Towards Excellence in Water And Culture

An analytical presentation on
yearwise World Water Day themes on
development of water sector

Gajanan Deshpande

Towards Excellence In Water and Culture

(Compilation of articles on World Water Day themes)

1 January 2024

Towards Excellence In Water and Culture

Shri Gajanan Deshpande
704, Aditi Ribera
Aundh - Balewadi link Road
Baner, Pune

DTP & Type Setting
Aarti Kulkarni

Cover Design & Interior Decoration
Ajay Deshkar

Published By :
Ajay Prakashan
A - 201, Mirabel Apartments
Near Pan Card Club,
Baner, Pune.

Towards Excellence In Water and Culture
(Compilation of articles on World Water Day themes)

Index

Introduction

It is a great pleasure that this book, 'Towards Excellence in Water and Culture', is now being placed in the hands of all those who are interested in the development of the water sector. In fact, it is a collection of my articles on the topic of 'World Water Day' year-wise themes published successively in 'Jalsamvad', a magazine dedicated to water.

It is well known that March 22 has gained unique and universal importance all over the world as 'World Water Day'. It has become a new festival to be celebrated in a spirit of unity in a world moving towards becoming more water-civilized. On the occasion of World Water Day, a different topic that will shed deep light on water-related issues is adopted as a main stream every year for global public awareness on behalf of the United Nations. On that occasion, efforts are made to implement various public awareness programs relevant to the subject. It has been going on continuously for the past 30 years.

A lot of awareness work has been carried out on this occasion through the years, keeping in view various water-related issues. The main purpose of those articles in Jalsamwad was to reach the general public and enlighten the readers. Special thanks to Dr. Datta Deshkar, editor of the magazine, for taking up this topic. I believe that the overall interpretative and critical writings that have come out in this book form will be able to be read in a homogeneous way by the common readers, and they, now, may find that many interconnected links about water, that were unseen or scattered, are integrated through this effort. Of course, I frankly admit that this interpretation is limited to the limits of my meager intellect.

At the 1992 United Nations Conference on Environment and Development in Rio de Janeiro, there was an in-depth discussion on the increasingly critical issue of 'water and the environment', and it was

realized that there is a need for greater public awareness on the issue of water at the global level. In fact, it may be said that the United Nations, which has brought about many reforms in other areas, has neglected this very important sector for so many years. As a result, the concept of celebrating World Water Day every year emerged out of that churning. Subsequently, the United Nations passed a similar resolution in its General Assembly and made sure to celebrate March 22nd every year as 'World Water Day'. Accordingly, celebration of 'World Water Day' started in 1993. Every year, it is celebrated with more vigor and deep passion.

This becomes a matter of special joy for Indians because the concept and inspiration behind it is essentially Indian. It is believed to have come out of the concept and efforts of internationally renowned hydrologist Dr. Madhavrao Chitale. When he was the Secretary of the Water Resources Department of the Government of India from roughly 1987 onwards, it was through his inspiration that the Water Resources Day celebrations started everywhere in India, and the concept became quite ingrained in the Indian public. He has widely enlightened the international community in this regard through various global forums. The resolution of the United Nations to celebrate 'World Water Day' is said to be the fruit of his efforts.

Every year, one or more of the 23 water-related organizations associated with the United Nations are entrusted with the special responsibility of organizing and coordinating various events on the occasion of World Water Day, and the theme suggested by them to draw attention to water issues related to those organizations is adopted as the main stream of the World Water Day of that year. In accordance with this, it is requested that every nation plan various activities related to the water resources of their nation and implement them with enthusiasm everywhere in the country. On this occasion, the attention of society is drawn to organizing water awareness programs to shed light on various aspects related to water.

We know how deep and ancient India's history of water and culture and their interconnectedness are. The importance of water to

Indians is not only related to water consumption but also has religious and spiritual significance. We believe that water is our culture as well as our life.

In the course of time, different cultures emerged in the world, and they became the distinctive identity of their respective societies. These cultures have proven to be very beneficial for exchange and innovation due to their inherent diversity. In this sense, they are the true heirs of humanity, and so preserving their identity will definitely be beneficial for future generations. Therefore, preserving the diversity of these different cultures is our first duty to the world. Cultural rights are part of human rights, and it is imperative to use them to protect these cultures.

If the global community consisting of these diverse cultures wants to survive in the world with strength, it would be possible to make each other stronger by sharing the good things of each other's culture, knowledge, craft, and technology and thereby increasing our capabilities. For this purpose, the main direction of the next action will be to create the participation of different sectors with one another. UNESCO has planned its work in this regard, and it is from this that a new concept of creating water-related participation at various levels, such as village-wise, city-wise, district-wise, river basin-wise, and nation-wise has emerged and efforts to create such participation are being encouraged.

On the occasion of World Water Day, many key topics have been touched upon. As such, it has been realized that women's power can resolve water-related issues more efficiently. But today's real picture in this regard is unfortunately very unfavourable. There is a complete difference between principles and actual practice. In our male-dominated culture, women have a very secondary role. If this situation is to be improved, it is the need of the hour to increase the participation of women in water use.

Water quality and cleanliness are closely related. It is said that where there is cleanliness, there will be good health, and where there is good health, there will be prosperity. Also, if abundant and good-quality

water is available, it brings about positive changes in people's job opportunities and their lives.

In many regions, safe, good-quality, and affordable water is insufficient to meet basic human needs. It is asserted that the wars and conflicts of the next century will be about water. Since water is an important resource for all, many tensions and conflicts are arising in communities, states, and countries. Therefore, it is the primary duty of everyone who depends on the water resources of that place to use water wisely, to take care of this resource in all possible ways, and to pay strict attention to how it will be managed and regulated properly.

The three most essential things for human beings to survive on this planet are air, water, and food. As our population grew, so did the pressure on resources, leading to greater use and exploitation of all natural resources. As a result of this human greed for centuries, the world is facing severe water scarcity and pollution. Today, there is such a crisis in the world that 65 million people are living without a safe water supply. They have to spend hours fetching water from distant sources. Apart from this, they also have to face the adverse health effects of consuming contaminated water.

This world is not only for us, but also for future generations. It therefore becomes important that we leave behind a warm and fresh environment for future generations. For that, water is as precious as gold, and we should be aware that we should not waste it unnecessarily. While taking care that the water is pollution-free, we should actively encourage water conservation techniques such as water recharge and reuse for sanitation and gardening. As conscious citizens, we can play a great role in creating this awareness in society. That should be the first responsibility of every citizen of the world, so that we can leave behind a promising state of water availability for the next generation by making the world a beautiful and civilized place.

The happy future of the country will depend on the proper use of this water while taking care to ensure that our water sources remain clean, potable, and useful for various social uses. That is the main purpose behind the concept of celebrating World Water Day. For that,

direct social action through public participation is needed. In order to create such people's participation, it is necessary to create a sense of interest and earnestness in society regarding the water issue. Understanding the importance of water and the value of scarce water while accepting the responsibility of frugality can only strengthen this movement.

Pune **Gajanan Dinkarrao Deshpande**
Date 01 Jan 2024

1
Importance and value of fresh water (Sustainable Management of Freshwater Resources)

22nd March has acquired extraordinary importance as 'World Water Day'. Keeping water issues in mind, this is a move towards becoming more water-civilized. Every year on the occasion of Water Day, a theme that will shed light on different water related issues is adopted as for global awareness by the United Nations and various public awareness programs are organized in accordance with that theme.

At the United Nations Conference on Environment and Development in Rio-de-Janeiro in 1992, there was an in-depth discussion on the increasingly critical issue of 'water and the environment', and it was realized that there is a need for greater public awareness on the issue of water at the global level. In fact, it has to be said that the United Nations, which has brought about reforms in other areas, has neglected this very important issue for so many years. As a result, the concept of celebrating Water Day every year was born out of that churning. The United Nations passed a resolution in its General Assembly and ensured that 22nd March is celebrated as 'World Water Day' every year. Accordingly, 'Water Day' started in 1993.

Every year, one or more of the 23 water-related organizations associated with the United Nations are entrusted with the special responsibility of organizing and coordinating various events on the occasion of World Water Day, and the theme suggested by them to draw attention to water issues related to those organizations is adopted as the main stream of the Water Resources Day of that year. In accordance with this, it is requested that every nation should plan various programs related to its water resources and draw the attention of the global community regarding the problematic aspects by dealing with various key issues related to water.

In many regions, safe, good quality and affordable water is insufficient to meet basic human needs. It is asserted that the wars and conflicts of the next century will be about water. Since water is an important resource for all, many tensions and conflicts are arising in communities, states and countries. Therefore, it is the primary duty of everyone who depends on the water resources of that place to use water wisely, to take care of this resource in all possible ways and to pay critical attention to how it will be managed and regulated properly.

The first year of World Water Day 1993 was focused on "the importance and value of fresh water and the sustainable management of freshwater resources". On this occasion, various water awareness programs were organized to highlight the availability of fresh water in developing countries, its cleanliness and the necessary improvements.

The three most essential things for humans to survive on this planet are air, water and food. As our population grew, so did the pressure on resources, leading to greater use and exploitation of all natural resources. As a result of this human greed for centuries, the world is facing severe water scarcity and pollution. Today there is such a crisis in the world that 65 million people are living without safe water supply. They have to spend hours fetching water from distant sources. Apart from this, they also have to face the adverse health effects of consuming contaminated water.

Water is a natural resource and water is very useful for the existence of living organisms. Water accounts for 70 percent of human body weight. 97% of the total available water on Earth is in the oceans and it is saline. Only 3 percent of water is in potable form. Of this, 69 percent of water is frozen in glaciers, 30 percent of the water is underground and the remaining 1 percent is available on the surface. People in rural areas like Maharashtra are mostly dependent on ground water sources.

Water scarcity affects families and communities. Without access to clean and easily available water, many communities are trapped in generational poverty, their children drop out of school and parents struggle to make both ends meet.

Safe and readily available water is important to public health - whether it is used for drinking, domestic use, food production or recreation. Improved water supply and sanitation, and better management of water resources can boost the economic development of countries and contribute greatly to poverty reduction.

Water is an important factor of production. So reduction in water supply also reduces economic growth. Water-related losses in agriculture, health, income and prosperity have seen the development rate of some regions decline.

Water and climate change are also inextricably linked. Climate change is also increasing both water scarcity and water-related hazards - such as floods and droughts, as rising temperatures disrupt precipitation and the entire water cycle.

Human society is overusing water and in many cases wasting it. Water wastage due to leakages, excessive use of water for washing, taps left open after use are some of the common places that contribute to the problem of water scarcity.

This world is not only for us, but also for future generations. It therefore becomes important that we leave behind a warm and fresh environment for future generations. For that, water is as precious as gold and we should be aware that it should not be wasted unnecessarily.

The happy future of the country will depend on the proper use of this precious water while taking care to ensure that our water sources remain clean, potable and useful for various social uses. That is the main purpose behind the concept of celebrating World Water Day. For that, direct social action through public participation is needed. In order to create such people's participation, it is necessary to create a sense of interest and earnestness in the society regarding the water issue. Understanding the importance of water and the value of scarce water while accepting the responsibility of frugality can only strengthen this movement.

******

2
Caring for our Water Resources is Everybody's Business

The main theme for World Water Day-1994 was "Caring for our Water Resources is Everybody's Business". Various events and activities were organized in that year.

All of us use water. We use water for hundreds of things - for drinking, for cooking, for processing food, for making various products etc. Water also plays an important role in protecting nature. Our ecosystem depends on the flow of water. The availability and quality of such vital thing i.e. water is becoming a matter of concern for each and every one of us day by day. The increasing use of water and the priorities we have adapted to the situation, have led to major water shortages around the world. Global freshwater resources are, therefore, in trouble.

Since water is an important resource for all, there are many tensions and conflicts in communities, states and countries. Therefore, prudent use of water, hopeful care of this resource in all respects and strict attention to its proper management and regulation is the primary duty of everyone who depends on the water resources of that place. If there is social inaction in this regard, its cost would be very high. Keeping this in mind, various events were planned around the world on the occasion of the 1994 World Water Day.

Every sensible citizen can easily contribute to the improvement of the situation by ensuring his participation in the following four matters in this social issue.

1. Discretionary use of water:

Household water is commonly used for drinking, cooking, washing vehicles, bathing, washing clothes, rinsing, flushing toilets, gardening and other minor activities - such as hand-foot-mouth washing as well as fruit-vegetable-grain washing. Care should be taken

to ensure that only as minimum water as required is used.

Good cleaning can be done without using excessive water. Many times it is found while washing clothes or washing utensils that the tap is kept on till the end of the work and it consumes three times more water. This should be avoided by carefully controlling our wrong habits.

- Avoid resorting to showers or tubs in the name of cleanliness.
- Do not keep the basin tap running continuously while shaving, washing mouth, use it finely.
- Repair leaking taps.
- Offer only as much water as needed to the guests and that too in a small glass.
- Do not use pure drinking water for toilet.
- As soon as the building tank gets full, turn off the motor immediately, do not allow any wastage there.
- Do not throw away stored water in the house as it never gets spoiled if properly preserved.
- Water the garden only as much water as it needs, rremember that excess water does not mean rapid growth.

2. Maintaining water quality:

Using unclean water for drinking causes many disorders. For this, everyone needs to take care of how to keep their water sources clean and pure. Care must be taken that no waste is dumped in those resources and no domestic or industrial effluent is discharged into it.

More attention should be paid to water purity in rural areas. Water should always be used after purification, first by adding alum to it and then straining it, boiling it and adding chlorine to it, so that it becomes drinkable. If possible, water purification devices should be used.

3. Water recharge:

The ground water level is going deeper day by day due to various reasons like population growth, urbanization, industrialization, mismanagement of land and water, neglect of soil and water conservation measures, lack of literacy in water use, increase in area under high irrigated crops, and inadequate efforts for groundwater

recharge. As a result, the wells and bore wells are drying up and they do not meet water even if the bore wells gets 300 feet deep. Therefore, in order to increase the ground water level, it is necessary to recharge rainwater wherever possible. Besides taking appropriate measures; the available ground water should be used sparingly and scientifically.

Groundwater can be recharged by letting rainwater in to it through a well or if the roof water is released into a drainage ditch or a bore well. Recharging water scientifically lets us avoid severe drought conditions and it also helps create water storages for future. With proper and effective planning of groundwater management and recharge through public participation in villages, we can overcome the drought situation to some extent.

4. Water recycling:

Water recycling is just like producing additional water. For this, more and more water should be recycled and reused. Reuse of water helps in reducing the demand for water. There are several possible home remedies for this. For example - bathwater should be collected separately and used for gardening. In the kitchen, water used for cleaning of dal, rice or vegetables can be given to the home plants to save water. Similarly, water used for washing of cloths can be used to clean the bathroom / toilet or basin.

All in all, a great deal of social awareness is needed to remind us that we have to take care of our own water resources.

******

3
The Place of Women in Water Development

The main theme for World Water Day-1995 was "Women and Water". Various events and related activities were organized in that year for public awareness. We all know that in Indian culture, women have an inseparable relationship with water. Even the main source of water like rivers and wells are known as feminine sense, as rivers are life-giving like a mother.

Our society, based on, water is facing a different problem today. Due to various reasons, especially due to population growth and increasing industrialization, water availability is becoming more and more difficult. Water resources are becoming increasingly polluted. There is a fear that the encroachment on resources will degrade our water culture and traditions. In such a situation, it is important to make sure that our water resources remain clean and drinkable. It is sure that the happy future of the country will depend on the proper use of water.

The status of women in water development:

It has been noticed that women can resolve water related problems more efficiently. At the International Water Council meeting held in Dublin in 1992, some basic principles regarding water were presented. It emphasized the role of women in water availability, water management and water conservation.

But, the true picture today is unfortunately very unfavorable. There is a complete difference between the principles and the actual practice. In our male-dominated culture, women have a very secondary place. If this situation is to improve, increasing women's participation in water use is a matter of time.

Women are considered to be the main custodians of water for the family. The housewife is very conscious about getting water for her family from the water available in her area, storing it properly, managing

the water required for cooking, drinking, cleaning, washing utensils, washing clothes, gardening in the house. She plays a key role in this. The responsibility of irrigating the crops has traditionally fallen on the woman from the farming family. Women seem to be at the forefront of such agricultural work. As a result, water management skills are traditionally acquired by women.

We see that women are heavily involved in water use in both domestic and manufacturing areas. Women's participation in household use is considered to be their primary duty; however, their participation in water use for production is considered secondary and ignored as well. This is a tragedy.

Despite such a dual form of active participation, they have no place in the decision-making process. They are not taken into account in any decision making in water management. Therefore, discrimination against women in equitable water sharing, social justice and necessary technical skills in water management must now be eliminated. Accordingly, their involvement in water management needs to be more proactive; so be it agriculture or domestic water use. There is an urgent need to include them in the decision-making process and give them special powers in it. Not only this, it will be in the interest of the society to build her reputation as the next chief manager in this field.

Women And Discretionary use of water:

- If women control the following things and control the wrong habits, they will be able to solve the water issues in the near future.
- Do not throw away previous day leftover water. The concept of leftover water, fresh water should be abandoned.
- Do not use treated water in the toilet or bathroom.
- When washing utensils, use water in the bucket; do not keep the tap running.
- Water the garden only as much as they need. Giving more water does not mean that the plants grow faster.
- In the kitchen, use washed water of dal-rice, vegetables for the plants. In this way water is reused and also saved.
- Use laundry water to clean bathroom-toilet-basin.

▪ Using unclean water for drinking causes many disorders. Diseases caused by contaminated water kill countless children every year. Hygiene should be inculcated in children to prevent these diseases. Women are better suited to do that. Women should take care that the water will be used only after purification. For this, use filtered water, boil it, stir alum and add medicines in it. Use a water purifier if possible.

Providing clean water to women near their homes can lighten the burden of their work and save time by contributing to the family's financial well-being. Also their daughters can be free to go to school.

Ultimately, since women's responsibility is paramount in family as well as for other water use, it is certain that skillful management and upliftment of human society's relationship with water can be done through women. This was the objective for 1995 world water day.

******

4
Water for the Thirsty Cities

On the occasion of World Water Day-1996, the main theme was 'Water for Thirsty Cities'. The issue of inadequate urban water supply affects almost all cities around the world. This issue is becoming more and more serious day by day and hence they are becoming a major obstacle in social and economic development. The issue was raised on the occasion of celebrating World Water Day - 1996 to draw people's attention to this profound question. Under this, the following five salient points were brought forward especially for public awareness.

- Water is for everyone.
- The value of water should be understood.
- Wasting of water in cities should be stopped.
- Water partnerships should be built.
- Water should be saved for the future.

Water is for everyone:

As water is an important resource for all, there are many tensions and conflicts in between communities, states and countries. Therefore, in order to resolve this issue, prudent and judicious use of water, taking care of this resource in every possible way and at the same time paying close attention to its proper management and regulation is the primary duty of every dependent entity on the water resources of the place. If there is social inaction in this case, the cost is very high.

The value of water should be understood:

There is no need to underestimate the importance of water for living things; it is well known. Everyone is aware of our sensitivity to water as well as how much we depend on this element. Proper use of water when there is abundant water is an important social cultural aspect. However, there is an universal feeling that we do not understand the proper value of water. Therefore, the culture of saving water is

found to be lacking in the common man. During the summer days, too much shower water is used bathing even for more than half an hour to beat the summer heat. Even if we see the bucket is overflowing, the simple rule of turning off the tap is not followed. At the same time, many simple water saving measures are not being implemented spontaneously.

Various types of water wastage in cities should be stopped:

Many cities like Mumbai are facing water shortages badly. This has created a dire need for water conservation. It is easy to come up with some less time consuming and less costly solutions. If these measures are adopted, enough water can be easily made available throughout the year. In many houses, a shower is used for bathing. While, just one bucket of water is enough for bathing, if you take a bath with a bucket instead of a shower, you can save many litters of water. We can save and store water by adopting the method of rainwater harvesting and water recycling in every society. If the whole society decides to undertake this project together, it will be less costly and more profitable. With the use of rainwater harvesting, water can be easily made available to every household throughout the year. Most of the water used in the house can be made available for reuse through recycling. Water recycling equipments are available in the market. Using them, water used for many purposes at home can be reused by processing it again. If a washing machine is used for washing clothes at home, many litters of water used in it are wasted every day. We can use that water for secondary work without wasting it.

Building Water Partnerships:

In the course of time, different cultures were created in the world and they became the one who gave a different identity to their respective societies. These cultures proved to be extremely conducive to exchange and innovation due to the diversity hidden in them. In that sense, they are the true inheritors of humanity, and maintaining their identity will surely benefit future generations. If the global community embodied in these diverse cultures wants to thrive in this world, it will be better for them to become more empowered by exchanging the

good things, knowledge and technology of each other's cultures. For this, the main direction of the next course of action will be to create maximum partnerships in various issues with each other.

UNESCO has planned its work in this direction. This led to the concept of Global Water Partnership (GWP). It is an international network designed to develop an integrated approach to water resources management and to provide practical advice for sustainable management of water resources and its members. It operates as a network - open to all organizations, including government agencies, UN agencies, bilateral and multi-development banks, business associations, research institutes, NGOs and the private sector.

There are different level water partnerships in water development. Such as 1) Country water participation 2) Regional water participation 3) Local area water participation etc. A special issue is planned by Jalsamvad to know comprehensive information in this regard.

Saving water for the future:

This world is not only for us, but also for future generations. So it is important that we leave behind a warm and fresh environment for future generations. For that, water is as valuable as gold and we need to be aware that we will not waste it unnecessarily. While taking care, that water should be pollution free, we should encourage more water conservation techniques like water recharge and reuse of water for sanitation and gardening. As a conscious citizen, we can play a greater role in creating this awareness in the society. That should be the first responsibility of every citizen of the world - so that we can make this world a beautiful and civilized place and hold back the promise of water for the next generation. That is the main purpose behind the idea of celebrating the world water day.

******

5
The World's Water: Is There Enough?

On the occasion of World Water Day-1997, the main topic "Global Availability of Water" was put before the people for consideration and for that a slogan "World Water: Is It Enough?" was created. Only 2.5% of the total water on earth is pure usable water and only 0.26% of it is available for use in lakes, rivers, streams and dams. As this amount of water is available for domestic, industrial and agricultural use, there are increasing tensions and problems in various communities to get it. Water pollution is adding to this. Also, as water consumption is increasing day by day, everyone has to think seriously about its availability and especially its value. The work of drawing people's attention to this has been done through this stream.

It is time for society to seriously consider whether the world's available water can meet the demand for water. Increasing water supply is not in our hands; because it is subject to nature. For this, if we want to strike a balance between supply and demand, we have to think about demand. Can we save water in each of the various uses of water? This is the real question of the hour. In short, it is a stream that encourages water conservation.

India is a region of sacred rivers, numerous lakes and reservoirs. The rivers originating from tall Himalayas in North India are perennial rivers. The rivers get water due to rain and due to melting of ice as well. This is the perception of common Indians for generations. But changed circumstances have pierced this fact. Freshwater availability has declined sharply, especially in North India and East India. This problem has become so serious that if immediate planned steps are not taken, the situation is likely to become more worrisome in the future.

Changes in the monsoon are one of the reasons for the declining availability of water. But, that is not the only or major reason. On the

other hand, the declining water availability here can be linked to human industries. Unrestricted groundwater abstraction is one of the major causes. In some parts of northern and eastern India, the rate of groundwater depletion is 3 to 6 cm per year. Perhaps one year's statistics don't give an idea of its severity. However, every decade the groundwater level is going down there by one to two feet permanently. This matter is serious. In areas of India where the groundwater level is steadily declining, the availability of fresh water is a serious problem.

In this context, the overall groundwater use in India needs to be given a serious thought. In India, rivers traditionally provide water for agriculture and other purposes. Large lakes were used where there were no rivers. However, these are the sources for surface water. In places where these sources were not available, man depended on groundwater. We still depend on this source in many regions. Groundwater is important for whole of India, including Maharashtra.

Groundwater depletion figures for the whole of India for the year 2011 are available. It says that in 2011, the country pumped 2 lac 45 thousand million cubic meters (245 billion cubic meters) of groundwater. That was about 25 percent of the world's total groundwater abstraction that year. Another fact is that the area of India is only two and a half percent of the total area of the world and one quarter of the total ground water of the world is extracted on this region. This is enough to make you realize the seriousness of the situation. Now what exactly is 2 lakh 45 thousand million cubic meters of ground water extracted in a single year? Koyna is currently the second largest dam in Maharashtra which has useful reserves of 2835 million cubic meters. This means that in 2011, the people of India pumped enough groundwater to fill 86 Koyna dams.

The overuse of this resource is the main reason for the shortage of drinking water in the context of India. Groundwater abstraction increases when surface water sources for agricultural, industrial-urban needs or other purposes become unavailable. Substitution is done regardless of the amount of recharge. Now that the technology of pumping water from the depths is at hand, the groundwater level is

going even deeper very fast.

Water pollution should be deliberately discussed in conjunction with unrestricted groundwater depletion. Take the example of rivers in Maharashtra or lakes in cities other than Bangalore. Water pollution is a major problem in all areas. It has no state or province exception. In fact, when the river passes close to the population, it becomes polluted. The larger the population, the higher is the pollution. Therefore, it is a disgrace to the citizens that this water source cannot be used even though it is a pillow. Such water sources are also being destroyed. The same problem is happening with groundwater now. In many areas, it has already happened. This is compounded by the growing number of unplanned cities. Lack of water planning, rain-fed cities, recyclable wastewater, water-saving irrigation systems, crop planning based on climate-water availability - all of these seem to have become a thing of the past. In the future, we will have to pay close attention to all these things and plan in detail.

******

6
Ground Water - The Invisible Resource

Many people have the misconception that there is separate water called groundwater. Groundwater is one stage in nature's larger cycle, which is known as the "water cycle', in which water moves from the sky to the ground, from the ground to groundwater and further back to flowing streams and rivers - from the streams and rivers to the sea, and back to the sky as steam. We need to always keep thinking about how we can make this stage in this larger cycle more favourable to us. Even today, 54 percent of our routine activities are dependent on groundwater. Till 30–40 years ago, the groundwater table was generally high, i.e., up to 25–30 feet. So, even though they often had to face heavy droughts, the people were able to successfully cope with the situation due to the availability of groundwater. In those days, when adequate surface irrigation facilities were not available, there was complete reliance on groundwater. Of course, water consumption was also limited then. However, ever since electric pumps came to our aid for pumping water, incessant and uncontrolled extraction of groundwater for various uses started, and gradually the groundwater level started deepening rapidly, and now it has gone to a depth of 300 to 700 feet at many places, as if out of human reach.

The largest and most influential component of groundwater is the aquifer. There are different layers of soil and rock in the ground to store water. There can have cracks in them. These processes depend on other factors like the place, suitability of the features like seeping water into the soil, capacity of remaining stored there, and disappearing from there due to soil slopes or due to capillary rise action. In that sense, groundwater is not a self-evident element of nature. It is a dependent factor depending on the water cycle and soil properties. In this sense, groundwater should be viewed in a scientific context.

Groundwater is not only used by humans but also by plants. The amount of water that plants need for themselves is often much greater than the amount of water we need for human consumption. In fact, we don't see it. Because the water is released in the form of steam through the transpiration process, The roots of trees are constantly absorbing groundwater from below the soil surface. The arrangements that have to be made in relation to how we can maintain the existence of such groundwater in a better way are called groundwater management. On the occasion of World Water Day-1998, the guiding theme "Groundwater: An Invisible Resource" was specially implemented by pointing out the following three shortcomings in groundwater management. As half of the world's population is dependent on groundwater, efforts have been made to draw the world's attention to these issues.

Issue 1. An awareness in the society and business sector about the scarcity of ground water and its depleting value day by day:

Even today in Maharashtra, 54% of transactions are dependent on groundwater. Until 40-50 years ago, the groundwater level generally seemed to be very high at 25-30 feet. Therefore, despite the frequent droughts, the availability of groundwater has enabled people to cope with the situation successfully. In those days, when there were no enough facilities for surface irrigation, there was a complete reliance on ground water.

Groundwater abstraction increases when surface water sources used for agriculture, industry, urban needs or for other purposes become unavailable. Drawls of groundwater are consistently done regardless of the recharge. Now that the technology of pumping water from the depths is at hand, the groundwater level is going even deeper.

The common man can quickly understand that the water in a pond, stored on the surface, is collective. But, it does not come to mind quickly that groundwater, which is invisible to the naked eye, is also collective. Our groundwater law is designed to streamline various rules as how much water one should use, how deep wells be dug and how much lifting be done while using this collective water.

For groundwater development, we need to work at different levels keeping in mind that all these things cannot be governed alone by the government. For this, a mass participation movement will have to be formed. People-organization is the most important factor in water management. From the government administration, we can pay attention to some rules and their strict implementation. However, everything does not come from the administrative system alone. Increasing people's skills in water use - be it on the farm, at home or in the factory - will have to be handled by the social elements.

Issue 2. Not addressing the economic aspects arising out of the demand and supply of ground water:

It is considered that there is an economics of groundwater development works. One thing, that is getting better now, is that the feeling that water has value is slowly taking root in people. Otherwise, until now, there was a kind of belief that water is a gift of God and available a lot in the nature and so use it as you want. That sentiment should go away now and water should be used sparingly and especially we should look at water management in terms of how to increase its productivity financially and how we can make the most of it. Fortunately, this approach has now grown. Therefore, the society will have to keep eye on the calculations of the capital required for water management, its recurring annual expenditure and the income we get from it. So, in the future, we have to move in this direction.

Issue 3. Degradation of water quality due to pollution through groundwater-recharge process:

Water pollution issues should be deliberately discussed in conjunction with unrestricted groundwater drawls. Take the example of rivers in Maharashtra, or lakes in cities other than Bangalore. Water pollution is a major problem in all areas. There is no state or province exception for this. In fact, when the river passes close to the civil areas, it becomes polluted. The larger the population, the higher is the pollution. In this way, water resources are also being polluted vastly. This is also the problem with groundwater. In many areas, it has already happened. This is compounded by the growing number of unplanned

cities. The cities are growing with lack of planning without considering water availability, reusable wastewater, its recycling etc. All of these things seem to be happening persistently. In the future, we will have to pay close attention to all these things and plan them in detail.

Water pollution causes substances with certain properties that get added in to the water to such an extent that it changes the natural quality of the water making it unusable. Water pollution affects the health of living things, spoils the taste of water and makes it dirty or smelly. Human action and other factors directly and indirectly change the natural quality of water and make water unusable for any purpose. Water pollution is a process that adversely affects human and aquatic life due to changes in the natural, chemical and biological properties of water.

According to a World Bank report on groundwater and health, about 21 per cent of infectious diseases in India are caused by poor health habits and improper water intake and 500 children under the age of 5 die of diarrhoea every day. We have to work hard to change this dire situation.

******

7
Everyone lives downstream

On the occasion of World Water Day-1999, the guideline " Everyone lives downstream " was specially implemented by pointing out the following shortcomings in water management. With half the world's population dependent on groundwater, it sought to draw the world's attention to these issues. The coordinating UN agency for the theme this year was UN Environment.

In water management, two terms are prevalent, upstream and downstream. Both of these terms are relative. The lower side of the stream becomes the upper side of the stream as the stream moves forward. The upstream and downstream side is important when the sewage from each village is discharged into the stream. The water coming from the upper reaches of the stream is polluted and it becomes more polluted by mixing the sewage from our village. Thus, as the stream moves forward, it becomes more and more polluted.

This means that the quality of water available to you is determined by your neighbours living in the upper reaches of the stream. For that, we need to work as an environmentally conscious partner in our watershed; so that, this will reduce the flow of polluted water and ensure proper protection of water quality.

Due to our improper social habits, water sources, rivers, streams, reservoirs are getting polluted on a large scale. Municipalities and factories discharge their effluents into these sources without any treatment, and this greatly pollutes the rivers and streams. This leads to constant health problems. Now we have to make special efforts to maintain this declining quality of water. Improper human activities, excessive use of chemical fertilizers, improper disposal of plastic waste are also increasing adverse effects on aquatic life in rivers, reservoirs and seas. There has been an era of total neglect or over-exploitation

instead of conservation and protection. It is now imperative to stop this.

The direct adverse effects of various human activities taking place in the modern lifestyle are on the environment and it has a negative impact on the environment. Water pollution is one of them. In today's fast paced life people are just engrossed in their work and keep themselves away from the environment. This is a sign that our overall social and mental sensibilities are rapidly declining. The overall depression in the society needs to be addressed immediately.

As a part of the society we are fully responsible for this environmental catastrophe, so it is our ultimate duty to take care of the protection of the environment and to rectify the mistakes that are being made in this practice. Something must be done first to change that. For this, we have to pay special attention to our natural resources like water, disposal of substances like plastic waste as well as cleanliness in the area, tree planting. It has become essential for the health of the society.

The happy future of the country will depend on the utilization of this water while taking care of how our water resources remain clean, potable and useful for various purposes. What is needed is direct social action through public participation. In order to create such public participation, it is necessary to create a feeling of faith and sincerity in the society regarding water issue. The movement can only be strengthened by embracing the responsibility of frugality while understanding the importance of water and the value of scarce water.

******

8
Water for the 21st Century

"Water for the 21st Century" was the main theme for World Water Day 2000. We all know that the availability and quality of water is under constant stress and there is no indication that this will change in the future. Therefore, the picture is that a large part of the world will be plagued by water problems in the near future. A conference of world-class water experts, rulers and high-ranking officials was held in Hague from 17 to 22 March 2000, taking the opportunity of World Water Day to find a solution. It discussed what the world should be like after 25 years if the world takes immediate action on these issues - and with that in mind, action plans for the future were drawn up.

Only 2.5% of the total water on earth is pure usable water and only 0.26% of it is available for use from lakes, rivers, streams and dams. With so much water available for domestic, industrial and agricultural use, tensions and problems are mounting in various communities to obtain it. Water pollution is adding to this.

Today, available water resources in many parts of the world are under great stress due to population and economic growth. As our world population grows and becomes richer, the demand for water will increase exponentially. At the same time water availability and quality will also come under increasing stress due to climate change, energy scarcity, types of land use as well as requirements for industry and mineral processing.

As water consumption is increasing day by day, everyone has to think seriously about its availability and especially its value. The work of drawing people's attention to this has been done through this stream.

Water Challenges in the 21st Century:

Many regions do not have access to safe, good quality and affordable water to meet basic human needs. The wars and conflicts of

the next century are said to be about water.

The major problems in the world regarding freshwater in the 21st century are 1) Lack of renewable supply 2) Unequal distribution of supplies 3) Water quality and health problems 4) Human rights 5) Not considering water as an economic commodity 6) Irrational use of water 7) It is not understood by many people that water is a common commodity; so are many other things.

1. Lack of renewable supply :

Like other ecological resources as forests and coal, water is a renewable resource. This means that its availability varies according to its position in a continuous hydrological cycle. One exception is groundwater - which is not as renewable as other water sources.

2. Uneven distribution of supplies :

From what was once considered an abundant resource, water is increasingly seen as a 'rare' resource that needs to be managed prudently. Today there is a huge disparity between water resources and the control of people over them. Scarcity is felt by everyone and everywhere. In western India, where water is scarce, irrigation pumps work 24 hours a day. At the same time, the drinking wells of the poor are dry. Urban society is also not cohesive. Slum dwellers and low-income families use far less water than the rich, and often do not use even half the amount needed to maintain basic health.

3. Water quality and health issues :

According to UNICEF and WHO, 1 in 3 people worldwide does not have access to safe drinking water. Lack of political will, low investment, inefficient allocation of water, changes in land use, population growth and lack of awareness of policy makers on serious water quality issues have left water quality issues unresolved and serious in developing countries.

About 80 percent of the world's wastewater is discharged untreated into rivers, lakes, and oceans - that is into our environment in large quantities. This widespread problem of water pollution is endangering our health. Such unsafe water kills more people each year than war or other forms of violence.

Due to our improper social habits, water sources, rivers, streams, reservoirs are getting polluted on a large scale. Municipalities and factories discharge their effluents into these sources without any treatment and this greatly pollutes the rivers and streams. This leads to constant health problems. Now we have to make special efforts to maintain this declining quality of water. Improper human practices, excessive use of chemical fertilizers, improper disposal of plastic waste are also increasing adverse effects on aquatic life in rivers, reservoirs and seas. There has been an era of total neglect or over-exploitation instead of conservation and protection. It is now imperative to stop this.

4. Water as Human Rights :

In the 1970s, international debates highlighted the importance of water in meeting basic health and hygiene needs. Responsibility for public health was seen as a fundamental right of the national government.

5. Water is an economic commodity :

Seeing water as an economic commodity and turning to demand management generally means that water must have a price. Free water is considered 'wasted water'. Lack of cost or insufficient cost is seen as a major factor in inefficiency of water use.

6. Discretionary use of water is everyone's responsibility :

As water is an important resource for all, there are many tensions and conflicts in communities, states and countries. Therefore, prudent use of water, hopeful care of this resource in all respects and strict attention to its proper management and regulation - is the primary duty of everyone who depends on the water resources of the place. If there is social inaction in this regard, the cost of this would be very high.

7. Water - A common commodity :

Water should be viewed as a commodity shared by the people and its management and ownership should be jointly ensured by the local water users. Thus, local people need to have control over their own rivers, watersheds or watersheds.

This world is not only for us, but also for future generations. So it is important that we leave behind a warm and fresh environment for future generations. For that, water is as valuable as gold and we need to be aware that we will not waste it unnecessarily. As a conscious citizen we can play a great role in creating this awareness in the society. That should be the first responsibility of every citizen of the world.

******

9
Water and Health

"Water and Health" was the main stream of World Water Day 2001. Given the close relationship between water and health, sufficient and pure water is essential for people to survive and alternatively sustain their planet and it was emphasized that solid efforts were needed to provide clean water.

Water is life! That is why the importance of clean and pure water in human life is unique. It is very important to know about water borne diseases and water quality to prevent them. Water quality is the determination of the physical, biological and chemical composition of water and its suitability for drinking, agriculture and industry. Water quality and sanitation are closely linked. It is said that where there is cleanliness, there will be health, where there is health, there will be prosperity.

We all know that for our health we need clean air, clean surroundings and clean drinking water along with nutritious food. For the economic and social development of the country, all the society should be healthy, for which there should be abundant and perennial supply of pure water.

Water that looks clean and pure to us is not necessarily pure and safe. Water that looks clean and pure can contain billions of germs that can be harmful to humans. Therefore, it is very important to disinfect water for drinking and cooking regularly.

Waterborne diseases:

Typhoid, cholera, diarrhoea, polio, jaundice, dysentery, intestinal diseases, various types of worms are the cause of many types of diseases.

Causes of water contamination:

Water from rivers, streams, streamlets, springs, ponds, dams is

polluted in the many ways. By defecating in a river banks, by bathing, by swimming, by washing clothes, by washing livestock, by washing vehicles, by discharging factory wastes, by discharging chemicals into rivers, by discharge of sewage, excrement and sewage from the village into the river, discharge of human, animal and bird carcasses into the water, immersion of idols in religious rituals, dumping of worship materials, flowers in the river and also if there is a settlement or animal herd near river banks.

Causes of Bore well Contamination:

Bore well water is contaminated due to various reasons. If there is a manure pit or a toilet or a sewerage within 100 feet of the area around the bore well not having proper cement platform around the hand pump, if it is cracked, washing clothes or utensils on the platform near the hand pump, the bore well is located in a deep drain or if there is a leakage in it, improper maintenance of the bore well, faulty construction of the bore well are the probable reasons of bore well contamination.

Causes of piped water scheme contamination:

Valve leakage, leakage pipeline, seepage of sewage water into the pipe line, lack of faucet, pipeline passing through gutters, drains, manure pits, sewers can lead to contamination of the entire piped water supply. The water can also be contaminated due to non-regular cleaning of piped water tank, lack of water tank cover, falling of mulch, birds and animals in to storage tank. Failure to prevent people and children from entering the water tank may result in contamination of water. The main source of the water supply scheme is unsafe, can also be one of the reasons of contamination.

Groundwater is basically pure, but it becomes impure because of the following reasons -

Wells : In case of mulch falling in open wells, sewage water entering into wells having no parapet walls, surrounding garbage goes with rain water in to well, swimming in the wells, fetching water by standing on the banks of the wells, fertilizer pits within 100 feet of wells, cattle sheds, their excrement all seep into the soil, mixing of hand, foot and

pot dirt in the water, poor construction of the well, field pesticide mixed water entering the well, washing of hands, feet and implements on the edge of the well.

Causes of Household water Contamination :

Water is contaminated due to various reasons like hand contact with water vessel, storage tank is not clean, the water vessel not kept high, the drinking water is not covered, not using the separate long rod utensil for fetching water. Use of water without hand washing with soap after defecation or not washing baby's hands, not cleaning the vessels regularly, not washing hands with soap before meals etc; drinking water in the house becomes unclean with dirty hands.

Effective measures need to be implemented through public participation:

In order to overcome the problem of water pollution, it is necessary to implement a large number of initiatives through public participation along with the help of government. For this it is necessary to increase the participation of people in quality control monitoring, repair and survey of all water sources in rural areas, enabling Gram Panchayats to participate in the implementation of the program and enable them. It is necessary to implement measures such as raising public awareness about the adverse effects of contaminated water.

Water contributes a lot to health. Good health is the essence of development. Therefore, water and health - these two valuable resources together is the key to development. What is needed is full public participation in water management, planning and development.

******

10
Water For Development

The main theme for World Water Day-2002 was "Water for Development" and the International Atomic Energy Agency (IAEA) was tasked with implementing it. This year, special emphasis was laid on how to plan and manage the water resources in an integrated manner for sustainable development in view of the perceived scarcity of water resources in a large area of the world.

Sustainable development means carefully utilizing the available resources, taking into account the development needs of the next generation while gradually developing the resources on earth. Sustainable development means to make efficient use of natural and man-made resources. Due to globalization and industrialization, natural resources are being used extensively and uncontrollably today. Sustainable development expects controlled use of these limited resources in view of our future generations.

Development is the essence of human society. Water development is of paramount importance. Development is impossible without water, which is one of the three natural resources i.e. land, water and air. Be it agriculture or industry - development is impossible without water. The key issue facing this problrm is the huge disparity between water distribution and its quality.

More than 50 percent of the body of an organism is made up of water, so it needs water to survive. As water becomes contaminated and unusable for a variety of reasons, it can have serious health consequences, leading to new serious illnesses. In that sense, our social habits and behaviour are not right. Our efforts to solve all these basic problems related to water are failing. Therefore, in order to achieve sustainable development, it is necessary to make efficient use of water and take measures to ensure clean and plentiful water supply by

avoiding water pollution.

The ground water level is going down day by day, the flow of the river is blocked. In underdeveloped countries, water is used extensively for agriculture, but yields are very low. Therefore, increasing agricultural production is a need of the hour. In view of this, agricultural technology that requires less water should be developed and used for sustainable agricultural development.

Water and energy have a unique relationship. Firstly, an option of hydroelectric project is considered for power generation. But, not all places have favourable conditions for setting up hydropower projects. Then, a thermal power project or a nuclear power project is considered. But for both of the above project options, only heat is generated from coal, gas, oil or atoms. Water is heated on using that heat to form steam and electricity is generated by running a generator on that steam. All of these options require a very large supply of water for keeping the system cool. Water is required for each product. Some industries require a lot of water and some less. But industrial development is impossible without water. The development of industrialization is important for social and economic development as well as for reducing rising unemployment.

The pace of urbanization is increasing tremendously. Developing countries account for 93 percent of the world's urbanization. The population density is increasing exponentially on small land area. Therefore, providing adequate water to this population, avoiding large scale wastage of water, treating and reusing wastewater from urban and industrial areas are some of the issues that stand in the way of sustainable water development.

Water should be distributed on equitable basis for the welfare of humankind. Such an unequal situation leads to fears of a warlike situation. It is also predicted that the third world war will be caused because of shortage of water. Since everything depends on water, any kind of development is impossible without water. Therefore, the bright future of the world will depend on how society pays attention to water conservation, its proper management and equitable distribution.

11
Water for the Future

In order to preserve the quality and quantity of fresh water for future generations, everyone in the world needs to behave more responsibly in water use. This thought was inculcated in the minds of the people so as to assure the next generation the necessary pure and sufficient water. Keeping this in mind, the main theme of World Water Day-2003 was kept as "Water for the Future". This year, an effort was made to create a proper understanding of the world in this regard. So also, this was the 10th World Water Day, which was celebrated as the International Year of Freshwater.

It was appealed to all to have prudent approach in water use so that water sustainability is maintained for future generations. At the same time, the aim was to inspire water conservation through political and community participation and to increase social awareness about more responsible water use and conservation needs. The United Nations, this year, had appointed the 'United Nations Environment Program - (UNEP)' as its coordinator.

Global Water Development Report - Water for People - Water for Life :

On the occasion of World Water Day-2003, the United Nations released the first edition of the World Water Development Report. The joint project, comprising 23 UN agencies, outlines a comprehensive approach to today's water problems and makes detailed recommendations for future water supply.

The Global Water Development Report is the first report of the United Nations assessment of global water resources. For the first time, all 23 UN water-related organizations have worked together to monitor progress on water-related targets in areas such as health, food, environment, cities, industry, energy, risk-management, economic assessment, and resource allocation. The water crisis is at the heart of our survival and our planet, which is one of the social and natural

disasters that human society has to face. However, despite the overwhelming evidence of the crisis, there seems to be little political commitment to overcome it. Over the last 25 years, many council have focused on water issues and set a number of objectives to improve water management. But, seldom have they been completed, the report said. Many countries and territories are already in crisis, and by the middle of this century, seven billion people in 60 countries will be facing a difficult situation of water scarcity, the report said. Despite the constant debate over the existence of such a crisis on the threshold, the water crisis is only going to get more and more serious.

To this end, the United Nations must engage the human community in its efforts to make water available in a sustainable, peaceful and protective environment in which equality prevails. Freshwater is essential for a healthy ecosystem, sustainable development and human survival, yet, in many places, water is wasted, contaminated and degraded. If this trend continues, more than two decades from now, two out of every three people on earth will face moderate to severe water scarcity; the report predicts. The poorest in the developing world suffer the most. This is a social, economic, environmental and political crisis, which should be one of the top priorities of the world community. A "Blue Revolution" is needed to improve the management of this vital resource.

******

12
Water and Disaster

The main theme on the occasion of World Water Day-2004 was "Water and Disaster". Natural and catastrophic disasters such as hurricanes, floods as well as droughts and unhealthy living conditions cause huge loss of life and property. In 2004, the idea of how to set up a proper global mechanism for paying close attention to such incidents, anticipating their movements and giving timely warning to the people was inculcated in the minds of the people.

The UN International Strategy for Disaster Reduction and the World Meteorological Organization organized various events in this regard. The main message conveyed to the masses was that the climate and water resources could have detrimental effects on socio-economic development and human health.

Water is so pleasant for life; however, it can also make you cry. Every year around the world, many big storms and heavy rains are constantly disturbing the society. The tsunami that struck Japan a few years ago and its aftermath are still troubling the Japanese government. The tsunami that hit the east coast of India is still not forgotten by the people there. Dry and wet droughts come regularly after the onset of rains; this is something India cannot forget. Due to all these reasons, the government has to face the emergency situation. Therefore, the importance of paying serious attention to what can be done to address these issues, was inculcated this year. Many things invite many emergencies. Such as -

The effects of climate change include global warming, changes in rainfall pattern, increasing frequency or intensity of weather events, and rising sea levels. These effects endanger your health by affecting the food you eat, the water you drink, the air you breathe, and the weather you experience.

The severity of these health hazards may depend on where a community lives, how sensitive it is to health hazards, how it copes with the effects of climate change, and how well the community is able to adapt to these changes.

People in developing countries are considered the most vulnerable to such health risks globally. But climate change poses significant health risks even in rich nations.

Safe drinking water is important for public health and well-being. Public health is endangered when water supply is disrupted, as drinking water supply is threatened in addition to sanitation and hygiene.

The catastrophic consequences of a natural disaster can be avoided by planning ahead for disaster management. They are instrumental in raising awareness about the effects of water-related disasters on a region and reducing its negative impact, and this is what has been encouraged through World Water Day-2004 theme to make greater efforts to promote the implementation of such plans and programs.

******

13
Water for Life
(2005-2015 - An International Decade for Action)

Maintaining the balance of the environment, eradicating poverty, solving the problem of hunger are essential for human health and well being and water has become a key issue in these development aspects. In the year 2005, the theme for world water day was "Water for Life : 2005 to 2015 - An International Decade For Action".

Since water is essential for life, it was expected that various plans would be drawn up from 2005 to 2015 to take practical action on developmental issues of water as per the above concept. Accordingly, various issues related to water were to be addressed in this decade and it was decided that each government should clarify its water policy. The member states were urged to implement the agenda within 10 years, set out at the Rio-de-Janeiro conference on Agenda 21.

Water and Environment :

The most important factors in maintaining the balance of the environment are water and human beings. Water is an essential element of life on earth for humans, animals, and plants. The essence of a happy life on earth lies in how nutritious this element is for the life of all of them. Based on water, man achieved his development and made paradise flourish on earth. In the Indian psyche, water has been given the name 'Tirtha' and placed in the highest place of reverence. In the same way, we celebrate various festivals like Pola, Nagpanchami, Vat-puja in order to increase the respect towards animals, birds and trees by recognizing their real importance in life. The feeling behind this is that the balance of the environment will be maintained properly.

However, it is now clear that true harmony and mentality are disappearing. Our rivers, reservoirs and various water sources are getting polluted, deforestation is taking place, cleanliness of our temples, our public places, our roads is declining, dust and pollution in

the air is increasing and crop practices are not being adjusted according to location. In general, it seems that our social and mental sensations are rapidly declining. Water will remain in the environment as a useful element to the extent that a vigilant society that conserves water surrounds that water.

With this in mind, environmentalists, scholars, rulers, administrators, social and political activists should all come together to discuss and manage environmental issues. It aims at holistic development of the society as well as elimination of social and economic inequality through balanced use of natural resources. A number of measures will have to be taken to curb and transform such issues that cross the boundaries of the environment. Water should not be an individual property but should be developed as a system of social ownership and social welfare.

To achieve this socially, you have to change your personal habits too. You just have to give up your habits like throwing out garbage anywhere or throwing something in the water. The environment is not only created by nature but also depends on the efficiency of human society to manage it consciously and this has to be brought to the notice of all. From schools to the educational system and beyond to the public forums, we will have to constantly undertake new initiatives for this and we will have to build organizations that can handle it.

Water and food security:

Due to the growing population and improved lifestyles, the demand for food has been steadily increasing not only in India but all over the world. The agricultural sector will have to play an important role in meeting the growing demand for modernization of cultivation methods, research on improved varieties of seeds, pest control and water management skills. The importance of water management for food security has now been formally recognized at the United Nations level. That is why the theme "Water for Food Security" has been widely used for universal awareness.

In the same way, we have to plan the use of water socially. It has to be matched with the natural availability of the region. Misuse of

groundwater, especially invisible to the naked eye, needs to be controlled more. For this, wide public dialogue and the laws that give it statutory status will have to be pursued. In that direction, the situation in the drought prone areas of Maharashtra will have to be changed in the coming decade and it will be desirable to implement measures such as shifting the sugar industry to the areas of water abundance i.e. Konkan region or in the valleys like Waingange and Wardha river.

******

14
Water and Culture

It is a matter of great joy for Indians that the theme "Water and Culture", which has been firmly entrenched in the minds of Indians for centuries, was adopted as a mainstream on the occasion of World Water Day-2006. Over the time, human beings have come to realize that culture evolves, develops and flourishes because of water. Water is highly valued in the glorious culture of India. Indian culture has been inextricably linked with water development since time immemorial. This view is also expressed in Vedic mantras like "Ima Aap: Shivatma ... Ima Rashtrasya Vardhini" (इमा आपः शिवतमा... ईमा राष्ट्रस्य वर्धिनी... "). In short, one can say - water is life and culture is the essence of life. As life is impossible without water, without culture man is like an animal. In this way, if the relationship between water and culture is to be linked to human life, it is like the interrelationship between water and fish.

Man's life depends on five basic elements - earth, water, fire, air and solar system or Brahma and according to this water and human life i.e. human culture have been interrelated since the beginning of this creation. This relationship is multi-faceted. Like the child grows on the mother's shoulders, so does culture in the river valley grows on the river's shoulders. So our villages were settled on the banks of the river. This relationship of the river was taken not only by our intellect, but also by our heart. That is why we call river as 'Mother' and water as 'Holy Teerth'.

The emergence and development of water culture was due to human efforts. Looking at life through the availability of water helps to understand the importance of water. For this, from time immemorial, human beings have connected with water at all levels. That relationship has evolved into a culture, and this water-based culture has evolved over hundreds of years of effort.

Culture is the interaction of a society with an unchangeable environment in a particular period of time. Considering the place of water in India's glorious and long tradition and saying India as "सुजलाम सुफलाम " country, the concepts as to how water is productive and how it bears good fruits - have all evolved from "Water & Culture". Water & culture is the perfect idea of what the place of water was in the established culture, what efforts were made by the society to make it available and how it brought stability in the social life. "Water & Culture" is the management done by the society with the sentimental proneness to water keeping in view the objectives of water scarcity, water allocation, its distribution and the efforts made to overcome it.

Our country is multi-ethnic, multi-lingual and multi-cultural. Water has a special place in the culture of this agriculture-dominated country. The identity of any society is determined by the folk culture of that society. The culture of a society is determined by how rich its culture is in literature, music, painting, dance etc. Rivers, reservoirs, wells, cisterns etc are considered to be sacred places of water. There seems a lot of literature, musical compositions and folk songs created on rivers, reservoirs, wells, ponds, etc. - for e.g. songs sung on the occasion of 'Akshay Tritiya'. We know that water has a great influence on literature and folk music and it has become a life force that inspires the society. This culture has cultivated deep faith and belief that water is an essential element for life and creation as well as for salvation.

There is a systematic realization of the inseparable relationship between human beings on the emotional, physical, spiritual, practical, cultural and other levels of water resources. As the entire society is involved in the three aspects of conservation, appropriation and protection of water resources, this culture, which has been formed from the inseparable relationship with each other, has remained intact for hundreds of years. But today, increasing industrialization, blind imitation of Western lifestyle and ruined rural culture has created a huge gap in the minds of the people, which has led to the pitiable situation of water resources. This glorious tradition of ours is being

ignored due to the recent attitude that new is only good and old is waste. There is a real need to recognize the importance of this tradition by looking at it more critically.

Our water-based society is facing different problems today. Due to various reasons, especially due to population growth and increasing industrialization, water availability is becoming more and more difficult. Water resources are becoming increasingly polluted. The encroachment on these resources due to increasing urbanization will not only lead to the decline of all these water-culture practices and traditions, but it is also feared that all of them will disappear. The whole world is plagued by this problem today. In such a scenario, it is important for our once prosperous and civilized society to take care our water resources as to how they will remain clean and drinkable; but at the same time, the happy future of the country will depend on the proper use of water. The United Nations especially felt the need to preserve water culture as they realized the fundamental principle that 'Water is there, everything is there' and hence 2006 was celebrated as the year of 'Water and Culture'.

******

15
Coping with Water Scarcity

On the occasion of World Water Day-2007, the special theme 'Coping with Water Scarcity' was chosen for global water awareness. An attempt was made to impress upon the global community that water is becoming scarce while realizing that the availability of water per capita is decreasing due to the continuous increase in world population. Water bodies are static; no growth is possible in them. Therefore, it was hoped that efforts should be made to create a feeling and awareness in the society that water should be used sparingly.

Water scarcity is one of the major problems facing the world in the 21st century. Water scarcity is generally defined as a situation when the availability of water in a country or region is below 1000 cubic meters per person per year. However, many regions of the world experience even more severe water scarcity, where less than 500 cum of water per person per year is available and can be considered acute water scarcity. 2000 cum per person per year is considered as the threshold limit and it indicates that a region is water stressed and water scarcity causes huge problems in overpopulated regions.

If we consider Maharashtra, the average annual availability of natural water from only one seasonal monsoon is very different in different basins and sub-basins. 13% of the total area of Maharashtra lay in water scarcity sub-basins. 32% of the area is in deficit sub-basins, 34% of the area is of general availability and only 6% of the area is of abundance and 15% of the area is of superabundance. The natural annual average per capita availability of water in the sub-basins of the drought-prone regions such as Girna, Agrani, Man, Yerala is very low. Considering the water required for food grains, vegetables, dairy farming and sanitation, the accumulated experience so far is that when the availability of water is more than 1000 cum per capita, it becomes

easier for that community to set up a system of various water uses. But when such availability is less than 500 cum per capita, there has to be strictness and coordination in water use. In such regions, it becomes very efficient to combine the water required for nature-based activities, such as agriculture, dairy farming, harvesting of forest products etc, with the water required for modern industrial and urban systems; and to create sufficient water security throughout the year for human habitation as well as domestic animals and wildlife.

Compared to the natural annual availability, the domestic water requirement for human settlement activities is actually not very high even in drought-prone regions. The experience of the Southern Plateau so far is that even in a dry year, 20% of the water is received as compared to an average rainy year. It should not be difficult to meet the minimum drinking water needs of human habitations and animal life. What is needed is the careful management of public affairs in that valley.

The cycle of nature is not static, it is oscillating. It changes as time and place changes. Therefore, the natural availability of water keeps changing every year. It is difficult to get all the required water from a single source every year as per criteria. Therefore, integrated planning and conservation of all available resources like surface water, rivers, lakes, ground water, recycling and utilization in a more complementary manner becomes more feasible in water-scarce regions.

In regions where population growth is many times greater than the sustainable use capacity of natural resources, the available water is insufficient to produce enough food to alleviate hunger and poverty. Water scarcity makes industrial, urban and tourism development unable to supply sufficient water without restricting water use and allocation policies for other user sectors; especially agriculture and there is limited capacity to deal with such increased demands.

Many regions of the world are already experiencing acute shortages, causing enormous problems for local populations and societies as a whole. Not enough water is available to produce the food grains needed to eradicate poverty and hunger. Water scarcity also hinders industrial, urban and tourism development, which in turn

constrains other sectors; especially agriculture. It causes water conflicts in stressed areas.

In water-scarce regions, water resources are already degraded, or both water quantity and quality are deteriorating, further increasing water scarcity. Health problems are usually more related to scarcity. Water borne diseases are increasing due to depletion of groundwater and surface water, as well as lack of proper water distribution and sewage system. Poverty makes it difficult to develop proper water distribution and sewage systems. Poverty related to water scarcity increases the number of people migrating within the country or to other countries, where they hope to find a better life; however, they are not well received there.

In regions where water is always scarce, cultures arose that successfully coped with water scarcity. These societies developed institutional solutions, water technology and management skills within the local cultural environment, allowing appropriate water use for domestic use, food production and local industrial purpose.

Changes in lifestyle and development over the past decade have created new water needs, conflicting expectations on cultural and institutional issues and a sharp increase in water demand. Because of this, the existing balance between demand and supply is disturbed. Hence, to bring a new balance in this aspect has become necessary. It should primarily be adapted to local culture, environment and institutions using modern technology and management tools. Finding such a new balance is a challenge for communities living in water-stressed areas and for many scientific and technological professionals who influence the cultural, social and ecological aspects of water resources.

******

16
Sanitation Matters

On the occasion of World Water Day-2008, the special theme 'Sanitation and Water for Health Protection' was chosen for awareness. This stream highlighted several key sanitation issues at the regional and national levels and taking urgent action to address them as a matter of priority.

Water is life! Therefore, the importance of clean and pure water in human life is unique. Water quality and cleanliness are closely related. It is said that where there is cleanliness, there will be health; and where there is health, there will be prosperity. We know that for health, we need clean air, clean surroundings and clean water for drinking along with nutritious food. All the society should even be healthy for economic and social development of the country.

Neglecting sanitation issues due to scarcity of water is an invitation to numerous diseases. That is why the approach of sparing water for reasons of health and hygiene is never justified. That is why the making available sufficient water for every family has become a key issue before the government in the precautions to be taken for health protection.

We are taking various precautions for personal hygiene or family hygiene and for this we are doing a lot of public awareness in the society. Just as everyone needs water for drinking, bathing, it is equally essential for maintaining proper cleanliness in the house from the point of view of health. For that, cleaning the house every day, having enough water available to flush the toilet and wash hands after using the toilet, is also important; otherwise it can be an invitation to many diseases. In short, it is not worth sparing even a drop of water for health protection.

Clean drinking water and sanitation are recognized as universal human rights, as they are of high importance to the life of every person.

On July 28, 2010, the United Nations General Assembly recognized this as a human right in international law. The human right to water assures everyone access to adequate, safe, acceptable, physically accessible and affordable water for personal and domestic use. Clean water, basic sanitation and adoption of good hygiene practices not only set children on the path to prosperity, but also keep them healthy in life.

World Health Organization (WHO) has brought forward the concept of WASH (Water, Sanitation and Hygiene) at the global level. A lot of efforts are being made to inculcate this concept and approach in the global community, especially in the backward areas. The concept of WASH focuses on teaching basic hygiene to community and school children with a special focus on girls' education and gender equality. The main objective of this stream is to attract the attention and action of global and local communities, organizations in order to restore safety to every person on earth from water stress and water-related disasters, raise awareness among the general public and motivate them to bring about a positive change in public opinion.

When water is scarce and cannot be obtained at the doorstep, poor people cannot afford the time required to fetch it from afar. Hence, by being dirty, not only themselves but also their rich neighbours are in great danger, and this is the main reason why the poor masses of the big cities are often in the throes of disease. The Greater Mumbai Municipal Corporation has fully recognized the importance of these matters and has provided ample water supply to the city at great expense, so that water is available not only for drinking but also for washing the clothes and houses of all the inhabitants and even for cleaning the streets.

Every citizen should have access to water which means that water should not be more than 1,000 meters or 3,280 feet away and should be accessible within 30 minutes. Availability of water is essentially a consideration of whether water supply is adequate, reliable and sustainable. Water quality refers to whether the water is safe for drinking or other purposes.

Water that looks clean and pure to us is not necessarily pure and safe always. Water that looks clean and clear may contain billions of

pathogens that can be harmful to humans. Therefore, it is very important to regularly disinfect the water used for drinking and cooking. It should not have any odour and should not contain any colour for water acceptability.

Sanitation is a public health condition related to the availability of clean drinking water and the disposal of human excreta and sewage. Preventing human contact with it is also part of hygiene, such as washing hands with soap. The purpose of sanitation systems is to protect human health by providing a clean environment, which will stop the spread of disease. For example diarrhoea, a major cause of malnutrition and stunted growth in children can be reduced through adequate sanitation. There are many other diseases that spread easily in communities with low levels of sanitation, such as cholera, hepatitis, polio, etc.

The definition of 'WASH' includes management of faeces. Sanitation generally refers to the provision of facilities and services for the safe disposal of human urine and. The term 'sanitation' also refers to the maintenance of sanitary conditions through services such as garbage collection and sewage disposal as well as excreta management systems, sewage management systems (this includes sewage treatment plants), solid waste management systems as well as rainwater drainage systems - also known as storm water drainage. Sanitation includes all these four technical and non-technical systems.

For developing countries, balancing the financial costs of addressing inadequate sanitation is a major concern. According to a World Bank study, the financial loss to the Indian economy due to inadequate sanitation is equivalent to 6.4% of GDP. This includes premature deaths, loss of productivity and additional expenditure on healthcare among other reasons. Inadequate sanitation also damages potential tourism revenue. As a whole, this theme 'Sanitation and Water for Health Protection', adopted for public awareness globally is of utmost importance.

******

17
Trans-boundary Shared Waters and Shared Opportunities

Every year on the occasion of World Water Day on March 22, the international community draws attention to the need for conservation and development of water resources. In the year 2009, the theme "Trans-boundary Shared Waters and Shared Opportunities" was specially chosen. It focused on problems related to lakes and river basins that cross the boundaries of two or more countries in the world.

The world's 263 trans-boundary international lakes and river basins cover 145 countries. They cover almost half of the earth's surface. Freshwater aquifers also flow across international borders through underground aquifers. Of those 263 lakes, nearly one-third are shared by 3 or more countries, while 19 are shared by five or more countries.

Many countries lack adequate facilities and resources for safe drinking water and sanitation. An estimated 880 million people still lack access to water of suitable drinking quality. They are at constant risk from unsanitary-related diseases. Poor quality water and lack of sanitation cause 1.6 million deaths worldwide every year. Most of these deaths occur in children under 5 years of age. It is a great example of the health threat posed by waterborne diseases. Although most deaths are due to these causes, many waterborne diseases are never even reported.

Every country is trying to meet its water needs from the limited water resources near it. However, some people think that in the future, conflicts between countries will flare up over water. But history shows that cooperation, not conflict, is the solution to international trans-boundary water disputes.

Hundreds of trans-boundary international water-sharing agreements have been successful despite the complexity of boundaries

inherent in these 263 lakes of the world. Over 200 international water treaties have been signed in the last 60 years and only 37 cases of violence between nations over water have been recorded. There is a need to strengthen and create an enabling environment for cooperation that trans-boundary water management can provide. UNESCO and the United Nations Economic Commission for Europe and other organizations are working to ensure peaceful cooperation in this work.

Shared water is an important resource for many people around the world. Major shared rivers include the Nile, Tigris, Euphrates and Jordan. A number of lesser-known underground aquifers are also shared. Beneficial opportunities for mutual water use are also available to these countries.

There are some general principles of international water law, which have emerged from customary international law. These principles are seen as guiding principles for the commitments required to implement resolutions in international water agreements, negotiations or conventions. The principle of equality states that international law should not be biased in favour of any particular person or country. The principle that gives each country the right to use shared waters is limited by co-basin rights. Accordingly, countries are expected to use the resources of a single water body without significantly harming others. While the principle of equitable distribution provides fair and reasonable rights to countries in each basin, the principle of reciprocity states that when a country acts within its rights, it should expect similar behaviour from other countries in fulfilling its obligations under international law.

The world must learn how to share this precious resource effectively and fairly. This can be achieved through increased cooperation in managing water resources. UNESCO is helping to achieve this by bringing together organizations concerned with surface and aquifer water resources. Their multi-disciplinary meetings propose new legislative agreements, promote awareness campaigns and explore water disputes and alternative ways of resolving them. A

number of studies are being conducted to highlight the benefits of trans-boundary cooperation in water resource management. The Blue Nile, Jordan, Mekong, Okavango and Inkomati river basins are examples of successful initiatives that bring benefits to all countries.

The Shared Water Partnership program provides a shared dialogue platform for strengthening trans-boundary water cooperation, through which cross-disciplinary knowledge and tools are acquired. Sustainable management of shared water provides opportunities for countries to prosper despite threats posed by environmental degradation and climate change. Good water management is very important in the current era of increasing water scarcity. This requires mutual cooperation with respect to shared rivers, lakes and aquifers in most parts of the world. This calls for raising awareness among the international community about the shared water partnership and the many benefits of cooperation in shared water resources.

******

18
Clean Water for a Healthy World

The slogan "Clean Water for a Healthy World" for World Water Day-2010 was created to emphasize how water quality is essential for the entire world. This includes reflecting the importance of water resources in water management, increasing water quality challenges, creating awareness for sustainability in healthy ecosystems and human development and addressing global water pollution issues.

Common citizens do not have much awareness about the good / bad quality of water and its consequences. Water is considered the most important resource in maintaining water quality and natural ecosystems for human well-being; which provides life support services to all animals and plants. Contaminated water is a major cause of illness and death. Water quality is also considered a critical factor for human poverty alleviation, education and economic development. But, unfortunately, water quality is declining worldwide; this poses a threat to the environment and human health worldwide. Waterborne diseases kill 1.5 million children every year and 2 million tons of sewage and other liquid wastes are released into water every day. The world is facing these problems in serious form day by day.

Due to our inappropriate social habits, water sources like rivers, streams, reservoirs are getting polluted on a large scale. Municipal councils and factories discharge their waste water into these sources without any treatment and thus pollute rivers and streams on a large scale. New health problems arise from this. We now have to make special efforts to preserve this deteriorating quality of water. Also, due to inappropriate human behaviour, excessive use of chemical fertilizers, improper disposal of plastic waste and the adverse effects on the aquatic life in rivers, reservoirs and oceans are also increasing. Instead of conservation and security, there has been an era of total neglect or

over-exploitation. It is very important to stop this now.

Most of the sacred water bodies like ponds, Pushkarani, Kund, step-wells at the places of our religious places have become polluted and smelly due to the garbage and sewage that is thrown in it by the devotees. To improve this situation, we have to brainstorm in the communities.

Due to this knowingly or unknowingly, many issues arise out regarding the water quality and health. Urban as well as industries generate large flows of sewage and it flows through rivers and reaches our drinking water sources, degrading its water quality to a large extent. This water is further supplied to citizens for drinking and consumption. As a result, people's health problems arise. Therefore, protecting water from pollution has become a major issue in front of us. The big challenge is to protect the quality of water and environment for human and animal life.

Hence, protecting water quality becomes a shared responsibility for the common good. Therefore, it requires action from governments, municipalities, civil society, individuals including international organizations to prevent pollution of our water resources.

The problem of groundwater pollution is very difficult to handle. In that context, whether it is the use of chemical fertilizers in agriculture or the methods we adopt for the disposal of municipal waste - we should consider their disposal appropriately. When it rains, it percolates into the ground. Some of the fertilizers are soluble and some of them are even harmful. They contain toxic components. Once they enter groundwater, they remain there for years. In this way, we have to be careful and take precaution that the ground water does not become contaminated. For overcoming this, some chemical purification processes are required, for that some purification plants are to be installed and some technical facilities need to be created. But, that is quite expensive.

Our pollution laws do not address our collective responsibilities. Whosoever creates faeces, creates filth, a proper provision as to how he should handle it and how should he purify it is there in the pollution

laws; however, it does not suggest, as to what type of forum should be there, to deal with all these things collectively. We have river pollution control boards. But that is not enough. It does not connect the relationship of the society with that element of pollution in the river.

It is easy to pollute water. But it is not so easy to restore the polluted water to a usable state. Also, it is very expensive. For this, voluntary social organizations should be formed to look after that environmental factor. They should represent the society and see that wherever there is any unfare thing happening, immediate attention should be paid there and the situation be improved. To achieve this socially, we need to change our personal habits a lot.

******

19
Water for Cities: Responding to the Urban Challenge

On the occasion of World Water Day 2011, a special theme, "Water for Cities: Responding to Urban Challenges," was adopted to focus international attention on the consequences of environmental issues such as global population growth, industrial expansion, climate change, and global warming. A major objective was to encourage governments, communities, individuals, etc. to actively participate in tackling the challenges of urban water management.

In the future, climate change will affect every aspect of the hydrological cycle and is said to have already begun, due to which there are more severe droughts and floods in some places. Climate change is increasing the frequency and intensity of droughts as well as floods and storms, along with rising sea levels. Warm air holds more moisture than cold air; as a result, rising temperatures lead to the absorption of more water into the air from oceans, lakes, soils, and plants and increase the aridity of the area, negatively impacting drinking water supplies. Since all of these are related to water, it is one of the most affected resources.

Extreme weather, which has been compounded in recent times by increasing population and social and economic stress, poses major challenges to the world in finding solutions to reduce these stresses. However, it is definitely possible to find solutions to these challenges. This has to be seriously considered everywhere now. We first need to update our understanding of the water-related problems posed by climate change and devise effective strategies to mitigate the foreseeable risks. Also, their strict implementation and compliance will be necessary.

On the one hand, climate change is creating water scarcity problems, and on the other, due to population growth and the expansion of industries, water consumption is also increasing on a large scale. However, the availability of water from nature will remain the

same. Of course, this will put a huge strain on the overall capacity of the water supply.

Many regions of the world are already experiencing severe water scarcity, which is creating huge problems for the local population and society as a whole. Water resources have already degraded in some water-scarce regions. It is degrading both the quantity and quality of the water. This also increases water scarcity, which in turn hampers industrial, urban, and tourism development.

The pace of urbanisation is increasing tremendously. 93 percent of the world's total urbanisation is occurring in developing countries, and the population density is increasing in small areas of the cities. Therefore, many issues stand in the way of sustainable water development in cities, like providing sufficient water to the growing population, avoiding large-scale wastage of water, recycling and reusing wastewater in urban and industrial sectors, etc.

Industrial development is impossible without water. The development of industrialization is also an important aspect of social and economic development, as well as reducing unemployment. Every product needs water. Some industries require a lot of water, while others require less. Keeping this in mind, it will be necessary to promote industrial products according to the availability of water in that region.

A June 2018 report of the "Niti Aayog" projected that about 21 cities across India will face water droughts in the coming years, and since then there has been talking that our cities are also heading towards aridity.

While finding the necessary measures to overcome this situation, we have to reduce the use of fresh water and increase the use of treated water. Most of the water we use in the city goes through sewers. Processing centres should be set up in different parts of the city to process it and make it reusable. If such small-scale recycling plants are set up, it will be possible to distribute the water obtained from it to the surrounding areas for consumption. Thus, we have to get used to using the processed purified water by reducing the use of fresh water.

To address the water crisis, Tamil Nadu has decided to prioritise the addition of two new desalination plants to the existing two projects to desalinate sea water. From this, they will be getting 150 million litres of water per day.

All in all, if we as citizens do not take initiative in all these issues today, our future generations will have to wade in search of water. "I pay the municipality for water; so, I should get as much water as I want!" Some of us have this understanding; they need to come to their senses now. Everyone should first understand that water is for everyone and that water has value, so water wastage in cities should be stopped.

******

20
Water for Food Security

Due to the increasing population and improved lifestyles, the demand for food is continuously increasing, not only in India but also all over the world. The agricultural sector has to meet this increasing demand through the modernization of cultivation methods, research into improved varieties of seeds, pest control, and the adoption of appropriate water management. Accordingly, on the occasion of World Water Day 2012, the international community drew attention to how every drop of water can be converted into more grain production through the judicious use of water so that food security can be achieved.

The natural resource for agriculture, which is mainly in the form of "water," generally has limited average availability and is uncertain from year to year. Therefore, large-scale water management skills must be acquired to ensure a sufficient and consistent water supply throughout the years.

A society can ensure food availability by either stockpiling food grain reserves from a good year's agricultural production or by importing food grains at a high cost. For the country to be self-reliant and economically strong, food grain production should be sustainable even in adverse weather conditions. For this reason, skill in water management plays an important role.

There is an extreme variation in annual rainfall in different parts of India. Similar differences can be seen elsewhere in the world. If we consider Rajasthan, this deviation will be up to 60 percent. In Maharashtra, the drought-prone area, which covers more than 40 percent of the state, has a deviation of 35 percent. Therefore, dry land cultivation suffers a lot in a year of low rainfall. There are often consecutive years of low rainfall. Moreover, in the year when the

drought is spread over a large area, there is obviously a great strain on the food grain management in the country.

Since India has at least one year of drought deficit every 10 years, one should always be prepared for such a flexible arrangement. During drought years, the natural process of water recharge in the soil is disrupted. If the agricultural sector wants to get assured water, one way is to plan to reserve sufficient water reserves for the next year in the reservoirs built on the rivers at the end of the year. Planning to retain such reserves will help to at least partially cover the water availability deficit in the coming years.

Possible changes in climate will add to the problem in the future by extending the period of consecutive dry days during the rainy season. Due to this, measures such as laying protective foliage on the agricultural land while irrigating and preparing the additional base of the farms for water supply will be necessary. When the roots of the crops get stressed due to a lack of water, the farmers will get help from the farms to supply water exactly when needed. The frequency of such climate changes is likely to increase in the coming years. In order to minimize their adverse effects, water management strategies have to be designed with foresight.

The successful retention of maximum rainfall within the watershed is an important principle of watershed development programs. The greatest enemy of hot and dry regions is evaporation loss. 4 to 6 mm of rain evaporates not only during the rainy season but also while it is raining. There is a loss of 400 to 500 mm through evapotranspiration if the whole monsoon season is taken into consideration. It costs so much. Mulching techniques can play a significant role in mitigating this.

The state of self-sufficiency in various types of food grains is not uniform in India at present. In some grains, we are doing well. Wheat and rice are two examples. We are also getting a good grip on maize. However, a lot remains to be done on Jowar and millet. For water-intensive crops like fruits and sugarcane, special attention needs to be given in the coming years to making drip irrigation widely adopted to

achieve water savings.

There is currently a huge gap in the production and demand of oilseeds and pulses. Oilseed crops are also vulnerable. Because most of these crops are dependent only on rainfall, Therefore, along with other measures, provision for improved water availability has to be made for them. Vegetable production is responding well to frost, drip irrigation, and the use of greenhouses. Henceforth, all such measures have to be an integral part of water management systems.

If the food basket of India is considered as a whole, it must contain all the items like grains, oilseeds, pulses, milk, and fish. However, grains play a more important primary role in food security. Grain, oilseed, and pulse proportions are expected to be 410 grams for grains, 82 grams for oilseeds, and 68 grams for pulses, respectively. We have not yet been able to maintain such a balance in the country.

Dairy and fish production are also important sources of food. Dependable inclusion of these sources in food planning is easily possible through careful management of catchment grasslands for livestock and poultry, as well as small surface water storage tanks and ponds.

Urbanization and industrialization are spreading to rural areas. As a result, first-class lands near such centers are frequently going out of agriculture. Due to this, the availability of water for agriculture is also decreasing. The "agriculture" business has to lose its resource base in a dual way, such as land and water. Therefore, the resulting deficit will have to be met by increasing productivity.

In the agricultural sector too, water available for agriculture is preferentially diverted to higher-value crops such as cotton and sugarcane, as well as fruits such as dates and bananas. This causes a reduction in the amount of water available for food grains. Therefore, the challenge before us is to have the ability to produce more food grains with less water. This requires management skills to resist evaporation, improved irrigation techniques for food crops resulting from modern research, and the adoption of new high-yielding crop varieties.

At least 80 percent of urban wastewater and 90 percent of industrial water should be returned to natural watersheds. Such water returns are a valuable addition to water deficit basins and sub-basins.

Excessive and unscientific use of pesticides, fertilizers, and irrigation water has resulted in the degradation of soil texture and a decline in productivity. Irrigation water should be used in controlled quantities.

Drainage of surface and subsurface water is as important as proper agricultural irrigation practices.

The importance of water management for food security has been formally recognized at the United Nations level. That is why the theme "Water for Food Security" was specially chosen for universal awareness on the occasion of World Water Day-2012.

******

21
Water Cooperation

Water consumption is increasing more and more everywhere in the world. Water use covers hundreds of things like household use, agriculture use, and use in factories. Water also plays an important role in protecting nature. Ecosystems depend on water flow. The world can run smoothly only if there is water. The availability and quality of such vital water are becoming a matter of concern globally. Due to the increasing use of water and the priority given to it according to local conditions, there has been a situation of severe water scarcity in many regions of the world.

Since water is an important resource for all, many tensions and conflicts are arising in communities, states, and countries. Therefore, judicious use of water, diligent care of this resource, and strict attention to how it can be managed and regulated become the primary duties of everyone who depends on the water resources of that place. The cost of social inaction in this regard is huge. Therefore, this precious water resource should be taken care of strictly. For that, it is necessary to have a spirit of cooperation among all the communities. Recognizing this, the United Nations declared 2013 as the International Year of Water Cooperation, and on that year's Water Day, the issue was brought to the attention of the global community by planning various programs around the world.

The importance of water cooperation lies in the fact that water is an all-encompassing factor that requires close attention at all levels and in all sectors. Water cooperation is a key issue and will be the foundation for 'ensuring water security and a sustainable future'.

One of the aims is to build strong and lasting partnerships and initiatives through water cooperation. This will help in maintaining peace and security among nations, communities, and stakeholders, as well as ensuring equitable distribution of water resources to society. Another important element underscoring the importance of 'water cooperation' is the identification of current challenges and stresses on

globally shared water resources by all stakeholders, so that a constructive and realistic dialogue can take place.

With the above issues and perspectives in mind, the 2013 International Year of Water Cooperation was called for at the global level to bring water to the center stage. It will help in establishing strong relations of cooperation between nations, states, and different communities.

In 1992, the importance of integrated water management was emphasized at the Rio de Janeiro conference. Organizations like the "World Water Council' and the "Global Water Partnership' emerged on the global stage to increase global cooperation in this regard. How important it is to have equitable distribution of water became clear from the functioning of these two organizations. This year's trend is expected to increase this cooperation at the global and national level.

The five main objectives of the water cooperation campaign are:

1. Raising awareness of the importance, benefits, and challenges of cooperation on water-related issues.
2. Enhancing knowledge and building capacity for water cooperation.
3. Undertaking concrete and innovative action programs for water cooperation
4. Enhancing partnerships, dialogue, and cooperation around water is a top priority.
5. Strengthening international cooperation among institutions, users, social and economic sectors, and others to agree on sustainable development goals, whereby we can effectively meet future water needs.

All in all, water cooperation creates peace, generates tangible economic benefits, and is an extremely important means for socioeconomic development, poverty alleviation, social equity, gender equality, and environmental sustainability. Water cooperation plays an important role in conserving water resources, ensuring their sustainability, and protecting the environment.

******

22
Water and Energy

On the occasion of World Water Day 2014, the theme of water and energy was adopted for global awareness. It emphasised the interdependence of water and energy and gave special attention to the water-energy nexus. Further, the development of inter-sectoral water-use networks, the facilitation of integrated operations, and sustainable water availability to secure green economy objectives were highlighted on the occasion of that year's World Water Day.

Hydroelectricity or hydroelectric power is the oldest and largest source of renewable energy, which uses the natural flow of water to generate electricity.

The three resources - water, food, and energy, that are at the heart of development share a sustainable relationship. Food production and energy are highly dependent on water. Agriculture is the largest consumer of the world's freshwater resources, and one-quarter of the energy consumed globally is spent on food production and supply.

Energy depends on water, and water depends on energy. This interdependence of water and energy is set to intensify in the coming years, with significant implications for both energy and water security.

About 8% of the energy generated globally is used to pump water, treat it, and transport it to various consumers. Apart from this, hydroelectric, nuclear, and thermal power generation also require the use of water resources.

Energy and water are closely related to each other. Most energy production is closely related to water. Water consumption is essential for almost all forms of energy production. For example, coal-fired power plants, nuclear reactors, and crop production for biofuels use water.

All energy sources (including power generation) require large amounts of water at various stages in the production process. A lot of

water is required for coal mining or other raw material production for power generation, growing crops for biofuels, powering turbines, draining out coal ash from thermal plants, and cooling the furnace temperature, which rises considerably during the process of power generation. For this purpose, large water reservoirs are specially constructed near those plants.

Increasing pressure on the water-food-energy nexus threatens the set goals of sustainable development. As water becomes scarcer, its ability and sustainability to support many Sustainable Development Goals—particularly poverty, hunger, and environmental progress—diminishes.

Water availability has already affected India's power supply. India lost 14 terawatt hours of thermal power generation in 2016 due to drought and water scarcity. You will also notice that more than half of the thermal plants in India are located in areas with high water stress.

Water scarcity is already affecting energy production and reliability. These difficulties, which loom larger, may call into question the physical, economic, and environmental viability of future projects. A growing global population, rapid urbanisation, changing diets, and economic growth are putting pressure on these interrelationships. Therefore, an integrated and sustainable management of water, food, and energy must be ensured to meet these current and future stresses and challenges.

India's energy sector development plans over the next two decades have a backdrop of increasing water stress. India accounts for only 4% of the global water supply, but 18% of the population. It is one of the most water-stressed countries in the world. India's rapid economic growth in recent years has led to a huge increase in demand for both energy and water, putting these interrelated resources under increasing pressure.

Agriculture accounts for 80% of India's water demand. But water is just as important to the energy sector, especially power generation. The development of India's energy sector in the next two decades will only be possible keeping in mind the increasing water

stress, climate change, and increasing demand for water in the agricultural, residential, and industrial sectors. Looking at the current rate of water consumption, the projected demand for water will be much higher than the available supply in the coming years, and dealing with it is going to be a major challenge for the energy production of the country.

******

23
Water and Sustainable Development

On the occasion of World Water Day 2015, the theme 'Water and Sustainable Development' was set by the United Nations to enlighten the global community. Through this theme, the concept of promoting the discovery of how water is closely connected with all the sectors needed for creating the secure future that we want and bringing about the development of those sectors has gained momentum.

Water is at the core of sustainable development. It is critical not only for socio-economic development, healthy ecosystems, and human survival but also for reducing the global burden of diseases, improving people's health, and thereby improving their well-being s he productivity. Water is important for providing many benefits to people, like industrial production, the creation of various facilities and services, and their conservation. Water is also at the heart of efforts to adapt to climate change, serving as a vital link between the climate system, human society, and the environment.

Water is a limited and irreplaceable resource fundamental to human well-being. It can be inexhaustible only if managed properly. Water can pose a serious challenge to the world on the path to sustainable development. But it can also play an important role in managing efficiently and equitably the task of strengthening the resilience of social, economic and environmental systems in the face of rapid and unpredictable changes.

Around 750 million people in the world still do not have access to a safe source of drinking water, and 2.5 billion people still do not have access to improved sanitation facilities. Also, over a billion people still defecate in the open. In this regard, the United Nations General Assembly passed a resolution in July 2010 that defined "the right of everyone to safe and clean drinking water and sanitation" as a human

right, which is essential for the full enjoyment of life as well as the enjoyment of all human rights.

Water and sustainable development in various sectors

Sustainable development is defined as development that meets the societal needs of the present without compromising the ability to meet the needs of future generations. Briefly discussed below are how to identify and rectify the deficiencies in the methodology adopted to achieve development in various sectors and how to bring about sustainable development.

Agriculture sector :

Globally, agriculture is the thirstiest consumer of water. It accounts for 70% of the world's water consumption. Of course, these figures vary considerably depending on the situation in the country. Rain-fed agriculture is the dominant agricultural production system worldwide, and its current average productivity is more than half of its potential under optimal agricultural management. By 2050, the agricultural sector will need to produce 60% more food globally and 100% more food in developing countries.

Health sector :

Water is essential for human health and survival. The human body can survive weeks without food but only a few days without water. The average human body is made up of 50–65% water. Babies have the highest water content. Newborns have 78% water. The best way to prevent the spread of germs is to avoid getting sick by washing your hands regularly and disinfecting them. One gramme of excrement can contain up to a trillion germs. That means clean hands can save your life.

Every day, every person needs water for drinking, cooking, and personal hygiene. Details of the minimum amount of water required for sanitation facilities without compromising health are available. 7.5 litres of water per capita per day for drinking, as recommended by the

World Health Organisation, will meet most people's needs. About 20 litres of water per person per day are required for basic sanitation and food hygiene. Despite impressive achievements in this regard over the last decade, 75 million people do not have adequate access to clean drinking water sources, and 2.5 billion people do not use improved sanitation facilities. It is estimated that Rs. 9000 billion will be spent annually over five years to maintain safe water and sanitation for every person worldwide.

Natural ecosystem :

Water is nature. Natural ecosystems lie at the centre of the global water cycle. Forests, wetlands, and grasslands are at the heart of the global water cycle. All freshwater ultimately depends on the continued healthy functioning of ecosystems, and understanding the water cycle is essential to achieving sustainable water management. Yet, most idealised economic models do not seem to place sufficient emphasis on freshwater among the essential services provided by ecosystems. This leads to the incessant use of water resources and environmental degradation. Pollution from untreated residential and industrial wastewater and agriculture also weakens the ecosystem's ability to provide water-related services.

Perhaps the most important challenge to the sustainable development of ecosystems has arisen in recent decades. That is, the rapidly unfolding global environmental crisis, which is becoming an obstacle to further human development, Attempts at ecologically sustainable development have not yet succeeded. Global environmental degradation has now reached critical levels, and many large ecosystems are on the brink of degradation, which may cause them to shrink drastically. Protecting the systems that support life on Earth requires respecting them. For this, it is necessary to develop an increased understanding of the extent of environmental problems on our planet, which in turn will be the fundamental basis for the future sustainable development of our planet. Adopting 'ecosystem-based management' is important to ensure the long-term sustainability of

water.

Cities and water :

More than half the world already lives in urban areas, and by 2050, more than two-thirds of the 9 billion people are expected to live in cities. Moreover, most of this growth will occur in developing countries, which have limited capacity to deal with this rapid change. This increase will also increase the number of people living in slums, whose living conditions are deplorable in terms of water and sanitation facilities. Therefore, the development of water resources for economic growth, social equity, and environmental sustainability will be closely related to the sustainable development of cities. The management of urban areas has become one of the most important development challenges of the 21st century. Our success or failure in creating sustainable cities will be a key factor in the success of the global development agenda.

A network of piped water supply systems spanning thousands of kilometres forms the water infrastructure of every city. Many old tap systems waste more than the fresh water that is delivered through them. Many fast-growing cities (small and medium-sized cities with a population of less than 5 lakh) have non-existent, inadequate, or outdated sewage infrastructure.

Industry :

Every product requires water for its production. Some industries are more water-intensive than others. 10 litres of water are used to produce one paper sheet, while 91 litres are used to produce 500 grammes of plastic. More water is used to build a car than to fill a swimming pool. Industrialization can lead to growth through increased productivity, jobs, income, gender equality, and youth employment opportunities. Unfortunately, the industry's priority remains how to maximise production rather than water efficiency and conservation.

Global water demand for production is expected to increase by 400% by the year 2050, which is far greater than water demand in other sectors. Major growth will occur in emerging economies and developing

countries. Many large industries have made significant progress in reducing their water use and supply chains by evaluating them. However, small and medium-sized enterprises face similar water challenges to a lesser extent.

Technology and smart planning can reduce water use and improve wastewater quality. Some progressive textile industries have introduced such technology that the water coming out of the mill is even cleaner than the drinking water in the city. Major beverage companies are also improving their water use efficiency, and they have significantly reduced the amount of water used in their production plants over the past 10 years.

Industry and power generation together cover 20% of water demand. In developed countries, where agriculture dominates, the industrial use of freshwater is higher than in less-developed countries. Balancing large-scale industrial needs with sustainable production against the traditional approach poses many challenges for the industry. The real issue is how to spread the benefits of globalisation and industrialization around the world without having uncertain impacts on water and other natural resources.

Energy :

Water and energy are inseparable friends, and they are natural partners with each other. Water is needed to generate energy, and water is also needed to deliver energy. Today, more than 80% of electricity generation is done through thermal power plants. A large amount of steam is required to run its nuclear generator. Water is heated to high temperatures to prepare it. At the same time, billions of litres of water are required to cool down the plants in this process. Therefore, it is necessary to limit the generation and use of less efficient coal-fired thermal power plants. Worldwide, hydropower accounts for 16% of global electricity generation. This hydropower generation capacity can be doubled in the next two decades.

Technologies, such as dry-cooling or highly efficient closed-loop cooling systems that require no water or very little water, should be

widely adopted when building new power generation plants. The use of alternative water sources such as seawater or wastewater has great potential to reduce pressure on freshwater resources. Also, renewable energy is a resource that regenerates naturally. e.g., sunlight, wind, rain, tides, waves, and geothermal heat. They do not require large amounts of fresh water. Such projects should now be rolled out on a large scale.

Food: Water is food. One litre of water is required to produce one calorie of food. However, using 100 litres of water to produce one calorie can be called inefficient water use. Agriculture is the largest user of water globally, accounting for 70% of total withdrawals. In some developing countries, 90% of the water is pumped for irrigation. By 2050, the agricultural sector will need to produce 60% more food globally and 100% more food in developing countries.

As prosperity increases, diets tend to shift more towards starch-based items like meat and dairy products, which require more water. For example, it takes about 3,500 litres of water to produce 1 kg of rice, while it takes about 15,000 litres to produce 1 kg of meat. This change in diet is the biggest change affecting water use in the last 30 years and is likely to continue until the middle of the twenty-first century.

The current rate of agricultural demand for the world's freshwater resources is unsustainable. Inefficient use of water for crop production reduces water storage, reduces river flows, degrades wildlife habitats, and leads to the salinization of 20% of the world's irrigated land area. Increasing water use efficiency can reduce water loss from agriculture and, more importantly, increase crop productivity.

Water is Equality :

Women and girls are responsible for collecting water every day in developing nations. Women in these regions spend an average of 25 percent of their day collecting water for their families. Therefore, they cannot use this time for income-generating work, family care, or schooling. There should be a drastic change in this mind set now, from which it becomes necessary to create gender equality in society today for a sustainable world of tomorrow.

Climate Change :

Climate change has a negative impact on freshwater resources. Current projections show that increasing competition for water among users due to increasing greenhouse gas emissions will affect regional water, energy, and food security, significantly increase the risks associated with freshwater, and create major challenges for water resource management with increasing water demand.

Natural hazards are inevitable. But much can be done to reduce the number of deaths and devastating disasters and to reduce their suffering. Its intensity can be reduced through proper preparation and advance planning. The global community has now committed itself to building coherent disaster prevention and response systems. For this, concrete and significant changes are needed now.

******

24
Better Water - Better Jobs

World Water Day 2016 under the theme "Better Water, Better Jobs" highlighted the interrelationship between water and job creation, which is directly or indirectly generated by water resources around the world. If abundant and good-quality water is available, it will increase the availability of jobs and bring about positive changes in people's lives. This year's programmes were implemented in collaboration with the International Labour Organisation. The event brought together key activists working in various sectors, such as the water sector and environmental groups, to highlight the symbiotic relationship between those sectors.

Water is an essential element for life. But as much as it is needed to quench thirst or protect health, it is essential for creating jobs and economic, social, and human development. Water quality and adequate availability can make a positive difference to societies, their economies, and the quality of life around the world.

Water is central to human existence as well as the environment and the economy. Communities with minimal access to water and sanitation often lack healthcare and stable jobs, perpetuating the cycle of poverty. Disparities in access to water and sanitation facilities between men and women, urban and rural areas, and rich and poor are also of concern.

This stream focuses on how proper water management can change the lives of workers. Water management and employment generation are closely interlinked. Almost all jobs depend on water. Small enterprises or large global enterprises cannot survive without reliable and safe access to water. At the same time, a large amount of educated manpower is required to establish, maintain, operate, and manage water systems well.

Where quality water and a good work culture exist, they have the power to change people's lives. Millions of people struggle to achieve these things. But many have to be deprived of it. Furthermore,

many people who work in these sectors do not receive real recognition for their work, and their basic labour rights are often not granted or protected.

Water is collected, used for various purposes, and finally returned to the natural environment, either directly related to its management (supply, infrastructure, wastewater treatment, etc.) or in economic sectors that rely heavily on water, such as agriculture, fishing, energy, industry, and health. It is an important factor in the development of employment opportunities. Good availability of drinking water and sanitation helps in attracting educated and energetic manpower, which becomes an essential factor for sustainable economic growth. It also highlights the important role of water in the transition to a green economy. In many developing countries where large quantities of water are required, irrigation projects are considered an important pillar of the economy and a source of employment.

Water is a force for job creation. Its safe and clean distribution requires a large number of workers. Almost half of the world's 15 million workers work in water-related sectors, and almost all jobs depend on water and those who ensure its safe delivery. However, many of these workers do not have access to clean water. When water and sanitation are lacking in workplaces and in the settlements where workers live, disease spreads, the gender gap widens, and economic growth slows; This makes it impossible to achieve global goals and achieve sustainable development.

As water scarcity becomes more of a reality, industries that rely heavily on water, such as textiles and agriculture, are at risk of rising costs putting wages and jobs at risk. This increased cost, is then passed on to the consumer.

The implementation of World Water Day 2016 brought recognition to organizations and their activists working to improve the quality and availability of water. Many of them realized the need to shift to better jobs, and many also got opportunities. Three out of four jobs worldwide are in water-dependent sectors. According to the World Water Development Report of the United Nations published on the

occasion of World Water Day 2016 in Geneva, it is opined that economic growth may be limited in the coming years due to scarcity or lack of water.

******

25
Why Waste Water?

Globally, more than 80% of wastewater produced by our homes, cities, industries, and agriculture flows back into nature without treatment or recycling. This causes serious environmental pollution that leads to disease and harms safe drinking water and food supplies. An attempt was made to draw attention to this issue on the occasion of World Water Day 2017. A special campaign, "Why Waste Water?" was also launched to motivate the community to think about what should be done to reduce and recycle waste water.

Wastewater is a valuable resource to help achieve sustainable development. One of the goals to achieve that is to reduce the waste water quantity by halving the amount and increasing water reuse and recycling worldwide. Wastewater can be used for various purposes after proper treatment. For example, you can reuse that water in cooling towers and even for irrigation.

Domestic, agricultural and industrial effluents that are released in large quantities into the environment every day pose a serious problem. If we look at that water as a valuable resource rather than a problem, we will realize that it has great potential for development.

One of the objectives is that if the waste water generation is basically reduced, it will automatically save water and reduce the cost of processing it.

A large portion of wastewater is still either not collected or is released into the environment untreated. This is particularly the case in low-income countries, where on average only 8% of domestic and industrial wastewater is treated, compared to 70% in high-income countries. As a result, water contaminated with bacteria, nitrates, phosphates, and other solvents is released into lakes, rivers, and oceans in many regions of the world, causing negative impacts on the

environment and public health.

The volume of wastewater that needs to be treated will increase significantly in the near future, especially in cities in developing countries with rapidly growing populations. At the same time, sewage generation is one of the biggest challenges associated with the growth of informal settlements (slums) in developing countries.

Population and city growth, rapid economic development, and agricultural expansion play integral roles in degrading the quality of wastewater discharged into nature. By 2050, nearly 70% of the world's population will live in cities, as compared to 50% as of today. Currently, most cities in developing countries do not have adequate infrastructure or resources to handle wastewater management in an efficient and sustainable manner.

Wastewater is often an underestimated and neglected resource. If managed properly, it can be recycled back into industrial processes, agriculture, or natural freshwater systems through treatment and recycling systems. Treating and reusing wastewater is considered one of the simplest circular economy practices.

Wastewater is not only ignored as having no value; it is not even visible to us, just as groundwater is invisible to us and flows through our freshwater ecosystems. Human waste, highly toxic chemicals, and medical waste contaminate the freshwater systems we use to prepare our food and drink.

1800 million people in the world use faeces-contaminated drinking sources, putting them at risk of cholera, dysentery, typhoid, and polio. About 0.842 million deaths occur every year due to unsafe water and a lack of sanitation. However, sewage management is neglected, which is critical. Its disposal should be viewed as a resource rather than a burden, so that it can be transformed into a useful resource.

Wastewater should be reduced and reused rather than wasted. We can reuse this grey water in our homes, gardens, and plots. We can treat waste water in our cities and reuse it for city gardens and greenery.

Water quality in lakes and rivers around the world is deteriorating mainly due to agricultural and domestic waste and other chemical pollutants. This has serious effects on fish and other forms of aquatic life, and there is especially rapid growth of algae. For this, more effective new management practises are being developed by integrating traditional hydrological assessment methods and local techniques, which preserve water quality and facilitate efforts to improve the quality of degraded lakes and rivers.

A number of treatment processes and systems have now been discovered that will help these waste waters meet the growing water demands of our growing cities, support sustainable agriculture, increase energy production, and promote industrial development. This will prove to be a boon for more sustainable, efficient, and equitable water use worldwide. For that, we have to focus on how this water cycle will work better for every living being by using this precious resource properly.

******

26
Nature for Water

The theme for world water Day-2018 was 'Nature for water'. The theme emphasized finding nature-based solutions to the water challenges we face in the 21st century and stressed the need to work with nature to improve global water management by raising awareness of nature-based solutions.

Environmental degradation (including climate change) is driving the water-related crises seen around the world. Disasters such as floods, droughts, and water pollution become more damaging due to degraded vegetation, soils, rivers, and lakes. When we neglect our ecosystems, it becomes increasingly difficult for everyone to access the clean water we need to survive and thrive.

Nature-based solutions have the potential to solve many water-related challenges. We need to do more about 'green' infrastructure and align it with 'grey' infrastructure wherever possible. Measures such as planting new forests, connecting rivers to flood zones, and restoring wetlands can rebalance the water cycle and improve human health and quality of life.

The report published on the occasion of World Water Day that year highlighted practical nature-based management practices for agriculture, which were set to achieve the twin goals of high food production and smart conservation of resources. The report focused on three main principles. Those principles are minimum tillage, permanent soil cover, and preservation of biodiversity. By cultivating crops with minimal tillage, farmers can create a natural environment for bacteria, fungi, and microorganisms in their soil. In that they can improve soil health and reduce soil erosion. Continuous tree growth and the use of mulch to cover the soil improve the water-holding capacity of the ground and reduce erosion. Biodiversity in agriculture has many

benefits. However, using those practices for water management can be beneficial in cultivating crops that are resistant to pests and diseases and thus reduce the need for chemical inputs.

Agriculture depends on clean, sustainable sources of water. However, common modern farming practices harm the water supply. For example, excessive plowing can damage the soil and cause erosion. Up to 40 billion metric tons of soil is carried away by waterways every year due to erosion. Improper use of chemical fertilizers, pesticides, and herbicides leaches these chemicals into streams and rivers and ultimately into urban water supplies. Long-term planning for sustainable agriculture requires sound farm management practices that meet the goal of efficient food production while ensuring the future health of soil, water, and ecosystems.

The above-mentioned report for this year's World Water Day highlights many other nature-based solutions for water management beyond agriculture. For example, the creation of natural buffers by cities between water sources and natural waterways can improve the water quality of rivers and streams. In general, restoration of forests, grasslands, wetlands, floodplains, and other natural ecosystems will greatly increase the amount of freshwater available worldwide.

While global water management and conservation face significant obstacles, it is becoming increasingly clear that the answer lies in nature. Global policies that harness the power of natural systems rather than fighting them can greatly improve water management and conservation.

With the help of isotopic hydrology, scientists can determine the quantity and quality of water supplies. They use naturally occurring isotopes as tracers to find out where groundwater comes from, whether it is recent or old, whether it is being recharged or polluted, and how it travels.

In addition, naturally occurring radioactive isotopes in water such as tritium, carbon 14, and noble gases can be used to estimate the age of groundwater (from a few days to a millennium). When groundwater is found to be ten thousand years old, it means that the

flow of water is very slow, and if improperly pumped, it may take thousands of years to replenish it.

All in all, the more friendly you are with nature and the more you take care of your water sources, the more abundant nature will surely put in your pocket, and if you make appropriate changes and improvements in your habits, there is no doubt that your future will be happy.

******

27
Leaving No One Behind
(Water as a Human Right and Refugees)

The Sustainable Development Goals set for water are clear: water for all by 2030. This means no one should be left behind to fetch water. Today, billions of people still live without safe water. Under these conditions, they work in their homes, schools, workplaces, farms, and factories and are constantly struggling to survive and prosper. This includes women, children, refugees, indigenous people, the disabled, and many others. They are generally ignored, and they also have to face discrimination. As a result, they struggle to get the necessary safe water and manage that water. Many conflicts are ignited due to this. To tackle this serious water crisis, special efforts have been made on the occasion of World Water Day 2019, and the theme of the human right to water has been taken up so that everyone can get their unalienable right.

The current situation:

- Today, 21 crore people are living without safe water.
- Globally, 80% of people who use unsafe water sources live in rural areas.
- The responsibility of collecting water in eight out of ten households where no water is available rests with women and girls.
- One in four primary schools does not have access to drinking water. Many students use unsafe sources or are thirsty.
- About 15 million people collect their drinking water from surface water sources such as lakes and streams.
- Nearly 70 million people are forced to leave their homes because they do not have water. There are problems with providing safe water services to them.
- About 4 billion people face acute water scarcity for at least one month of the year.

- More than 700 children under the age of five die every day from diarrhea caused by drinking unsafe water and inadequate sanitation.
- Over 800 women die every day due to complications during pregnancy and childbirth.
- By 2030, severe water scarcity is expected to displace 70 million people worldwide.

Why do people lag behind?

- People are left behind without safe water for various reasons. There are following 'grounds of discrimination', due to which they have to face special disadvantages in accessing water.
- Sex, Race, Religion, Birth, Caste, Language and Nationality.
- Disability, age and health status.
- Property, residence, economic and social conditions.
- Other factors such as environmental degradation, climate change, population growth, conflicts, forced displacement and migration may also affect marginalized groups through water-related impacts.

Water is a human right.

It is against this backdrop that the United Nations declared in 2010 that the "Right to safe and clean drinking water and sanitation" is a fundamental human right essential for the full enjoyment of life and all human rights. The human right to water represents a commitment to ensure that everyone has access to adequate, safe, acceptable, physically accessible, and affordable water for personal and domestic use without discrimination. This includes drinking, personal and household hygiene, laundry, food preparation, etc. Considering this essential need for water, various international laws have been passed.

Whoever you are, wherever you are, water is your human right. Access to water underpins public health and is therefore critical to sustainable development and a stable and prosperous world. We cannot move forward as a global society when so many people live without safe water.

In India too, the Supreme Court of India has protected the right to water as a fundamental human right as part of the right to life under

Article 21 of the Indian Constitution. The human right to water is indispensable for living a life with dignity. It is a prerequisite for the realization of other human rights.

Water to be supplied as a human right should have the following properties.

Sufficient Availability:

The human right to water requires that every person have an adequate and continuous supply of water for personal and domestic use. These uses commonly include drinking, personal hygiene, laundry, food preparation, and personal and household hygiene. According to the World Health Organization, 50 to 100 liters of water per person per day is the minimum required to meet most basic needs and not cause health problems.

Safe Water:

Safe water is water that is available in our locality as needed and is free from contamination. The water required by everyone for personal or domestic use must be safe and clean, free from microorganisms, chemical substances, and radiological hazards, so as not to pose a health risk.

Acceptability:

Water made available to everyone for personal or domestic use should be acceptable in terms of colour, smell, and taste.

Physically easier:

Everyone has the right to access water and sanitation services, which must be physically accessible or close to their home, educational institution, workplace, or health facility. According to the World Health Organization, the source of water must be within 1,000 meters of the house, and the collection time should not exceed 30 minutes.

Financially affordable:

Water and water facilities and services should be affordable to all, and their cost should not exceed 3 percent of household income.

So that no one is left behind, our efforts should be focused on the marginalized or neglected. The needs of marginalized groups should be addressed through social services related to water. Also, their voice

should be heard and included in the decision-making process. Regulatory bodies and legislation should recognize the right of all people to water and ensure that adequate funding is available to those who need it most.

The day called on States and international organizations to provide safe, clean, and affordable drinking water and sanitation facilities and financial resources for all, particularly in developing countries, to support capacity-building and technology transfer.

******

28
Water and Climate Change

We have been hearing a lot about global climate change and its effects for the last two decades, and it is evidenced by our first-hand experience of erratic rainfall patterns, shrinking ice sheets, rising sea levels, floods and droughts. It is becoming clear how water and climate change are inextricably linked and how climate change is adversely affecting the world's water. With this important topic at the centre, World Water Day-2020 was focused on the theme 'Water and Climate Change and how they are Interrelated'.

Climate is the condition of heat, wind, rain and cold in a certain place for many years. Climate change is causing changes in this average climate and resulting in an increase in the Earth's temperature. This is seeing the effects of extreme changes in climate and it is posing serious problems to human life, and so, many lives and livelihoods are in danger.

This is mainly due to various human activities. Due to increasing human activities, the amount of carbon-dioxide emission is increasing and as a result the temperature is also increasing. The use of oil, gas and coal by humans at home, in factories and for transportation is causing rapid climate change. Methane, another greenhouse gas released into our atmosphere, is also exacerbating climate change. Greenhouse gases are emitted when bio-fuels are burned. It is high in carbon dioxide. These gases trap the heat from the sun in the atmosphere and thereby increase the temperature of the earth.

Water balances our climate. It drives the primary cycle of performing the delicate balancing act between water and climate, evaporation and precipitation. As our climate changes, so do the processes of droughts, floods, melting glaciers, rising sea levels and intensifying storms.

Since the 1980s, the world's water use has been increasing by about one percent per year, and the same rate of growth in water use is projected to continue until 2050. Experts say that due to the increasing demand for water and the effects of climate change, the pressure on water resources will increase tremendously.

Climate change has a negative impact on fresh water resources. Current projections show that increased competition for water between users due to increasing greenhouse gas emissions will significantly increase freshwater risks, affecting regional water, energy, and food security, and will pose major challenges to water resource management with increasing water demand.

In 2007, the International Committee for the Study of Climate Change (IPCC) prepared a report. In this report, it has been opened that the water cycle will continue to intensify in the twenty-first century, based on science. Compared to the 19th century, the global temperature has increased by 1.2 Celsius. The amount of carbon dioxide in the atmosphere has increased by 50 percent. Scientists say that if the adverse effects of climate change arising from this are to be avoided, it is necessary to prevent the global temperature from rising.

Today, nearly two billion people worldwide do not have access to safe drinking water, and approximately half of the world's population experiences severe water scarcity at least part of the year. This number is likely to increase due to climate change and population growth.

As temperatures rise, polar ice and glaciers are melting faster. As a result, the risk of flooding in low-lying coastal areas has increased due to rising sea levels. It will also create more favourable weather conditions for forest fires and wildfires.

The retreat of glaciers is also an example of a changing water cycle. Warming will reduce the century-long supply of melt water from glacier-capped peaks and mountain ranges, reducing the availability of water during hot and dry periods in the supply regions, where more than one-sixth of the world's population currently lives.

In subtropical regions, which are relatively more arid, precipitation will decrease in the twenty-first century (eg, Tropic of

Cancer and Tropic of Capricorn). This will increase the probability of drought. This aridity will be greater in the polar regions of the subtropics. (eg, the Mediterranean Basin, South Africa, South Australia, and Southwestern America), which are currently known as the monsoon regions. In such equatorial and high latitude areas the annual rainfall trend will continue to increase.

Between 1950 and 2000 the salinity of the surface oceans was studied. This research confirms the hypothesis that the intensifying water cycle will cause saline areas to become more saline and saline areas to become more desalinized in the future. Also, some other studies show that as temperatures increase, arid areas will become drier and wetter areas will become wetter. Sea-level rise will increase salinization of groundwater, reduce the availability of freshwater for humans, and have adverse effects on coastal areas.

Rising global temperature increases atmospheric moisture. This results in more storms and heavy rains. But, paradoxically, as water evaporates from the soil and global climate changes, more severe droughts occur.

Climate change is also affecting the environment. Frequent and severe climate-related events such as sea-level rise, hurricanes, floods, and droughts in some areas and forest fires are occurring, which is causing biodiversity loss and environmental change. This can have far-reaching effects on the availability of water and food resources. Also, the amount of carbon-dioxide in the atmosphere is increasing.

Climate change can have many effects on nature as well. Some species will migrate to new favorable locations. Climate change is also having detrimental effects on biodiversity. Many plant and animal species are becoming extinct, which can have far-reaching ecological and economic consequences. Oceans are becoming more acidic, harming marine life and ecosystems.

Climate change has many potential health impacts. Heat-related disorders, respiratory problems, infectious diseases and malnutrition may increase. An increase in the range of infectious disease-carrying insects can also increase the spread of diseases such as malaria and

dengue fever.

Climate change can cause significant economic losses. Especially in low-lying areas, where flooding is more likely. It also affects agriculture, fisheries and forestry, thereby impacting food security and livelihoods.

Climate change damages many types of infrastructure. This can have several significant economic consequences, including a reduction in agricultural productivity. In particular, conflicts over resources such as water and food can escalate, leading to issues such as political instability and migration.

Climate change can change the lifestyle of humans. Fertile soil can turn into sandy soil. Lack of water can also make growing crops and food difficult. Extreme changes in weather can occur. Heat waves, heavy rains, storms increase in frequency and can become dangerous to human life, resulting in social problems such as displacement and migration, resulting in increased inequality.

In short, climate change is likely to have far-reaching and severe impacts on many aspects of life, including the environment, human health, economy, security and society.

Efforts to mitigate climate change:

The United Nations has decided to take various measures to deal with climate change at the global level. Some of the salient points are given below.

Setting emission reduction targets:

Greenhouse gas emission reduction targets have been set globally to limit global temperature rise. Under the Paris Agreement, all countries have committed to keeping the rise in global average temperature below 2 degrees Celsius above pre-industrial levels.

Implementing carbon pricing : Many countries have implemented carbon pricing mechanisms such as carbon taxes or cap-and-trade systems to reduce their greenhouse gas emissions and incentivize businesses.

Promotion of renewable energy :

Development and use of renewable energy sources such as

wind and solar power are being encouraged to reduce dependence on fossil fuels.

Promotion of renewable energy :

Development and use of renewable energy sources such as wind and solar power are being encouraged to reduce dependence on fossil fuels.

Supporting research and development :

The government is supporting research and development in new clean technologies to help reduce greenhouse gas emissions.

International Cooperation :

Countries around the world have agreed that the challenge of climate change can be tackled together. A landmark agreement reached in Paris in 2015 set a goal of limiting global temperature rise to 1.5 Celsius by 2100. Experts say that this growth is safe. However, the effectiveness of actions on climate change varies widely from country to country, and more ambitious and coordinated efforts are needed to address the global challenge of climate change.

Healthy aquatic ecosystems and improved water management can reduce greenhouse gas emissions and provide protection against climate hazards.

Climate-smart agriculture can help reduce demand on freshwater supplies by using drip irrigation and other means of more efficient water use.

Nature is a tool we can use to repair our broken planet.

Adapting to climate change impacts on water will protect health and save lives.

Action plans from different sectors need to be integrated and coordinated across borders to combat climate change, and one thing they should have in common is safe and sustainable water management.

Using water more efficiently will reduce greenhouse gases. Reducing greenhouse gas emissions is essential to reduce the effects of climate change.

Only 2% of all funds used to deal with climate disruption go to natural climate solutions. The functions of nature and natural solutions can help countries build climate resilience.

If urgent steps are not taken in this regard, it will pose a threat to both man and nature. Terrible droughts will occur, sea levels will rise, and many species of birds and animals will die out. By the end of this century, the temperature of the earth is feared to increase by 2 degrees Celsius. If nothing is done and inaction is shown, the Earth's temperature will rise by 4 degrees Celsius, resulting in catastrophic heat waves, rising sea levels, displacing millions of people, and irreparable damage to planet Earth and its biodiversity.

The biggest challenge is the changed lifestyle and principles of life. The new entrenched principle, more consumption - more development, is causing the overall balance of nature to deteriorate. Water is our most precious resource. We should use it more responsibly. We must balance the water needs of all communities while ensuring that the poorest are not left behind. It is time to decide whether to use natural resources to provide basic comforts to those who do not have them, or to feed those who do have. But who will tie a bell around a cat's neck?

******

29
Water as a valuable good

Many problems are arising at the national / international level in relation to water. Due to various reasons, especially due to population growth and increasing industrialization, water availability is becoming more critical day by day. Increasing urbanization is increasing the stress on this precious water resource.

Everyone has a feeling that whenever water is available in unlimited nature, it is free in the economic sense. But the economic value of water becomes more apparent only when supply falls short of demand. When access to water becomes scarce, its economic value increases, as many users compete to obtain it.

Proper use of water is one of our important traditional water rituals. However, the value of water is often misunderstood. Therefore, it can be seen that the practice of saving water has decreased recently. Although water is provided by nature, it has economic value. Recognizing that value and moving towards sustainability through proper water management is the need of the hour. Water resources should be used keeping in mind that they will be useful to future generations. For this two aspects of integrated thinking and public participation are very important. Keeping this in mind on the occasion of World Water Day-2021, the topic "Value of Water" was taken for public awareness and efforts were made to inculcate the following five principles regarding water in the minds of the people.

Five important principles of water :

1. To recognize the different values that water has and to inform different groups and communities about all decisions that affect water;
2. Build consensus and trust in upholding values by adopting fair, transparent and inclusive practices;

3. To protect watersheds, rivers, aquifers, associated ecosystems and resources including watercourses used for present and future generations;
4. To sensitize, educate and raise awareness among all stakeholders about the intrinsic value of water and its essential role in all aspects of life;
5. Ensuring that there is adequate investment in the institutions, infrastructure, information technology and innovation required to deliver the many benefits of water.

Till now there was a kind of belief that water is given by nature and that it is abundant and free. So it works no matter how you use it. But that belief has gone and now we should use water sparingly and we should look at the management of that water from the point of view of how it will increase the productivity of that water from the economic point of view and how it will benefit us more and more. So, the society has started calculating the capital and annual recurring costs of water management and the returns we get from it, and the feeling that water has value is now slowly gaining importance among people.

The whole world has now realized that water is an economic commodity. Many simple and straightforward examples can be given to understand how water acquires this economic value. E.g. when we drink a cup of tea, we never consider how many liters of water it takes to make that much tea. We simply assume the simple equation that one cup of tea equals one cup of water. But if we think about it in depth, we realize that it takes 70 liters of water to make one cup of tea. A common man may wonder whether this is an equation or a puzzle. But 15 liters of water is required to produce the same amount of sugarcane used in a cup of tea. An animal consumes about 20 liters of water for the milk used in one cup of tea. After such calculations, we will realize how 70 liters of water is required for one cup of tea. No one accounts for such water and it is wasted on the assumption that water is available for free.

Farmers use water as an essential factor for agricultural production. In fact, water is the single most influential factor in the cost of production of agricultural commodities. Despite this, the cost of

water use or the cost of water is not taken into account while determining the price of agricultural produce. When a well is dug, water is needed and it is considered that we have got that water for free, because no one has to pay for that water. But such free water is later lifted thoughtlessly and horticultural crops grown. Over time, when the water reserves in that land are exhausted, more and more deep wells have to be dug. In many of those bore wells often don't have water and are dry. However, it costs a lot. Due to these expenses, many farmers become indebted, some even commit suicide. It is then realized that the cost of water is high and it is not free.

The water we get in our house through taps is supplied by the municipality. But for water to reach us, we have to spend much money on it, like, firstly pumping the water from the dam to the water supply in the city with the help of an electric pump, where it involves the cost of electricity, the cost of water purification, and the cost of establishing the manpower for all this management, etc. But we don't realize the real cost of water and we use it indiscreetly. If this water is saved and used for other productive purposes, it contributes to the development of the nation.

Keeping in mind that water has value, we can plan many solutions. Like, a shower is used for bathing in many homes, whereas a bucket of water is enough for bathing. Therefore, if you take a bath with a bucket instead of a shower at home, you can save several liters of water. Also, if the used water is diverted to plants, then that water can also be used twice.

Every society can save and store water by adopting the methods of rainwater harvesting and water recycling and that way every house can have availability of water required throughout the year. Also water used at home can be made available for second reuse also through recycling. Various water recycling machines are available in the market these days. By using these machines, we can treat the water that has been used earlier for many purposes at home and reuse it again and again.

If a washing machine is used for washing clothes at home, several liters of water used in it is wasted every day. We can use this water for flushing the sink and save it from wasting.

Water has immense value from economic, social, religious and ecological perspectives. Achieving future food security while using water resources sustainably is a major challenge for this and future generations. The big question is how we can increase the productivity of water, so that more is produced per drop.

Our's was once a prosperous and civilized country with regards to water. Now we have to be sure that we use our water resources wisely keeping in mind the value of water. Although nature has freely given us water, its value is immense. Therefore, we need to move forward towards water sustainability only by recognizing that value.

******

30
Groundwater - Making the Invisible Visible

Groundwater is an important water source that supplies half of all domestic water consumption worldwide. Also, it supplies about 38% of the world's irrigated area and about a third of the water needed for industry. India withdraws more groundwater than any other country in the world. Therefore, our ground water resources are in serious crisis. On the occasion of World Water Day-2022, a special theme on "Groundwater - Making The Invisible Visible" was ensured to seriously brainstorm on the topic.

Importance and Scope of Ground Water:

The groundwater beneath the soil is 'invisible'. It is a hidden treasure that enriches our life. Almost all of the world's liquid fresh water is groundwater. Groundwater sustains ecosystems and helps maintain river flows during dry periods. Groundwater is also an important component of climate change adaptation. It is an alternative source of water during droughts and other calamities. We all depend on ground water. Hence its sustainable availability should be taken care of.

It is estimated that India will have only half of this water available by 2030, given the massive groundwater abstraction and current usage patterns. As the climate crisis escalates, its effects are causing significant changes in river flows. Hence, the availability of water for future water demand and supply of cities is a matter of real concern. Groundwater is a renewable resource and only if managed sustainably will it remain a reliable source of water supply for our cities in the future.

Groundwater Utilization Status of India:

India has 16% of the world's population. But only 4% of the world's fresh water resources are in India. India is by far the world's largest user of groundwater with a global share of 25% in water withdrawals. 45% of water supply to cities in India comes from

groundwater. 89% of groundwater is used for irrigation of agricultural sector, while 11% is used for domestic and industrial purposes. 230 billion cubic meters of groundwater is used for irrigation every year. Groundwater is rapidly depleting in many parts of the country. The total depletion of groundwater in India is estimated at 122-199 billion cubic meters.

Future Status of Groundwater:

Groundwater will not run out. But, readily available fresh and clean groundwater may be depleted, making its availability and availability increasingly difficult. Prevention is the key to prevent further deterioration. If we do not act on it today, we will leave behind a weak legacy for our next generation.

In the near future, people will increasingly try to settle in areas where groundwater is safe and well managed. Where there is good ground water, resourcefulness can be proven to follow. But, since groundwater is an important resource, it can also be competitive for access. Therefore, there will be a need to create a system of more positive, fair and favorable approaches in such places.

Can agriculture survive without groundwater?

Groundwater is undoubtedly essential for food production. In the last half century, groundwater has filled the water gap created by the growing demand for food grains. We have to think creatively and find innovative solutions to support the ever-increasing demand for food. It is estimated that by 2050 we will need to produce 60% more food to feed the world's 9.3 billion people. Also, agricultural water demand will also have to be compromised in the future due to increasing water needs of urban areas and industries. Therefore, modern technology that gives more production with less water by using ground water more strictly will have to be adopted, only then will agriculture be sustainable.

Important role in mitigating the effects of climate change:

Groundwater plays an important role in mitigating the effects of climate change. It provides a more climate resilient resource. It is protected underground from excessive heat. During dry periods we can

reach the ground water and use it. It is then refilled during monsoons. The main property of groundwater is to balance water during dry and wet periods and to combat climate change through that function.

Efforts to make groundwater 'visible':

Groundwater is invisible, but its influence is everywhere. Groundwater may be out of sight, but it should not be out of mind. Groundwater is facing many challenges. But, they rarely get visible evidence. As a result, groundwater problems are often not immediately apparent. It is only when it is studied extensively that its facts emerge.

Cities withdraw far more groundwater than is naturally recharged. Due to this, the ground water level of cities like Delhi, Bangalore and Hyderabad has decreased rapidly.

A better understanding of this 'hidden' resource from an urban perspective is essential. The city's overall water management strategy calls for mainstreaming groundwater in a sustainable manner. As most of our urban areas are heavily dependent on groundwater, it is essential to have a strong base of knowledge about this resource to bridge the supply-demand gap and inform about the sustainable policies. Citizen participation in this work is important.

Groundwater crisis and climate crisis have many similarities and are closely related. So it needs to be solved together. Conserving our groundwater is a major challenge facing our lives along with the climate crisis. For this, we need to take an active role in the matter of groundwater from the individual level to the global level. Everyone can play their part in it. Efforts can start from our own backyard, where we can harvest rainwater, at the same time intentional or unintentional dumping of chemicals or hazardous waste into water should be avoided and awareness and vigilance should be created at all levels.

Due to human development, urbanization and intense water pressure for agriculture, groundwater quality is deteriorating overall. Problems that once existed in developed countries are now seen in developing countries as well. Soil and groundwater have a natural ability to 'self-remediate' poor water quality through various processes. But current levels of pathogens and chemicals seeping uncontrollably

into the soil make this process inadequate. As a result it has adverse effects on people's health and environment.

At the same time coastal aquifers - on which half a billion people depend - are increasingly threatened, as groundwater is being withdrawn at an ever-increasing pace. Rising sea levels are causing flooding and salinity to encroach on former freshwater sources. Such hazardous and human-induced chemicals can be stored in groundwater for years. It can cause significant damage. These persistent new chemicals pose a long-term health hazard to humans and ecosystems. For that non-degradable chemicals should be banned.

Securing India's water future requires an emotional movement that involves everyone. We should go beyond being just 'water users' and everyone should be actively involved. It must be ensured that water use is not only environmentally or economically beneficial, but also socially and culturally appropriate.

Finally, countries and regions that manage their groundwater resources sustainably will enjoy future water security and resilience even under a changing climate.

******

31
Accelerating Change through Partnerships and Cooperation

Every year on World Water Day, different aspects of freshwater are highlighted through a special theme. On the occasion of World Water Day-2023, the theme 'Accelerating Change through Partnerships and Cooperation' was adopted in order to accelerate the actions on the water and sanitation issues. While emphasizing the need for more aggressive action in this regard, an international commitment to meeting the Sustainable Water Development Goals has been expressed through these actions.

Hydrologists predict that increasing scarcity of fresh water could affect many parts of the world within a few decades. Only 2.5% of the Earth's surface water is fresh and suitable for human consumption, which is distributed over 71% of its surface. Recycling processes through Earth's natural water cycle keep this amount of fresh water nearly constant. However, competition for access to this resource is intensifying due to increasing demand for clean water due to population growth. Therefore, water scarcity and the problems arising from it have become a matter of concern, which needs to be resolved urgently.

Today, many schools, businesses, factories, health care centers, farms do not have facilities like safe water and toilets that are essential for health. Because of this, millions of people face serious problems from health to hunger, gender inequality to jobs, education to industry in various fields. Progress so far in resolving these global problems has been very slow. Keeping in mind the need to take immediate steps to overcome these problems, the United Nations has focused on bringing about rapid change. It has been decided to achieve the target of sustainable development by 2030.

In view of precautions to be taken for health protection, availability of sufficient water for every family has become a key issue

before the governments. The concept of WASH (Water, Sanitation and Hygiene) has been promoted globally by the World Health Organization. Priority efforts are being made to root them, especially, from backward and rural areas and informal settlements. Through this concept, special focus is placed on girl child education, gender equality and social integration, and the program emphasizes on teaching basic hygiene to backward communities and school children.

Sanitation as defined by 'WASH' generally refers to the provision of facilities and services for the safe disposal of human urine and faeces. It includes four technical and non-technical systems namely excreta management system, sewage management system, solid waste management system and rain water drainage system. Its progress so far has been very slow.

The main objective of this year's theme is to attract the attention of global and local communities and organizations and to inspire swift action in that regard. These efforts will provide safety to every person on earth from water stress and water related disasters, increase awareness among the general public and encourage positive change in the public mind. In order to achieve these goals by 2030, it has been decided that each country should double its public expenditure for effective implementation.

What is rapid change?

It is expected that the international community will work together to bring more investment, creativity and good governance to water development programs designed to ensure effective management of water resources, to ensure safe and sustainable water for all.

Play Your Role:

As water affects everyone, everyone needs to act. Do your part by doing what you can and prove your commitment to it. You and your family, school and community can make a difference by improving the way we use and manage water.

As the human rights to water and sanitation are not being fully complied with, the governments have seriously restricted access to

millions of people, countless schools, businesses, health care centers and factories. To complete all these changes within the specified time frame, the governments need to accelerate their efforts at four times the current pace. But, this situation cannot be handled by the governments alone with full competence. For that, the conscientious society should also come forward with promptness and enthusiasm.

While the campaign highlights actions that everyone can and should take, reaching the ambitious targets set out requires massive changes in our flawed social practices. Actions such as citizens and pharmaceutical companies not dumping chemicals into drains, local municipalities not releasing untreated waste into local waterways, constructing sewage treatment plants in their areas and treating sewage, etc., are necessary.

Water sector development requires partnership and cooperation:

The United Nations has released the World Water Development Report in 2023. It emphasizes the importance of cross-sector partnerships and collaboration across all dimensions of sustainable development to accelerate progress towards the Sustainable Development Goals on water, and also recognizes the human rights to water and sanitation.

Protecting water, food and energy security through sustainable water management, providing water supply and sanitation services to all, supporting human health and livelihoods efforts, helping to mitigate the effects of climate change and extreme natural events, sustaining ecosystems sustainably - such valuable Services require partnerships and collaborations from local to global levels.

Every country needs to show commitment to provide at least basic water and sanitation services to all as soon as possible. For this, it is necessary to enshrine the human rights to water and sanitation in our national laws and to establish and properly implement effective mechanisms for the equitable implementation of those rights. Otherwise, our failure to do so may prove costly for future generations.

******

32
Leveraging Water for Peace

World Water Day-2024 focuses on 'Using Water for Peace'. How to balance the needs of everyone and ensure that no one is left behind will be implemented with the aim of working together with dedication to make water use more of a catalyst for a peaceful world. The occasion will provide an opportunity for individuals, organizations and governments to come together to solve the water and sanitation crisis and accelerate the necessary changes.

Water is central to human existence, the environment and the economy. Communities with minimal access to water and sanitation often lack healthcare and stable jobs, perpetuating the cycle of poverty. Disparities in access to water and sanitation facilities between men and women, urban and rural areas, rich and poor are also of concern.

Small enterprises or large global enterprises cannot survive without reliable and safe access to water. If abundant and good quality water is available, it will increase the availability of jobs and bring about positive changes in people's lives.

Water and peace

Water is the essence of life - an invaluable resource that supports survival, nourishes the environment and drives human progress. In cultural, religious and spiritual terms water can mean a connection to community and self, while in political terms water can mean peace, harmony and protection.

Today the world is facing an unprecedented water and sanitation crisis. Millions of people lack access to safe drinking water and adequate sanitation facilities. A government's inability to provide basic water services can lead to increased social unrest, particularly in the context of food insecurity, high unemployment and internal migration. These challenges must be addressed as water scarcity and pollution threaten the lives of millions of people worldwide.

The pressure of various factors on water is increasing. The water-related impacts of climate change are worsening, and demand for this limited resource is increasing due to a growing global population. In many countries, access to safe drinking water is unequal and not distributed equitably. A widespread lack of trans-boundary cooperation in relation to shared water resources in many countries threatens the quality and quantity of water supplies, and threatens social and international stability. This can ignite a conflict there.

Water conflicts can erupt when the interests of various water users, including states and provinces, collide and are perceived as incompatible, or when water quantity or quality declines, which can affect human and ecosystem health. Also, water becomes an issue of conflict when water sources, water systems, or utility workers are the target of casualty or violence. During an armed conflict, water can be a weapon to exert pressure on the opposing side. Such attacks on civilian infrastructure, including water systems, pose health risks and violate international humanitarian law.

Decades ago newspaper headlines warned that future wars would be fought over water, but those predictions did not come true. History shows that cooperation, not conflict, is the solution to international trans-boundary water disputes. There have been more instances of cooperation than conflict over water. Research shows that countries do not go to war over water. It was found that countries are more likely to cooperate over shared waters than to go to war.

Water becomes a tool for peace when different communities and countries cooperate with each other regarding this precious shared resource. Water brings us to peace, helps us build trust in each other. It keeps the door of communication open even in times of conflict and relieves tension in the path of prosperity.

There is an urgent need to work together to protect and conserve this most precious resource of ours. Cooperation on water paves the way for cooperation on all shared challenges. So we must use water as a tool to create a more peaceful and prosperous world for all.

Research into how the risk of armed conflict can be reduced through the sustainable management of natural resources has become important. Good water management and awareness can contribute greatly to food security and livelihoods for people in low-income countries.

Water is not just a resource to be used and contested - it is a human right. Access to drinking water has been recognized as a human right. Water can be a stabilizing force and a catalyst for sustainable development. It is inherent to every aspect of life; we must act with this in mind.

The world must learn how to share this precious resource effectively and fairly. This can be achieved through increased cooperation in managing water resources. Countries should develop bilateral, regional or global cooperation agreements on trans-boundary waters and establish institutions to peacefully manage water resources that cross international borders.

Water is at the heart of sustainable development, peace and humanitarian programmes. Linking policy and science therefore becomes a fundamental tool for conflict prevention, and for that collaboration has become a key issue at the local, national and international levels.

******

आमच्या प्रकाशनातर्फे प्रकाशित केली गेलेली व भविष्यात प्रकाशित होणारी इ पुस्तके :

१. मी एक जलप्रेमी : डॉ दत्ता देशकर

२. जाणून घ्या आपले पाणी : डॉ. दत्ता देशकर

३. जल सुसंस्कृतीच्या दिशेने : श्री. गजानन देशपांडे

४. उद्योजकता : आपले यश आपल्या हाती : डॉ. दत्ता देशकर

५. जलक्षेत्रातील यशोगाथा : डॉ.दत्ता देशकर

६. जलक्षेत्रात कार्य करणाऱ्या संस्थांचा परिचय : श्री. विनोद हांडे

७. पाण्या तुझा रंग कसा : श्री. विनोद हांडे

८. स्टॉकहोम पुरस्काराचे मानकरी : श्री. गजानन देशपांडे

९. Towards Excellence in Water and Culture : Shri Gajanan Deshpande

१०. Recepients of Stckholm Water Prize : Shri Gajanan Deshpande

११. मी एक जलप्रेमी (भाग २) : डॉ. दत्ता देशकर

१२. गोष्ट पाण्याची : डॉ. दत्ता देशकर

This Book was published at the hands of Dr. D.G. Deshkar, Chairperson of Indian Institute of Water & Culture at Stockholm (Sweden) during the World Water Week held between 20th to 24th August 2023