

Conceptual Framework for Water Poverty

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Abstract

Conceptual understanding water poverty and its various dimensions is significant, for either reducing it or escaping from it. The word 'water poverty' has always been understood differently in different countries, contexts and times. Defining water poverty has a wider connotation to it, as it directly impacts the governments' interventions and thus the lives of the poor. Any change in the definition, would mean including or excluding the citizens from the list of beneficiaries. Despite much research and available extensive literature on water poverty, this still remains a grey area. This is because; there is no single consensus on the definition across different countries of the world. Given this background, this paper attempts to understand the concept of water poverty at the community level and its specific contextual dimensions. For this purpose, theoretical approaches, approaches adopted in various developing countries were reviewed and key challenges for assessing water poverty were identified. Frequently used parameters for defining water poverty were analyzed and categorized as socio-economic, physical/environmental and political/institutional dimensions. Based on this categorization, a conceptual framework for defining water poverty was developed, particularly at the community level.

Keywords: Water poverty, urban poor, water scarcity, water deprivation, water stress.

INTRODUCTION

Water poverty or deprivation is usually understood differently in different countries and contexts giving rise to various ambiguities in undertaking the development activities. The parameters, benchmarks and thresholds are different based on the policy, context and location. Based on the definitions, the development agencies identify the water poor and extent of water poverty. The development activities are usually prioritized based on the extent of water poverty. Understanding water poverty, in general is an herculean task as different development agencies use different definitions to define the scarcity and poverty issues related to water. This is due to the fact that the term 'water poverty' does not have a clear or universally agreed definition. In the existing literature, the term 'water poverty' is usually associated and referred at a macro scale i.e., at a country or city level. However, there is a lack of substantial literature at the

community level. Therefore it is in this context, it is critical to answer the questions 'who is water poor?' and 'what constitutes water poverty?' A conceptual understanding of these can help in addressing various water poverty related issues at the community level, as it has a direct impact on the lives of the people, particularly the poor.

Water Poverty Scenario

Water is essential for the survival of human beings. It is a basic requirement for all ecosystems of the world. It is therefore considered to be a synonym for life on the Earth(UNDP, 2004). It is no denying fact that water as a resource has many obscurities associated with it. It is estimated that by the year 2030, the global water requirement will increase by 40% i.e., from 4500 to 6900 billion cubic meters(Liliana Miranda, 2011). According to another estimate, around 3.5 billion people of the world will have chronic water shortage by 2025. Out of which around 1.1 billion people are from the developing countries. A staggering number of around 700 million people i.e., two-third population in Asia alone lacks access to safe drinking water (Biswas, 2009). Among them, slum residents are the most disadvantaged and often remain as 'water poor'. In the last few decades, water foot print has reduced drastically(Seetharam A. B., 2009). This phenomenon can particularly be seen in the developing countries. A review of water poverty is undertaken in four developing countries viz., India, Bangladesh, Sri Lanka and Myanmar.

India: This scenario of water shortage is no different in a country like India, which is one of the fastest growing economies of the world. The current state of urban service delivery in India is simply unacceptable. This is particularly true in the case of urban water supply(HPEC, 2011). As per the Census of India 2011, only 43.5% households in India have tap water connection. However, the problem is more acute in slums. This could be particularly attributed to the geographical location of the slums such as inaccessible corners, ditches, drains, sub-urban fringe (Khosla R, 2013). In Indian cities, there is seemingly a huge gap between demand and supply of potable¹ water. In order to reduce this,

¹The 'potable' or 'drinking water' is defined as having acceptable quality in terms of its physical, chemical, and bacteriological parameters so that it can be safely used for drinking and cooking. (Gadgil, 2008)

performance indicators of water supply need to be established. This in turn can help in measuring the efficiency levels for providing access to safe drinking water (Biswas, 2009).

Bangladesh: The rate of urbanization in Bangladesh is one of the highest in Asia with more than one third (35.6%) of the country's total population (164.8 million) already living in urbanized areas. Of 58.6 million people living in urban areas, seven million live in slums which lack access to sources of clean drinking water, thus making it a challenge in urban areas (UNICEF Bangladesh, 2011). The WHO estimates that a staggering 60% of the population has to endure unsafe drinking water (Saima Hedrick, 2017). The situation is however peculiar during June to October. The country faces widespread flooding due to the excess of surface water and a scarcity of water in the relatively drier periods of April and May. In Dhaka, the country's capital and largest urban area, only 18% of the daily water requirements are sourced from sources of water on the surface, while the remaining is abstracted from ground water which has resulted in the water table sinking by more than 50 meters since independence. Increasing levels of Arsenic in the water along with wastes from industrial development polluting surface water, is further reducing the available amount of water for human consumption. Besides this, ground water samples have been tested positive for contamination by both organic and inorganic contaminants. Water shortages have reached such dire levels that the government had to deploy troops to guard water pumps following angry protests in 2010 (Wadud M, 2017). Improving the situation would thus require the management of the excess water in the rainy season along with higher investment, improved revenue collection, structural reforms and the establishment of a regulatory body to oversee the same (Khondaker Azharul Haq, 2006).

Sri Lanka: Around 1.3% of Sri Lanka's land area is under water which along with ground water a major resource used by the country's 21.27 million inhabitants to fulfill their water needs. Under 40% of the country's population have organized water supply facilities and about 60% of the population. This includes the 10% that depend on unprotected sources of water use wells, tube wells, streams and rivers etc., as their primary source of water. Although the country should be 90% self-sufficient in its water requirements, 47% face scarcity of water. The main reason for this water shortage in the country is the trade in Virtual water (Ananda Gunatilaka, 2008). Increasing salinity levels in water bodies close to the coast, contamination of the surface sources due to improper disposal of waste and excessive extraction of ground water are some of the threats to water security in Sri Lanka (C. Hettiarachchi, 2011). Unless methods which aim at artificially recharging ground water such as rainfall harvesting are explored, the country is expected face severe water shortages in the future (Ananda Gunatilaka, 2008).

Myanmar: It is at a crucial juncture where its increasing population and developing economy are looking progressively towards water resources in order to support growth. 82.3% of the total population and 93.2% of the population living in urban areas have access to an improved source of drinking water (UNICEF Myanmar, 2011). Myanmar exemplifies how water security underpins all security. Poverty and lack of

access to resources are particularly critical issues for the civilian population of Myanmar. According to the United Nations Development Program, almost a one-third of Myanmar's population lives below the poverty level, primarily in rural areas. These same communities suffer from unsafe drinking water. Responsible water management and overall resilience to vulnerabilities are required to meet the processes of urbanization, economic growth and progress with prudence (Mai Mizuno, 2016).

Causes and steps to reduce for Water Poverty

One of the key challenges is to measure the water deprivation levels, as there is a lack of robust database on the indicators. In light of this, water has become the focus of considerable research in the recent past. The alarming situation in different developing countries on water shortage illustrates the intensity of water related issues across the developing countries. The above facts and figures depict the water scarcity in different countries and highlight the reasons such as unsafe drinking water leading to health hazards, ineffective institutional framework that regulates management of water. Most commonly found issues across the developing countries are inaccessibility, insufficiency, poor service coverage and water deficit situations.

There is an apparent increase in the water resource conflicts between the cities of the developing countries due to unrealistic water demand assessments which needs to be refined. This is further increasing the water management issues and resource conflicts. To address these issues, various countries and international agencies have increased focus on providing safe drinking water and formulating water governance index for evaluating the performance levels of water. This is being done by improving the accessibility by providing the individual taps within the premises, geographically extending the services by addressing the service coverage issues so as to reduce severe water shortages in the cities.

WATER POVERTY: A THEORETICAL UNDERSTANDING

Measuring water deprivation is one of the key challenges, as there is a lack of strong database. Water deprivation / poverty index is often determined by the indicators chosen or identified for measuring it. In light of this, water has become the focus of considerable research in the recent past. The above statistics on water shortage illustrate the intensity of water related issues across the developing countries. In addition, these facts and figures can provide a base to understand the magnitude of the problem. It varies as per the dimensions, context and depends on the socio-economic dimensions. Efforts are being undertaken to universalize the definition, as there is no universally agreed definition. However, conflicting viewpoints exist as to what constitutes the concept of water poverty.

Feitelson and Chenoweth(2002) defined *water poverty as a situation where a nation cannot afford the cost of sustainable clean water to all people at all times*. This definition emphasizes on the accessibility to safe water. It also indicates that the water poverty is based on the availability, affordability, and quality of drinking water. As per the definition by Caroline Sullivan (2002), water poverty is described as *a lack of adequate and efficient water supply that links physical estimates of water availability with socio-economic variables*. Further, Lawrence, et al (2003), defined *water poor in two different ways:(i) those who lack access to water or have insufficient water availability to meet their basic needs, and (ii) those with insufficient income to access water even when the supplies exist*. In this definition, water is viewed as a survival need, indicating poverty as one of the key determinants of water poverty. Meigh, J(2002) describes ‘water poor’ in terms of physical access, income and sufficiency of water. *People can be ‘water poor’ in the sense of not having sufficient water for their basic needs. They may have to walk a long way to get it or even if they have access to water nearby, supplies may be limited for various reasons. People can also be ‘water poor’ because they are ‘income poor’; although water is available, they cannot afford to pay for it*. It is interesting to note from the definition that, in general, ‘water poor’ are not always dependent on the poverty or affordability of the people. However, people who can afford may still be ‘water poor’, if they cannot have access to water.

The urban water poverty is not simply the result of resource scarcity or poorly managed utilities but rather a socially constructed process produced and reproduced through multiple socio-political processes of exclusion and discrimination, spanning from the macro-level to the micro-cosmos of the household. Urban water poverty is above all a ‘deficiency of entitlement’ (Sen, 1999).According to

Savenije(2000) water poverty is a new concept. It is described as the *new concept of water poverty provides a new dimension to clarify the neglected connection between water availability and socio-economic dimensions*. Salameh (2000) defined water poverty as *insufficiency of existing water resources for domestic use, food production to meet domestic, production needs and occurs when the water demand is less than the availability for the population of a certain area but it does not account for the social causes of water shortage*. Here, water poverty is viewed in terms of its usage. Also, it depends on the link between demand and availability. As per Allen A (2011), *urban water poverty is concerned with the political, social, economic and institutional dimensions*. Urban water poverty is distinct from water scarcity.

While urban water poverty is concerned with the political, social, economic and institutional dimensions; water scarcity is related to the resource availability. Water scarcity is defined as a *state of insufficient water to satisfy normal requirements (Chenoweth, 2008, p5)*. Besides, a number of other terms such as water crowding and water stress are also used to describe the water related issues. In 1989, *‘water crowding’ was first defined as a measure of how many people shared the same flow unit of water placing a clear emphasis on the social demands of water rather than physical stress (Falkenmark and Rockstrom, 2004)*. Crystal Fenwick (2010) defined ‘water stress’ as *the number of people that a flow unit of freshwater can sustain. Conversely, water stress is also defined as how many people can be supported by each flow unit within given technological and managerial capabilities?(Fenwick, 2010)*.

After a review of the multiple dimensions of water poverty, key parameters considered for defining water poverty / shortage / scarcity / deprivation / stress, etc. are listed in the table below:

Table 1: Key parameters of the definitions of water poverty

S.No.	Definition by	Year	Key parameters of the definition		
			Exclusion	Discrimination	Deficiency of entitlements
1	Sen A	1999	Exclusion	Discrimination	Deficiency of entitlements
2	Savxenije	2000	Neglected connection	Water availability	Socio-economic dimensions
3	Salameh	2000	Inefficiency of existing water resources	High Water demand	Water usage type (domestic, irrigation, etc.)
4	Caroline Sullivan	2002	Lack of adequate and efficient water supply	--	--
5	Meigh J	2002	Lack of physical access	Insufficiency of water	Non-affordability
6	Feitelson and Chenoweth	2002	Non-affordability for clean water	Non - availability for all people at all times	--
7	Lawrence	2003	Lack of access to water	Insufficient water availability	--
8	Chenoweth	2008	Number of people supported by each flow unit	--	--
9	Fenwick C	2010	Limited Technological capabilities	Limited Managerial capabilities	--
10	Allen A	2011	Resource availability	Concerned with political, social, economic and institutional dimensions	--

DISCUSSION AND CONCLUSION

Predicting water poverty continues to be a challenging task, as it is often marred by subjectivity, scale and the magnitude of the problem. Water situations in the developing countries indicate that in reality, there is an apparent imbalance between water demand and supply. Different parameters were considered in different countries to define water poverty. Due to these varied parameters, understanding water poverty remains a complex task. Therefore, a need is felt to develop a theoretical framework categorizing the parameters for a holistic understanding of water poverty. This framework can act as a base or a platform for coining new terms or new definitions.

A review of various definitions and approaches in the developing countries reveal that in general, physical, social-economic and political vulnerability of communities form the basis for these definitions. In view of this, parameters used for defining water poverty or deprivation as mentioned in the above table are divided into three categories. They are: (i) Socio-economic dimensions – non-affordability, high demand for water (ii) Physical / environmental dimensions – inaccessibility, non-usability, inefficiency of water resources, neglected connections, unavailability of water and (iii) Political / institutional dimensions – socio-political processes of exclusion and discrimination, limited technological capabilities and limited management capabilities (See Figure-1)

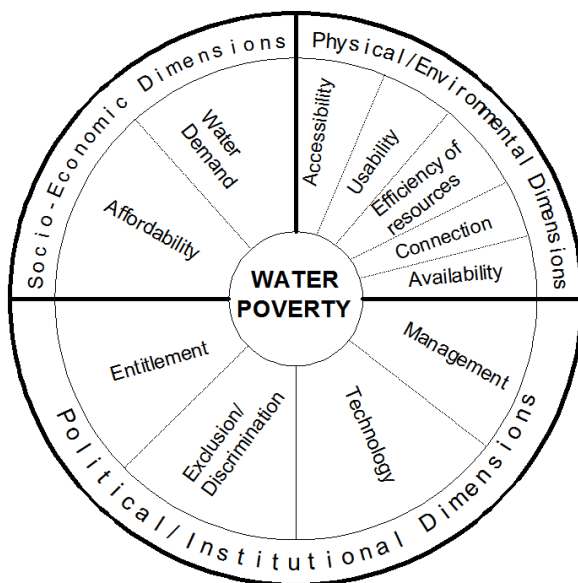


Figure 1: Proposed conceptual framework for water poverty

Definitions play a vital role for identifying the beneficiaries or prioritizing the water investment. While defining water poverty, context specific or locational parameters need to be considered. Therefore, it is important for the development agencies to carefully consider or adopt the definitions in the local context rather than the global context. The definitions in the global context may fail to address the local problems and hence may not be applicable to the local conditions.

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