, while the government has established various legal and institutional frameworks to curb corruption on the ground, implementation has proven problematic. These frameworks are useful for detecting corruption but many more efforts are needed to enforce these laws strongly and in order to eradicate corruption effectively.

Conclusion

Exploring historical events and the old and ancient traditions of India reveals that the water and associated problems of Delhi are embedded in the status of residents and their social profile. It is these factors which largely decides the degree of access to different people to have water. As a result of Indian culture and traditions, it is hard for people of higher classes to accept those who come from lower classes or of a lower social or economic status. Differences in economic status affects mobility in society. The

ancient caste system is a real enemy of various social problems. On the surface, it might seem that a modern and educated society in Delhi would not prominently experience such problems, but one only needs to scratch below the surface to understand these social problems.

The status of being an authorized and legal settlement colony plays an important role in terms of access to water because the rest of the factors like eligibility to have an official water connection depends upon the factor of legal status. In a city like Delhi, which receives large numbers of migrants every day and experiences shortages in housing and other public services, it is essential to establish plans to accommodate this informal population as well. City planners, decisions makers and policy makers need to meet the basic service needs of incoming migrants. The city in turn will benefit from the cheap labour force they provide.

Corruption endangers rule of law and adversely affects various sectors both public and private such as economy, health sector and education at various dimensions and scales. As people need water on a daily basis, the consequences of corruption are extreme even though corruption is used to make life move on and provide water to those who are not receiving it in a legal way. The social norms and cultural values of Indian society have had a great influence on the emergence of corruption in today's life. Corruption is one of the biggest reasons for the ineffective performance of water governance in Delhi. It is linked to the weak transparency of the government system and non-availability of information about functionality of water authorities, the lack of accountability of water authorities to answer on various water issues to the citizens and the lack of participation of all stakeholders in decision making process.

Corruption in the water sector in Delhi occurs at all stages, from procurement procedures to service delivery; it happens in a very non-transparent environment that makes it hard to detect its existence and degree. Only its consequences can be observed. Corruption has affected households in different ways in Delhi as seen in the surveyed colonies. The degree of corruption appears to be dependent upon households' economic status and also on their level of awareness of the issues of class and its connection with water distribution and also their awareness in relation with their rights. There have

been direct and indirect and visible and invisible effects of corruption on each household. Detection of the effects is linked to people's understanding about the connection of the problems they are experiencing to the corruption.

9. Major Findings, Recommendations and Future Research Investigations

The megacity Delhi suffers from inequality and corruption in the water management sector. These problems are linked to cultural and religious values and norms. The poorest in the population must live with the risks associated with inadequate water supply and corruption, which adversely affect their social surroundings, health and financial security. Age old cultures and societal patterns have negatively impacted urban services. Societal hierarchies can be seen in the form of different economic status. Those with a lower status are less likely to be connected to the city's public water infrastructure.

This chapter concludes the present research and makes some broad recommendations based on its findings. Since each individual chapter has its own concluding remarks, here the goal is to answer the research question asked at the beginning of this dissertation and drawing out the most important findings of the study. The chapter gives information related to the new policy turn and rise of the new government in Delhi and discusses the benefits of the changes it has introduced. Some of the challenges which might come as a hurdle in the working of this new government are also pointed out. The chapter discusses the most possible solutions to improve the water supply situation, and points out the scope and limitations of the research project. It further discusses the theoretical contributions of the research and suggests possible areas for future research.

9.1. Central Argument

Delhi is the capital of the world's largest democracy, India and a growing economy. India's economy has grown 7.4 per cent on a year basis in the third quarter of 2015. It is projected that the Indian economy will grow even faster than China in the next two years (Bryson 2015). In India over 55% of this growth in GDP is contributed to its cities; cities make an important contribution to the country's overall growth (Dudhwala 2012: 1). The growing economy, however, means the urban population is also growing tremendously and this is bringing with it several challenges; this is the case of Delhi.

Being the capital for many, Delhi promises employment, higher education and health facilities. But the city has trouble in providing basic necessities, especially water to all of its citizens.

A large-scale migration into Delhi started after independence in 1947, triggered by the development of industrial and commercial activities (Saigal et al 1994). According to the International Organization for Migration (IOM), migrants are not a burden but drivers of the growing economy of cities (International Organization for Migration 2015). Delhi has grown like other cities such as New York and Tokyo in terms of its population, urbanization, and changing life styles. What is different in Delhi is that this urbanization has led to a large economic gap between different classes. The city has two faces: one group enjoys the city's luxuries and the other struggles to get basic services. Delhi is a city of imbalances in terms of economic and social status and in terms of resource distribution and livelihood opportunities due to economic development and rapid migration (Kumar 2013). One of the major challenges, which Delhi has is in providing adequate levels of water to the entire city. Delhi today has a highly non-uniform water distribution pattern. There are several factors responsible for the water problems in the city, such as growing population, pollution, the changing life style of citizens and the high demand for water in industrial and domestic sectors.

There is much politics tied to the water sector (Truelove 2011); the politics is connected with migrants who come from different states and belong to different cultures and castes and settle in the city (Kumar 2013). Indian societal patterns are heavily influenced by culture and religion (Misra 2009; Coomaraswamy 1983; Freitas 2006). The ancient caste system is today linked to class identity and continues to have a great importance over relationships (Robson and Kjørstad 2001). Use of personal contacts and relations on the basis of caste and religion influence business transactions. To have access to services based on caste and religion has become business as usual and this results in corruption. Those in Delhi who do not have access to legal water connections, have had to turn to contacts or corruption as the only route to get water.

The central argument of the dissertation is that the informal institutions of the ancient caste system and corruption have become institutionalized because of the strong

effects of path-dependencies and the weakness of formal institutions. The study has focused on the divisions in society produced by the caste system and the hatred and discrimination which it generates against lower caste people. The exclusion of lower caste people by the so-called upper castes produces exploitative institutions and appropriation of resources differently among different groups. Corruption is rampant in society.

9.2. Limitations of the Study

The present study analyses water governance performance through the lens of corruption and the caste system but also considers the environmental and sustainability implications of Delhi's problematic water situation. It also suggests a major part of the problem lies in social exclusion. The study identifies areas where effective action is needed to alleviate these problems. It provides insights into how participation of excluded stakeholders can be rectified so the poor also can have a voice in decision-making. It also considers the role of social capital in enhancing social inclusion and in raising awareness about rights and hazards related with water non-availability.

One of the limitations in analyzing corruption is its nature as an illegal activity. This makes it difficult to openly observe. It is difficult to obtain facts about corruption from the type of analysis which was conducted and the questions which were asked during the survey. Certainly, some forms of corruption were not detected because of its hidden characteristic. Due to the link between corruption and cultural values it is also sometimes difficult to decide if an action is perceived as corrupt or not.

Another difficulty is that while the existence of corruption is common knowledge, nobody wants to give information about it or its influences. It is hard to talk about corruption during an interview. It is not only the non-transparent environment of corruption which is found as a barrier in the study but that mostly people do not complain about it.

To analyze inequality, areas were selected for the survey which included both legal and illegal settlements and individuals of different economic status. Although the economic status was not completely the same within a colony, generalizations were made

based on the dominant group as also those who were of somewhat higher status still had to bear with the situation of those of lower status. During the survey it was also difficult to make it in the daytime because in the daytime a male person is not present at home and female person is not open to talk in some areas especially in Muslim colonies.

There is little specific literature related to the link between caste system and water governance performance. The uniqueness of the Indian caste system is well known, but its impacts on water are not well studied and not well known by the Indian people. The low level of awareness among citizens was found to be one of the biggest barriers to getting useful information for analysis. Despite the many relevant issues respondents were not really informed about them or appeared not to care about them. As an example, respondents did not seem interested in participating in the meetings to raise their voices and make demands. The reason seems to be that in their opinion taking care of problems is the job of government.

9.3. Revisiting the Research Question

The study set out to explore urban water management problems in Delhi and to identify the major causes for its poor water governance performance. The city has been unable to supply water to all. The study sought to answer the research questions:

**Why has water governance in Delhi not been effective in providing
basic water services to the inhabitants of Delhi?**

In order to answer these questions, this dissertation turned to historical institutionalism and path-dependency to explain the influence of the caste system and corruption (independent variables) on water governance performance.

9.4. Discussion of the Major Empirical Findings

The findings of the research, which are based on empirical study support the theoretical aspects described by theories stemming from historical institutionalism and path dependence. In Delhi, path breaking strategies have been called for and some have

already been applied by the Aam Aadmi Party (AAP). The AAP appears to realize that Delhi's water problems are not simply a natural water crisis but rather are linked to various factors, including:

9.4.1. Crisis of Governance

One of the very first findings of the study is that the **water crisis in Delhi is a crisis of governance**. For decades, Delhi's government has not been able to provide adequate amounts of water to all the citizens of the city, to manage the wastewater of the city or to control surface/ground water pollution (Aarshi 2013; Narain and Pandey 2012; Agarwal and Krause 2013; Singh 2006).

Delhi's water problems were made worse by:

1. Pollution of major water resources.
2. Management of wastewater in Delhi.
3. Exploitation of groundwater.
4. Haphazard Urban Planning.

Chapter 6 showed that there is enough water in Delhi to fulfill daily needs of the population; this is a crisis created artificially by powerful and influential authorities and decision makers. Most of the people interviewed and surveyed agreed on this point and blamed the government for their water problems. Chapter 8 confirmed that the level of awareness of the people especially in low lying and problem areas is very low. People do not fully understand related laws and also do not know their rights and the duties of responsible authorities to supply them with adequate water.

9.4.2. Significant Political linkages: A Historical Overview

In this study the influence of the caste system on Indian society was emphasized and observed in relation to the water distribution in Delhi. Over the course of several decades several things have changed; the population has grown, there has been urbanization, the economic status of many people has improved and their life styles have become more consumption oriented. What has not changed are the mindsets of many people, which are still strongly influenced by old traditions and culture. The caste system

and other religious and cultural values are the most important and identified obstacles to good water management (Siddaramu 2013). These factors have a very strong character of path-dependence. Chapter 5 emphasized the relationship between water, society and politics in India. The issue of inequality in water distribution is not new. There continues to be a strong historical influence of the caste system under which lower caste people typically have no access to the city's public water infrastructure; this attitude is associated with the beliefs of society that the lower castes are polluted (Grinsell 2010).

The study found that despite various formal institutions designed to manage water, politicians, authorities and the common people actively depend on traditional informal institutions and continue to believe in traditional norms. These patterns were analyzed in chapter 8 which discussed the factors influencing Delhi's uneven distribution of water. The least amount of water is supplied to areas where poor people are living. To battle such problems, the National Water Policy and several other laws and concepts, such as the polluter pay principle and the Right to Information Act were introduced. But the goals of these laws and policies have yet to be fulfilled because of deeply entrenched norms and behaviours.

9.4.3. Lack of Political Will

Delhi has suffered from a high lack of political will to address the problems in the management of its water sector or to find a more efficient approach. The water sector is governed and managed by politicians (Truelove 2011). Political stability is the foundation of political will; India is a multi-party democratic country where political stability is not easy to achieve (Suri 2005). In terms of water in India there is no lack in qualified professionals who could work on development good policies, but there has been a lack of political will and ambivalence towards the public interest.

9.4.4. Influence of Caste System on Participation

The social structure of Delhi in the form of caste/class does not promote people from different classes and religions to come together to achieve social equity. The actors are neither homogenous in composition nor harmonious (Kumar 2013; Government of

NCT of Delhi 2012; Govt. of National Capital Territory of Delhi and Institute of Human Development 2013; Singh et al. 2009). The study in chapter 8 has demonstrated the role played by power and relations for obtaining access to services. The study has argued that the participation of stakeholders in the process of decision-making in Delhi's water management was shaped by social capital, networking and power positions and was only heard in the time of elections. The findings confirm that the formal participatory process was highly influenced by the caste system and the concept of class in Delhi, which is very closely related with the power to raise voice. The ones who are at the margin are highly neglected and have no 'say'. Lack of participation of stakeholders makes the process less informative and introduces more chances for corruption. This was demonstrated in chapter 8. The lowest level of community participation was from the areas where the economically weakest sections of society are living. The caste system, which leads to differentiation in society, still plays a key role even in today's modern times.

9.4.5. Influence of Institutional Complexity on Transparency and Accountability

Delhi has a complex governmental institutional structure. There are a large number of public and private institutional actors and there is a lack of coordination due to fragmentation among them. Fragmentation among various authorities is influenced by the caste system/caste politics of the city. For example, there are various authorities involved in the development and maintenance of water supply in the city, namely, DDA (Delhi Development Authority), DJB (Delhi Jal Board), MCD (Municipal Corporation of Delhi), DCB (Delhi Cantonment Board) and NDMC (New Delhi Municipal Corporation). The conflicting priorities of these different authorities and the lack of coordination among them affects the delivery of services in the city (Agarwal 2011). This is a big hurdle for promoting transparency in the system (Singh and Shukla 2005). The strength and power of government bodies which have been created through parliamentary acts, such as the DDA, MCD and National Capital Region Planning Board (NCPRB) make horizontal and vertical linkages difficult, confusing and conflicting. One body is responsible for several functions and performs several different duties; this makes the decision making process complicated rather than informative (Singh and Shukla 2005: 31). The complexity in

responsibilities of government departments makes the accountability process difficult for the commoners to complain about certain persistent problems.

9.5. Recommendations: Social Movements

One of the most emphasized elements of the explanation provided in this study for the persistence of corruption in Delhi's urban water supply is the institutional system that underpins the performance of water governance and hence the lower class/caste people suffer. For this discrimination the ancient caste system is responsible and needs to be abolished. This implies rooting out the conceptualization of class/caste system from the Indian society should be taken into consideration. Therefore, social movements demanding equality are recommended as one of the possible solutions in Delhi. Charles Tilly says that social movements are the series of contentious performances, displays and campaigns by which ordinary people make collective claims and participate in public politics (Tilly 2004). The role of social movements can be served as a basis for effective action which can be helpful in dealing with the enforcement of the equity laws which are recognized by the Indian Constitution and political changes. In several cases in India it has been witnessed that immensely powerful social movements had occurred and made a great impact to change the situation for which the movement had been initiated; the list covers a wide range of women's rights, student's rights, tribal and Dalit uprising and even middle class movements (Goswami and Bandyopadhyay 2013).

Among many, women's movements are remarkable because of women's oppression in relation to men both in personal and public life in the Indian society and exclusion of women from formal education. Women's movement in India has a long history and the records showed that the norms had been challenged by some 'exceptional' but common women (Desouza 2011). As a result of those movements initiated by women's group, in contemporary times there are several organizations working for women's rights in the country but with different challenges such as sexual harassment at the work place. The 73rd and the 74th Amendments to the Constitutions are some of the examples of the legislations that have transformed the lives of Indian women when they had been provided 33 per cent reservation seats in urban and rural local bodies (Desouza

2011). They also had been provided with the opportunities to take part in formal decision making and governance. As an outcome of the movements, women's position in Indian society has changed where a wider recognition to women's rights towards education, gender equality and discrimination has given and also the socio-political environment in the country is affected by those movements (Desouza 2011).

Recently, in February 2016, Jat community in Haryana protested for their inclusion in the backward class community and demanded reservation in government jobs and educational institutions. The protest lasted for 10 days where rail and road traffic was disrupted and water supply of Delhi was also disturbed. As a result of the protest, the state government appointed a committee to look into protester's demands and examine the issue in detail.¹¹⁶

9.5.1. Influence of Social Movements on Indian Democracy

Along with the crisis of regular elections and governmental changes alongside allegations of election rigging, caste and communal politics and violence and conflict, Indian democracy was also holding the challenge of not having well-informed citizens and transparency of information which are vital to its functioning until the Right to Information (RTI) Act came into force in 2005 (Sengupta 2010; T.B., Sharma and Cheriyan 2010). RTI is taken as one of the highly successful example carried out by the social movements in rural India. The movement was emerged to pressurize the state to become more transparent, accountable and responsive towards the needs of poor and marginalized (Sharma 2015). The movement was started by mostly poor wage workers in Rajasthan¹¹⁷ against rampant corruption in the system and later the movement spread to other parts of Rajasthan to lead it as a nationwide movement for RTI. One of the reasons behind the success of this campaign is its innovative focus and the techniques used such as public hearing and social auditing which worked as a signal of transformation in political culture (Dreze and Sen 2002). As a result of the movement states took the initiative by enacting RTI (T.B., Sharma and Cheriyan 2010). This has not, of course, led

¹¹⁶ The Hindu, 'Jats intensify stir for reservation, Haryana CM invites them for talks'. Published on 17th February 2016. <http://www.thehindu.com/news/national/other-states/jats-intensify-stir-for-reservation-haryana-cm-invites-them-for-talks/article8246092.ece>. Accessed 8th September 2016.

¹¹⁷ Rajasthan is one of the states on the north-western side of India.

to the sudden eradication of corruption but at least the issue is on political agenda and there is some scope for securing practical results to bring it into implementation (Dreze and Sen 2002). On the whole from the movements initiated by people, it is seen that notions of development brought forth the accountability in the functioning of government bodies (Goswami and Bandyopadhyay 2013).

9.5.2. Anti-Corruption Movement and Rise of the AAP

The Aam Aadmi Party (translation: Common Man Party; abbreviated as AAP) is an Indian political party which was formally launched on 26th November 2012. The party was formed by Anna Hazare in 2011 out of the India Against Corruption (IAC) movement. The AAP is a one-man party run by Mr. Arvind Kejriwal, which was started with public donations. The founders of the IAC movement were not interested in politicizing the movement but Arvind Kejriwal one of the party members, felt that to change the system it would be important to enter politics. He argued that the movement alone would not realize its main objectives. Thus the party emerged in 2012 with a broom as their election symbol. On December 28, 2013 Kejriwal was elected as Delhi's chief minister, winning 28 of 70 seats. But after remaining in power for only 49 days, Kejriwal resigned from his position because the government failed to introduce the Jan Lokpal Bill, a strong anti-corruption bill into the Delhi Assembly.¹¹⁸ Kejriwal ran again in the Delhi Assembly elections of 2015, this time winning 67 of 70 seats, a political tsunami. During the election campaign important promises were made by the party regarding equality and justice. The party turned to the Indian Constitution and argued that previous parties in power had failed to implement the fundamental rights of the citizens guaranteed by the Constitution (Dhillon and Vohra 2014; Kumar 2014).

The AAP is the result of the anti-corruption movement in India headed by Anna Hazare and other civil society actors. The major objective of the movement was not only against high-level corruption but also against the moral humiliation that the citizens experience daily when they have to pay bribe to get the services. The agitation demanded

¹¹⁸ Mohammad Ali, Vishal Kant and Sowmiya Ashok, The Hindu, Arvind Kerival quits over Jan Lokpal, Published on 15th February 2014. <http://www.thehindu.com/news/cities/Delhi/arvind-kejriwal-quits-over-jan-lokpal/article5688528.ece>. Accessed 21 January 2016.

for a legislation for immediate punishment of government officials involved in financial fraud (Goswami and Bandyopadhyay 2013). They demanded for *jan lokpal bill* to come into effect with no dependence on government. The campaign was supported by some spiritual leaders and other celebrities through social media networks. Even BJP and communist party also came out in their support. The role played by some organized NGOs in providing basic resources for organizing campaigns is also noticeable in the entire anti-corruption movement. The anti-corruption movement was also fueled by the media and has gathered strength because of the boom in both electronic and print media (Goswami and Bandyopadhyay 2013). One one hand where the anti-corruption movement was able to gather the support from various directions, on the other hand it showed its ability to make a disconnect from other movements around issues of environment, peace and security, rights and displacement of marginalized communities. One of the biggest success of the movement was that it was able to attract the common masses irrespective of their socio-economic status; the reason was that corruption has affected the people in India from all levels of society (Goswami and Bandyopadhyay 2013). And this is one of the main reasons that the AAP came into power in Delhi.

9.5.3. The AAP and Delhi's Water Policy Change

The AAP argued that like air, water is a basic requirement for human survival. The AAP stated that the provision of clean water is a fundamental duty of any government (Delhi Dialogue 2015). On the basis of the water management situation in Delhi, the AAP promised in its 2015 manifesto to:

- ensure 20 kilolitres of water per month to every household in Delhi without any fee.
- provide each household in Delhi with a metered connection 700 litres of water every day and 20 kilolitres of water per month. This 'lifeline' water is equal to the amount of water needed for the survival of humans with dignity as defined by the

United Nations.¹¹⁹ In areas without access to the pipeline network, tankers will supply water.

- connect the entire population in Delhi with piped water supply and to the sewage network irrespective of their legal status; work without discrimination between planned/unplanned, authorized/unauthorized.
- upgrade the water infrastructure to reduce water losses.

(Delhi Dialogue 2015)

Benefits of the Scheme as Argued by the AAP:

The AAP argued that their water scheme had manifold benefits. Under their scheme, consumers will get up to 20 kilolitres of water free of cost.¹²⁰ Those who consume more than 20 kilolitres per month will have to pay for the entire volume of water they use. This scheme is intended to promote water conservation; it should help people to be more conscious about their water use, cut their consumption, and thereby cut their water bills. The scheme should also facilitate the supply of water to water stressed areas because of the party's equal water distribution plan. The population will be encouraged to make use of water meters. Another important benefit of the scheme is equal water distribution to all citizens and the recognition of water provision as a human right. The scheme is anti-discriminatory (Delhi Dialogue 2015). Actions are to be taken to secure the sustainability of present water resources (surface and groundwater) in Delhi. This is to be done by promoting rain water harvesting and preventing wastewater going into the Yamuna River. The AAP claims it will follow a fair and transparent water pricing scheme under which everyone in Delhi will be able to pay for water.

As all parties due in elections, the AAP made many promises during its election campaigns. What appears different from the case with earlier parties is that since being

¹¹⁹ AAP has used the guidelines provided by United Nations in terms of water consumption per capita per day.

Source: United Nations. International Decade for Action `WATER FOR LIFE` 2005-2015. Accessed 11 January 2016. http://www.un.org/waterforlifedecade/human_right_to_water.shtml.

¹²⁰ It was investigated by the author through interviews still there are areas in Delhi having water shortages or people are really paying more for their water bills. In some areas such as Okhla in the South Delhi, still pipelines are broken and water supply is interrupted.

elected, the AAP has taken steps to start to implement the promises it made. The goals set by the AAP are ambitious and will need deep rooted changes, which will need a long time to be realized.

The AAP is taking steps to deal with the city's water problems, but the water problems in Delhi are not just 'water problems'. They are problems linked to inequality, lack of equal rights, corruption, the feculent political culture of the country, and the paralyzed behaviour of Indians who fail to stand up against corruption and injustice. The AAP will have to face up to several challenges to their remaining in power if they really want to make India corruption free. One of the challenges for the AAP is to find an economic model which not only provides clean government to its people but also creates a respectable standard of living where at least basic necessities are provided. Kumar (2014) argues that "good economics is bad politics" (Kumar 2014: 154); delivering economic growth for the country will be a real and long term challenge for the AAP.

The situation under the AAP appears to be getting better but it is too premature to judge the performance of the new government as it pertains to water governance. It is beyond the scope of this dissertation to explain how effective the party's new approach will be or to study its actual implementation as not much time has passed. But if the AAP is really looking for a sustainable solution to Delhi's water problems, the root causes of the problem must be understood. This dissertation has examined water governance and how it has contributed to the persistent water problems facing many groups in Delhi.

The new policy developments under the AAP are promising and suggest the party is serious about addressing water inequality. Some opposition parties and other experts in the field of water management have expressed their opinions that AAP is encouraging water theft in the city with its promise to provide 20 kilolitres of water per month free of costs.¹²¹ Such a practice would work against efforts to promote conservation of water and could constitute a new form of corruption.

¹²¹ NDTV, Aam Aadmi Party 'Encouraging Theft' by Promising Freebies: Sheila Dikshit, Published on 20th February 2015. <http://www.ndtv.com/india-news/aap-encouraging-theft-by-promising-freebies-like-free-water-sheila-dikshit-740910>. Accessed 21 January 2016.

9.6. Theoretical Contributions

This study has created a basis for a future reflection how to develop theoretical instruments in the sense of research about the solution of a realistic problem. This research had made a significant contribution to research on informal institutions examined by Historical Institutionalism and path dependence by showing their importance in the study of urban water governance and the politics around it. A significant contribution to theory of the study is made in three main areas. First, this study examined the role of informal institutions on the performance of urban water governance rather than technology failure. Traditionally the water sector has been considered a sector where technology is a decisive factor and the water industry is prepared for technological innovations to overcome water crisis (United Nations Framework Convention on Climate Change 2014). This study made it apparent that institutions play a major role in order to have effective water governance and the solution of Delhi's water problem lies in its institutions and not in technology based solutions.

Second, the dissertation applied ages old concepts of the caste system as informal institutions to a city where the population is educated and modern (Government of NCT of Delhi 2012); they follow less religious and cultural values than ancestors. The current dissertation further extends the understanding of social differences and highlights their importance to have access to water.

Third theoretical contribution of the dissertation involves enhancement of understanding on the relationship of corruption and class structure that is the caste system and its interaction with non-uniform water distribution in Delhi. Inequality in the water distribution which is conceptualized by nature, in this study is redefined by examining the social differences among communities. According to Eric M. Uslaner (2008) "Economic inequality provides a fertile breeding ground for corruption – and in turn, it leads to further inequalities" (p. 28) and corruption tends to enlarge already existing inequalities by facilitating unequal distribution of wealth and asset ownership (You and Khagram 2005). This research extends the understanding on the relationship of corruption and inequality when economically disadvantaged group in Delhi was paying more for water than the upper class.

9.7 Research Issues to be Investigated in the Future

This doctoral research has focused on the weaknesses of the urban water governance in Delhi which demands reforming processes and policy change to overcome with the associated water problems of the city. These reforms are not only needed in the water sector but also pointing out the issues of discrimination and clean government functionalities. Social movements have already made a vital contribution since historical times in the country but was not analysed in detail, therefore, the role of social movements “process framing” should be considered for future analyses (Benford and Snow 2000). Several movements had emerged already in the past against inequality and discrimination related to the caste/class system but it still persists which shows failure of those movements. Further research can be conducted on the factors that are important for the development of social movement in the country so that the future movements can be organized by learning from the findings. Delhi was experiencing its water problem from decades and in this issues several times people protested and demanded for water supply.¹²² Delhi’s water is not related with water shortage or any other problem associated with water sector. Therefore, it is recommended to look for “diagnostic framing” for future research where problem identification and attribution are conducted (Benford and Snow 2000).

Leadership plays a critical role in proceeding and shaping movements in numerous ways. “They mobilize followers, galvanize indigenous organizations and forge coalitions. They influence responses to external repression, and their action, rhetoric, and style affect conflict outcomes” (Nepstad and Bob 2006: 1). A leader plays a crucial role in mobilizing community and challenging prevailing social norms and institutional structures. Despite of the significance of leadership it has not been studied well among collective action researchers. Delhi is a city of divided society which belongs to various castes and classes; in that case social movement leaders may face the challenges of collecting community support. The further research can be conducted on characteristics

¹²² The Tribune, online edition, `protests for water turns violent`. Pulished on 7th July 2010. <http://www.tribuneindia.com/2010/20100707/delhi.htm>. Accessed 11 September 2016.

of social movement leader needed for the development of innovative strategies for campaigning to gather mass support.

“The relationship between social movements and major political parties is an uneasy one. Social movements challenge established centres of power and major parties embody them” (Green, Rozell and Wilcox 2001: 413). It is necessary for the social movements to interact with political parties in order to gain access to the institutional environment because political parties are the first and fundamental barrier that may reject the social movement demands (Bolger 2016). Therefore, the analysis of this relationship is emphasized that how social movements impact the political parties and under what conditions this impact occurs? In case of Delhi the research can be extended to recognize what is common between social movements and political parties and what differentiates them.

Finally, this thesis shows that political will matters. Some legislatives and their implementation problems had already been mentioned in the thesis and identified as the result of low degree of political will from the ruling elites such as right to water reforms and anti-corruption framework implementation. Scholars should design studies that allow them to analyse the strategies needed to build political will. The decisions taken by the AAP in order to resolve the issues of water in Delhi is a perceivable case of high political will. Political will in order to improve Delhi’s water situation is affected by power relations which is mentioned in the study, further analysis of this aspect would be a valuable contribution to this study where the drivers of political will are studied in depth such as political interests and benefits which can be derived from supporting anti-corruption reforms (Kukutschka 2014).

In summation, this dissertation is one of the first attempts to study in depth the relationship of informal institutions and urban water sector. Even though it is a single case study analysis but the findings are likely to be relevant for other fast growing Asian cities that are experiencing similar challenges in their water governance.

Publications

- Aarshi, Asmita (2013): "Community Ownership of Yamuna. An effective solution to its problems." Centre for Civil Society (CCS Working Paper No. 285). Available online at https://ccsinternship.files.wordpress.com/2013/05/285_community-ownership-of-yamuna_asmita-aarshi.pdf. Accessed 13 March 2016.
- Aarshi, Asmita (2013): "Privatizing Sewage Treatment in Delhi." Centre for Civil Society (CCS Working Paper No. 292). Available online at https://ccsinternship.files.wordpress.com/2013/05/292_privatizing-sewage-treatment-systems-in-delhi_asmita-aarshi.pdf. Accessed 9 March 2016.
- Abbas, Hoveyda; Kumar, Ranjay and Alam, Mohammed Aftab (2011): *Indian government and politics*. New Delhi: Dorling Kindersly.
- Abdulraheem A (2009): `Corruption in India: An Overview (Causes, Consequences and Remedial Measures)`. *Social Action* Vol.59, No. 4, pp. 351-363.
- Abidi, Azra and Abbas, Shariq (2011): `Educational Marginalization of Muslim in A Metropolitan. A Sociological Study of Jamia Nagar Government Schools, New Delhi`. *Social Science Journal* Vol. 4, No. 1.
- Acharya, Avidit; Roemer, John E. and Somanathan, Rohini (2015): *Caste, Corruption and Political Competition in India*. University of Delhi, Stanford University, Yale University. Available online at <http://stanford.edu/~avidit/caste.pdf>. Accessed 6 March 2016.
- Adams, John; Chartier, Yves; Harvey, Ben and Maison, Dominique (2012): "Water, Sanitation and Hygiene (WASH) in health-healthcare facilities in emergencies." World Health Organization. Available online at http://www.washclustermali.org/sites/default/files/wash_in_health_facilities_in_emergencies_who.pdf. Accessed 13 March 2016.
- Addae-Korankye, Alex (2014): `Causes of Poverty in Africa: A Review of Literature`. *American International Journal of Social Science* Vol.3, No. 7.
- African Development Bank (2008): *AfDB Study on Water Sector Governance: Draft Final Report*. African Development Bank and Cowater International Inc. Available online at <https://capacity4dev.ec.europa.eu>. Accessed 19 September 2014.
- Afroz, Ahmad (1988): `Environmental Impact Assessment of the Gandak Canal Irrigation project and guidelines for its management`. *International Journal of Environmental Studies* Vol 32, pp. 137-149.
- Agarwal, Trisha and Panda, Gyana Ranjan (2013): `Public Provisioning in Water and Sanitation. Study of Urban Slums in Delhi`. *Economic and Political Weekly* Vol. 5.
- Agarwal, Ravi and Krause, Till (2013): *Yamuna Manifesto*. New Delhi: Goethe Institute and Toxics Link.

- Agrawal, K. C. (2013): *India in shambles. Only the judiciary can save us*. Mumbai: BecomeShakespeare.com.
- Agarwal, K. P. (2011): *Delhi A Role Model of Urban India*. India: Educreation Publishing.
- Ahmad, Sohail and Choi, Mack Joong (2011): 'The Context of Uncontrolled Urban Settlements in Delhi'. *ASIEN* Vol. 118, pp. 75-90.
- Ahmed, Mughees and Naseem, Fozia (2011): 'Social System Influences Political System. A Comparative Study of Sub-Continent'. *Berkeley Journal of Social Sciences* Vol. 1, No. 1.
- Aluko M A O (2002): 'The Institutionalization of Corruption and Its Impact on Political Culture and Behaviour in Nigeria'. *Ordic Journal of African Studies* Vol.11, No. 3, pp. 393-402.
- Ananda, Jayanath; Crase, Lin and Pagan, P.G (2006): 'A Preliminary Assessment of Water Institutions in India. An Institutional Design Perspective'. *The Policy Studies Organizations* Vol. 23, No. 4.
- Andvig, Jens Chr; Fjeldstad, Odd-Helge; Amundsen, Inge; Sissener, Tone and Sereide, Tina (2001): "Corruption A Review of Contemporary Research." CHR. Michelsen Institute. Available online at <http://bora.cmi.no/dspace/bitstream/10202/225/1/R%202001%207.pdf>. Accessed 14 March 2016.
- Appadurai, Arjun (1986): 'Is Homo Hierarchicus'? *American Ethnologists* Vol.13, No. 4, pp. 745-761.
- Arnstein, R. Sherry (1969): 'A Ladder of Citizen Participation'. *American Institute of Planners* Vol. 35, No. 4, pp. 216-224.
- Arora, Manish (2011): *Universal's guide to ll.b. entrance examination 2011-12. 21st edition*: Universal Law Publishing.
- Aruna Venkat (2011): *Environmental law and policy*. New Delhi: PHI Learning.
- Asian Development Bank (1998): *Anti-Corruption. Our Framework Policies and Strategies*. <http://www.adb.org/documents/anticorruption-policy>.
- Asian Development Bank Factsheet (2011): "Discrimination and the Anti-Discrimination Board of New South Wales". Available online at <http://www.antidiscrimination.justice.nsw.gov.au/Documents/discrimination-and-the-anti-discrimination-board-of-nsw-factsheet.pdf>. Accessed 25 June 2014.
- Asthana, Vandana (2009): *Water policy processes in India. Discourses of power and resistance*. London, New York: Routledge (Routledge contemporary South Asia series, 18).
- Asthana, Vandana and Shukla, A. C. (2014): *Water security in India. Hope, despair, and the challenges of human development*. New York: Bloomsbury Academic.
- Aureli, A. (2004): *Women and water. An ethical issue*. Paris: UNESCO (Series on water and ethics, essay 4).

- Australia India Institute and The Nossal Institute for Global Health (2011): "Asha. Hope and Transformation in the Slums of Delhi." Australia India Institute and The Nossal Institute for Global Health. Available online at http://asha-india.org/wp-content/uploads/2014/04/Asha_Hope_and_Transformation_in_the_slums_of_Delhi.pdf. Accessed 9 October 2015.
- Awoniyi, Sunday (2015): 'African Cultural Values. The Past, Present and Future'. *Journal of Sustainable Development in Africa* Vol. 17, No. 1.
- Aziz, Hamidi Abdul; Feng, Chae Tyng and Bashir, Mohammed J.K (2013): 'Advanced Treatment of Landfill Leachate Effluent Using Membrane Filtration'. *International Journal of Scientific Research in Environmental Sciences* Vol.1, No. 3, pp. 36-43.
- B Siddaramu (2013): 'The Consciousness of Caste in the Contemporary Indian Society'. *International Journal of Research in Humanities, Arts and Literature (IJRHAL)* Vol.1, No. 1, pp. 1-4.
- Bailey, F. G. (1957): *Caste and the Economic Frontier. A Village in Highland Orissa*. Manchester: Manchester University Press.
- Bakker, Karen; Kooy, Michelle; Shofiani, Nur Endah and Martijn, Ernst Jan (2006): "Human Development Report 2006. Disconnected: Poverty, Water Supply and Development in Jakarta, Indonesia." United Nations Development Program. Available online at http://hdr.undp.org/sites/default/files/bakker_et_all.pdf. Accessed 14 March 2016.
- Banerjee, Abhijit; Bhardawaj, Anjali; Pande, Rohini and Walton, Michael (2012): "Delhi's Slum Dwellers. Deprivation, Preferences and Political Engagement Among the Urban Poor." International Growth Centre. Available online at <http://www.theigc.org/wp-content/uploads/2015/07/Banerjee-Et-Al-2012-2-Policy-Brief.pdf>. Accessed 14 March 2016.
- Bansal, Anumeha (2012): "Private Water Tankers. A Legitimate Solution to Delhi's water woes?" Centre for Civil Society. Available online at http://ccs.in/internship_papers/2012/265_private-water-tankers_anumeha-bansal.pdf. Accessed 28 September 2014.
- Bansil, P. C. (2004): *Water management in India*. New Delhi, India: Concept Publishing.
- Barbour, Christine and Wright, Gerald C. (2013): *Keeping the Republic. Power and Citizenship in American politics*. Edition 7. Los Angeles: Sage.
- Barraque, B. (2004): *Institutional issues*. Paris: UNESCO (Series on water and ethics, Essay 11).
- Barth, Fredrik (1971, c1960): *The System of Social Stratification in Swat, North Pakistan*. In Edmund Ronald Leach (Ed.): *Aspects of caste in south India, Ceylon, and north-west Pakistan*. Cambridge, New York: Cambridge University Press (Cambridge papers in social anthropology, 2).
- Bartram, J., K. Lewis, R. Lenton, and A. Wright (2005): 'Focusing on improved water and sanitation for health'. *The Lancet* Vol 365, pp. 810-812.

- Batchelor, Charles (2007): "Water Governance Literature Assessment." International Institute for Environment and Development (iied). Available online at <http://pubs.iied.org/pdfs/G02523.pdf>. Accessed 14 March 2016.
- Baviskar, B. S. and Mathew, George (2008): *Inclusion and exclusion in local governance. Field studies from rural India*. New Delhi, Thousand Oaks, Calif: Sage Publications.
- Bedner, Jenna and Page, Scott E. (2005): "Culture, Institutional Performance, and Path Dependence." University of Michigan. Available online at <http://vserver1.cscs.lsa.umich.edu/~spage/instpath.pdf>. Accessed 14 March 2016.
- Begović, Boris (2006): "Economic Inequality and Corruption." Center for Liberal-Democratic Studies and School of Law, University of Belgrade. Available online at <http://danica.popovic.ekof.bg.ac.rs/206.pdf>. Accessed 14 March 2016.
- Beland Daniel (2005): `Ideas and Social Policy: An Institutional Perspective.` *Social Policy and Administration* 39, pp. 1-18.
- Bell, Stephen (2002): *Institutionalism: Old and New*. In Dennis Woodward, Andrew Parkin, John Summers (Eds.): *Government, politics, power and policy in Australia*. 9th ed. Frenchs Forest, NSW: Pearson Education Australia.
- Belliappa, Jyothsna Latha (2013): *Gender, class and reflexive modernity in India*. Basingstoke: Palgrave Macmillan (Genders and sexualities in the social sciences).
- Benford, Robert D and Snow, David A (2000): `Framing Processes and Social Movements: An Overview and Assessment`. In *Annual Review of Sociology* 26, pp. 611–639.
- Berreman, Gerald D. (1967): `Caste as Social Process`. *Southwestern Journal of Anthropology* Vol. 23, No. 4, pp. 351-370.
- Berreman, Gerald D. (1968): `The Concept of Caste`. In *International Encyclopaedia of Social Sciences* Vol. 2.
- Berreman, Gerald D. (1972): *Hindus of the Himalayas; Ethnography and change*. [2d ed., rev. and enl.]. Berkeley: University of California Press.
- Berry, Kate A. and Mollard, Eric (2010): *Social participation in water governance and management. Critical and global perspectives*: Earthscan.
- Béteille, André (2002): *Caste, class and power. Changing patterns of stratification in a Tanjore village*. 2nd ed. New Delhi, New York: Oxford University Press (Oxford India paperbacks).
- Béteille, André (2003): *Equality and universality. Essays in social and political theory*. Oxford: Oxford University Press.
- Bhattacharyya, Harihar; Sarkar, Partha and Kara, Aṃśumāna (2010): *The politics of social exclusion in India. Democracy at the crossroads*: Routledge (Routledge advances in South Asian studies, 14).
- Bisht, Shikha; Patra B.A; Gupta, Dr. N.C; Arora, Saurabh and Singh, Dr. R.A (2007): "Assessment of Drinking Water Quality of Delhi, India." Proceedings of 12th

- ISMAS Symposium cum RSP-1 Workshop on Mass Spectrometry. Available online at <http://www.nio.org/userfiles/file/events/RSP-1%20Shikha.pdf>. Accessed 26 September 2014.
- Biswas, Asit K. (2009, c2006): *Water Management for Major Urban Centres*. In Cecilia Tortajada, Asit K. Biswas, Rafael Izquierdo (Eds.): *Water management for large cities*. London: Routledge.
- Björklund, G and Sjödin, J (eds) (2010): “The Human Right to Water and Sanitation. Securing Access to Water for Basic Needs.” Swedish Water House Policy Brief No. 8. Available online at http://www.siwi.org/documents/Resources/Policy_Briefs/Policy_Brief_Human_Rights_to_Water_web.pdf. Accessed on 21 September 2014.
- Blarel, Nicolas (2012): “India: The Next Super Power? London School of Economics and Political Science.” Available online at <http://eprints.lse.ac.uk>. Accessed 31 March 2016.
- Bolger, Brian (2016): “The Impact of Social Movements on Political Parties. Examining whether anti-austerity social movements have had an impact on social democratic political parties in Ireland and Spain.” 2011-2016. Master Thesis. Uppsala University. Available online at <http://www.diva-portal.se/smash/get/diva2:911940/FULLTEXT01.pdf>. Accessed 11 September 2016.
- Bonzon, Yves (2014): *Public participation and legitimacy in the WTO*. Cambridge, United Kingdom: Cambridge University Press.
- Bose, Nirmal Kumar (1965): `Class and Caste`. *Economic and Political Weekly* Vol. 17, No. 35. Available online at http://www.epw.in/system/files/pdf/1965_17/35/class_and_caste.pdf. Accessed 14 March 2016.
- Bros, Catherine and Couttenier, Mathieu (2011): “Is Blood Thicker Than Water? Untouchability and Public Infrastructure.” Manuscript. Université de Paris, Centre de Sciences Humaines: Delhi.
- Brunetti, A., G. Kisunko; B. Weder (1997): “Credibility of rules and economic growth – evidence from a worldwide private sector survey.” Background paper for the World Development Report 1997. Washington D.C: World Bank.
- Bryson, Jay H. (2015): “Will India Continue to Realize Strong GDP Growth?” Wells Fargo Securities, LLC Economics Group (Special Commentary, (704) 410-3274).
- Campbell, John L. (2004): *Institutional change and globalization*. Princeton, N.J: Princeton University Press.
- Castree, Noel; Demeritt, David; Livermann, Diana; Rhoads, Bruce (Eds.) (2009): *A companion to environmental geography*. Chichester, UK: Wiley-Blackwell (Blackwell companions to geography).

- Census (2011): *Nangloi Jat City Census 2011 data*. Available online at <http://www.census2011.co.in/census/city/61-nangloi-jat.html>. Accessed 28 January 2016.
- Census of India (2011a): *Primary Census Abstract. Data Highlights. Districts and Sub-Districts*. National Capital Territory of Delhi.
- Census of India (2011b): *Provisional Population Totals Urban Agglomerations and Cities*. Government of India.
- Central Vigilance Commission (2010b): *National Anti-Corruption Strategy*. Available online at <http://cvc.nic.in/NationalAntiCorruptionStrategydraft.pdf>. Accessed 21 March 2014.
- Central Pollution Control Board (2015): *River Stretches for Restoration of Water Quality. Monitoring of Indian National Aquatic Resources*. MINARS/37 /2014-15. Ministry of Environment, Forests and Climate Change. Available at http://cpcb.nic.in/upload/Publications/Publication_528_RESTORATION-OF-POLLUTED-RIVER-STRETCHES.pdf. Accessed 25 March 2016.
- Centre for Civil Society (2007): *User Charges: A Case Study of Water Pricing*. Available online at http://ccs.in/sites/default/files/files/CCS_4_User%20Charges.pdf. Accessed 15 March 2016.
- Centre for Media Studies-Transparency (2015): *CMS-India Corruption Study. Perception and Experience with Public Services in Delhi*. Available online at http://cmsindia.org/sites/default/files/ICS_Report-2015.pdf. Accessed 15 March 2016.
- Centre for Policy Research (2015): *Categorisation of Settlements in Delhi*. Policy Brief. Available at <http://cprindia.org>.
- Chakrabarty, Bidyut (2008): *Indian politics and society since independence. Events, processes and ideology*. London, New York: Routledge.
- Chakraborty, Priyanka (2011): "Competition Policy in Public Procurement." Competition Commission of India. Jawaharlal Nehru University. Available online at <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.646.978&rep=rep1&type=pdf>. Accessed 22 August 2014.
- Chand, Vikram K. (2006): *Reinventing public service delivery in India. Selected case studies*. Washington, DC, New Delhi, Thousand Oaks: World Bank; Sage Publications.
- Chapaitkar, Sunil B. (2013): `Brief Review on Caste and Politics in India`. *International Journal of Advanced System and Social Engineering Research* Vol 3, Issue 2, pp. 50-54.
- Chaudhary, S. N. (2005): *Human rights and poverty in India. Theoretical issues and empirical evidences*. New Delhi: Concept Publishing Co.
- Chaudhry, Prashant (2013): `Caste as an Institutionalized System of Social Exclusion and Discrimination: Some Evidences`. *International Journal of Gender and Women's Studies* Vol. 1, pp. 56-63.

- Chavis, Larry (2011): "Social Networks and Bribery. The Case of Entrepreneurs in Eastern Europe." University of North Carolina at Chapel Hill. Available online at www.unc.edu/~chavis/. Accessed 15 March 2016.
- Chene, Marie (2009): "Overview of Corruption and Anti-Corruption Efforts in India." U4-Anti Corruption Resource Centre. Available online at <http://www.u4.no/publications/overview-of-corruption-and-anti-corruption-efforts-in-india/>. Accessed 7 December 2015.
- Cherodian, Rowan and Thirlwall, A.P (2013): "Regional Disparities in Per Capita Income in India. Convergence or Divergence?" University of Kent. Available online at <https://www.kent.ac.uk/economics/documents/research/papers/2013/1313.pdf>. Accessed 15 March 2016.
- Chetwynd, Eric; Chetwynd, Frances and Spector, Bertram (2003): "Corruption and Poverty: A Review of Recent Literature." Management Systems International, Washington D. C. Available online at <http://www.eldis.org/vfile/upload/1/document/0708/DOC14285.pdf>. Accessed 15 March 2015.
- Comptroller and Auditor General of India (2013): *Thematic Audit of Water Management in Delhi*. Available online at http://www.indiawaterportal.org/sites/indiawaterportal.org/files/chap_3.pdf. Accessed 27 March 2016.
- Cooley, Heather; Ajami, Newsha; Ha, Mail-lan; Srinivasan, Veena; Morrison, Jason; Smith, Juliet Christian and Donnelly, Kristina (2013): "Global Water Governance in the 21st Century." Pacific Institute. Available online at <http://www.pacinst.org/wp-content/uploads/2013/07/pacinst-global-water-governance-in-the-21st-century.pdf>. Accessed 13 July 2014.
- Coomaraswamy, Ananda K. (1983): `The Religious Basis of the Forms of Indian Society`. *Studies in Comparative Religion* Vol. 15, No. (1&2).
- Coulmas, Florian (2005): *Sociolinguistics. The study of speakers' choices*. New York: Cambridge University Press.
- CQ Researcher (2010): *International issues in social work and social welfare. Selections from CQ researcher*. Los Angeles: SAGE.
- Cullet, Philippe (2009): *Water law, poverty, and development. Water sector reforms in India*. Oxford, New York: Oxford University Press.
- Cullet, Philippe (2012): "Water Use and Rights. India." International Environmental Law Research Centre. Available online at <http://www.ielrc.org/content/a1205.pdf>. Accessed 27 March 2016.
- Cullet, Philippe (2013): "Right to Water in India. Plugging Conceptual and Practical Gaps." International Environmental Law Research Centre. Available online at <http://www.ielrc.org/content/a1301.pdf>. Accessed 27 March 2016.

- Cullet, Philippe and Gupta, Joyeeta (2009): *Evolution of Water Law and Policy*. In Joseph W. Dellapenna, Joyeeta Gupta (Eds.): *The evolution of the law and politics of water*. Dordrecht: Springer.
- CUTS International (2010): *Analysing the Right to Information Act in India*. CUTS International (Briefing Paper, 1/2010). Available online at [http://www.cuts-international.org/cart/pdf/Analysing the Right to Information Act in India.pdf](http://www.cuts-international.org/cart/pdf/Analysing_the_Right_to_Information_Act_in_India.pdf). Accessed 21 March 2017.
- Das, Bhagwan (2000): 'Moments in a History of Reservations'. *Economic and Political Weekly*, p.3831 - 3834. Available online at <http://www.ambedkar.org/research/Bhagwandas.pdf>. Accessed 29 January 2016.
- Das, Priyam and Tamminga, Kenneth R. (2012): The Ganges and the GAP: An Assessment of Efforts to Clean a Sacred River. *Sustainability* Vol. 4, No. 12, pp. 1647-1668. DOI: 10.3390/su4081647.
- Datta, Ayona (2012): *The illegal city. Space, law and gender in a Delhi squatter settlement*. Farnham: Ashgate Publishing Ltd (Gender, Space and Society).
- Dayanand, Navoneel (2004): "Overview of Legal Systems in the Asia-Pacific Region: India." Overview of Legal Systems in the Asia-Pacific Region Paper 1. Available online at http://scholarship.law.cornell.edu/lps_lsapr/1. Accessed 15 March 2016.
- Delhi Development Authority (2007): *Master Plan for Delhi - 2021*. Delhi Development Authority. Delhi. Available online at <https://dda.org.in/ddanew/pdf/Planning/reprint%20mpd2021.pdf>. Accessed 21 July 2014.
- Delhi Dialogue (2015): *AAP Manifesto-Delhi Assembly Election 2015*. Available online at <http://www.aamaadmiparty.org/AAP-Manifesto-2015.pdf>. Accessed 27 March 2016.
- Delhi Jal Board (2015): *Delhi Jal Board sets a role model for recycling of water and zero energy consumption* (Press Release). Available online at http://www.delhi.gov.in/wps/wcm/connect/f1b5850046f035378772ff7d994b04ce/Pr_08-01-2015.pdf?MOD=AJPERES&lmod=-1749480591. Accessed 27 March 2016.
- Delhi Urban Art Commission (2014): *Aya Nagar Urban Development. Planned Development of Unauthorized Colonies*. Available online at <http://architexturez.net/system/files/Aya%20Nagar%20Urban%20Development.pdf>. Accessed 27 March 2016.
- Department for International Development (2006): *Eliminating world poverty. Making governance work for the poor: A White Paper on international development*. London: Stationery Office.
- Desouza, Shaila (2011): "Organising women for empowerment: a study of an experiment in Goa." Tata Institute of Social Sciences. Available online at <http://hdl.handle.net/10603/2722>. Accessed 6 September 2016.

- Dhesi, Auta S. (1998): 'Caste, class synergies and discrimination in India'. *International Journal of Social Economics* Vol. 25, No. 6/7/8, pp. 1030-1048.
- Dhillon, Dr. Jaskaran Singh and Vohra. P. S (2014): 'The Day Aam Aadmi Had a Party. A Success Story of the Brand "AAP (Aam Aadmi Party): A Case Study'. *International Journal of Management and Business Studies* Vol. 4, No. 3.
- Dhupdale, Vivek (2014): 'Problems and Prospects of Indian Democracy. An Analysis of Working for Designing processes of Change'. *Navjyot*, Vol. 3, No.1. Available online at <http://www.navjyot.net/wp-content/uploads/2014/04/4.pdf>. Accessed 15 November 2015.
- Dirks, Nicholas B. (2001): *Castes of mind. Colonialism and the making of modern India*. Princeton, N.J: Princeton University Press.
- DiSilvio, Joseph D. (2007): 'The Rise of the Bharatiya Janata Party in India'. *The Orator* Vol. 2 No. 1, pp. 17-28.
- Dittmer, Lowell and Liu, Guoli (2006): *China's deep reform. Domestic politics in transition*. Lanham, Md: Rowman & Littlefield Publishers.
- Dobler, Constanze (2009): "The Impact of Formal and Informal Institutions on Per Capita Income." Universität Hohenheim. Available online at <https://www.uni-hohenheim.de/RePEc/hoh/papers/319.pdf>. Accessed 9 February 2014.
- Dreher, Axel and Herzfeld, Thomas (2005): "The Economic Costs of Corruption: A Survey and New Evidence." <http://www.uni-goettingen.de>. Accessed 9 March 2016.
- Dreze, Jean and Sen, Amartya (2002): 'Democratic Practice and Social Inequality in India'. *Journal of Asian and African Studies* Vol. 37, No. 2, pp. 6-37.
- Dudhwala, Hema (2012): 'Assessment of Social Security and Quality of Life of Urban Poor through Slum Permanent Record System (SPRS)'. *International Journal of Social Science and Interdisciplinary Research* Vol. 1, No. 7, pp. 165-177.
- Dumont, Louis (1980): *Homo hierarchicus. The caste system and its implications*. Complete rev. English ed. Chicago: University of Chicago Press.
- Dupont, Veronique (2004): 'Socio-spatial differentiation and residential segregation in Delhi: A question of scale?'. *Geoforum*, Vol. 35, No.2, pp. 157-175. Available online at <http://www1.geo.ntnu.edu.tw/~moise/Data/Books/Social/03%20race%20and%20ethnic%20groups/sociospatial%20differentiation%20and%20residential%20segregation%20in%20delhi.pdf>. Accessed 27 March 2016.
- Duran S, Gustavo (2009): "New Urban Poverty and Water Governance in Santiago De Chile (1977-2008)." A morphologic and ethnographic approximation to the transformations in the structures of dwelling consumption in the frame of a neoliberal privatization. Available online at https://www.ufz.de/export/data/29/39282_FP_Duran.pdf. Accessed 27 March 2016.

- Dutta, Ventakesh (2006): "Preference Heterogeneity, Public Choice and Willingness to Pay. Study of Water Supply Reform in a Megacity." PhD Thesis. TERI University. Available online at <http://shodhganga.inflibnet.ac.in/handle/10603/6299>. Accessed 27 March 2016.
- Ebben, Wouter and Vaal de Albert (2009): "Institutions and the Relation between Corruption and Economic Growth." Nijmegen Center for Economics (NiCE), Institute for Management Research, Radboud University Nijmegen.
- EEA (2012): *Urban adaptation to climate change in Europe. Challenges and opportunities for cities together with supportive national and European Policies*. European Environment Agency. Copenhagen, Denmark. Available online at <http://www.eea.europa.eu/publications/urban-adaptation-to-climate-change>. Accessed 19 March 2017.
- EEA Report (2009): *Ensuring quality of life in Europe's cities and towns. Tackling the environmental challenges driven by European and global change*. Copenhagen, Luxembourg: European Environment Agency; Office for Official Publications of the European Communities (EEA report, no. 5/2009). Available online at <http://www.eea.europa.eu/publications/quality-of-life-in-Europes-cities-and-towns>. Accessed 19 March 2017.
- Engel, Katalina; Jokiel, Dorothee; Kraljevic, Andrea; Geiger, Martin and Smith, Kevin (2011): "Big Cities, Big Water, Big Challenges. Water in an Urbanizing World." WWF. Available online at http://www.wwf.se/source.php/1390895/Big%20Cities_Big%20Water_Big%20Challenges_2011.pdf. Accessed 15 March 2016.
- Environmental Law Research Society (2012): *Governing Water in India. Review of Law and Policy Developments*. Environmental Law Research Society. Available online at http://www.elrs.in/content/primer_main.pdf. Accessed 29 September 2014.
- Estifania, Edna A. Co (2005): "Challenges to Philippine Culture of Corruption: Causes, Consequences and Change." University of Manchester. Available online at <http://www.sed.manchester.ac.uk/research/events/conferences/documents/Redesigning%20The%20State%20Papers/Co.pdf>. Accessed 15 March 2016.
- European Commission (2010): *Poverty and Social Exclusion. Special Eurobarometer 355*. Available online at http://ec.europa.eu/public_opinion/archives/ebs/ebs_355_en.pdf. Accessed 15 March 2016.
- Fawcett, Ben and Joshi, Deepa (2001): *Water, Hindu mythology and an unequal social order in India*. Paper presented at the Second Conference of the International Water History Association, Bergen, August 2001. www.wateraid.org. Accessed 14 October 2014.
- Federal Ministry for European and International Affairs and Austrian Development Agency (2011): *Good Governance*. Policy Document. Available online at http://www.entwicklung.at/uploads/media/PD_Good_governance_July2011_01.pdf. Accessed 15 March 2016.

- Fernando, A. C. (2011): *Business environment*. Chennai: Pearson.
- Fioretos, Orfeo; Falleti, Tullia G and Sheingate, Adam (2016): *Oxford Handbook of Historical Institutionalism*: Oxford University Press.
- Flannery, Kent V. and Marcus, Joyce (2012): *The creation of inequality. How our prehistoric ancestors set the stage for monarchy, slavery, and empire*. Cambridge, Mass, London: Harvard University Press.
- Fodgen, Josephine (2009): "Access to Safe Drinking Water and Its Impact on Global Economic Growth." Available online at <http://faculty.washington.edu/categ/healthanddevgbf/wordpress/wp-content/uploads/2010/03/Access-to-Safe-Drinking-Water.pdf>. Accessed 15 March 2016.
- Freitas, Kripa (2006): "The Indian Caste System as a Means of Contract Enforcement." Northwestern University. Available online at http://web.stanford.edu/~avner/Greif_228_2007/Freitas,%20Kripa.%202006.%20The%20Indian%20Caste%20System.pdf. Accessed 15 March 2016.
- Frow, John (2000): *Cultural studies and cultural value*: Oxford University Press.
- Fry AI (2005): *Water. Facts and trends*. Geneva, Switzerland: World Business Council for Sustainable Development.
- Gallaher, Samuel and Heikkila, Tanya (2014): "Challenges and Opportunities for Collecting and Sharing Data on Water Governance Institutions". *Journal of Contemporary Water Research & Education* No. 153, pp. 66-78.
- Gambetta, Diego (1993): *The Sicilian Mafia: The Business of Private Protection*. Cambridge: Harvard University Press.
- Gambetta, Diego (2002): *Corruption: An Analytical Map*. In Stephen Kotkin, András Sajó (Eds.): *Political corruption in transition. A skeptic's handbook*. Budapest, New York: Central European University Press.
- Ganeri, Anita (2013): *Indian Culture*. London: Raintree.
- Ganguly, Sumit; Larry Jay; Diamond and Plattner, Mark F (2007): *The state of India's democracy*. Baltimore: Johns Hopkins University Press.
- Gehlbach, Scott (2001): "Social Networks and Corruption. Department of Political Science and Economics." UC-Berkeley. Available online at <http://www.noiorizonturi.ro/attachments/article/120/Social%20Networks%20and%20Corruption.pdf>. Accessed 17 September 2014.
- Gesteland, Richard R. and Gesteland, Mary C. (2010): *India. Cross-cultural business behavior: for business people, expatriates and scholars*. 1st ed. [Frederiksberg], Portland, OR: Copenhagen Business School Press; Distribution, North America, International Specialized Book Services.
- Ghosh, Peu (2012): *Indian Government and Politics*. New Delhi: Asoke K. Ghosh, PHI Learning Private Limited.

- Ghuman B.S and Mehta, Akshat (2005): "Health Care for the Poor in India with Special Reference to Punjab State." Asian Development Bank. Available online at http://www.napsipag.org/pdf/Punjab_State.pdf. Accessed 15 March 2016.
- Gill, Manmohan Singh (2003): *Punjab Society, Perspectives and Challenges*. New Delhi: Concept Pub. Co.
- Girling, John (1997): *Corruption, capitalism and democracy*. London, New York: Routledge (Routledge studies in social and political thought, 4).
- Gisselquist, Rachel M. (2012): *Good governance as a concept, and why this matters for development policy*. Helsinki: WIDER (Working paper / World Institute for Development Economics Research).
- Glaeser, Edward L., Jose Scheinkman, and Andrei Shleifer (2003): 'The Injustice of Inequality'. *Journal of Monetary Economics* Vol. 50, pp. 199-222.
- Gleick, P.H (2000): 'Look at Twenty-First Century Water Resources Development'. *Water International* Vol. 25, No. 1, pp. 127-138.
- Gleick, P.H (2003): 'Global freshwater resources: soft-path solutions for the 21st Century'. *Science* Vol. 302, pp. 1524-1528.
- Goefl, Ute (2008): "Water Centrality for Water and Society." Edith Cowan University. Available online at <http://ro.ecu.edu.au/cgi/viewcontent.cgi?article=1021&context=theses>. Accessed 17 September 2014.
- Gomez, Edmund Terence (2002): *Political business in East Asia*. London, New York: Routledge (Politics in Asia series).
- Goswami, Debika and Bandyopadhyay, Kaustuv K (2013): "The Anti-Corruption Movement in India." Centre Tricontinental. Available online at http://www.cetri.be/IMG/pdf/Anti-Corruption-Movement_India.pdf. Accessed 19 March 2017.
- Gould, Harold A. (1987-1990): *The Hindu caste system*. Delhi: Chanakya Publications.
- Government of India (2007): *The Constitution of India*. Available online at <http://lawmin.nic.in/coi/coiason29july08.pdf>. Accessed 15 March 2016.
- Government of India (2010): *Zonal Development Plan for Zone 'F'. (South Delhi-I). Area Planning – I*. Delhi Development Authority. Accessed 7 September 2015.
- Government of India (2011): *Faster, Sustainable and More Inclusive Growth. An Approach to the Twelfth Five Year Plan*. Planning Commission. Available online at http://planningcommission.gov.in/plans/planrel/12appdrft/approach_12plan.pdf. Accessed 29 September 2014.
- Government of NCT of Delhi (2007): *Economic Survey of Delhi*.
- Government of NCT of Delhi (2008-2009): *Economic Survey of Delhi*.

- Government of NCT of Delhi (2012-13): *Economic Survey of Delhi*. Available online at [http://www.indiaenvironmentportal.org.in/files/file/Delhi Economic survey 2012-13-1.pdf](http://www.indiaenvironmentportal.org.in/files/file/Delhi_Economic_survey_2012-13-1.pdf). Accessed 7 July 2014.
- Government of NCT of Delhi (2012): *Statistical Abstract of Delhi 2012*. Directorate of Economics & Statistics. Available online at <http://delhi.gov.in/DoIT/DES/Publication/abstract/SA2012.pdf>. Accessed 3 July 2015.
- Government of NCT of Delhi (2014-15): *Economic Survey of Delhi*. Available online at <http://www.indiaenvironmentportal.org.in/files/file/economic%20survey%20of%20Delhi%202014-15.pdf>. Accessed 21 March 2017.
- Government of National Capital Territory of Delhi and Institute of Human Development (2013): *Delhi Human Development Report. Improving lives, promoting inclusion*. New Delhi: Academic Foundation and Institute for Human Development.
- Government of NCT Delhi (2014): *Housing Conditions in Delhi*. Government of National Capital Territory of Delhi. Available online at <http://www.delhi.gov.in/wps/wcm/connect/616b1980469d49c9bcb6fc7d994b04ce/69th+round+housing+cond+final+pdf+report.pdf?MOD=AJPERES&lmod=1609131284&CACHEID=616b1980469d49c9bcb6fc7d994b04ce>. Accessed 15 March 2016.
- Gray, Mel; Midgley, James and Webb, Stephen A. (2012): *The Sage handbook of social work*. Los Angeles: Sage.
- Green, John C.; Rozell, Mark J and Wilcox, Clyde (2001): 'Social Movements and Party Politics: The Case of the Christian Right'. Vol. 40, No. 3, pp. 413–426.
- Grindle, Merilee (2010): "Good Governance: The Inflation of an Idea." Harvard Kennedy School. Faculty Research Working Paper Series. RWP10-023. <http://www.hks.harvard.edu>. Accessed 29 March 2016.
- Grinsell, Scott (2010): 'Caste and the Problem of Social Reform in Indian Equality Law'. *Yale Journal of International Law* Vol. 35, No. 199, pp. 199-236.
- Groenfeldt, David (2013): *Water Ethics. A values approach to solving the water crisis*. Abingdon: Eathscan from Routledge.
- Grossman, Margaret Rosso (2007): 'Agriculture and the Polluter Pays Principle'. *Electronic Journal of Comparative Law* Vol. 11.3.
- Gupta, Dipankar (2004): *Caste in question. Identity or hierarchy?* New Delhi, Thousand Oaks, Calif: Sage Publications (Contributions to Indian sociology, 12).
- Gupta, Sanjeev; Davoodi, Hamid and Alonso-Terme, Rosa (1998): "Does Corruption Affect Income Inequality and Poverty?" International Monetary Fund (IMF Working Paper, WP/98/76). Available online at <https://www.imf.org/external/pubs/ft/wp/wp9876.pdf>. Accessed 21 March 2017.
- Gupta, Sanjeev; Davoodi, Hamid; Alonso-Terme, Rosa (2002): 'Does corruption affect income inequality and poverty?' *Economics of Governance*. Vol. 3, pp. 23–45.

- Gupta, Shreekant and Kumar, Surender and Sarangi Gopal K (2012): `Measuring the performance of water service providers in urban India. implications for managing water utilities`. *Water Policy* Vol. 14, pp. 391-408.
- Gupta, Sushil K. (2011): *Modern hydrology and sustainable water development*. Chichester, West Sussex, UK, Hoboken, NJ: Wiley-Blackwell.
- Habitat (UNCHS) (1994): *Population, Urbanization and Quality of Life*. Nairobi: United Nations Centre for Human Settlement.
- Haberman, David L. (2006): *River of love in an age of pollution. The Yamuna River of northern India*. Berkeley, Calif: University of California Press.
- Haider, Almas (2016): "Inequalities in Water Service Delivery in Delhi." Water Integrity Network. Berlin (Urban Issues). Available online at <http://www.waterintegritynetwork.net/2016/02/02/inequalities-in-water-service-delivery-in-delhi/>. Accessed 8 February 2016.
- Hall, Peter; Pain, Kathy (2006): *The polycentric metropolis. Learning from mega-city regions in Europe*. London, Sterling, VA: Earthscan.
- Hall, Peter A and Taylor, Rosemary C.R (1996): "Political Science and the Three Institutionalisms." Max-Planck-Institut für Gesellschaftsforschung, Germany. Available online at http://edoc.vifapol.de/opus/volltexte/2011/2782/pdf/dp96_6.pdf. Accessed 9 May 2014.
- Haq, Kazi Sabrina (2014): `Water Crisis and Urban Poor. The Case of Poor Communities in Dhaka City, Bangladesh`. *Developing Country Studies* Vol. 4, Issue 16, ISSN 2225-0565 (Online).
- Hasan, Zoya (2014): *Democracy and the crisis of inequality*. New Delhi: Ratna Sagar/Primus Books.
- Hassan, Fekri (2011): *Water History for our times; IHP Essays on water History*. Paris, France: United Nations Educational, Scientific and Cultural Organization.
- Heidenheimer, Arnold J. and Johnston, Michael (2002): *Political corruption. Concepts & contexts*. 3rd ed. New Brunswick, N.J: Transaction Publishers.
- Heinrich, Carolyn J. and Lynn, Laurence E. (2000): *Governance and performance. New perspectives*. Washington, D.C: Georgetown University Press.
- Helmke, Gretchen and Levitsky, Steven (2003): "Informal Institutions and Comparative Politics. A Research Agenda." Kellogg Institute. Available online at <https://kellogg.nd.edu/publications/workingpapers/WPS/307.pdf>. Accessed 9 February 2014.
- Helmke, Gretchen and Levitsky, Steven (2006): *Informal institutions and democracy. Lessons from Latin America*. Baltimore: Johns Hopkins University Press.
- Helmke, Gretchen and Levitsky, Steven (2004): `Informal Institutions and Comparative Politics. A Research Agenda`. *Perspectives on Politics* Vol. 2, No. 4, pp. 725-740.

- Hildebrand, Mark; Kanaley, Trevor and Roberts, Brian (2013): "Strategy Paper. Sustainable and Inclusive Urbanization in Asia Pacific." UNDP. Available online at http://www.unclearn.org/sites/default/files/inventory/undp134_0.pdf. Accessed 30 March 2016.
- Hill, Margot (2013): *Climate change and water governance. Adaptive capacity in Chile and Switzerland*. Dordrecht, New York: Springer (Advances in global change research, v.54).
- Högberg, Andreas (2009): "Formal and Informal Institutions in Asia. A Survey of Asian Corporate Governance." Jönköping International Business School (JIBS), Sweden. Available online at <http://www.diva-portal.org/smash/get/diva2:279299/FULLTEXT01.pdf>. Accessed 15 September 2014.
- Hooker, John (2008): "Corruption from a Cross-Cultural Perspective." Carnegie Mellon University. Available online at <http://web.tepper.cmu.edu/jnh/corruption08s.pdf>. Accessed 15 March 2016.
- Narula, Smita (1999): *Broken People. Caste Violence against India's "Untouchables"*. New York, London: Human Rights Watch.
- Hunsaker John and Hanzl Brenda (2003): "Understanding Social Justice Philanthropy." National Committee for Responsive Philanthropy. Available online at <http://www.simonejoyaux.com/downloads/NCRPSocialJusticePhilanthropy.pdf>. Accessed 29 March 2016.
- Huntington, Samuel P. (1971, ©1968): *Political order in changing societies*. New Haven: Yale University Press.
- Huntington, Samuel P. and Harrison, Lawrence E. (2000): *Culture matters. How values shape human progress*. New York: Basic Books.
- Hutton, John Henry (1946): *Caste in India: Its Nature, Function and Origin*: Oxford University Press.
- Hyden, Goran and Court, Julius (2002): "Governance and Development." World Governance Survey Discussion Paper 1. United Nations University. Available online at <http://archive.unu.edu/p&g/wga/publications/WGS-discussionPaper1.pdf>. Accessed 9 December 2014.
- Indian National Science Academy, Chinese Academy of Sciences, U.S. National Academy of Sciences (2001): *Growing populations, changing landscapes. Studies from India, China, and the United States*. Washington, D.C: National Academy Press.
- Infrastructure Development Finance Company (2011): *India Infrastructure Report. Water Policy and Performance for Sustainable Development. Review of Reforms in Urban Water Sector: Institutional and Financial Aspects*. With assistance of Pranjali Deekshit, Tejas Pol, Subodh Wagle: Oxford University Pr.

- Infrastructure Development Finance Company, Indian Institute of Management and Indian Institute of Technology (2004): *India Infrastructure Report 2004 Ensuring Value for Money*: Oxford University Press.
- Inoguchi, Takashi (2005): *Values and life styles in urban Asia. A cross-cultural analysis and sourcebook based on the Asia Barometer survey of 2003. India's Urban Middle Class*. With assistance of Sanjay Kumar. 1st ed. Tokyo, Mexico City: Institute of Oriental Culture, University of Tokyo; Siglo XXI Editors (Institute of Oriental Culture special series, 19).
- Institute of Development Studies (2010): *Review of Impact and Effectiveness of Transparency and Accountability Initiatives: Synthesis Report*. Available online at <https://www.ids.ac.uk/files/dmfile/IETASynthesisReportMcGeeGaventaFinal28Oct2010.pdf>. Accessed 15 March 2016.
- Institute of Objective Studies (New Delhi, India) (2015): *Access to urban basic services in the 'Muslim localities' of Delhi*. A research study. First edition.
- International Dalit Solidarity Network (2014): *Working Globally against Caste based Discrimination*. Annual Report. Available online at <http://idsn.org/wp-content/uploads/2015/02/IDSN-Strategy-2015-18.pdf>. Accessed 15 March 2016.
- International Federation of Accountants (2013): *Good Governance in the Public Sector— Consultation Draft for an International Framework*. Available online at <http://www.ifac.org/system/files/publications/files/Good-Governance-in-the-Public-Sector.pdf>. Accessed 29 March 2016.
- International Organization for Migration (2015). *World Migration Report. Migrants and Cities: New Partnership to Manage Mobility*.
- International Risk Governance Council (2010): *Emerging risks in Megacities*. Available online at http://irgc.org/wp-content/uploads/2012/04/Emerging_risks_Megacities.pdf. Accessed 22 May 2015.
- Irish Aid (2009): *Building Good Governance through Development Cooperation. Policy Orientations for Irish Aid*. Irish Aid, Department of Foreign Affairs. Available online at <https://www.irishaid.ie/media/irishaid/allwebsitemedia/20newsandpublications/publicationpdfsenglish/good-governance-through-development-cooperation.pdf>. Accessed 22 September 2014.
- Irvin, Renee A. and Stansbury, John (2004): `Citizen Participation in Decision-Making: Is it Worth the Effort?` *Public Administration Review*, Vol. 64, No. 1.
- Ishiyama, John T. (2011): *Comparative politics. Principles of democracy and democratization*. Malden, MA: Wiley-Blackwell (POPS - Principles of Political Science / John T Ishiyama).
- Ishtiyag, M. and Kumar, Sunil (2010): `Typology of Informal Settlements and Distribution of Slums in the NCT of Delhi`. *Institute of Town Planners, India Journal* pp. 20-33.

- Ishtiyag, M. and Kumar, Sunil (2011): `Typology of Informal Settlements and Distribution of Slums in the NCT, Delhi`. *Journal of Contemporary Indian Studies: Space and Society, Hiroshima University* Vol. 1, pp. 37-46.
- Jäger, Johannes and Köhler, Bettina (2007): “Theoretical Approaches to Regional Governance. Theory of Governance.” University of Applied Sciences bfi Vienna. Working Paper Series. Number 51/2008. Available online at http://www.fh-vie.ac.at/var/em_plain_site/storage/original/application/0bf912fd0ead27d11eaad7ba3770b63d.pdf. Accessed 29 March 2016.
- Jacobson, Maria; Meyer, Fiona; Oia, Ingvild; Reddy, Paavani and Tropp, Hakan (2013): User’s Guide on Assessing Water Governance. UNDP, Water Integrity Network, Water Governance Facility and SIWI. <http://www.undp.org>. Accessed 16 May 2017.
- Jagmohan (2005): *Soul and structure of governance in India*. New Delhi: Allied Publishers.
- Jain, Neha (2013): *Indian Economy*. New Delhi: V. K. Publications.
- James, Mallory; Dowd, Anne-Maree; Rodriguez, Shelley and Jeanneret, Talia (2012): “How Australians Value Water. Results from a Literature Review.” Global CCS Institute. <http://www.csiro.au>. Accessed 17 September 2014.
- Jamwal, Priyanka and Mittal, Atul K. (2010): `Reuse of treated sewage in Delhi city: Microbial evaluation of STPs and reuse options`. *Resources, Conservation and Recycling* Vol. 54, Issue 4, pp. 211-221. DOI: 10.1016/j.resconrec.2009.08.002.
- Janelle Plummer and Tom Slaymaker (2007): “Rethinking governance in water services” - ODI Working Papers 284 - Discussion papers. Overseas Development Institute. Available online at <https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/602.pdf>. Accessed 19 March 2017.
- Jangir, Dr. Sunil Kumar (2013): `Reservation Policy and Indian Constitution in India`. *American International Journal of Research in Humanities, Arts and Social Sciences*, pp. 126-128.
- Javid, Hassan (2012): “Class, Power, and Patronage. The Landed Elite and Politics in Pakistani Punjab.” London School of Economics (PhD Thesis). Accessed 29 August 2014.
- Jha, Pravin Kumar (2012): *Indian politics in comparative perspective*. New Delhi: Dorling Kindersley (Always learning).
- Jideonwo, Judith Afooma (2014): “Ensuring Sustainable Water Supply in Lagos, Nigeria.” University of Pennsylvania. Available online at http://repository.upenn.edu/cgi/viewcontent.cgi?article=1056&context=mes_capstones. Accessed 28 July 2015.
- Jin, Furong (2007): “Within-urban inequality and the urban-rural gap in China.” Available online at <http://www.ceauk.org.uk/2008-conference-papers/Furong-China-inequality.pdf>. Accessed 17 October 2014.

- Johansson, Christian and Lext, Carl. Johan (2013): "Corruption and Income Inequality. A study of the impact from different legal systems." Jönköping International Business School, Jönköping University. Available online at <http://www.diva-portal.org/smash/get/diva2:633870/FULLTEXT01.pdf>. Accessed 30 March 2016.
- Johari, J. C. (2004): *Indian polity. (a concise study of the Indian constitution, government and politics)*. New Delhi: Lotus Press.
- Johnston, Barbara Rose and Hiwasaki, Lisa (2012): *Water, cultural diversity, and global environmental change. Emerging trends, sustainable futures?* Paris, Dordrecht, New York: UNESCO; Springer.
- Jolly, U. S. (2010): *Challenges for a megacity. Delhi, a planned city with unplanned growth*. New Delhi: Concept Pub. Co.
- Joy, K. J.; Paranjape, Suhas and Bhagat, Sarita (2014): "Conflicts around Domestic Water and Sanitation in India. Cases, Issues and Prospects." Forum for Policy Dialogue on Water Conflicts in India. Available online at http://waterconflictforum.org/lib_docs/DrinkingWaterandSanitationCompendium-Forum-Full-forweb.pdf. Accessed 29 September 2014.
- Kabeer, Naila (2006): "Social Exclusion and the MDGs. The Challenge of 'Durable Inequalities' in the Asian Context." Institute of Development Studies. Available online at <http://www.eldis.org/vfile/upload/1/document/0708/DOC21178.pdf>. Accessed 19 March 2017.
- Kalliga, Kouris (2006): "A Historical Institutionalist Analysis of the Security and Defense Policy of the European Union." University of Warwick. Available online at <http://www.eliamep.gr/old/eliamep/files/PN07.018634.pdf>. Accessed 9 September 2014.
- Kanbur, S. M. Ravi and Lustig, Nora (2001): *World Development Report*. Oxford: Oxford University Press; World Bank.
- Kapur, Devesh and Mehta, Pratap Bhanu (2006): "The Indian Parliament as an Institution of Accountability." United Nations Research Institute for Social Development. Available online at <https://casi.sas.upenn.edu/sites/casi.sas.upenn.edu/files/bio/uploads/The%20Indian%20Parliament.pdf>. Accessed 15 October 2014.
- Kaufmann; Daniel, Aart; Kraay, Massimo; Mastruzzi (2009): "Governance Matters VIII. Aggregate and Individual Governance Indicators." Policy Research Working Paper. Number 4978. The World Bank. <https://www.worldbank.org>. Accessed 9 December 2014.
- Kaufmann, D. and S.-J. Wei (1999): "Does 'grease money' speed up the wheels of commerce?" IMF Working Paper. WP/00/64. International Monetary Fund. Available online at <https://www.imf.org/external/pubs/ft/wp/2000/wp0064.pdf>. Accessed 30 March 2016.
- Kaufmann, Daniel and Kraay, Aart (2002): "Growth without Governance." World Bank. Available online at <http://www.worldbank.org>. Accessed 30 March 2016.

- Kaufmann, Daniel and Shang-Jin, Wei (2000): "Does 'Grease Money' Speed Up the Wheels of Commerce?" - WP/00/64. International Monetary Fund (WP/00/64). Available online at <https://www.imf.org/external/pubs/ft/wp/2000/wp0064.pdf>. Accessed 19 March 2017.
- Kaur R, Wani S. P, Singh A. K and Lal K (2012): "Wastewater production, treatment and use in India." Water Technology Centre, Indian Agricultural Research Institute, New Delhi, India, International Crops Research Institute for the Semi-Arid Tropics, Hyderabad and Indian Council of Agricultural Research, New Delhi, India. Available at http://www.ais.unwater.org/ais/pluginfile.php/356/mod_page/content/111/CountryReport_India.pdf. Accessed 25 March 2016.
- Kaushik, Dr. Baljit (2012): Right to Equality Vis-a-Vis Reservation Policy in India. *Research Expo International Multidisciplinary Research Journal* Vol, 3, No. 3.
- Keister, Lisa A. and Southgate, Darby E. (2012): *Inequality. A contemporary approach to race, class, and gender*. Cambridge, New York: Cambridge University Press.
- Kemp, Deanna and Bond, Carol J. and Franks, Daniel M. and Cote, Claire (2010): 'Mining, water and human rights. making the connection'. *Journal of Cleaner Production* Vol. 18, No. 15, pp. 1553-1562.
- Khairullah, Durriya H.Z and Khairullah, Zahid Y. (2013): 'Cultural Values and Decision-Making in China'. *International Journal of Business, Humanities and Technology* Vol. 3, No. 2.
- Khan, Mohammad Mohabbat (1999): "Political and Administrative Corruption. Concepts, Comparative Experiences and Bangladesh Case." United Nations Public Administration Network. Available online at <http://unpan1.un.org/intradoc/groups/public/documents/APCITY/UNPAN019105.pdf>. Accessed 13 October 2014.
- Khan, Mushtaq H. (1996): 'A Typology of Corrupt Transactions in Developing Countries'. *IDS Bulletin* Vol. 8, No. 5.
- Khan, Seema (2009): "Topic Guide on Social Exclusion." Governance and Social Development Resource Centre. International Development Department, University of Birmingham. <http://www.gsdrc.org>. Accessed 19 June 2014.
- Knack, S. and Keefer, P. (1995): 'Institutions and economic performance: cross-country tests using alternative institutional measures'. *Economics and Politics* Vol.7, pp. 207-227.
- Koelble, T.A (1995): 'The New Institutionalism in Political Science and Sociology'. Vol. 27, pp. 221-244.
- Kothari, Rajni (1994): *Politics in India*. New Delhi: Orient Longman.
- Kobayashi-Hillary, Mark (2004): *Outsourcing to India. The offshore advantage*. Berlin; New York: Springer.
- Kraas, Frauke (2007): 'Megacities and Global Change in East, Southeast and South Asia'. *ASIEN*, pp. 9-22.

- Kraas, Frauke; Aggarwal, Surinder; Coy, Martin; Heiken, Grant; Mulder, Eduardo de; Marker, Brian et al. (2005): "Megacities - our global urban future. Planet Earth-Earth Sciences for Society." International Year of Planet Earth. Available online at <http://yearofplanetearth.org>. Accessed 30 March 2016.
- Kukutschka, Roberto Martínez B. (2014): "Building Political Will. Topic Guide. Compiled by the Anti-Corruption Helpdesk." Transparency International. Available online at http://www.transparency.org/files/content/corruptionqas/Topic_Guide-Political_Will.pdf. Accessed 6 September 2016.
- Kumar, Jitendra (2015): 'Metropolises in Indian Urban System: 1901 – 2011'. *European Journal of Geography* Vol. 6, Number 3: 41 – 51.
- Kumar, K. N. (1990): *Political parties in India, their ideology and organisation*. 1st ed. New Delhi, India: Mittal Publications.
- Kumar, Madhuresh and Furlong, Mark (2012): "Our Right to Water. Securing the Right to Water in India. Perspectives and Challenges." The Blue Planet Project, Canada. Available online at <http://www.indiaenvironmentportal.org.in>. Accessed 30 September 2014.
- Kumar, Rajesh (2004): 'Brahmanical Idealism, Anarchical Individualism, and the Dynamics of Indian Negotiating Behavior'. *International Journal of Cross Cultural Management* Vol. 4, Issue 1, pp. 39-58.
- Kumar, Rakesh (2014): 'Aam Aadmi Party (AAP). A Turning Point for Democracy in India'. *International Journal of Political Science and Development* Vol.2, Issue 7, pp. 151-157.
- Kumar, Sanjay (2013): *Changing Electoral Politics in Delhi. From caste to class*. New Delhi: Sage Publications India.
- Kumar, Vikram; B.N. Nagpal; Pande, Veena; Srivastava, Aruna; Saxena, Rekha; Singh, Himmat; Anushitra; Gupta, K. Sanjeev; Tuli, N.R.; Yadav, N.K.; Olivier, Telle; Richard, Paul and Valecha, Neena (2015): 'Detection of dengue virus in individual Aedes aegypti mosquitoes in Delhi, India'. *J Vector Borne Dis* Vol. 52, No. 2, pp. 129-133.
- Kuznets, Simon (1955): 'Economic Growth and Income Inequality'. *The American Economic Review*, Vol. XLV, No. 1. Available online at <https://www.aeaweb.org/aer/top20/45.1.1-28.pdf>. Accessed 17 October 2014.
- Lall, Somik V. (2013): *Planning, connecting, and financing cities now. Priorities for city leaders*. Washington, D.C: World Bank.
- Lambsdorff, J.G (2011): *Causes and consequences of corruption. what do we know from a cross-section of countries?* In Susan Rose-Ackerman, Tina Søreide (Eds.): International handbook on the economics of corruption. Cheltenham, Northampton, MA: Edward Elgar, pp. 3-51.
- Lambsdorff, Johann Graf (1999): "Corruption in Empirical Research-A Review." Transparency International Working Paper. Transparency International. Available

- online at
http://gwdu05.gwdg.de/~uwvw/downloads/contribution05_lambsdorff.pdf.
Accessed 19 March 2017.
- Lange, Frederik Esko (2009): "Urban Governance. An Essential Determinant of City Development?" Theory and Practice No. 6. World Vision Institute for Research and Development.
- Larsen, Mattias (2011): *Vulnerable daughters in India. Culture, development, and changing contexts*. New Delhi: Routledge
- Lauth, Hans-Joachim (2000): "Informal Institutions and Democracy". *Frank Cass, London* Vol. 7, No. 4, pp. 21-50.
- Laxmikanth, M. (2010): *Indian Polity. For civil services examinations*. 3rd ed. New Delhi: Tata McGraw Hill Education Private Limited (Tata McGraw-Hill's WE series).
- Laxmikanth, M. (2011): *Governance in India*. New Delhi: Tata McGraw Hill Education Private Limited
- Leach, Edmund R. (1967): *Caste, Class and Slavery: the taxonomic problem*. In De Reuck, Anthony V. S, Julie Knight (Eds.): *Caste and race. Comparative approaches*. London: J. & A. Churchill (A Ciba Foundation volume).
- Leach, Edmund Ronald (Ed.) (1971, c1960): *Aspects of caste in south India, Ceylon, and north-west Pakistan*. Cambridge, New York: Cambridge University Press (Cambridge papers in social anthropology, 2).
- Leach, M., Bloom, G., Ely, A., Nightingale, P., Scoones, I., Shah, E. and Smith, A. (2007): *Understanding governance. Pathways to sustainability: STEPS Centre (STEPS working paper, 2)*. Available online at http://steps-centre.org/wp-content/uploads/final_steps_governance.pdf. Accessed 19 March 2017.
- Lee, Myungsuk (2003): "Conceptualizing the New Governance. A New Institution of Social Coordination." Indiana University, Bloomington, Indiana, USA. Available online at http://www.indiana.edu/~workshop/seminars/papers/y673_spring_2003_lee.pdf. Accessed 29 September 2014.
- Li, Enjie; Endter-Wada, Joanna; Li, Shujuan (2015): "Characterizing and Contextualizing the Water Challenges of Megacities". *Journal of the American Water Resources Association* Vol. 51 No. 3, pp. 589-613.
- Lindner, Samira (2014): "Literature review on social norms and corruption. U4 Expert Answer." U4-Anti Corruption Resource Centre and Transparency International. www.u4.no. Accessed 1 May 2015.
- Lindsey, Timothy (2008): *Indonesia, law and society*. 2nd ed. Leichhardt, N.S.W., Australia, [Singapore]: Federation Press; Distributed by ISEAS in Asia.
- Liu, Jie (2011): *Water ethics and water resource management*. Bangkok: UNESCO Bangkok.

- Llamas, Manuel Ramón; Martínez-Cortina, Luis and Mukherji, Aditi (2009): *Water ethics*. Boca Raton: CRC Press.
- Lok Satta Party (2009): "Political Parties and Indian Democracy." Available online at <http://ap.loksatta.org/documents/advocacy/pol%20parties.pdf>. Accessed 14 October 2014.
- Loughhead, Susan and Mittal, Onkar (2000): "Urban Poverty and Vulnerability in India. A Social Development Perspective." A Discussion Paper for South Asia Urban and City Management Course. Accessed 7 July 2014.
- Lowndes, V. (1996): 'Varieties of New Institutionalism. A Critical Appraisal'. *Public Administration* Vol. 74, Issue 2, pp. 181-197.
- Lui, Francis T (1985): 'An Equilibrium Queuing Model of Bribery'. *The Journal of Political Economy*, Vol. 93, No. 4, pp.760-781.
- Lynn, Laurence E.; Heinrich, Carolyn J. and Hill, Carolyn J. (2001): *Improving governance. A new logic for empirical research*. Washington, D.C: Georgetown University Press ([American governance and public policy series]).
- Maas, Anthony (2011): "Water, Governance and Sustainability. A Case Study of Water Allocation in Whiteman's Creek Watershed, Ontario." Master Thesis of Environmental Studies. University of Waterloo, Canada.
- MacDonald, Ronald and Majeed, Muhammad Tariq (2011): "Causes of Corruption in European Countries. History, Law, and Political Stability." University of Glasgow. Available online at http://www.gla.ac.uk/media/media_218412_en.pdf. Accessed 30 March 2016.
- Mahajan, Kanika and Goyal, Yugank (2005): "School Education in Delhi Under the Lens." Centre for Civil Society, New Delhi. Available online at http://ccs.in/internship_papers/2005/8.%20School%20Education%20under%20le ns.pdf. Accessed 30 March 2016.
- Mahesh, D. and Shivalingappa, B.N (2012): 'An Appraisal of Population Characteristics in Union Territories of India'. *International Journal of Research in Management* Vol. 3, No. 2.
- Mahoney, James (2000): 'Path Dependence in Historical Sociology'. *Theory and Society* Vol. 29, No. 4, pp. 507-548.
- Mahoney, James (2001a): 'Path Dependent Explanations of Regime Change. Central America in Comparative Perspective'. *Studies in Comparative International Development* Vol. 36, Issue 1, pp. 111-141.
- Mahoney, James (2001b): *The legacies of liberalism. Path dependence and political regimes in Central America*. Baltimore: Johns Hopkins University Press.
- Malik, Khalid (2013): *Human development report 2013. The rise of the South: human progress in a diverse world*. New York, United States: UNDP

- Malik, Farooq Ahemad and Malim, Bilal Ahmad (2014): `Indian National Congress at Cross Roads`. *International Journal of Research in Humanities, Arts and Literature (IMPACT: IJRHAL)* Vol. 2, No. 7, pp. 2321-8878.
- Mallica (2005): "Poor Children in Rich Schools." Institute of Social Studies Trust (Working Paper Series, WP 2005/1). Available online at <http://www.isst-india.org/pdf/poor%20children%20in%20rich%20school.pdf>. Accessed 6 December 2014.
- March, James G and Olsen, Johan P (1984): `The New Institutionalism. Organizational Factors in Political Life`. *The American Political Science Review* Vol. 78, No. 3, pp. 734-749.
- March, James G and Olsen, Johan P (2005): "Elaborating the New Institutionalism". Centre for European Studies, University of Oslo. Working Paper No. 11. Available online at <http://www.unesco.amu.edu.pl/pdf/olsen2.pdf>. Accessed 30 March 2016.
- Maria, Augustin (2006): `The role of groundwater in Delhi's water supply. Interaction between formal and informal development of the water system, and possible scenarios of Evolution`. *NATO Science Series*, Vol. 74, pp. 459-470.
- Marriott, Lisa (2008): "The Politics of Retirement Savings Taxation. A Trans-Tasman Comparison." PhD Thesis. Victoria University of Wellington.
- Marriott, Lisa (2010): *The politics of retirement savings taxation. A Trans-Tasman comparison*. Sydney, N.S.W: CCH Australia (CCH and ATTA doctoral series, v. 1).
- Mathur, Om Prakash and Thakur, Sandeep (2006): "Urban Water Pricing. Setting the Stage for Reforms." The Indian Institute of Public Administration, UNDP-India. Available online at http://iipa.org.in/common/pdf/PAPER%203_Urban%20Water%20Pricing.pdf. Accessed 10 January 2014.
- Matsagar, Vasant (2015): *Advances in structural engineering*. New Delhi [u.a.]: Springer.
- Mauro, P. (1995): `Corruption and Growth`. *The Quarterly Journal of Economics* Vol. 110, No. 3, pp. 681-712.
- Mauro, Paolo (1998): `Corruption and the Composition of Government Expenditure`. *Journal of Public Economics* Vol. 69, pp. 263-279.
- Mauro, Paolo (2002): "The Persistence of Corruption and Slow Economic Growth." International Monetary Fund (IMF Working Paper, WP/02/213). Available online at <https://www.imf.org/external/pubs/ft/wp/2002/wp02213.pdf>. Accessed 30 March 2016.
- Mauro, Paolo (2004): `The Persistence of Corruption and Slow Economic Growth`. *International Monetary Fund*, Vol. 51, No. 1. Available online at <http://www.imf.org/external/Pubs/FT/staffp/2004/01/pdf/mauro.pdf>. Accessed 31 March 2016.

- Majumdar, Maya (2005): *Encyclopaedia of gender equality through women empowerment*. New Delhi, India: Sarup & Sons.
- McIntosh, Arthur C. (2014): *Urban water supply and sanitation in Southeast Asia. A guide to good practice*. Philippines: Asian Development Bank.
- Meon, Pierre-Guillaume and Sekkat, Khalid (2005): `Does corruption grease or sand the wheels of growth?` *Public Choice*, Vol. 122, pp. 69-97.
- Millar Jayne (2002): "The Ability of the Maldives to Cope with Freshwater Scarcity Via the Adaptive Capacity of Its Political Economy." Occasional Paper No. 44. Water Issues Study Group, School of Oriental and African Studies, University of London. <https://www.soas.ac.uk>. Accessed 2 July 2014.
- Miller, David (1979, c1976): *Social justice*. Oxford, New York: Clarendon Press; Oxford University Press.
- Ministry of Agriculture (2013-14): *Crop Diversification Program in Haryana, Punjab & Western Uttar Pradesh. Sustainable Agriculture with Increased Productivity & Profitability*. Available online at <http://nfsm.gov.in/Guidelines/CDGuidelines.pdf>. Accessed 15 July 2014.
- Misra, Anil Kumar (2010): `A River about to Die: Yamuna`. *JWARP* Vol. 2, No. 5, pp. 489-500. DOI: 10.4236/jwarp.2010.25056.
- Misra, Girishwar (2009): *Psychology in India. Social and Organizational Processes*. New Delhi, India: Longman (ICSSR survey of advances in research).
- Mitra, Barun S.; Okonski, Kendra and Satyanand, Mohit (2007): *Keeping the water flowing. Understanding the role of institutions, incentives, economics, and entrepreneurship in ensuring access and optimising utilisation of water*. New Delhi: Academic Foundation in association with Liberty Institute.
- Mo, P.H (2001): `Corruption and Economic Growth`. *Journal of Comparative Economics* Vol. 29, pp. 66-79.
- Mohammad, Tarique (2008): *Modern Indian History*. Delhi: Tata McGraw Hill.
- Mohanty, Alekha C. (2010): "Urban Poverty in India. The Missing Linkage." National Law University, Orrissa. Available online at <http://papers.ssrn.com>. Accessed 30 March 2016.
- Mooij, Jos E. (2005): *The politics of economic reforms in India*. New Delhi; Thousand Oaks, Calif: Sage Publications.
- Mukherjee, Bharati (1991): *Political culture and leadership in India. A study of West Bengal*. 1st ed. New Delhi, India: Mittal Publications.
- Munshi, Kaivan and Rosenzweig, Mark R. (2005): "Why is Mobility in India so Low? Social Insurance, Inequality, and Growth." Center for International Development at Harvard University. Available online at http://www.hks.harvard.edu/var/ezp_site/storage/fckeditor/file/pdfs/centers-programs/centers/cid/publications/faculty/wp/121.pdf. Accessed 30 March 2016.

- Nag, Tirthankar and Garg, Amit (2013): “Strategies to Improve Urban Water Delivery in West Bengal, India. An Analysis of Water Institutions and Benchmarking of Water Delivery Organizations.” Indian Institute of Management, Ahmedabad India. Available online at <http://www.iimahd.ernet.in/assets/snippets/workingpaperpdf/19569140852013-04-02.pdf>. Accessed 30 March 2016.
- Najiullah, Syed (2011): *Muslim minorities and the national commission for minorities in India*. Newcastle upon Tyne: Cambridge Scholars Publishing.
- Nallathiga, Ramakrishna (2008a): “Reforming Urban Water Supply Sector in India.” Indian Water Works Association, Mumbai. Available online at <http://unpan1.un.org/intradoc/groups/public/documents/cgg/unpan046318.pdf>. Accessed 11 July 2014.
- Nallathiga, Ramakrishna (2008b): “River Water Conservation through Management Interventions. A Case Study of Yamuna Action Plan in India.” Centre for Good Governance, Hyderabad. Available online at <ftp://ftp.solutionexchange.net.in/public/wes/cr/res-10011102.pdf>. Accessed 26 August 2014.
- Narain, Vrinda (2007): `Water as a Fundamental Right. a Perspective from India`. Vol, 34:000. Available online at <http://lawreview.vermontlaw.edu/files/2012/02/narain.pdf>. Accessed 23 January 2014.
- Narain, Sunita and Pandey, Pratap (2012): *Excreta matters. State of India's environment: a citizens' report 7*. New Delhi: Centre for Science and Environment.
- Narayanan, Yamini (2015): *Religion, heritage and the sustainable city. Hinduism and urbanization in Jaipur*. London: Routledge.
- Narayanasamy, N.; Boraian, M. P. and Jeyaraju, M. A. (2000): *Corruption at the grassroots. The shades and shadows*. New Delhi: Concept Pub. Co.
- National Academy of Engineering (1999): `The Bridge`. *National Academy of Engineering*, Vol 29, No. 4. Available at <https://www.nae.edu/File.aspx?id=7369>. Accessed 26 March 2016.
- National Institute of Urban Affairs (2003): `Small-Scale Private Water Providers — A Growing Reality`. *Quarterly Newsletter of the National Institute of Urban Affairs* Vol 6, No. 3.
- National Institute of Urban Affairs (2016): *Towns of India: Demography, Economy and Social Structures, and the Status of Basic Infrastructure and Housing*. New Delhi, India: National Institute of Urban Affairs.
- National Institute of Urban Affairs (2015): “Urban Water Supply and Sanitation in Indian Cities.” National Institute of Urban Affairs. Available online at <http://www.citiesalliance.org/sites/citiesalliance.org/files/GP-IN2%20WATSAN.pdf>. Accessed 27 March 2016.

- Nayak, Gautam (2012): "Pollution Control Boards. An agenda for reform." National Law University, Jodhpur. Available online at <http://papers.ssrn.com>. Accessed 30 September 2014.
- Nayak, Minakshi Sheshadri (2013): "Bicycle Level of Service in Urban Indian Context." National Institute of Technology, India. Available online at <http://ethesis.nitrkl.ac.in/4720/1/211CE3245.pdf>. Accessed 27 March 2016.
- Negi, Nalin Singh and Ganguly, Sujata (2011): "Development Projects vs. Internally Displaced Populations in India. A Literature Based Appraisal." Centre on Migration, Citizenship and Development. Available online at https://www.uni-bielefeld.de/tirc/ag_comcad/downloads/workingpaper_103_negi_ganguly.pdf. Accessed 27 March 2016.
- Nema, Asit (2007): "Japanese Assistance for River Pollution Control. A Case Study of Yamuna Action Plan, India." Foundation for Greentech Environmental Systems, New Delhi. Available online at <http://www.green-ensys.org/site/publications/Japanese%20assistance%20for%20YAP.pdf>. Accessed 26 August 2014.
- Nepstad, Sharon Erickson and Bob, Clifford (2006): "When do leaders matter? Hypothesis on Leadership Dynamics in Social Movements". In *Mobilization: An International Journal*. Vol. 11, No. 1, pp. 1–22.
- Niemczynowicz, Janusz (1996): "Megacities from a Water Perspective". *Water International* Vol. 21, No. 4, pp. 198-205.
- North, Douglass C. (1990): *Institutions, institutional change, and economic performance*. Cambridge, New York: Cambridge University Press (The Political economy of institutions and decisions).
- North, Douglass C. (1991): "Institutions". *The Journal of Economic Perspectives* Vol. 5, No. 1, pp. 97-112.
- North, Douglass C. (1993): "Institutions and Credible Commitment". *Journal of Institutional and Theoretical Economics* Vol. 149, No. 1, pp. 11-23.
- Nussbaum, Martha Craven and Sen, Amartya (1995): *The quality of life. A study for the World Institute for Development Economics Research (WIDER) of the United Nations University*. Oxford: Clarendon Press (WIDER studies in development economics).
- Nye, J. S. (1967): "Corruption and political development". *American Political Science Review* Vol. 62, No. 2, pp. 417-427.
- OECD (2007): *Development Centre Studies Informal Institutions. How Social Norms Help or Hinder Development*. Washington, Mitcham: Organization for Economic Cooperation & Development; Central Book Services [Distributor].
- OECD (2013): Issue Paper on Corruption and Economic Growth. Available at: <http://www.oecd.org/g20/topics/anti-corruption/issues-paper-on-corruption-and-economic-growth.htm>. Accessed 27 March 2016.

- OECD (2014): The Rationale for Fighting Corruption. OECD. Available online at <http://www.oecd.org/cleangovbiz/49693613.pdf>. Accessed 27 March 2016.
- Oestigaard, Terje (2009): *Water, culture and identity. Comparing past and present traditions in the Nile basin region*. Bergen: BRIC Press.
- Ohlsson, L. (1999): "Environment, Scarcity and Conflict: A study of Malthusian concerns." PhD thesis. University of Göteborg.
- Olken, Benjamin A and Pande, Rohini (2012): 'Corruption in Developing Countries'. *Annual Review of Economics* Vol. 4, pp. 479-509.
- Olsen, Johan P. (2007): "Understanding Institutions and Logics of Appropriateness. Introductory Essay." Centre for European Studies, University of Oslo. Working Paper No. 13. Available online at http://www.sv.uio.no/arena/english/research/publications/arena-working-papers/2001-2010/2007/wp07_13.pdf. Accessed 19 March 2017.
- Olson, Mancur (1982): *The rise and decline of nations. Economic growth, stagflation, and social rigidities*. New Haven: Yale University Press.
- Oommen, T. K. (Ed.) (2010): *Classes, citizenship, and inequality. Emerging perspectives*. Delhi: Longman.
- Ostrom, Elinor (2007): "A Diagnostic Approach for Going Beyond Panaceas". Available online at http://www.indiana.edu/~workshop/colloquia/materials/papers/ostrom_paper.pdf. Accessed 15 September 2014.
- Overgaard, Louise (2010): "An analysis of Indian Culture in an Era of Globalisation." Department of Language and Business Communication, Aarhus University. Available online at <http://pure.au.dk/portal/files/13754/236687.pdf>. Accessed 3 April 2014.
- Oxfam Working Paper (2014): "Working for the Many. Public Services Fight Inequality." 182 Oxfam Briefing Paper. Available online at <https://www.oxfam.org/sites/www.oxfam.org/files/bp182-public-services-fight-inequality-030414-en.pdf>. Accessed 21 March 2017.
- Padwal, Rajan (2005): "Issues of Pricing Urban Water." Department of Economics, University of Mumbai. Working Paper No. 13. Available online at <http://www.esocialsciences.org/Download/repecDownloades&AId=34&fref=repec>. Accessed 27 March 2016.
- Pahl-Wostl, C. (2006): 'The importance of social learning in restoring the multifunctionality of rivers and floodplains'. *Ecology and Society* Vol. 11, No. 1. Available online at <http://www.ecologyandsociety.org/vol11/iss1/art10/>. Accessed 16 May 2017.
- Pahl-Wostl, Claudia (2009): 'A conceptual framework for analysing adaptive capacity and multi-level learning processes in resource governance regimes'. *Global Environmental Change* Vol. 19, Issue 3, pp. 354-365.

- Pandey A.K (2010): `Coalition Politics in India. Prospects and Problems`. *International Research Journal* Vol. 1, No, 12. Available online at <http://www.ssmrae.com/admin/images/7dc4b27aace9e21c05dd9316b7bebdac.pdf>. Accessed 15 October 2014.
- Panickar, Meena (2007): "State Responsibility in the Drinking Water Sector. An Overview of the Indian Scenario." International Environmental Law Research Centre. Switzerland. Available online at <http://www.ielrc.org/content/w0706.pdf>. Accessed 22 August 2014.
- Parekh, Bhikhu (2011): "The Crisis of Indian Democracy." Available online at https://www.cambridgetrust.org/assets/documents/Lecture_32.pdf. Accessed 27 March 2016.
- Paswan, Sanjay and Jaideva, Pramanshi (2002-2003): *Encyclopaedia of Dalits in India*. Delhi: Kalpaz Publications.
- Paul, Samuel (2003): "New Mechanism for Public Accountability. The Indian Experience." Available online at http://regulationbodyofknowledge.org/wp-content/uploads/2013/03/Paul_New_Mechanisms_for.pdf. Accessed 24 August 2014.
- Pavarala, Vinod and Malik, Kanchan K. (2010): *Religions, ethics and attitudes towards corruption. A study of perspectives in India*. [Birmingham]: International Development Dept., University of Birmingham (Religions and development working paper, 53).
- Peacock, Kathy Wilson (2008): *Natural resources and sustainable development*. New York: Facts on File (Global issues).
- Percy-Smith, Janie (2000): *Policy responses to social exclusion*. Buckingham, Philadelphia, PA: Open University Press.
- Peters, B. Guy (op. 2012): *Institutional theory in political science. The new institutionalism*. 3rd[rev.] ed. London [etc.]: Continuum.
- Petithomme, Mathieu (2011): `The Institutionalisation of Informal Politics Beyond the State. The Case of UNITA-MPLA Conflict in Angola`. *The Open Area Studies Journal* Vol. 4, pp. 62-72.
- Pham, John-Peter (2005): *Child soldiers, adult interests. The global dimensions of the Sierra Leonean tragedy*. New York: Nova Science Publishers.
- Pierson, Paul (2000a): `Increasing Returns, Path Dependence and the Study of Politics`. *The American Political Science Review* Vol. 94, No. 2.
- Pierson, Paul (2000b): `Not Just What, but When: Timing and Sequence in Political Processes`. *Studies in American Political Development* Vol. 14, pp. 72-92.
- Pierson, Paul and Skocpol, Theda (2002): *Historical Institutionalism in Contemporary Political Science*. In Katznelson Ira, Milner V Helen (Ed.): *Political Science: State of Discipline*. Washington, DC: American Political Science Association, pp. 693-721.

- Piff, Paul K.; Stancato, Daniel M.; Cot, Stephane, Mendoza-Denton, Rodolfo and Keltner, Dacher (2012): `Higher social class predicts increased unethical behavior. ` *Proceedings of the National Academy of Sciences* Vol. 109, pp. 4086-4091.
- Pikit, Hans and Kouba, Ludek (2013): “The Interrelation of Informal Institutions and Governance Quality in Shaping Welfare State Attitudes.” Work Package 104, MS22 "Research paper on connection between welfare state reforms and informal institutions" Working Paper No. 38. Available online at <http://www.foreurope.eu>. Accessed 21 March 2017.
- Pingle, Vibha and Varshney, Ashutosh (2014): *India's Identity Politics: Then & Now*, pp. 353–385. In Kelly, D. A.; Rajan, Ramkishan S.; Goh, Gillian H. L. *Managing globalization. Lessons from China and India*. New Jersey: World Scientific Publications.
- Planning Commission (2011a): *Report of the Working Group on Urban and Industrial Water Supply and Sanitation for the Twelfth Five-Year- Plan (2012-2017)*. Available online at http://planningcommission.nic.in/aboutus/committee/wrkgrp12/wr/wg_indu_sani.pdf. Accessed 29 January 2016.
- Planning Commission (2011b): *Slums of Delhi*. Centre for Global Development Research Private Limited, New Delhi. Available online at http://planningcommission.nic.in/reports/sereport/ser/ser_slum.pdf. Accessed 28 January 2016.
- Planning Commission, Govt. of India (2013): *Twelfth five-year plan (2012-2017)*: Sage Publications India Pvt Ltd.
- Plummer, Janelle (2012): *Diagnosing corruption in Ethiopia. Perceptions, realities, and the way forward for key sectors*. Washington, D.C: World Bank (Directions in development. Public sector governance).
- Pope, Jeremy (2000): *Confronting corruption. The elements of a national integrity system*. Berlin: Transparency International.
- Popovich, Vasily V. and Zeile, Peter (2011): *REAL CORP 2011. Change for stability: lifecycles of cities regions, the role and possibilities of foresighted planning in transformation processes: proceedings of 16th International Conference on Urban Planning, Regional Development and Information Society, 18-20 May 2011 SANAA building, Zollverein World Heritage Site, Essen, Germany*. Schwechat: CORP, Competence Center of Urban and Regional Planning.
- Prasad, Satish C., Ph. D (2013): *On human dilemma. Memoir of a physicist*: Dorrance Pub Co.
- Pritchard, Bill (2014): *Feeding India. Livelihoods, entitlements and capabilities*. US and Canada. Routledge.

- Pruthi, Raj (2004): *Indian caste system*. New Delhi: Discovery Publishing House (Culture and civilization series).
- Punyaratabandhu, Suchitra (2004): "Commitment to Good Governance, Development, and Poverty Reduction. Methodological Issues in the Evaluation of Progress at National and Local Levels." CDP Background Paper No. 4. ST/ESA/2004/CDP/4. National Institute of Development Administration, Bangkok Thailand. Available online at <http://un.org>. Accessed 15 September 2014.
- Pushkaran, Neha (2015): "Dilli-6. Once self-sufficient, now a dry zone." Hindustan Times. Available online at <http://projects.hindustantimes.com/once-self-sufficient-now-a-dry-zone>. Accessed 9 October 2015.
- Putnam, Robert D.; Leonardi, Robert and Nanetti, Raffaella (1993): *Making democracy work. Civic traditions in modern Italy*. Princeton, N.J: Princeton University Press.
- Quah, Jon S. T (2008): "Curbing Corruption in India: An Impossible Dream?" *Asian Journal of Political Science* Vol. 16, No. 3, pp. 240-259.
- Quah, Jon S. T (©2011): *Curbing corruption in Asian countries. An impossible dream?* Bingley: Emerald Group Pub. (Research in public policy analysis and management, v. 20).
- Rai, Suresh Chand (2011): "Water Management for a Megacity. National Capital Territory of Delhi". *Water Management Resources* Vol. 25, No. 9, pp. 2267-2278.
- Rajan, Vithal (2011): "Dalits and the Caste System of India. Some Explorations and Conjectures." A Transcend Research Paper for Discussion. Available online at https://www.transcend.org/tri/downloads/The_Caste_System_in_India.pdf. Accessed 31 March 2016.
- Ramesh S (2013): "Draft National Water Policy 2012 - A review." Dhan Foundation. www.dhan.org. Accessed 19 August 2014.
- Rao, Jasmine (2010): "The Caste System: Effects on Poverty in India, Nepal and Sri Lanka". *Global Majority E-Journal* Vol. 1, No. 2, pp. 97-106.
- Rao Vijayendra and Ban Radu (2007): "The Political Construction of Caste in South India." The World Bank. Available online at http://eml.berkeley.edu/~webfac/bardhan/e271_f07/rao.pdf. Accessed 31 March 2016.
- Reddy, G Rama Chandra (2007): *Fault lines in Indian democracy*. New Delhi, P.H. Pub.
- Rhodes, R.A.W (2007): "Understanding Governance: Ten Years On". *Organization Studies* Vol. 28, No. 8, pp. 1243-1264.
- Richardson, H.W (1989): "The Big, Bad City: Mega-City Myth? Third World Planning Review". Vol. 11, No. 4, pp. 355-372.
- Robson, Peter and Kjønstad, Asbjørn (2001): *Poverty and the law*. Oxford [England], Portland, Or: Hart Pub. (Oñati international series in law and society).
- Rodda, John C. (2004): *The basis of civilization - water science?* Wallingford: IAHS (IAHS publication, 286).

- Rogers, Peter and Hall, Alan W. (2003): *Effective water governance*. Stockholm: Global Water Partnership (TEC background paper, no. 7).
- Rose-Ackerman, Susan (2006): *International handbook on the economics of corruption*. Cheltenham: Edward Elgar (Elgar original reference).
- Rosegrant, Mark W.; Cai, Ximing and Cline, Sarah A. (2002): *Global water and food. Prospects to 2025*. Washington, D.C: International Food Policy Research Institute.
- Rothstein, Bo and Torsello, Davide (2013): "Is Corruption Understood Differently in Different Cultures? Anthropology meets Political Science." QOG The Quality of Government Institute (Working Paper Series 2013:5). Available online at <http://www.qog.pol.gu.se>. Accessed 31 March 2016.
- Rowley, Charles K. and Schneider, Friedrich (2004): *The Encyclopedia of public choice*. Dordrecht, Boston: Kluwer Academic Publishers.
- Rudolph, Susanne Hoeber and Rudolph, Lloyd I. (2002): 'South Asia Faces the Future. New Dimensions of Indian Democracy'. *Journal of Democracy* Vol. 13, No. 1.
- Saenz, Rogelio; Embrick, David G. and Rodriguez, Néstor (2015): *The international handbook of the demography of race and ethnicity*: Springer (International Handbooks of Population, volume 4).
- Sahu, Samanta (2009): "Politics of Access to Drinking Water in Urban Areas in India: State and Market Interventions. A Case Study of Hyderabad." Doctor of Philosophy. Department of Political Science. University of Hyderabad. Available online at <http://shodhganga.inflibnet.ac.in/handle/10603/4070>. Accessed 21 September 2014.
- Saigal Omesh, Kumar Prakash, Gupta R K and Mudgal R (1994): *Problems & prospects of industrial development in a metropolitan city. A case of Delhi*. 1st ed. New Delhi, India: Mittal Publications.
- Saint-Martin, Denis (2005): 'Path Dependence and Self-Reinforcing Process in the Regulation of Ethics in Politics. Toward a Framework for Comparative Analysis'. *International Public Management Journal* Vol. 8, No. 2, pp. 135-152.
- Saleth, R. Maria (2004): *Strategic analysis of water institutions in India. Application of a new research paradigm*. Colombo, Sri Lanka: International Water Management Institute (Research report, 79).
- Samadi, Ali Hussein and Farahmandpour, Bahare (2013): 'The Effect of Income Inequality on Corruption in Selected Countries (1995-2007)'. *Journal of Emerging Issues in Economics, Finance and Banking (JEIEFB)* Vol. 1, No. 3.
- Sarangi, Prakash (2001): 'The Party System in India'. *An Internet Journal of Pedagogy* Vol. 1, No. 1.
- Sarkar, Papiya (2003): "Solid Waste Management in Delhi. A Social Vulnerability Study." Toxics Link, New Delhi. Available online at http://www.seas.columbia.edu/earth/wtert/sofos/Sarkar_SWM%20in%20Delhi%20-%20A%20Social%20Vulnerability%20Study.pdf. Accessed 22 October 2014.

- Satapathy, Biraja Kabi (2014): `Safe Drinking Water in Slums. From Water Coverage to Water Quality`. *Economic and Political Weekly* Vol. 49, No. 24.
- Scanlon, John; Cassar, Angela; Nemes, Noemi (2004): *Water as a Human Right?* Gland, Switzerland: IUCN, The World Conservation Union.
- Schrenk, Manfred (Ed.) (2013): *Planning times. You better keep planning or you get in deep water, for the cities they are a-changing ---: proceedings = Tagungsband.* Schwechat-Rannersdorf: CORP - Competence Center of Urban and Regional Planning; = Kompetenzzentrum für Stadtplanung und Regionalentwicklung.
- Scott, James C. (1972): *Comparative Political Corruption.* University of Wisconsin.
- Sehring, Jenniver (2008): "Path dependencies and institutional bricolage in Post-Soviet water governance." Institute of Political Science & Social Research, University of Würzburg. Available online at <http://www.irsa-world.org/XII/papers/28-3.pdf>. Accessed 31 March 2016.
- Sehring, Jenniver (2009): *The politics of water institutional reform in neopatrimonial states. A comparative analysis of Kyrgyzstan and Tajikistan.* 1st ed. Wiesbaden: VS, Verlag für Sozialwissenschaften (Politik in Afrika, Asien und Lateinamerika).
- Seleim, Ahmed and Bontis, Nick (2009): `The relationship between culture and corruption. a cross-national study`. *Journal of Intellectual Capital* Vol. 10, No. 1, pp. 165-184.
- Sen, Amartya (2000): "Social Exclusion. Concept, Application and Scrutiny." Asian Development Bank. Social Development Papers No. 1. Available online at www.adb.org. Accessed 29 January 2016.
- Sen, Amartya (2001): *Development as freedom.* Oxford, New York: Oxford University Press.
- Sengupta, Chandan and Corbridge, Stuart (2010): *Democracy, development, and decentralisation in India. Continuing debates.* New Delhi and UK: Routledge.
- Sengupta, Ranjana (2007): *Delhi Metropolitan. The making of an unlikely city.* New Delhi: Penguin Books.
- Shah, Ghanshyam (2004): *Caste and democratic politics in India.* London: Anthem (Anthem South Asian studies).
- Shah, Parth J. (2007): "User Charges. A Case Study of Water Pricing." CCS Series on NURM Reforms No.4. Centre of Civil Society. Delhi. Available online at <http://ccs.in>. Accessed 21 July 2014.
- Sharma, Hemanti (2014): "Evaluation of Groundwater Depletion Scenario and its Impacts in NW India by Geodetic Techniques & Modelling Approaches NW India by Geodetic Techniques & Modelling Approaches." Master Thesis. Indian Institute of Remote Sensing. Available online at <http://www.iirs.gov.in>. Accessed 30 March 2016.

- Sharma, Prashant (2015): *Democracy and transparency in the Indian state. The making of the Right to Information Act*. New York: Routledge (Routledge/Edinburgh South Asian studies series).
- Sharma, Rajendra K. (2004): *Indian Society, Institutions and Change*. Delhi: Atlantic Publisher and Distributor.
- Sharma K.N (2005): `Unique Ideas on Water in Ancient Indian Scriptures and Culture.` *Proceedings of the IWRA XII World Water Congress, New Delhi* Vol. 3, No. 6.1-6.8.
- Sharma, Ram Nath and Sharma, Rajendra K. (2004): *Problems of education in India*. New Delhi: Atlantic.
- Sheahan, John (1999): *Searching for a better society. The Peruvian economy from 1950*. University Park, Pa: Pennsylvania State University Press.
- Shinde, Prem K. (2005): *Dalits and human rights*. Delhi: Isha Books.
- Siddaramu B (2013): `The Consciousness of Caste in The Contemporary Indian Society`. *International Journal of Research in Humanities, Arts and Literature (IJRHAL)* Vol. 1, Issue 1.
- Siddharth, P. Praveen and Mohan, Shriya (2011): "Crisis at the Delhi Jal Board." Lee Kuan Yew School of Public Policy and National University of Singapore. Available online at <http://lkyspp.nus.edu.sg>. Accessed 2 October 2014.
- Siddiquie, Mohd Shawahiq (2008): "Water policies and legal framework in India." International Water Management Institute. Available online at <http://publications.iwmi.org/pdf/H042921.pdf>. Accessed 1 October 2014.
- Singh, Amita; Kapoor, Kapil and Bhattacharyya, Rabindranath (2009): *Governance and poverty reduction. Beyond the cage of best practices*. New Delhi: PHI Learning.
- Singh, Avjeet (2007): "Political Economy of Reforms in The Urban Water Supply Sector in India. Lessons from the Delhi Water Sector Experience." John F Kennedy School of Government, Harvard University. <http://www.hks.harvard.edu/index.php/content/download/66912/1240458/version/1/file/singh-sypa.pdf>. Accessed 30 March 2016.
- Singh, Devinder (2013): "Role of Civil Society in Indian Democracy." Available online at http://www.internationalseminar.org/XIV_AIS/TS%202/3.%20Devinder%20Singh.pdf. Accessed 8 February 2015.
- Singh, Mohinder (1996): *Social policy and administration in India*. New Delhi: M D Publications.
- Singh, R.B (2004): *Assessment of Wastewater generation, management pattern and its re-use potential in Urban India*. In Steenvoorden, J. H. A. M, Theodore A. Endreny (Eds.): *Wastewater re-use and groundwater quality*. Wallingford, Oxfordshire [England]: IAHS (IAHS publication, 285).

- Singh, Reena (2008): "Wastewater Problems and Social Vulnerability in Megacity Delhi/India." Doctoral Thesis, University of Cologne. At the Faculty of Mathematics and Natural Sciences. Accessed 19 May 2014.
- Singh, Swapnil (2013): `The Caste System: Continuities and Changes`. *International Proceedings of Economics Development and Research* Vol. 64, No. 15. DOI: 10.7763/IPEDR.
- Singh, Vijai P. (1976): *Caste, class, and democracy. Changes in a stratification system*. Cambridge, Mass: Schenkman Pub. Co.
- Singh R B (2001): `Sustainable regional water management in the Yamuna River basin. Case study of the Delhi region (India)` . *IAHS*, No.268, pp. 25-32.
- Singh, Dr. Arun Kumar (2006): "Delhi's Watery Woes. A Cross-sectoral Analysis of the Water Crisis in Delhi." Centre for Trade & Development (Centad). Delhi (Occasional Paper - I). Accessed 24 September 2014.
- Singh, Kishor Kumar and Shukla, Shikha (2005): "Profiling Informal City of Delhi. Policies, Norms, Institutions & Scope of Intervention." WaterAid India. Available online at <http://www.wateraid.org/~media/Publications/profiling-informal-delhi-city.pdf>. Accessed 24 March 2016.
- Singh, R.B and Singh, Anju (2005): *Integrated Water Management in India: The case of Delhi Megacity*. In Dragan Savic, Juan Carlos Bertoni, Marino A.Miguel, Savenije Hubert H.G (Eds.): Sustainable water management solutions for large cities. The proceedings of the international symposium on Sustainable Water Management for Large Cities (S2): held during the Seventh Scientific Assembly of the International Association of Hydrological Sciences (IAHS) at Foz do Iguacu, Brazil, 3-9 April, 2005. Wallingford, Oxfordshire, UK: IAHS (IAHS publication, no. 293), pp. 98-110.
- Society for Participatory Research in Asia (2014): *Delhi Study Report 2014. Government Led Exclusion of the Urban Poor: A Greater Contributor though a Lesser Recipient*. Society for Participatory Research in Asia. Available online at https://terraurban.files.wordpress.com/2014/01/delhi-study_april-2014.pdf. Accessed 9 July 2015.
- Soksreng, T. E. (2007): `Good Governance in Cambodia. Exploring the Link between Governance and Poverty Reduction`. Vol. 11, No. 6, pp.55-76. Available online at <http://kamome.lib.ynu.ac.jp/dspace/bitstream/10131/3127/1/4-Te.pdf>. Accessed 30 March 2016.
- Sondhi, Sunil (2000): "Combating Corruption in India. the Role of Civil Society." Prepared for the XVIII World Congress of International Political Science Association, August 1-5, 2000, Quebec City, Canada. Available online at <http://unpan1.un.org/intradoc/groups/public/documents/APCITY/UNPAN019103.pdf>. Accessed 30 March 2016.
- Sorensen, André and Okata, J. (2011): *Introduction. Megacities, Urban Form and Sustainability*. In Sorensen, André and Okata, J. (Ed.): Megacities. Urban form,

- governance, and sustainability. Tokyo, New York: Springer (cSUR-UT series, 10), pp. 1-12.
- Sorensen, André and Okata, Junichiro (2011): `Megacities. Urban form, governance, and sustainability`; [International Workshop on World Megacities held 7-8 March 2008 by the Center for Sustainable Urban Regeneration (cSUR) at the University of Tokyo]. *Megacities* Vol. 10.
- Soviana, Soviana and Puspa, Jofi (2009): "Problems and Critics Toward Water Management in Megacities: A Case in Indonesia." University of Hamburg. Available online at <http://www.tropentag.de>. Accessed 10 July 2014.
- Sowman, Merle and Wynberg, Rachel (2014): *Governance for justice and environmental sustainability. Lessons across natural resource sectors in Sub-Saharan Africa*. New York: Routledge.
- Srivastava, Amit; Yadav, Deepanshu; Gaur, Bharat (2015): `Ground Water Quality Assessment around Gazipur Landfill Site, Delhi`. *The International Quarterly Journal* Vol. 1, No. 4, pp. 149-156.
- Srivastava, Smita (2010): `The Right to Information in India: Implementation and Impact`. *Afro Asian Journal of Social Sciences* Vol. 1, Issue 1.
- State of California, Natural Resources Agency and Department of Water Resources (2013): *California Water Plan. Investing in Innovation and Infrastructure*. <http://www.waterplan.water.ca.gov>. Accessed 21 March 2017.
- Stefanick, Lorna (2013): "Transparency, Accountability and Good Governance: Is Alberta Cursed?" Canadian Association of Political Science. Available online at http://auspace.athabasca.ca/bitstream/2149/3372/1/Stefanick,%20Lorna_CPSA.2013.pdf. Accessed 27 March 2016.
- Steiner, Andrej; Martonakova, Henrieta and Guziova, Zuzana (2003): *Environmental governance sourcebook*. Bratislava, Slovak Republic: UNDP Regional Bureau for Europe and the Commonwealth of Independent States.
- Steinmo, Sven (2001a): "Institutionalism." Edited by Nelson Polsby. University of Colorado. International Encyclopedia of the Social and Behavioral Sciences. Available online at <http://stripe.colorado.edu/~steinmo/polsby.pdf>. Accessed 9 February 2014.
- Steinmo, Sven (2001b): *The New Institutionalism*. In Clarke, Paul A. B., Joe Foweraker (Eds.): *Encyclopedia of democratic thought*. London, New York: Routledge.
- Steinmo, Sven (2008): *What is Historical Institutionalism?* In Donatella Della Porta, Michael Keating (Eds.): *Approaches and methodologies in the social sciences. A pluralist perspective*. Cambridge, N.Y: Cambridge University Press.
- Stinchcombe, Arthur L. (1987): *Constructing social theories*. Chicago: University of Chicago Press.
- Subedi, Madhusudan (2013): `Some Theoretical Considerations on Caste`. *Dhaulagiri Journal of Sociology and Anthropology* Vol. 7.

- Suchinmayee, Rachna (2008): *Gender, human rights and environment*. New Delhi: Atlantic Publishers & Distributors.
- Suez Environment (2012): *Water Stories Paris. Leasing Contract Drinking Water Distribution*. Suez Environment. France. Available online at <http://www.suez-environnement.com>. Accessed 31 March 2016.
- Sugam, Rudresh and Ghosh, Arunabha (2013): "Urban Water and Sanitation in India. Multi-stakeholder Dialogues for Systemic Solutions." Council on Energy, Environment and Water. Available online at <http://ceew.in/pdf/CEEW-Veolia-Urban-Water-and-Sanitation-in-India-Nov13.pdf>. Accessed 27 March 2016.
- Suri, K.C (2005): "Parties Under Pressure. Political Parties in India Since Independence." Centre for the Study of Developing Societies (CSDS). Delhi. Available online at <http://www.democracy-asia.org/qa/india/KC%20Suri.pdf>. Accessed 14 October 2014.
- Suri, Sushma (1994): *Ecology, ethnicity and identity*. New Delhi: Atlantic Publishers & Distributors.
- Sujatha. K (1999): "Education of Indian Schedule Tribes. A Study of Community Schools in the District of Vishakhapatnam, Andhra Pradesh." Strategies of Education and Training for Disadvantaged Groups. Working Document in the Series: Strategies of Education and Training for Disadvantaged Groups. Paris: International Institute for Educational Planning/UNESCO. www.unesco.org/iiep. Accessed 30 March 2016.
- Swamy, Arun R. (2004): `Ideology, Organization and Electoral Strategy of Hindu Nationalism. What's Religion Got to Do with It'? *Religious Radicalism in South Asia*, pp. 73–100.
- Tamina, Christopher B. (2015): *Corruption. A theoretical and empirical analysis, the case of the Democratic Republic of Congo: De Amicitia*.
- Tanzi, V.; H. Davoodi (1997): "Corruption, Public Investment, and Growth." IMF Working Paper 97/139. International Monetary Fund, Washington, D.C. <http://www.imf.org>. Accessed 30 March 2016.
- T.B. Simi; Sharma, Sudan and Cheriyan, George (2010): "Analysing the Right to Information Act in India." CUTS International (Briefing Paper, 1/2010). Available online at http://www.cuts-international.org/cart/pdf/Analysing_the_Right_to_Information_Act_in_India.pdf. Accessed 21 March 2017.
- Tear Fund (2007): *Sanitation and hygiene in developing countries: identifying and responding to barriers. A Case Study from Burkina Faso*. Available online at <http://waterfund.go.ke>. Accessed 31 March 2016.
- Teddle, Charles and Yu, Fen (2007): `Mixed Methods Sampling. A Typology with Examples`. *Journal of Mixed Methods Research* Vol. 1, No. 1, pp. 77-100.

- Teorell, Jan (2007): "Corruption as an Institution. Rethinking the Nature and Origins of the Grabbing Hand." THE QOC Institute Quality of Government. Available online at <http://www.qog.pol.gu.se>. Accessed 31 March 2016.
- The Economic and Social Council (2014): *Global Classrooms*. Available online at <http://mun.lau.edu.lb/documents/msmun-escosoc-water-and-sanitation.pdf>. Accessed 17 September 2014.
- The Energy and Resource Institute (2010a): *Review of current practices in determining user charges and incorporation of economic principles of pricing of urban water supply*. Ministry of Urban Development, Govt. of India (2009/A02). Available online at http://moud.gov.in/upload/uploadfiles/files/TERI_UC_Report26.pdf. Accessed 19 March 2017.
- The Energy and Resource Institute (2010b): *State of Environment Report for Delhi*. Department of Environment and Forests, Government of NCT of Delhi. Available online at <http://www.indiaenvironmentportal.org.in/files/SoEDelhi2010.pdf>. Accessed 31 March 2016.
- The National Bureau of Asian Research (2013): *India's Water Crisis. Causes and Cures*. Available online at http://www.nbr.org/downloads/pdfs/outreach/NBR_IndiaCaucus_August2013.pdf. Accessed 31 March 2016.
- The World Bank (1997): *Helping Countries Combat Corruption. The Role of the World Bank*. Poverty Reduction and Economic Management. The World Bank. Available online at <http://www1.worldbank.org>. Accessed 31 March 2016.
- The World Bank; Water Partnership Program; Water and Sanitation Program (2012): *Integrated Urban Water Management. Case Study: Sao Paulo*. Available online at <http://siteresources.worldbank.org>. Accessed 31 March 2016.
- Thelen, Kathleen and Steinmo, Sven (1992): *Historical Institutionalism in Comparative Politics*. In Thelen Kathleen, Steinmo Sven, Longstreth Frank (Ed.): *Structuring Politics*, pp. 1-32.
- Thorat, Sukhadeo and Mahamallik, Motilal (2007): "Chronic Poverty and Socially Disadvantaged Groups. An Analysis of Causes and Remedies." Indian Institute of Public Administration. Working Paper No. 33. Accessed 25 June 2014.
- Thornley, A. and P. Newman (2011): *Planning World Cities. Globalization and Urban Politics*. Hampshire: Palgrave Macmillan.
- Tilly, Charles (2004): *Social movements, 1768-2004*. Boulder: Paradigm Publishers.
- Tiwari, Anand Prakash (2007): "Creating Enabling Conditions for Sustained Reforms in Urban Water Sector. A Case for Legal Reforms in National Capital Region of Delhi." International Environmental Law Research Centre. <http://www.ielrc.org>. Accessed 24 September 2014.
- Tonoyan, Vartuhí; Strohmeier, Robert; Habib, Mohsin and Perlitz, Manfred (2010): *'Corruption and Entrepreneurship. How Formal and Informal Institutions Shape Small Firm Behavior in Transition and Mature Market Economies'*.

- Entrepreneurship Theory and Practice* Vol. 34, No. 5, pp. 803-831. DOI: 10.1111/j.1540-6520.2010.00394.x.
- Transparency International (2013): *Guidelines for Good Governance in Grassroots Sport*. Available online at <https://www.transparency.de>. Accessed 21 March 2017.
- Treisman, Daniel (2000): 'The Causes of Corruption. A Cross-National Study'. *Journal of Public Economics* Vol. 76, No. 3, pp. 399-457.
- Tripathi, Sabyasachi (2013): An Overview of India's Urbanization, Urban Economic Growth and Urban Equity. Institute of Social and Economic Change; Bangalore India. Munich Personal RePEc Archive (MPRA). Paper No. 45537. <http://mpra.ub.uni-muenchen.de>. Accessed 8 July 2014.
- Trompenaars, Alfons and Hampden-Turner, Charles (1998): *Riding the waves of culture. Understanding cultural diversity in global business*. 2nd ed. New York: McGraw Hill.
- Truelove, Yaffa (2007): "On the Verge of Water Crisis? State Discourses & the Production of Water Inequality in Delhi, India." Master Thesis. University of Colorado.
- Truelove, Yaffa (2011): '(Re-)Conceptualizing water inequality in Delhi, India through a feminist political ecology framework'. *Geoforum* Vol, 42, No. 2, pp. 143-152. DOI: 10.1016/j.geoforum.2011.01.004.
- Tsakiris G (2007): "Water Scarcity Management: An Introduction." Centre for the Assessment of Natural Hazards and Proactive Planning & National Technical University of Athens. Available online at <http://www.waterinfo.gr/pages/pdf/scarcity.pdf>. Accessed 13 July 2014.
- Uberoi, N. K (2003): *Environmental Management*. New Delhi: Excel Books.
- Umeh, J.C; Kyarem, Richard N.; Martins, Iyoboyi (2013): 'Beneficial Grease Hypothesis of Public Sector Corruption in Economic Development: The Nigerian Experience'. *Journal of Economics and Sustainable Development* Vol. 4, No. 16.
- UN (op. 2012): *The United Nations world water development report*. 4th ed. Paris: UNESCO.
- UN Water (2006): *Water. A shared responsibility. Chapter 2: The Challenges of Water Governance*. With assistance of Charles Darwin. Paris, France, New York: United Nations Educational, Scientific and Cultural Organization (UNESCO); Berghahn Books (United Nations world water development report, 2).
- UN Water (2008): *Transboundary Waters. Sharing Benefits, Sharing Responsibilities*. UN Water – Thematic Paper. <http://www.unwater.org>. Accessed 27 March 2016.
- UN Water (2009): *Water in a Changing World. Case Study Volume*. Paris: UNESCO Publ. [u.a.] (The @United Nations world water development report, 3).
- UN, OHCHR, UN-Habitat, WHO (2010): *The Right to Water*. Fact Sheet No. 35. <http://www.ohchr.org>. Accessed 19 March 2017.

- UNDP (1997): *Governance for Sustainable Human Development. A UNDP Policy Document*. Foreword - UNDP Governance policy paper. Available online at <http://www.pogar.org/publications/other/undp/governance/undppolicydoc97-e.pdf>. Accessed 31 March 2016.
- UNDP (2004a): *Decentralised Governance for Development. A Combined Practice Note on Decentralisation, Local Governance and Urban/Rural Development*. Available online at <http://www.undp.org>. Accessed 19 March 2017.
- UNDP (2004b): *Water Governance for Poverty Reduction. Key Issues and the UNDP Response to Millennium Development Goals*. Available online at <http://www.undp.org/water>. Accessed 19 March 2017.
- UNDP (2007): *Effective Water Governance. The Key to Sustainable Water Management and Poverty Eradication*. Available online at <http://www.undp.org/water>.
- UNDP (2008): *Corruption and Development. Anti-Corruption Interventions for poverty reduction, Realization of the MDGs and Promoting Sustainable Development*. Available online at <http://www.pogar.org/publications/finances/anticor/Corruption-and-Development-Primer-08e.pdf>. Accessed 30 March 2016.
- UNDP and Global Integrity (2008): *A User's Guide to Measuring Corruption*. Available online at <http://www.undp.org>. Accessed 21 March 2017.
- UNESCO (2011): *Water ethics and water resource management*. Bangkok: UNESCO
- UNESCO (2013): *Social inclusion of internal migrants in India. Internal migration in India initiative*. New Delhi: UNESCO.
- UN-Habitat (2006): *Responding to the Challenges of an Urbanized World. Annual Report*. Nairobi, Kenya: United Nations Human Settlements Programme.
- UNICEF and World Health Organization (2012): *Progress on drinking water and sanitation*. New York, N.Y, Geneva: UNICEF; World Health Organization.
- United Nations (2001): General Assembly, Road map towards the implementation of the United Nations Millennium Declaration Report of the Secretary-General. A/56/326. <http://www.un.org>. Accessed 16 May 2017.
- United Cities and Local Governments (2012): *Who can Address Urban Inequality? The Often Forgotten Roles of Local Government*. Available online at <http://www.uclg.org>. Accessed 21 March 2010.
- United Nations (2010a): *Resolution adopted by the Human Rights Council. Human rights and access to safe drinking water and sanitation*. Resolution 7/22. Available online at <http://daccess-dds-ny.un.org/doc/UNDOC/GEN/G10/166/33/PDF/G1016633.pdf?OpenElement>. Accessed 22 September 2014.
- United Nations (2010b): *Rethinking poverty. Report on the world social situation 2010*. New York: United Nations, Dept. of Economic and Social Affairs.

- United Nations (2011): *Population Distribution, Urbanization, Internal Migration and Development. An International Perspective*. United Nations Department of Economic and Social Affairs, Population Divisions. ESA/P/WP/223. Available online at <http://www.un.org>. Accessed 21 March 2017.
- United Nations (2012a): *Governance and Development. Thematic Think Piece*. UNDESA, UNPD, UNESCO. UN System Task Team on the Post-2015 UN Development Agenda. www.un.org. Accessed 21 March 2017.
- United Nations (2012b): *World Urbanization Prospects: The 2011 Revision*. United Nations, New York (ST/ESA/SER.A/322). <http://www.un.org>. Accessed 21 March 2017.
- United Nations (2012c): General Assembly, Human Rights Council, Twenty-First Session, Agenda item 3, Promotion and Protection of all human rights, civil, political, economic, social and cultural rights, including the right to development. Final draft of the guiding principles on extreme poverty and human rights, submitted by the Special Rapporteur on extreme poverty and human rights, Magdalena Sepúlveda Carmona. A/HRC/21/39. <http://www.un.org>. Accessed 21 March 2017.
- United Nations (2012d): *Review of the contributions of the MDG Agenda to foster development: Lessons for the post-2015 UN Development Agenda*. UN System Task Team on the Post-2015 UN. <http://www.un.org>. Accessed 21 March 2017.
- United Nations (2013): *World economic and social survey. Sustainable development challenges*. New York: United Nations publication.
- United Nations (2014a): *Water and Energy Facts and Figures*. The United Nations World Water Development Report. WWDR 2014. <http://unesdoc.unesco.org>. Accessed 21 March 2017.
- United Nations (2014b): *World Urbanization Prospects*. United Nations. New York (ST/ESA/SER.A/352). www.esa.un.org. Accessed 21 March 2017.
- United Nations (2015): *Towards a sustainable, inclusive and resilient urban future for Asia and the Pacific*. Economic and Social Commission for Asia and the Pacific. E/ESCAP/71/13 (27 March 2015). <https://www.unescap.org>. Accessed 21 March 2017.
- United Nations (2015): *The Millennium Development Goals Report*. New York: United Nations. <http://www.un.org> -
- United Nations and Asian Development Bank (2007): *Access to Basic Services for the Poor. The Importance of Good Governance*. Asia-Pacific MDG Study Series. ST/ESCAP/2438. <http://www.unescap.org/publications>. Accessed 21 March 2017.
- United Nations and Economic and Social Commission for Asia and the Pacific (ESCAP) (2009): *What is Good Governance?* Available online at <http://www.unescap.org/resources/what-good-governance>. Accessed 14 May 2014.

- United Nations Committee on Economic, Social and Cultural Rights (2003): *Substantive Issues Arising in the Implementation of the International Covenant on Economic, Social and Cultural Rights*. E/C.12/2002/11 (20 January 2003). Available online at <http://www2.ohchr.org>. Accessed 16 May 2017.
- United Nations Economic and Social Council (2006): "Definition of Basic Concepts and Terminologies in Governance and Public Administration." Available online at <http://unpan1.un.org/intradoc/groups/public/documents/un/unpan022332.pdf>. Accessed 9 December 2014.
- United Nations Framework Convention on Climate Change (2014): "Technologies for Adaptation in the Water Sector." United Nations Framework Convention on Climate Change (TEC Brief-5). Available online at http://unfccc.int/ttclear/misc/StaticFiles/gnwoerk_static/TEC_column_L/0cac6640a3b945c08e7a54f8e496223e/55e192e14cd6495f975f4098843baf7e.pdf. Accessed 9 September 2016.
- United Nations Human Settlements Programme and Transparency International (2004): *Tools to support transparency in local governance*. Nairobi, Kenya: United Nations Human Settlements Programme; Transparency International (Urban governance toolkit series).
- United Nations Human Settlements Programme, UN-HABITAT (2002): *The global campaign on urban governance. An inventory. 2nd ed.* Nairobi, Kenya: UN-HABITAT.
- United Nations Offices for Drug Control and Crime Prevention (1999): *Prevention: An Effective Tool to Reduce Corruption. Global Program against Corruption*. United Nations (CICP-2).
- UN-Water Decade Programme on Advocacy and Communication (UNW-DPAC) (2012): *The Human Right to Water and Sanitation*. Available online at http://www.un.org/waterforlifedecade/pdf/human_right_to_water_and_sanitation_milestones.pdf. Accessed 21 September 2014.
- Upadhyay, Alka and Rai, Raveendra Kumar (2013): *Water Management and Public Participation: Case Studies from the Yamuna River Basin, India*. New Delhi: Springer.
- Uslaner, Eric M. (2008): *Corruption, inequality, and the rule of law. The bulging pocket makes the easy life*. Cambridge, New York: Cambridge University Press.
- Uslaner, Eric M. (2010): "Corruption, Inequality, and Trust." University of Maryland. Available online at <http://www.gvpt.umd.edu/uslaner/uslanersocialcapitalhandbookelgar.pdf>. Accessed 17 July 2014.
- Vadackumchery, James (1998): *Policing the Largest Democracy: 50 Years and After*. New Delhi: APH.
- Van Leeuwen, Kees and Sjerps, Rosa (2015): *Istanbul: the challenges of integrated water resources management in Europa's megacity*. Springer. Available online at

- <http://www.eip-water.eu/sites/default/files/art%253A10.1007%252Fs10668-015-9636-z.pdf>. Accessed 30 March 2016.
- Varghese, Shiney (2012): "Corporatizing Water. India's Draft National Water Policy." Institute for Agriculture and Trade Policy. Available online at http://www.iatp.org/files/2012_02_28_IndiaNWP_SV_0.pdf. Accessed 10 January 2014.
- Varis, Olli; Biswas, Asit K.; Tortajada, Cecilia and Lundqvist, Jan (2006): 'Megacities and Water Management'. *Water Resources Development* Vol. 22, Issue 2, pp. 377-394.
- Varkkey, Helena (2015): *The haze problem in Southeast Asia. Palm oil and patronage*. Malaysia: Routledge.
- Verma, Shraddha (2000): "The Influence of Culture and Politics on Accounting Change in India from 1947 to 1998." Doctor of Philosophy. Department of Marketing and Strategic Management. Warwick Business School, University of Warwick.
- Verme, Paolo; Milanovic, Branko; Al-Shawarby, Sherine; El Tawila, Sahar; Gadallah, May; El Majeed, Enas Ali A (2014): *Inside inequality in the Arab Republic Egypt. Understanding facts and perceptions of inequality among the rich and the poor*. Washington, DC: World Bank Publications (World Bank studies).
- Vincent, J. Cyril Mathias (2011): 'Legal Culture and Legal Transplants the Evolution of the India Legal System (With Reference to Private Law)'. *International Academy of Comparative Law* Vol. 1, No. 1.
- Voskanyan, Frunzik (2000): "A Study of the Effects of Corruption on Economic and Political Development of Armenia." American University of Armenia. Available online at <http://unpan1.un.org/intradoc/groups/public/documents/ASPA/UNPAN000533.pdf>. Accessed 28 March 2016.
- Wade, Robert (1982): 'The system of administrative and political corruption: Canal irrigation in South India'. *The Journal of Development Studies* Vol. 18, No. 3, pp. 287-328.
- Water Aid (2001): *Looking Back: The long term impacts of water and sanitation projects*. www.wateraid.org. Accessed 1 December 2015.
- Water and Sanitation Program (2005): *Engaging with Citizens to Improve Services*. <http://www.wsp.org>. Accessed 23 August 2014.
- Water Partnership Program (2010): *Water Sector Governance in Africa, Vol. 2 - Assessment Guidelines*. Available online at <http://www.afdb.org>. Accessed 23 August 2014.
- Water Privatization-Commercialization Resistance Committee (2012): *Privatization of Water Services: Myth and Reality*. Available online at <http://www.indiawaterportal.org>. Accessed 28 March 2016.
- Weber, Max (1978): *Economy and society*. Berkeley: Univ. of California Pr.

- Weber, Max; Gerth, Hans Heinrich; Mills, C. Wright (2007, ©1948): *From Max Weber. Essays in sociology*. New York: Routledge.
- Wei, Shang-Jin (2000): “Bribery in the Economies: Grease or Sand?” The Brookings Institution, Harvard University. Available online at <http://www.brookings.edu/~media/research/files/papers/2000/1/15globalization%20wei/20000115.pdf>. Accessed 30 March 2016.
- Wei, S-J (1997): “How Taxing is Corruption on International Investors?” NBER Working Paper 6030. NBER, Washington DC. *Forthcoming in Review of Economics and Statistics*.
- Weisee, Friedl and Steiner, Silke (2006): `Transparency as an Element of Good Governance in the Practice of the EU and the WTO: Overview and Comparison`. *Fordham International Law Journal* Vol. 30, No. 5.
- Whittington D (2003): `Municipal Water Pricing and Tariff Design. A Reform Agenda for South Asia`. *IWA Publishing* Vol. 5, pp.61-76. Available online at http://www.sswm.info/sites/default/files/reference_attachments/WHITTINGTON%202003%20Municipal%20Water%20Pricing%20South%20Asia_0.pdf. Accessed 22 July 2014.
- WHO (2008): *Linking Poverty Reduction and Water Management. Poverty-Environment Partnership*. Available online at <http://www.who.int>. Accessed 28 March 2016.
- WHO and UNICEF (2000): *Global Water Supply and Sanitation Assessment 2000 Report*. Available online at http://www.who.int/water_sanitation_health/monitoring/jmp2000.pdf. Accessed 1 August 2017.
- Windhoff-Héritier, Adrienne (2007): *Explaining institutional change in Europe*. Oxford, New York: Oxford University Press.
- World Bank (1998): *India Water Resources Management Sector Review Initiating and Sustaining Water Sector Reforms*. Report No. 18356-IN. Available online at <http://www-wds.worldbank.org>. Accessed 28 March 2016.
- World Bank (1999): *Initiating and sustaining water sector reforms. A synthesis*. Washington, D.C: World Bank (South Asia rural development series).
- World Economic Forum (2014a): *The Competitiveness of Cities. A Report of the Global Agenda Council on Competitiveness*. World Economic Forum (REF 040814). Available online at http://www3.weforum.org/docs/GAC/2014/WEF_GAC_CompetitivenessOfCities_Report_2014.pdf. Accessed 28 March 2016.
- World Economic Forum (2014b): *The Future of Urban Development & Services: Urban Development Recommendations for the Government of India*. World Economic Forum. Available online at http://www3.weforum.org/docs/WEF_IU_FUDS_Urban_Development_Recommendations_Government_India_Report_2015.pdf. Accessed 28 March 2016.

- Wright, Erik Olin (2003): "Social Class." University of Wisconsin - Madison. Available online at <https://www.ssc.wisc.edu/~wright/Social%20Class%20--%20Sage.pdf>. Accessed 30 March 2016.
- Xaxa, Virginius (2010): *Social Inequality and Peasantry. The Evolving Trajectory*. In T. K. Oommen (Ed.): *Classes, citizenship, and inequality. Emerging perspectives*. Delhi: Longman, pp. 79-97.
- Xie, Jian (2009): *Addressing China's water scarcity. Recommendations for selected water resource management issues*. Washington, D.C: World Bank.
- Yadav, Jeetendra and Shekhar, Chander (2015): 'The Dynamics of Water and Sanitary Problem Among Delhi Slum Migrants'. *International Multidisciplinary Research Journal* Vol. 2 No. 7.
- Yashwantrao Chavan Academy of Development Administration (2012): *Maharashtra human development report. Towards inclusive human development*. Delhi: Sage Publications India Pvt. Ltd.
- You, Jong-Sung (2005): "A Comparative Study of Income Inequality, Corruption, and Social Trust: How Inequality and Corruption Reinforce Each Other and Erode Social Trust." Unpublished draft of Ph.D. dissertation, John F. Kennedy School of Government, Harvard University.
- You, Jong-Sung and Khagram, Sanjeev (2005): 'A Comparative Study of Inequality and Corruption'. *American Sociological Review* Vol. 70, No. 1, pp. 136-157. Accessed 16 May 2017.
- Young, Peyton H. (2008): *Social Norms. The New Palgrave Dictionary of Economics*. Edited by Durlauf, Steven N and Blume, Lawrence E. Basingstoke: Nature Publishing Group.
- Zhang, Xing Quan (2011): *The economic role of cities*. Nairobi: United Nations Human Settlements Programme (Global urban economic dialogue series).
- Zhu, Nong; Luo, Xubei and Zhang, Cuizhen (2007): "Growth, Inequality and Poverty Reduction. A Case Study of Eight Provinces in China." Conference paper in the 6th International Conference on the Chinese Economy. Available online at http://cerdi.org/uploads/sfCmsContent/html/203/Zhu_Nong.pdf. Accessed 27 March 2016.

Appendix I: Millennium Development Goals

Goal 1	Eradicate extreme poverty and hunger.
Goal 2	Achieve Universal primary education.
Goals 3	Promote gender equality and empower women.
Goal 4	Reduce Child mortality.
Goal 5	Improve maternal health.
Goal 6	Combat HIV/AIDS, Malaria and other diseases.
Goal 7	Ensure environmental sustainability.
Goal 8	Develop a global partnership for development.

Source: United Nations. The Millennium Development Goals Report 2015.

Appendix II: List of Interviewees

Name of the Interviewee	Affiliation/Institution	Date/Mode of Interview
Prof.Arun Kansal	Professor in Department of Regional Water Studies, TERI University	18 th October 2013, Interview via skype.
Alexandra Follmann	Lecturer in the Department of Geography, University Koeln	15 th May 2013, Interview via phone.
Prof.Usha P. Raghupathi	Professor in National Institute of Urban Affairs, Delhi.	22 nd May 2013, Interview via phone.
Shabana Khan	Independent Consultant Chance2Sustain Europe,	23 rd May 2013, Interview via phone.
Debashree Mukherjee	Former Chief Executive Officer, DJB	25 th June 2013, Interview via phone.
Dr. Marie Helene Zerah	Research Fellow, Institut de Recherche pour le Développement (IRD - France).	5 th August 2013, Interview via skype.
Janek Hermann Friede	Programme Coordinator, Water Integrity Network, Berlin	19 th September 2013, in Berlin.
Binayak Das	Programme Coordinator, Water Integrity Network, Berlin	19 th September 2013, in Berlin.
Dr.Veronika Selbach	Scientific Staff, University Koeln	23 rd October 2013, Interview via phone.
Sunita Narain	Director General at Centre for Science and Environment Delhi	18 th March 2014, Interview via email.
Dr.Maheshwar Singh	Associate Professor in National Law University Delhi	19 th March 2014, Interview via phone.
Anonymous	Government Official, India	19 th June 2014, Interview in Berlin.
Prof.Jagpal Singh	Professor in IGNOU	21 st July 2014, Interview via skype.

Lotte Feuerstein	Advisor for anticorruption and integrity in sectors at GIZ.	08 th August 2014, Interview via phone.
Ashutosh Mishra	Assistant to Executive Director at Transparency international India.	12 th August 2014, Interview via email.
Prof. Phillip Cullet	Senior Visiting Fellow at the Center for Policy Research in New Delhi.	17 th August 2014, Interview via email.
Prof. Alakh N. Sharma	Director at Institute of Human Development, Delhi	22 nd August 2014, Interview via phone.
Afsar Jafri	Senior Research Associate at Focus on Global South	23 rd August 2014, Interview via skype.
Dr. Tanuka Tendow	Fellow at Institute of Human Development Delhi	1 st September 2014, Interview via phone.
Dr. Preet Rustagi	Professor at Institute of Human Development Delhi	1 st September 2014, Interview via phone.
Siddharth Das	WaterAid India	28 th April 2015, Interview via skype.
Anonymous	Ministry of Water Resources, Delhi – India	23 rd June 2014, Interview via email.
Anonymous	Department of Education, Jamia Millia Islamia Central University, Delhi	22 nd July 2014, Interview via skype.
Anonymous	Academic Institute in Delhi	5 th August 2013 20 th July 2014 via skype.
Anonymous	TERI University, Delhi	4 th March 2013 via skype
Anonymous	Non-government Organization in Berlin	27 th September 2013.
Anonymous	Non-profit Independent Institute in Delhi	8 th August 2014 via phone.
Anonymous	Non-political and non-government Organization in India	11 th August 2014 via email.
Anonymous	Research Centre in Delhi	18 th August 2014 via email.
Anonymous	Think Tank in Delhi	25 th August 2014 via skype.

Appendix III: Interview Questions (Unstructured)

1. Is there any influence or change in the identity politics in India because of globalization?
2. How far identity politics in India influencing its own people such as in distribution of resources such as electricity and water are not efficiently provided in several areas even in a city like Delhi.
3. How the movement of Indian societal pattern influence, Indian politics, here I mean because Indian society is religious and culture oriented so do these factors influence politics in India if so how?
4. Does democracy has contribution in the development of India in reality because several times we come to know that Indian voting system is not fair, public opinion in the country is created etc.
5. Is emergence of corruption in India is different from the rest of the world?
6. In India where do you see the risks related with corruption especially in public sector.
7. In your opinion, is corruption is really a barrier, because at several places it works as grease in the wheels.
8. How do you differentiate inefficiency of governance and corruption?
9. Who plays the most important role in abolishing corruption, citizens, politicians etc or whom to blame for corruption in India?
10. What steps are taken by TI in designing the process of Integrity? Or what steps are taken by the TI to abolish corruption in India.
11. What is water policymaking process in India? And how far the public interference is included in the whole process and if yes at which stage of the process.
12. How the transparency in the whole water sector in India (Delhi) is added?
13. What is the influence of Indian political culture on the water policy? Here I mean that some areas have water some do not have so it means that the objective of the policy is not achieved. Why?

14. In your opinion what is the main problem in water sector in India (specifically in Delhi), even though we have national water policy and other laws and regulations in place but their implementation is not achieved.
15. How far water law is useful in reducing poverty in India especially in big cities such as Delhi where most of the marginalized do not have access to safe drinking water. And how this has an impact on the development (Human development, economic development of the city).
16. If we talk about specifically Delhi, where non-uniform water distribution is the major issue rather than its availability, how the population has rights on water and their social inclusion is safe.
17. In your opinion, where does India stand on rights to water as a human right? And how far it is related with the right to stay because in Delhi significant number of people live in unauthorized colonies, they do have right on water but they do not have its provision.
18. In the Delhi development report it is clearly mentioned that Delhi provides world-class education facilities, economic development is there. But what about the basic amenities for the citizens?
19. As the population is increasing in the city and there is huge pressure on the resources especially water, in your opinion how the development will be achieved if water is not provided?
20. What is the major constrain that when government of Delhi has all the plans and agendas but even then the population is not provided with the services.
21. How do you see when a significant number of population is excluded from basic services, the objectives of human development of India will be achieved.
22. Do you think there is a connection of water distribution in Delhi and poverty reduction target of India and they both are linked with such as social, mobility of marginalized people, social security, social justice etc. because the number of these kinds of people is really huge.
23. How do you see the relationship between inequality in economic status and provision to basic services in Delhi? Because that is the part of the human development.
24. Why in Delhi there are problems in only some selective areas?
25. In your opinion how far corruption is responsible for water problem in Delhi

26. Why corruption in only some area is popular especially in unauthorized colonies because they do not get water from govt. But why
27. How corruption in procurement process happens in DJB?
28. In your opinion what is the major cause of corruption specifically in India?
29. And one more issue is related with National Water Policy. I read in several papers that the policy making process is not defined as such it goes in the direction wherever the participants agree on. But in one of interviews which was in the Ministry of Water Resources official said that the policy has a defined participatory process where all the stakeholders can participate and it is very much transparent. What are your views on that?
30. How corruption is detected in general?
31. Once the corruption is diagnosed in water sector, how you do deal with it to abolish it because it is highly difficult to tackle it without political will.
32. What benefits are offered to the stakeholders so that they agree to fight against corruption because corruption works as grease in the wheels many times?
33. How do you see the relationship between inequality in economic status and provision to basic services in Delhi? Because that is the part of the human development.
34. Why in Delhi there are problems in only some selective areas? Why not the development is uniform. What is the reason behind it?
35. In your opinion, what is the main driving force to solve the water problem in Delhi? And Why?
36. What role Ministry of Water Resources is playing in setting new schemes to overcome water problem in Delhi?
37. In regard with the water in unauthorized colonies, is there any plan in consideration because not having water in those areas has several indirect and direct impacts on social, economic and environmental problems in the city.
38. If we talk about Indian scenario where cultural and traditional values are strongly rooted in all the sectors, how far they are considered when a program or scheme is planned in Delhi?

39. In order to achieve the goals of National Water Policy, in your opinion which steps needs to be taken both from government's side as well as from citizen's side?
40. In several other cases, success in Delhi was remarkable such in lowering air pollution but why not in water sector? Your opinion on that.
41. What are the discussions going on at present in consideration of water problem in Delhi in taking into account that in future population is going to be increase and demand of water will rise?
42. How far national water policy takes into account the ones who are living in illegal areas in Delhi when water is a human right? If yes, how far they have been successfully achieved and if not why?
43. At which stage of policy making, citizens intervene or they do not?
44. How far population in slums in Delhi get the benefits from National Water Policy, which gives priority to drinking water?
45. How does Ministry coordinate with DJB about their schemes and programs and also in monitoring that how far they have been successfully implemented?

Appendix IV: List of the Videos

S. No	Details of the Video
1.	`Delhi Water Crisis – The Capital Going Dry`, Published on 24 February 2014. Accessed 9 March 2016. Available at https://www.youtube.com/watch?v=dG_4GCN7Mto
2.	`Philippe Cullet: Right to Water in India: Plugging Conceptual and Practical Gaps`, Published on 16 October 2013. Accessed 9 March 2016. Available at https://www.youtube.com/watch?v=nasrH-3cnog
3.	`Sanjay Upadhyay: Water Law in India- Incentives and Enforcement`, Published on 11 November 2013. Accessed 9 March 2016. Available at https://www.youtube.com/watch?v=DGP2l_f0jfU
4.	`The NDTV Dialogues: Delhi elections - has class replaced caste? `, Published on 8 February 2015. Accessed 9 March 2016. Available at https://www.youtube.com/watch?v=veVSzwx-sgw
5.	`Thirsty City, documentary film on water crisis for slum dwellers in Delhi (India) by Nikhil Sablania`, Published on 15 August 2015. Accessed 9 March 2016. Available at https://www.youtube.com/watch?v=AcZCSEZ7JV0
6.	`Yamuna: A River in Peril`, Published on 12 February 2013. Accessed 9 March 2016. Available at https://www.youtube.com/watch?v=mdgq17kjHcw

Appendix V: Survey Questions

PERSONAL INFORMATION

1. What is your name? Full name.

Age?

Sex?

2. EDUCATION

i. No school Education

ii. Till what level education has taken.

3. How many number of family members?

4. What is the main occupation?

5. How many are earning members?

6. What is the total household income?

i. less than 3000

ii. 3000 – 6000

iii. more than 10,000

iv. more than 20,000

7. Caste:

8. Do you have a ration card & an election card?

Yes.

No.

9. For how many years you are living in this house?

10. What kind of area it is?

- i. Authorized
- ii. Unauthorized
- iii. Resettlement colony
- iv. Jhuggi Jhopri

WATER AVAILABILITY

11. How do they get water in their house?

- i. Tap in the house
- ii. Tap in the community
- iii. Hand Pump
- iv. Tanker Supply from private
- v. Tanker from Delhi Jal Board
- vi. Fetching from far
- vii. Any other

12. How much they spend on water monthly? Percentage of their total income.

- i. 10%
- ii. 20%
- iii. 30%
- iv. 40%

13. Do you think, the water you get is enough for all your needs,

Yes

No.

14. Do they have a water connection in their house?

Yes.

No.

If yes is this legal/illegal.

15.How much bill you pay every month?

16.Are you satisfied with the costs?

i. too high

ii. too low

17.Have they ever paid bribe to get water or water connection in their house? Or do they know if someone else paid bribe in neighbourhood for water connection?

Yes.

No.

If yes, who they think is responsible for that, bribe themselves or the other party.

If yes, how much.

18.How do you find the water quality? Ask for color or any smell.

Good

Bad

Okay

19.If government will give you water for this much of money will you accept that because then you do not need to line up in queue and wasting your time and energy? Do they trust authorities.

Yes.

No.

But if government increase the price but provide water will they accept that.

Yes

No.

20.For how many hours per day they get water and in what time of the day/night?

- i. 2hours
- ii. 4hours
- iii. 6hours
- iv. 8hours
- v. 24hours

21.Are there any conflict over water in your area?

Yes.

No.

22.Is there a restriction to use water directly from the source?

Yes.

No.

23.Did you ever made any complaint for non-availability of water

Yes.

No.

? If yes to whom.

24. What response did you receive against your complaint?

i. any improvement in situation

ii. no improvement

25. Did anyone from authorities come to visit this place and give you assurance for betterment? such as any person who is named for elections.

Yes.

No.

26. Are you informed about any development in your area from authorities for water problem?

Yes.

No.

27. Do you participate in any kind of meeting related with the water problem in your area?

Do you know what is Right to Information Act?

Yes.

No.

28. Were you aware of water problem in Delhi before migrated to Delhi?

Yes.

No.

29. How much do you feel you are affected with water scarcity?

i. Strongly

ii. Moderately

iii. Less

iv. No effect

30. In your opinion who is responsible for water crisis in the city? Is this man-made or natural?

- i. Government
- ii. People in your area
- iii. Heat of the city
- iv. No water in Yamuna

31. What are your suggestions to improve water scarcity problem in your area?

Rule of Law

32. How far do they obey the rules concerning water?

- i. Not extracting groundwater more than permissible limits.
- ii. Not throwing waste/wastewater into water resources

33. How is the reaction of authorities whenever they get in contact with them?

- i. Do they cooperate?
- ii. Do they carefully listen to them?
- iii. Do they register their complaint?

AWARENESS

34. Are you aware of the other related problems of this water scarcity?

- i. Such as on your health
- ii. On your income
- iii. On your children's education
- iv. On your social life
- v.

35. Do you know who is responsible to provide water in their area?

36. Do they think that everyone in the city gets equal water? If not, why.

37. Are you aware of the water regulations, such as water conservation? How far do they follow that?