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Water Management for Sustainable Cities

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Abstract—*Water is a prime natural resource for humans and hence a precious national asset. Nowadays, it is hard to find freshwater due to huge growth in population, agricultural and industrial activities and contamination of water resources. Therefore, it is essential to manage the water bodies for the present and future generations.*
So far as the Earth is concerned, 97% of the water on it is salt water, with an average salinity of 35‰ (or 3.5%, roughly equivalent to 35 grams of salts in 1 kg of seawater and only 3% is fresh water, of which slightly over two thirds is frozen in glaciers and polar ice caps. The remaining unfrozen freshwater is mainly found as groundwater, with only a small fraction present above ground or in the air. Surface water is only 0.3 %. The planet's little fresh water is very unevenly distributed.
Present human-induced changes/variability in climate show a very disturbing trend. Humans are destroying the water, air and land environment not only through pollution but also through greed. Over-Population + GREED + lavish lifestyles of men has resulted in direct impact of climate on vital areas as water quantity and quality, agriculture, air, ecosystems and human health. Under pressure from climate change, water problems and other problems will aggravate. The laws of the water and land face numerous challenges. There is ongoing tension between the life and freedom of the other species and men. Understanding and managing water and other precious resources is, therefore, critical to the public and decision-makers in the government, industry and hazard mitigation.
Therefore, short-term and long-term solutions need to be sought to mitigate water stress carefully and on a planned, continuous basis for humanity specially cities for sustainability of life. We need to improve and protect the water sources very carefully through utmost understanding and responsibility. The urbanizing civilization needs an international, thorough and long-lasting approach to solve its water problems.

1. INTRODUCTION

Over 1.1 billion individuals still lack access to a water from a clean, safe source and over 2.6 billion people do not have access to toilets and other adequate sanitation facilities.

The problem will be magnified by rapid urban growth. In 1950, there were less than 100 cities with a population in excess of 1 million; by 2025, that number is expected to rise to 650. India's urban population was 377 million in 2011. It is greater than the total population of USA (319 million). India is on the brink of an urban revolution with its population in towns and cities expected to reach 600 million by 2031.

This lack of access is a primary cause of water contamination and water-borne diseases. Every 8 seconds, a child dies from a water-related disease. 80 percent of diseases in the developing world are caused by contaminated water. 20 percent of freshwater fish species have been pushed to the edge of extinction from contaminated water.

From an urban perspective, and especially in the developing world, challenges related to water and sanitation will magnify in the future due to an ever growing city population needing to share already insufficient and poorly managed resources.

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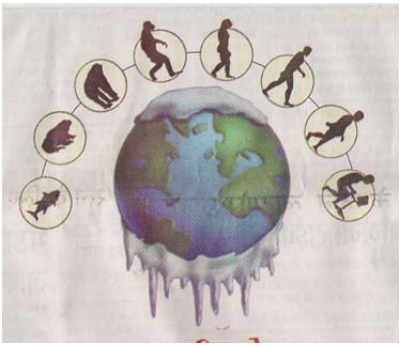


The overall per capita water availability in India is diminishing day by day, as is evident from the following figures :

1947	6008 cubic metres / year
1948	6008 cubic metres / year
1951	5177 cubic metres / year
2001	1820 cubic metres / year
2025	1340 cubic metres / year
2050	1140 cubic metres / year

फिलहाल राजधानी को छोड़ पूरे प्रदेश में अघोषित कटौती जारी है। गांवों में 10 घंटे तक कटौती हो रही है। बारिश न होने से बिजली की मांग भी लगातार बढ़ रही है।

बीसलपुर में अभी 310.15 आरएल पानी है। 295 आरएल पानी लिया जा सकता है। यूं तो ये अगली जुलाई तक पर्याप्त है, मगर बारिश नहीं हुई तो सप्लाई में कटौती होना तय है।

राजधानी समेत प्रदेश के ज्यादातर इलाकों में बादलों के कारण गर्मी कम हुई है। मगर 65% तक आर्द्रता के कारण उमस ने बेहाल कर रखा है।

सरकार के प्रयास

ऊर्जा मंत्री ने पिछले दिनों कहा था कि बिजली कम्पनियों को बिजली खरीद के लिए 3 करोड़ दिए गए हैं। संकट 1 हफ्ते में

सरकार के प्रयास

सरकार ने पानी के लिए 436 करोड़ का इमरजेंसी प्लान तैयार किया है। मंशा है अगले मानसून तक पेयजल व्यवस्था सुदृढ़ करने की।

सरकार के प्रयास

सरकार फिलहाल सिर्फ बारिश का ही इन्तजार कर सकती है। मौसम से सीधे निपटने की कोई कार्ययोजना नहीं है।

हकीकत : छाया अंधेरा

गुरुवार को 8 घंटे तक अघोषित कटौती। रात 8 बजे से उद्योगों की बिजली ठप। फ्रिक्वेंसी 49.3 हुई तो रात को गांवों में सप्लाई रोकी। रेनवाल में श्रद्धालु भी अंधेरे में।

हकीकत : कटौती तय

अगर बारिश नहीं हुई तो सितम्बर में समीक्षा के बाद बीसलपुर से आपूर्ति में कटौती होगी। अभी जयपुर को 3100 व अजमेर को 2100 एमएलडी पानी मिल रहा है।

हकीकत : राहत नहीं

गुरुवार को चूरू, भरतपुर और अलवर में हल्की बारिश हुई। बाकी राज्य उमस से बेहाल रहा। मौसम विभाग के मुताबिक फिलहाल राहत की उम्मीद नहीं।

4. दाल-रोटी भी होगी महंगी

दाल और सब्जियों के भाव चढ़ रहे हैं। प्रदेश में बुआई का रकबा कम रह गया है। आने वाले दिनों में स्थिति और गम्भीर हो सकती है।

सरकार के प्रयास

पीडीएस के जरिये दालों पर 20 रु. तक सब्सिडी की योजना।

हकीकत : और बढ़ सकते हैं भाव

सामान	आठ दिनों में तेजी (अभी तक)	तेजी और आशंका
अनाज	14%	10%
दालें	8-22%	6-8%
तेल	10-18%	6-7%

सबसे ज्यादा सूखे दिन

25 जून से 25 जुलाई यानी मानसून की सक्रियता के 30 दिनों में से 25 सूखे ही रह गए। यानी प्रतिदिन 5 मिमी. या इससे कम बारिश ही हुई।

138 मिमी.

वर्षा 1 जून से 25 जुलाई तक हुई 270 मिमी. होनी चाहिए थी

2009 से बुरी स्थिति

2009 में 25 जुलाई तक 190 मिमी बारिश हुई थी। मौसम विभाग ने माना उत्तर-पश्चिम में स्थिति चिंतनीय है।

The water scarcity in river basins is growing fast with increase in urban population and persistent water shortages in some parts and annual floods in other parts of India are becoming a major challenge. 40 % water demand in Indian cities is met by ground water and the ground water table is also falling at an alarming rate (2-3 m / year).

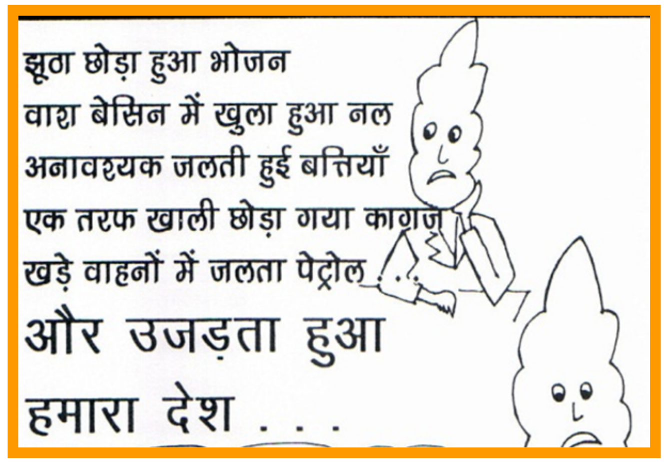
It is becoming essential to avoid the impending wars for water as is indicated by the diminishing per capita water availability in India. Every person needs a minimum of 20 litres of water per day to meet the minimum basic requirements. This undermines overall social and economic development of civilization.

Thus we see that floods and droughts affect vast areas of the country, transcending State boundaries. One-sixth area of the country is drought-prone. Out of 40 million hectare of the flood prone area in the country, on an average, floods affect an area of around 7.5 million hectare per year. Approach to management of droughts and floods has to be co-ordinated and guided at the national level.

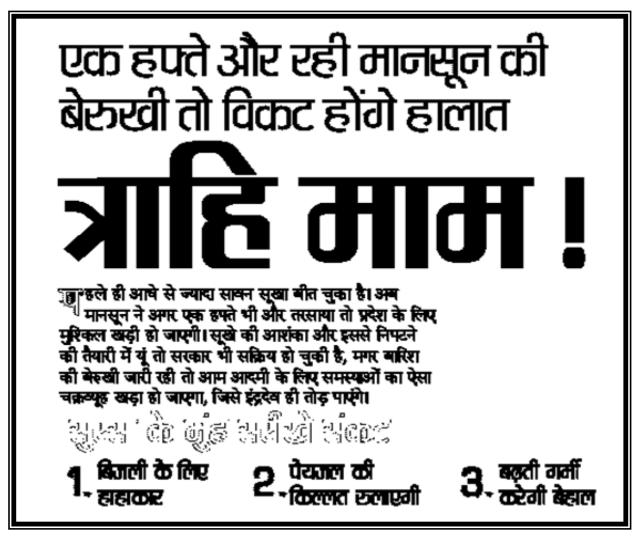
2. THE BASIC PROBLEM :

United Nations analysis says that 35 billion cases of illness and 5.3 million deaths are caused each year by unsafe water.

Present human-induced changes/variability in climate show a very disturbing trend.



Under pressure from climate change, water problems and other problems will aggravate. The laws of the water and land face numerous challenges. There is ongoing tension between the life and freedom of the other species and men.



एक हफ्ते और रही मानसून की बेरुखी तो विकट होंगे हालात

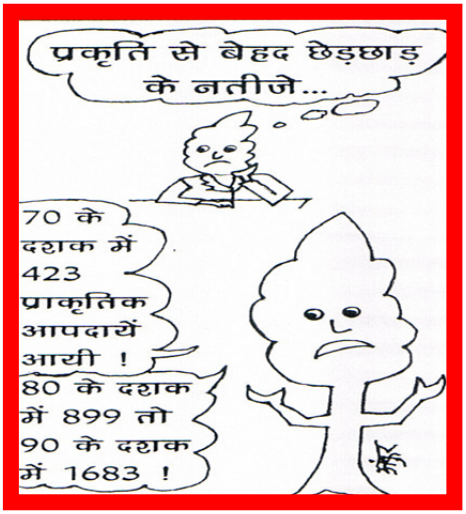
त्राहि माम !

पहले ही आधे से ज्यादा सावन सूखा बीत चुका है। अब मानसून ने अगर एक हफ्ते भी और तरसाया तो प्रदेश के लिए मुश्किल खड़ी हो जाएगी। सूखे की आशंका और इससे निपटने की तैयारी में यूं तो सरकार भी सक्रिय हो चुकी है, मगर बारिश की बेरुखी जारी रही तो आम आदमी के लिए समस्याओं का ऐसा चक्रव्यूह खड़ा हो जाएगा, जिसे इंद्रदेव ही तोड़ पाएंगे।

1. बिजली के लिए हाहाकार
2. पेयजल की किल्लत रुलाएगी
3. बढ़ती गर्मी करेगी बेहाल

Environmental degradation of water sources, in particular, reduced water quality and quantity due to pollution from urban or land-based activities is a major concern. Too little money and attention is paid to improve such basic infrastructures as water and wastewater systems. Many nations are spending profusely on war preparation than on water providing.

Further, improving the water and sanitation situation in an urban setting is not an easy task, as the required infrastructure, either new or upgraded, needs to be accommodated by already existing structures, such as roads or buildings.



Save Water ! Respect Varun Dev !!

Humans are destroying the water, air and land environment not only through increasing pollution, population but also through greed, careless life-styles. Over Pollution + Over Population + GREED + lavish, careless lifestyles of men has resulted in direct impact of climate change on vital areas such as water quantity and quality, agriculture, air, ecosystems and human health.

3. STATUS OF WATER RESOURCES IN INDIA :

India receives an annual precipitation of 4,000 billion cubic meter (BCM), equivalent to 4,000 cubic kilometers of which 75% occurs just in the four months of the monsoon period. From the annual precipitation, 1,869 BCM of water appears as runoff in various river basins. The utilizable water resource has been assessed as 1,132 BCM. Rainfall in India is erratic and uneven that ranges from 11,000 millimeter annually in some parts of North Eastern India to 100 millimeter in Western India. Therefore, India is expected to face acute water problem in the coming years due to different precipitation patterns, wastage and mismanagement.

Out of 40 million hectares of the flood prone area in the country including States like Bihar, Bengal, Assam, Uttar Pradesh, Coastal Andhra Pradesh, Orissa, on an average, floods affect an area of around 7.5 million hectares per year.

In general, India has water abundance in the north and east and water scarcity in the west and south.

The availability of water resources in various river basins of the country is highly uneven. While 32% of the total water resources are still available in the Brahmaputra basin, 28% of the total water resources in the Ganga basin, this availability is merely 0.2% in the Sabarmati basin.

Out of 12 major and 48 medium river basins in India, the government predicts that by 2025 the 8 deficit river basins will be Ganga, Subernarekha, Krishna, Mahi, Tapi, Cauvery, Pennar and Sabarmati.The surplus basins would be Brhamaputra, Barak, Narmada, Brahmani-Baitarani, Mahanadi, Godavari and Indus.

4. SOLUTION

Water crisis will be the burning problem sooner than later. Understanding and managing water and other precious resources is, therefore, critical to the public and decision-makers in the government, industry and hazard mitigation. It is essential to manage the water bodies for the present and future generations.

Therefore, short-term and long-term solutions need to be sought to mitigate water stress carefully and on a planned, continuous basis for humanity specially cities for sustainability of life.

This calls for strong legislation, guidelines, and building codes, which can only be instituted and monitored by national and local governments.

Cities cannot be sustainable without ensuring reliable access to safe drinking water and adequate sanitation. Coping with the growing needs of water and sanitation services within cities is one of the most pressing issues of this century. Sustainable, efficient and equitable management of water in cities has never been as important as in today's world.

Earth provides enough to satisfy every man's need
But not every man's greed
—-Mahatma Gandhi

Water Reuse, Recycling and Rain-water harvesting will be the key solutions in the highly urbanized world.

Urban waste water is to be cleaned and reused in a big way in all big, metropolitan cities. Sewage water cleaning and recycling will be essential to save human population on the urbanizing earth from extinction .

Rain-water harvesting on ground around the urban areas and roof water harvesting in the cities would have to be taken up on a very large scale, specially in western and southern India and similarly situated geographical areas on this globe.

We need to improve, clean and protect all types of our water sources very carefully through utmost understanding and responsibility.

The urbanizing civilization needs local to international, thorough and long-lasting approach to solve its water problems.

5. CONCLUSION

Urban watersheds development, demand management and water audits are necessary for sustainable cities. Integrated urban water resource management (IUWRM) should be applied to the entire urban water cycle, including rainwater, desalination, ground and surface water, etc., as well as storage and distribution, treatment, recycling and disposal, and the protection, conservation and storage of water resources.

If we do not promote and practice judicious use of our precious water resources, it will turn into a human-ecological-economic disaster. This will collapse the economies all over the world. It is essential to learn from past experiences so as not to commit the same mistakes all over again and face similar environmental disasters which take another few centuries to recover from.

The entire country's natural water cycle need to be understood and respected like the Ganga Maa.

We have to be very sensitive to avoid over-use, misuse, wastage of the liquid of life – water.

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