ISSN: 2278-4632
Vol-11 Issue-02 2021

Water as a Resource: Different Perspectives in Literature

Dr. Atul[1], Deepak Kumar Hota[2]
[1]MED,Gandhi Engineering College,Bhubaneswar, India
[2] MED,Gandhi Engineering College,Bhubaneswar, India

***Abstract* - Population growth and urbanization are major changes taking place globally. Although we live on a planet that is covered with water, besides being distributed inequitably very little of that is fresh. Water is an essential resource required for sustaining life and livelihoods. Water in the natural environment ensures the provision of a multitude of ecosystem services to meet basic human needs and support economic and cultural activities. This creates tremendous research opportunities on various aspects related to water. Authors desire to assess the global concern towards water through review of some key water reports. UN water, ADB, UNESCO are some of the renowned organizations which are dedicatedly involved in research of different issues at different level. This paper is exclusively a literature review. Some current prominent reports are collected and reviewed. It was realized that water standing condition is at alarming stage. Water availability, quality, different use and demand management need considerations for sustainable future of the earth.**

Keywords—Water Resource, Urbanization, UN Water, ADB, UNESCO

I. INTRODUCTION

–Water is life‘s matter and matrix, mother and medium. It is a unique natural resource among all sources available on earth. There is no life without water‖. It is essential for all the important activities like food production, industries like energy, production and manufacturing, but it is a finite resource. It plays an important role in economic development and the general well being of the country. Water is a regional resource, but water shortage is becoming a global issue due to increasing population, economic growth and climate change. Development of new sources of water beside its efficient use, together with conservation measures, should be an important component of any country‘s national water plan (Lalzad, 2007). Today, water along with other resources has become the victim of man‘s indifference. The ramifications of such an attitude towards the life giving source of water, for the present as well as the future, has resulted in a water crisis the world over, especially in the Third World countries (Jain, 2014). Only 2.53 per cent is fresh water and it is a finite resource. Water is critical for socio- economic development, healthy ecosystems and for human survival itself (UN-Water, 2014). All aspects of social and economic development – often referred to as the food–energy–health–environment_nexus‘ – depend on water. These activities determine how water is allocated, managed and used, and as they affect the quantity and quality of water resources, they impact on these and all other developmental sectors. Indeed, all of the sectors of the development nexus are interlinked through water (UNESCO, 2012). A combination of growing populations, increasing demands for resources associated with improving standards of living, and various other external forces of change are increasing demand pressures on local, national and regional water supplies required for irrigation, energy production, industrial uses and domestic purposes, as well as for the environment. These forces are undergoing rapid, accelerating and often unpredictable changes, creating new uncertainties for water managers and increasing risks and creating new opportunities for all water users (UNESCO, 2012).

II. STUDY SIGNIFICANCE AND OBJECTIVE

The world population is predicted to grow from 6.8 billion in 2010 to 8.3 billion in 2030 and to 9.1 billion in 2050 (UNESCO, 2012). Between 2009 and 2050, the world population is expected to increase by 2.3 billion, from 6.8 to

billion. At the same time, urban populations are projected to increase by 2.9 billion, from 3.4 billion in 2009 to 6.3 billion total in 2050. According to UNDESA, 68% of these 9 billion people will reside in urban settings. Thus, the urban areas of the world are expected to absorb all of the population growth over the next four decades, while also drawing in some of the rural population. Furthermore, most of the population growth expected in urban areas will be concentrated in the cities and towns

of less developed regions(UN-Habitat, 2006) as mentioned in (UNESCO, 2012).

Water scarcity already affects almost every continent and it is projected that by 2025, 1.8 billion people will be living in countries or regions with absolute water scarcity, and two- thirds of the world's population could be living under water stressed conditions (FAO, 2012). If we look population growth projections in context of water stress this is projected that most population growth will occur in developing countries, mainly in regions that are already experiencing water stress (WWDR, 2012) i.e. human numbers are growing most rapidly where water is scarce. An estimated 90 per cent of the three billion people who are expected to be added to the population by 2050 will in developing countries, many in regions that are already experiencing water stress (Jain, 2014).

It is well documented that urban growth is occurring at a faster rate in the less developed than in developed countries (UN, 2012). By 2030, more people will live in urban settings than in rural areas. A similar trend is seen in India, according to the latest census, where 31 percent of the population of India living in urban centres already (UN, 2012).

In this context managing water provisions, coping with the unprecedented growth of cities in the developing world needs attention. At this point, it would be worthwhile to review some water reports to understand different issues associated with this finite and precious resource.

III. CONCERN AREAS FOR WATER RESOURCES

Water could be discussed in terms of its available amount and distribution, its uses, quality, supply and distribution management. Water problem assessment comprises reliable assessment of water availability, water quality, water needs and water shortage (Lalzad, 2007).

A. Water Quantity

About 75% of the earth's surface is covered by water. Water is the most widespread substance on earth. It forms oceans, seas, lakes, rivers and the underground water. In a solid state, it exists as ice and snow cover in polar and alpine regions. A certain amount of water is contained in the air as water vapour, water droplets and ice crystals, as well as in the biosphere. Huge amounts of water are present in the composition of the different minerals in the earth's crust (Lalzad, 2007). Out of all the water available on the Earth, 97

% of water is saline and is in oceans, 3% of water is freshwater available in rivers, streams and glaciers (UNESCO, 2011). The above description may be re-expressed quantitatively. According to UNEP (2002) the total amount of water on the Earth is about 1400 million km³. About 97.5% of this amount is saltwater and only 2.5% or about 35 million km³ is freshwater (Lalzad, 2007).

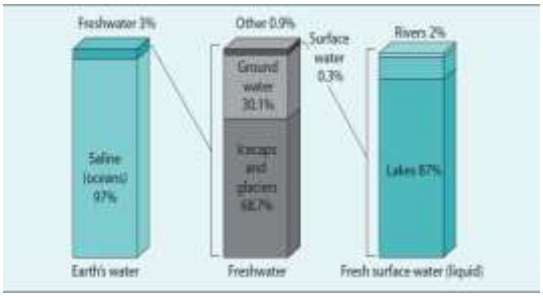

Figure 1: Distribution of Earth's Water

Source: USGS http://ga.water.usgs.gov/edu/earthwherewater.html as coated in (UNESCO, 2011)

Per capita availability of less than 1700 cubic metres (m3) is termed as a water-stressed condition while per capita availability below 1000m3 is termed as a water scarcity condition.

B. Water Used in different sector

Water use could be discussed on sector basis. Agriculture, industry, household recreation and

environment are mass amount users of water. According to World Water Development Report 2014, agriculture is the biggest water user, with irrigation accounting for 70% of global water withdrawals. The industrial and domestic sectors account for the remaining 20% and 10%, respectively, although these figures vary considerably across countries. In most of the world's least developed countries, agriculture accounts for more than 90% of water withdrawals. As economies grow and diversify, they experience competing demands for water to meet the needs of more municipal and industrial uses, as well as agriculture (World Water Development Report 2014)

Water withdrawal can be very high for certain industries, but consumption is generally much lower than that of agriculture. Water uses for household purposes include drinking water, bathing, cooking, sanitation and household gardening etc. Recreational water use is a small but growing percentage of total water use. Recreational usage is usually non- consumptive. Environmental water use is for the benefit of ecosystems or the environment, rather than for human benefit. Explicit environmental water use is a small but growing percentage of total water use, including artificial wetlands, artificial lakes intended to create wildlife habitat, fish ladders around dams, and water releases from reservoirs timed to help fish spawn (UNESCO, 2011).

C. Water Quality

Over 80% of used water worldwide is not collected or treated (Corcoran, Nellemann, Baker, Bos, Osborn, & Savelli, 2010) as mentioned in (UNESCO, 2012). Human health risks are without doubt the major and most widespread concern linked to water quality. Each year ~3.5 million deaths related to inadequate water supply, sanitation and hygiene occur, predominantly in developing countries (WHO, 2008). Diarrhoeal diseases, often related to contaminated drinking water, are estimated to cause the death of more than 1.5 million children under the age of five per year (Black, et al., 2010) as mentioned in (UNESCO, 2012). There are 884 million people still using unimproved sources for drinking water (WHO/UNICEF, 2010). The rural population suffers from low water quality but the urban and semi-urban areas are most prone to water shortage (Green Clean Guide, 2014).

D. Water Supply and Access

Inadequate access to water is often referred to as one of the biggest factors limiting development in India. It is an indispensible factor of production in almost all enterprises, and access to water is inextricably linked to achieving the Millennium Development Goals (MDGs) (UNICEF, FAO, & SaciWATERs, 2013). Improving access to safe water could have huge economic returns (UNESCO, 2012). Water woes are because of insufficient or low pressure and erratic supplies in terms of leakages and illegal connections (Green Clean Guide, 2014). Rapid population growth dynamics seriously affect targets like MDG 7c, which is closely related to water and cities and aims for the reduction by half of the number without sustainable access to safe drinking water by 2015. This is very well reflected in statistics that while between 1990 and 2008, 1052 million urban dwellers gained access to improved drinking water, the urban population in that period grew by 1089 million people (WHO/UNICEF, 2010)

IV. WATER CONCERN FROM DIFFERENT DESKS

As mentioned development is taking place at a faster pace. As such the impact of this ever-increasing population- base combined with dangerously depleted natural resources highlights the urgent need for changes in human lifestyles and land-use patterns (Lane, 2009). A comparison of the latest estimates from 2008 with those of 2000 indicates deterioration in both water and sanitation coverage in urban areas (AquaFed, 2010). The urban areas require enormous concentrations of food, water, and materials in a small area. Also this high degree of consumption is associated with huge quantity of waste production and sewage (Aspeslagh, 1994). 141 million urban dwellers worldwide do not have access to improved drinking-water (Water and Urbanization). By 2025, two thirds of the world‘s population could be living in water- stressed countries if current consumption patterns continue (UN-Water, 2014).

All countries share a responsibility to actively participate in the global forums designed to address and create solutions to impending resource challenges. The United Nations Framework Convention on Climate Change (UNFCCC) remains to this day one of the most significant global agreements addressing

sustainable development. Despite the multitude of valuable multilateral environmental agreements (MEAs), the UNFCCC has captured the imagination and buy- in of international policy-makers and the general public alike more than any other process on the environment or sustainable development in the past two decades. In this context, ensuring a strong focus on water under the UNFCCC is likely to remain a high priority for the water community (UNESCO, 2012).

In order to address the effects of economic water scarcity, increasing access of safe, accessible drinking water was made an international development goal by the United Nations at the Millennium Summit in the year 2000. During this time, the Millennium Development Goals were drafted and eight goals were agreed upon by all 189 UN members. MDG 7 sets a target for reducing the proportion of the population without sustainable access to safe drinking water by half by the year 2015.

In 2010, resolutions by the United Nations General Assembly and the Human Rights Council confirmed that access to safe water and sanitation is a human right. Member States are required to ensure the progressive implementation of the right to water and sanitation to everybody in their jurisdiction (UNESCO, 2012). The United Nations Committee on Economic, Social and Cultural Rights established a foundation of five core attributes for water security. They declare that the human right to water entitles everyone to sufficient, safe, acceptable, physically accessible, and affordable water for personal and domestic use.

At the United Nations Conference on Sustainable Development in 2012 (Rio+20), governments recognized that water is ―at the core Of sustainable development as it is closely linked to a number of key global challenges‖. Achieving the development objectives of ending poverty, overcoming inequalities, realizing human Rights for all and boosting and sustaining economic development is reliant upon healthy freshwater systems. National water policy is the key initiative in Indian context. Way back in 1983, a National Water Resource Council headed by the Prime Minister, with concerned Union Ministers, and Chief Ministers of all the states and Union Territories was set up. A National Water Policy was adopted in 1987 based on the Council‘s recommendations. The policy aimed at optimum utilisation of water resources, with the objective of sustainable development in harmony with the environment. The highest priority in the National Water Policy was the provision of safe drinking water to every human being. Ensuring availability of irrigation facilities followed by water for industrial use was the next priority.

V. CONCERN TOWARDS WATER IN LITERATURE

E. A post - 2015 Global Goal for Water: Synthesis of key finding and recommendations from UN-Water (UN- Water, 2014)

It suggests that water‘s fundamental importance for human development, the environment and the economy needs to feature prominently in the new post- 2015 development agenda. UN- Water and its partners have come together to develop suggestions for a dedicated global goal for water,

‗Securing sustainable water for all‘. The proposal aims to support the protection of water resources from over exploitation and pollution while meeting drinking water and sanitation needs, energy, agriculture and other uses. It further aims to protect communities from water related disasters. It supports the realization of the human right to safe drinking water. It proposes targets and related indicators that will help countries to reach the goal by 2030. It illustrates the costs and benefits of doing so and discusses means of implementation.

The proposed global goal for water addresses the priorities agreed at Rio+20 and in other Intergovernmental processes. It draws on lessons learnt from the MDGs, the unfinished business of implementing the MDG agenda, and on outputs from global, national and regional stakeholder consultations.

F. Global Risk 2014 - Ninth Edition (World Economic Forum, 2014)

The Global Risks 2014 report highlights how global risks are not only interconnected but also have systemic impacts. The world faces risks that can be addressed only by long-term thinking and collaboration among business, governments and civil society. The Global Risks 2014 report aims to

support this process by: exploring the nature of systemic risks; mapping 31 global risks according to the level of concern they arouse, their likelihood and potential impact, as well as the strength of the interconnections between them and looking in-depth at the ways in which three constellations of global risk – centred on youth, cyberspace and geopolitics – could interplay and have systemic impact.
Based on a survey of the World Economic Forum's multistakeholder communities, the report maps 31 global risks according to level of concern, likelihood and impact and interconnections among them. The risks of highest concern to respondents are fiscal crises in key economies, structurally high unemployment and underemployment, and water crises.

G. World Water Development Report (UNESCO, 2014)

World Water Development Report (WWDR) is a comprehensive review of the state of the world's freshwater resources. It shines light on the interdependence between the management of water and energy. It provides a mechanism for monitoring changes in the resource and its management and tracking progress towards achieving targets, particularly those of the Millennium Development Goals and the World Summit on Sustainable Development. It offers best practices as well as in-depth theoretical analyses to help stimulate ideas and actions for better stewardship in the water sector. Report depicts the complexity of challenges and provides directions to guide decision-makers in tackling them.

H. Glass 2012 Report (UN-Water, 2012)

The Global Annual Assessment on Sanitation and Drinking-Water (GLAAS) report on the capacity of countries to progress towards the MDG water and sanitation target and on the effectiveness of external support agencies to facilitate this process. The objective of the GLAAS is to monitor the inputs required to extend and sustain water, sanitation and hygiene (WASH) systems and services. The 2012 progress report of the World health organization (WHO)/ United Nations children's fund (UNicef) Joint Monitoring Programme for Water Supply and Sanitation (JMP) announced that the MDG target for drinking-water was met in 2010: the proportion of people without access to improved drinking-water sources had been more than halved (from 24% to 11%) since 1990 (UNICEF and WHO, 2012). however, the progress report also noted that the benefits are very unevenly distributed.

I. Status Report on the Application of Integrated Approaches to Water Resources Management (UNEP, Status Report on the Application of Integrated Approaches to Water Resources Management, 2012)

Determine progress towards sustainable management of water resources using integrated approaches. Findings from the analysis of data from over 130 countries show that there has been widespread adoption of integrated approaches with significant impact on development and water management practices at the country level. It will facilitate information exchange to enhance the coherence and impact of national efforts to improve water resources management and related work of the UN and other external support agencies at country level.

J. Integrated Urban Water Management Global Water Partnership Technical Committee (Bahri, 2012)

The challenges facing today's major cities are daunting, and water management is one of the most serious concerns. Integrated urban water management (IUWM) promises a better approach than the current system, in which water supply, sanitation, storm water and wastewater are managed by isolated entities, and all four are separated from land-use planning and economic development. IUWM calls for the alignment of urban development and basin management to achieve sustainable economic, social, and environmental goals. Planning for the water sector is integrated with other urban sectors, such as land use, housing, energy, and transportation to overcome fragmentation in public policy formulation and decision-making. IUWM encompasses all aspects of water management: environmental, economic, social, technical, and political. A successful approach requires engaging local communities in solving the problems of water management. Collaborative approaches should involve all stakeholders in setting priorities, taking action, and assuming responsibility.

K. Good Practices in Urban Water Management Decoding Good Practices for a Successful Future (ADB, 2012)

The 21st century will be the Asian century. Similarly, it will also be the first urban century. From the

year 2008, for the first time ever in human history, more people lived in cities than in rural areas. It provides significant new insights into urban water management in eight selected Asian cities. There is a lot of expertise on water in Asia that the world can learn from. This provides a good example of the kind of contributions that the Integrated Water Plan can make. It offers a comprehensive reviews and concise analyses of the performance of the eight cities in urban water management and the key factors that contribute to the progress.

L. Global Water Issue A Compendium of Articles (Bureau of International Information Programs, 2011)

It compiles many articles regarding water and its relation with different aspects. It introduces water as an indispensable resource. Major relations of water are presented with food security, climate, and health. Politics of water and water management are other concern of this report. It also focuses on the catalyst for change. It finally ends with the statements that: It‘s the wheel of fortune, It‘s the leap of faith, It‘s the band of hope,, Till we find our place on the path unwinding in the circle, the circle of life.

M. Big Cities. Big Water. Big Challenges.
Water in an Urbanizing World (Engel, Jokiel, Kraljevic, Geiger, & Smith, 2011)

The growth of the earth‘s urban population and areas continues as a major demographic trend; it is projected that 70 % of the world‘s population will live in urban areas by 2050. As seen in this report‘s case study chapter highlighting megacities with different social, environmental, and economic situations, the main threats to urban water are water scarcity, decreasing water quality and pollution, water overuse and associated salt-water intrusion in addition to infrastructural, institutional, and social problems. For cities to be sustainable, reliable access to safe drinking water and adequate sanitation are an important prerequisite. Sustainability goes beyond physical engineering and manipulation of water flows; Urban water management must integrate a larger proportion of solutions like raising awareness to reduce consumption, law enforcement and controls, reuse and recycling of storm-and wastewater, corporate water stewardship, economic and fiscal incentives and instruments, cost recovery, integrated river basin management, payment for environmental services, and climate change adaptation.

N. Water Ethic and Water Resource Management (UNESCO, 2011)

This report examines ethical issues associated with water resource utilization and management, including its uses in energy and other domains. The report systematically discusses how water ethics can make a difference to water related practices and provides a cross-cultural review of the issues. It reveals gaps in existing knowledge to researchers, policy makers and funders of research, which could be used to examine linkages between research and policy making, and presents areas of policy options to governments. The report examines some possible ethical principles to resolve moral dilemmas involving water. Existing problems in current water management practices are discussed in light of these principles. The conclusions of this report are applicable to all human uses of water, not only those related to direct use in energy production, or indirect use such as in energy intensive agricultural production systems.
The construction of water ethics needs joint efforts and interdisciplinary collaboration at all levels. By following certain general principles, adopting scientific methods and tools, arousing experts, stakeholders and decision makers‘ responsibility, and conducting ethical education for young people, the construction of ethically acceptable water utilization and management system can be expected to occur in the near future.

O. Access to Drinking Water and Sanitation in Asia: Indicators and Implications (ADB, 2007)

Report states that aiming for inclusive growth in Asia will make little practical sense unless targets are set and policies, programs, and projects are articulated to achieve universal water and sanitation access. This paper provides, in relation to developing member countries (DMCs) of the Asian Development Bank (ADB), an evaluation of the well known Water Poverty Index and proposes an Index of Drinking Water Adequacy (IDWA). The case for fine-tuning the water and sanitation MDG in terms of house connections is provided and a critical review of available and globally publicized data on access to water and sanitation is presented. IDWA is simple to interpret; its components indicate di- rections for policy,

ISSN: 2278-4632
Vol-11 Issue-02 2021

program, and project actions. However, there is a need to re-examine how water and sanitation access data are collected and how a fair degree of accuracy and cross country comparability can be assured.

P. Handbook for the Assessment of Catchment Water (HR Wallingford, 2003)

The –Handbook responds to the growing need to balance supply-side and demand-side approaches to managing scarce water resources in catchments and river basins. It recognizes that a plethora of research and methodologies are readily available to assist planners and managers to assess water resource availability in a catchment yet little is available to assist in assessing water demand and use. The Handbook therefore aims to fill this gap by bringing together a range of methodologies, examples of their application, supporting information and key references. The Handbook is aimed at professionals and practitioners in the southern African region.

It provides the user with a range of appropriate methods for estimating water demand and use across a range of water uses including environmental, urban, industrial, rural domestic and agricultural sectors. Guidance on the advantages and disadvantages of different assessment techniques are provided and the texts supplemented by worked examples. Methods suitable for forecasting long-term water demand and use are also included.

Q. Water in India: Situation and Prospects (UNICEF, 2013)

Since independence, India has made significant progress in developing its water resources and supporting infrastructure. Today, India has the capacity to store about 200 BCM of water, an irrigated area of about 90 Mha, and an installed hydropower capacity of about 30,000 MW. However, due to rapid development, increasing population and iniquitous distribution of water, the demand for this natural resource far outweighs its supply. In recent decades, much interest has been generated in India's water management and policy matters. Report focus on the need of new indices to measure available water resources. It finds water demand is far exceeding supply and leading to inter- sectoral conflicts, increasing water pollution is ticking.

R. 2007 Benchmarking and Data Book of Utilities in India (ADB, 2007)

The 2007 Benchmarking and Data Book of Water Utilities in India examined the performance of water utilities in 20 cities in India, with service areas ranging from one city to several towns and cities. Performance indicators were derived using basic data provided by the utilities and following various computations using the formulas. Utilities were compared on the basis of different aspects of production, services, management, tariffs and operation and maintenance. Data on estimates of population served by house connections and by public taps were provided by the utilities. Normally, these two values are computed using the number of house connections and public taps multiplied by the corresponding average number of persons served by each type of connection. However, in a number of instances, the reliability of the average number of persons served became suspect when the resulting population served exceeded the total population in the area of responsibility.

ISSN: 2278-4632
Vol-11 Issue-02 2021

Focus of concern towards water resource in Literature
Literature: A post - 2015 Global Goal for Water: Synthesis of key finding and recommendations from UN-Water 2014 **Concern Area:** Water resource conservation and protection, Human Health, Human Rights to water, cost and benefit in water management, access to water, water governance, water treatment and reuse, Water related disaster **Concern Perspective:** Towards sustainability as importance of water for human development, environment and economy needs were considered. **Level of Concern:** Global
Literature: Global Risk 2014 - Ninth Edition **Concern Area:** Water Crises **Concern Perspective:** Collaboration among business, governments and civil society **Level of Concern:** Global
Literature: World Water Development Report – 2014

TABLE 1: REVIEW SUMMARY OF SELECTED WATER BASED REPORTS

VI. FINDING AND DISCUSSION

Water could be discussed in terms of its available amount, amount used in different sector and for different purpose, water quality which also covers water pollution and contamination and last but most wide scope area of water is its management. Identified concern through literature could be grouped in these classes. Water availability is a global concern. It talks about the distribution of water on earth. It finds the there is a very small amount of fresh water which is useful human activities. The drivers of water use and availability can originate from far beyond national and regional boundaries. The unavoidable reality that water resources do not respect political boundaries demonstrates the supranational dimensions of water, and represents a compelling case for international cooperation on water management. Thus it is insignificant to discuss water resource availability and use at national and regional level.

Intensive use of this resource inevitably results in depleting the storage components and has adverse consequences. Only 2.53 per cent is fresh water and it is a finite resource. Demographics change due to urbanization and the increasing consumption that comes with rising per capita incomes—better lifestyles, longer life expectancies, population growth, and globalization of trade and advertising—are contributing to the increase in per capita use of water. There is research scope to find the correlation between water consumption and socioeconomic factors. The 2012 progress report of the World health organization (WHO)/ United Nations children‘s fund (UNicef) Joint Monitoring Programme for Water Supply and Sanitation (JMP) announced that the MDG target for drinking-water was met in 2010: the proportion of people without access to improved drinking-water sources had been more than halved (from 24% to 11%) since 1990 (UNICEF and WHO, 2012). It suggests coverage of water is greater than what MDG had decided. There are still concerns in coverage as it is unequal in urban and rural distribution.

Water management has wide scope in context of above aspects. The concept of sustainability could be workable for water only with the sustainable management initiatives. It covers management in water extraction, storage, quality, supply, and finally end use. Management of water risk is also an alarming concern. There are substantial technical and financial constraints along with the political and institutional barriers in water management. Embedding water management as the central pillar of sustainable development requires institutions that facilitate discussion and decisions on society‘s targets and the allocation of water resources to optimize generation and equitable distribution of its many benefits.

At the aggregate level, other things being equal, population growth most assuredly does reduce

ISSN: 2278-4632
Vol-11 Issue-02 2021

per capita water availability. It is in this light that the Global International Waters Assessment listed population growth first in a series of root causes of the ―global water crisis‖

(UNEP, Challenges to International Waters—Regional Assessments in a Global Perspective, 2006). There is more to population change than growth alone, and specific impacts of population dynamics on water often come down to a complex array of place specific factors that relate to economic and climatic changes, including agricultural and industrial technologies, sewage treatment, and institutional mechanisms. One of the challenges to research in this area is the common property nature of water resources, and another challenge is caused by rapid regulatory changes as water resources become scarcer, which alters the institutional context (Sherbinin, Carr, Cassels, & Jiang, 2007).

Since in large parts of the world it is getting difficult to meet growing water demands by mobilizing more water, the discourse has turned its focus to demand management, governance and the necessary concern for aquatic ecosystems.

VII. CONCLUSION

At the present time, sustainable standards for the development and use of water resources are not maintained in many parts of the world. The increasing demand for water, the reduction of river flow volumes with serious consequences for users and ecosystems, the over-exploitation of aquifers at rates greater than the rate of natural replacement, the problems of pollution and degradation of water quality, difficulties of access to the resource for basic needs on the part of a high percentage of the population, are challenges that urgently require strategies which enable the numerous tasks of water resources use to be addressed.

A growing population, increasing water pollution and changing consumption patterns, provide the basis for the concern that water scarcity and diminishing water quality will become a main constraint on economic and social development and environmental sustainability. Water availability, allocation, use and quality have been identified as major concern area in the selected water related reports. Availability is dependent on physical or environmental factors like geography of a particular region, climate change, whereas use is more dependent on socio economic and political factors like share of various sectors in economy, their water use efficiency in terms of respective share.

Looking to the urbanization and population growth trends in context of water scarcity it is clearly reflected that the water habits and attitudes of urban users will play a crucial role in demand management and future policies of water.

In a world increasingly dominated by cities, the study highlights the need of effective water management practices with long term vision and motivation. The belief that more people will require more water is no longer practical. It is time to begin thinking in a new way about what humans need, what they want, and how much water is required to meet these demands. Population, human welfare, water availability, and use must be considered to be dimensions of the same complex problem.

In the past water resources planning have been supply driven. However, with water resources becoming increasingly

scarce it is important that water demand and use is managed efficiently before new sources of water are developed. To manage water resources effectively, current and future water demand and use for all sectors should be estimated as accurately as possible.

Leanings from the study could be summarized in terms of following:

- Water as an important resource required for life and livelihoods
- Rapid urbanization, change in consumption and ignorance to the protection of water made it limited source
- Global trends point towards increasing water consumption due to population growth and changes in consumption patterns

- Water amount available, its consumption pattern, accessibility, quality and management are major areas of concern.
- There is a need to focus on economic, environmental and social aspect of water resource which would be helpful to move in sustainable direction.
- Rural area have less coverage of water compare to urban but the quantity of per capita water consumption in urban area is much higher than rural area.

REFERENCES

[1] ADB. (2007). Access to Drinking Water and Sanitation in Asia: Indicators and Implications. Asian Development Bank.
[2] ADB. (2007). Benchmarking and Data Book of Utilities in India. Ministry of Urban Development Government of India.
[3] ADB. (2012). Good Practices in Urban Water Management . Singapore: Asian Development Bank.
[4] AquaFed. (2010). Access to Drinking Water is Deteriorating in the Urban Half of the World. Stockholm.
[5] Aspeslagh, W. (1994). Carrying Capacity and its application to Portland metropolitan area.
[6] Bahri, A. (2012). Integrated Urban Water Management. Stockholm, Sweden: Global Water Partnership.
[7] Black, R. E., Cousens, S., Johnson, H. L., Lawn, J. E., Rudan, I., Bassani, D. G., et al. (2010). Global, regional, and national causes of child mortality in 2008: A systematic analysis. The Lancet , 375 (9730), 1969-1987.
[8] Bureau of International Information Programs. (2011). Global Water Issues. Washington D.C.: Bureau of International Information Programs, United States Department of State.
[9] Corcoran, E., Nellemann, C., Baker, E., Bos, R., Osborn, D., & Savelli, H. (2010). Sick Water? The Central Role of Wastewater Management in Sustainable Development. The Hague: UN-Habitat/UNEP/GRID.
[10] Engel, A. K., Jokiel, D., Kraljevic, A., Geiger, M., & Smith, K. (2011). Big Cities. Big Water. Big Challenges. Water in an Urbanizing World. WWF Germany, Berlin.
[11] Green Clean Guide. (2014). Earth‘s water distribution and Indian scenario | For the Changing Planet. Retrieved July 29, 2014, from Green Clean Guide: http://greencleanguide.com/2011/07/28/earths- water-distribution-and-indian-scenario/
[12] HR Wallingford. (2003). Handbook for the Assessment of Catchment Water . DFID.
[13] Jain, A. (2014). Complacency: Compounding the Urban Water Crisis. Indian Journal of Public Administration , 105-116.
[14] Lalzad, P. (2007). An Overview of the Global Water Problems and Solutions. London.
[15] Lane, M. (2009). The Carrying Capacity Imperative: Assessing Regional Carrying Capacity Methodologies for Sustainable land use planning. Annual Meeting of the International Society for the Systems Science. Brisbane: University of Queensland.
[16] Sherbinin, A. d., Carr, D., Cassels, S., & Jiang, L. (2007). Population and Enviornment. Annual Reviews.
[17] UNEP. (2006). Challenges to International Waters—Regional Assessments in a Global Perspective. Nairobi: UNEP.
[18] UNEP. (2012). Status Report on the Application of Integrated Approaches to Water Resources Management . Nairobi, Kenya: United Nations Environment Programme.
[19] UNESCO. (2012). Facts and figures from the WWDR4. Paris: United Nations World Water Assessment Programme.
[20] UNESCO. (2012). Managing Water under Uncertainty and Risk. Paris: United Nations Educational, Scientific and Cultural Organization.
[21] UNESCO. (2014). The United Nations World Water Development Report 2014 Volume 1: Water and Energy. UNESCO.
[22] UNESCO. (2011). Water Ethic and Water Resource Management. Bankok: UNESCO.
[23] UN-Habitat. (2006). Meeting Development Goals in Small Urban Centres: Water and Sanitation in the World‘s Cities. Nairobi, London: UN-Habitat, Earthscan.
[24] UNICEF and WHO. (2012). Progress on Drinking Water and Sanitation 2012. UNICEF and World Health Organization.
[25] UNICEF. (2013). Water in India: Situation and Prospects. New Delhi: UNICEF.
[26] UNICEF, FAO, & SaciWATERs. (2013). Water in India: Situation and Prospects. New Delhi: UNICEF.
[27] UN-Water. (2014). A post - 2015 Global Goal for Water: Synthesis of key finding and recommendations from UN-Water . United Nations.
[28] UN-Water. (2012). UN-water global annual assessment of sanitation and drinking-water (GlAAS) 2012. WHO library.
[29] Water and Urbanization. UN-Water.
[30] WHO. (2008). The Global Burden of Disease: 2004 Update. Geneva: WHO.
[31] WHO/UNICEF. (2010). Progress on Sanitation and Drinking-Water: 2010. Geneva, New York: WHO.
[32] World Economic Forum. (2014). Global Risks 2014. Geneva: World Economic Forum.

