

Water Pollution and Increasing Water Stress in 21st Century and Curriculum which can promote safe water mission at School Level.

¹Monojit Gope, ²Pravakar Rawat

¹Research Scholar, Department of Education, North-Eastern Hill University, Meghalaya, India.

²Research Scholar, Department of Education, Rabindra Bharati University, Kolkata, India.

Email – ¹monojit.singhanian@gmail.com, ²pravurawat@gmail.com

Abstract: Water is the most important element for the Human body. The human body cannot sustain itself without water. So we should understand the importance of water. Water crisis-related awareness has been one of the most important key issues in the present situation. We should use water in a good manner and also should preserve or save water for future generations it is also the responsibility of teachers to make their students conscious of the importance of water. Through the school education student shall develop a sense of awareness regarding water pollution and water crisis. The inclusion of water-related concerns has been incorporated in the school to develop a sense of concern about water. Keeping this thing in mind this paper is written. In this paper, researchers followed a qualitative research approach for conducting this research. Finding of the research may create concern on the mind at the same time it can revert this situation by some necessary change. In this paper, researchers considered all the things, and this paper shall provide a clear concept about causes of water pollution and water crisis and require measure for this problem. This research paper will give way to solve problems related to water pollution and water stress and will promote awareness among the students and peoples around the world.

Key Words: Water Pollution, Water Stress, Social awareness, School Education.

1. INTRODUCTION:

"The earth, the air, the land, and the water are not an inheritance from our forefathers but on loan from our children. So we have to handover to them at least as it was handed over to us."

- Mahatma Gandhi

Water is the source of life without water no life is possible on the earth. Water is regarded as the most essential natural resource. It is an abiotic element and around 75 percent area of the earth is cover by water. However, approximately 98 percent of this water is seawater and it not drinkable because of salt presence. Approximately 2 percent of water is fresh but around 1.6 percent of this water is block as polar ice and glaciers. Another 0.36 percent is found underground in aquifers and wells. Only about 0.036 percent of the planets' water supply is found in lakes and rivers.

According to the composite water management index (CWMI) report released by the Niti Aayog in 2018, 21 major cities are racing to reach zero groundwater level by 2020 affecting access for 100 million people. The world health organization (WHO) stated that an individual requires around 25 liters of water daily for meeting his/her basic hygiene and food need. The rest is used for non-potable purposes. Thus for sustainability water must be treated and supplied according to usage.

Present students are the future of tomorrows, so we should develop a sense of responsibility among them and should follow the same in our lives too preserving and saving water for future generations is our responsibility once their habit of saving and preserving is grown this will lend to be concern about the water crisis and water pollution and they may sustainably manage their life. Students staying in school for years could be an effective measure in this regard. School curriculum should be reformed with a perspective of water concern education. So school should give scope to student for exercising the concern related to water. As it is referring that another name of water is life, which means water gives life to living beings.

1.1. OPERATIONAL DEFINITION OF THE TERM USED:

- **Water Pollution:** - Water pollution means when quality of the water get decline by harmful chemical and micro-organisms. This degrading water quality is toxic for humans as well as Environment.
- **Water Stress:** - Water Stress occurs when require amount of water is not available during a certain period for use. This Stress occurs due to excessive use of water resources.

- **Social Awareness:** - Social awareness is the process of awaking people regarding certain phenomena. Social awareness help people in deciding societal perspective.
- **School Education:** - School education mean education at the school level. The period varies from country to country. In India from class 1-12 is considered School level education.

1.2 AIMS FOR AWARENESS ABOUT WATER CRISIS AND WATER POLLUTION:

Aims for awareness about the water crisis and water pollution should be fixed at first while setting the curriculum and should have proper planning for implementing too. There should be both theoretical areas as well as practical tasks for the pupils to fulfill these aims. Teachers should focus on water-related concerns and should follow different education courses with a positive attitude to bring out high benefit from their pupils. Teacher should mold and develop students as below mention points

- To make the pupils sensitive regarding the water pollution and crisis.
- To engage them in community services like campaigning on water crisis and water pollution.
- To engage the pupils in developing an eco-friendly lifestyle.
- To ensure sustainability of water through the fragments of their activities.
- To inculcate water-related ethics and values among the pupils.
- To make them empathize what are the water-related problems.

1.3 CULTURAL BACKGROUND OF WATER:

The water is referred to as life. Which means water gives life to earth. Indian has rich cultural history. People from different cultures live here. Indian people pay respect and worship water indicating water as 'JAL DEVI', who is the source of Shakti (power).

Indian people always serve water first to their guests because it is considered as Pure and gives relief quickly. There is a belief in the concept which says if we give water to anyone you will receive it when required to oneself. It is considered as one of the great works for humanity.

The river Ganga is also called "Ganga Maa". Everyone wants to go to the Ganga River believing it gives mental relief.

1.4 IMPORTANT OF WATER IN OUR DAILY LIFE:

Most probably we hear news on cities facing a water crisis due to decreasing groundwater levels. Due to deforestation and increase in pollution level undistributed rain occur during monsoon. On the other hand, humans misusing water.

- Indeed, human being cannot sustain without water. Approximately 70 percent of the human body is made of water and 75 percent of our brain is also made of water. Lack of water makes our body dehydrated
- Without water cultivation and agricultural work becomes impossible. Crop (plants) prepare food in the presence of sunlight (the process called photosynthesis) in this process water is very essential.
- Unhygienic condition makes us ill and most of the disease occur due to unhygienic condition. So we need to maintain our daily hygiene. While maintaining proper hygiene huge amount of water is required.
- For harvesting fertile soil is required, without fertile soil high-quality crop cannot be produced. Water is essential for soil fertility lack of water may cause desertification in certain areas.
- Forest is a rich source of oxygen and without oxygen, human beings can't survive. Rainwater promote afforestation around the globe. Rainwater bring new life to the earth and help in their growth.
- Rainwater bring Greenery on the earth. During the summer session, the soil becomes dusty and unfertile. When monsoon come the whole scenario gets change. New plants start growing themselves because at that particular time land becomes very fertile.

1.5 RATIONALE OF THE STUDY:

Scientist says that "The next world war is going to held due to water" thought of this on mind is only very dangerous. African country is at high risk for desertification due to scarcity of water sources and rainwater. At the same time, it is known that how important water is no one can imagine life without water. As being most knowledgeable on Earth humans should take this thing very seriously. To promote awareness among the people each individual needs to take positive and active steps on this condition. Recently water-related issue become a global issue most of the country faced huge problems related to water. In this list MENA (Middle East and North Africa) regions were first, MENA (Middle East and North Africa) regions faced more challenges compared with any other countries. This study will help to know the importance of water in our daily life and what might happen if require amount of water is not available on the earth. Is there any alternative to water? What should school practice to tackle this situation? And, Awareness among the people about water pollution and crisis can change the attitude of the people and that can change the whole scenario of the world? Keeping in view the above mention point the Researchers find it justified to research on Water Pollution

and increasing Water Stress in 21st Century and Curriculum which can promote safe water missions at School Level. No such attempt has been made earlier especially the topic on which researchers work on.

2. OBJECTIVES OF THE RESEARCH PAPER:

The current research paper is undertaken with the following objectives:

- To study the cause and crisis of water pollution in the 21st century.
- To explore the school-based activities for promoting awareness about the water crisis and water pollution.
- To know the consequences of water crisis and stress on normal life.

3. METHODOLOGY OF THE RESEARCH:

Method: - Qualitative research approach has been followed for this research paper. In this paper depth discussion has been done on different issues regarding water pollution and water crisis, make aware about water preservation and water Conservation through School education, and holistic analysis of the present predicament of the water pollution and water crisis.

Data collection: - Data are collecting from various primary and secondary sources. Like newspaper, Article, Journal, Governmental database etc.

Data Analysis: - Data are analyzed systematically and logically and follow the proper step by step process

4. RESULT AND DISCUSSION:

OBJECTIVE-1: TO STUDY THE CAUSE AND CRISIS OF WATER POLLUTION IN 21ST CENTURY.

- **Domestic Sewage:** - Growing up of demand leads to increase domestic sewage which pollutes water each second. Domestic sewage is one of the main causes of water pollution. We dump domestic sewage into the drain, during the rainy season all the domestic sewage flows into the river and badly damage the water body.
- **Industrial water and water use:** - Every country is in a hurry for industrialization. They do not care about anything they continually make all the waste material flow to the river which causes water pollution. On the other hand, they use an excessive amount of water for their work. Which also causes for water crisis in the world. At the same time, its impact on marine life.
- **Rapidly increasing in use of pesticide:** - Due to growing population to meet the need of the people we used pesticide for high production. When this pesticide meets with water body it creates water pollution. At the same time due to lack of rain farmers use groundwater for cultivation and agricultural work which increasing the risk of water stress.
- **People awareness:** - People are not aware of the water crisis-related issue. So why they are not very serious related to this. For this result, they show irresponsible behavior. This behavior creates water stress more rapidly.
- **Over Exploitation of Ground Water:** - Recently groundwater are excessively used for irrigation in agricultural land. This condition is bringing huge trouble in the security of drinking water. Research suggests that globally we consume around 4 trillion cubic meters of fresh water in a year. Agriculture alone consumes around 75-90 percent of a region's available water.
- **Lack of Data regarding Water:** Resent research are indicated that 80 percent of the world population is exposed to high levels of threat to water security. But there are minimum data related to this issue. This phenomenon makes doubt in people's minds.
- **Rapid Increase of Demand:** - Due to rapid growth of population and demand for water create water crisis. Water use has been increasing worldwide by about 1% per year since the 1980s. This happen due to population growth, socio-economic development and changing consumption pattern increase the stress of water.
- **Climate Change:** - Climate Change and Global warming create a thread of water crisis. Because of Climate Change and global warming effect on rain falling. Lack of rain increase the thread of Water Crisis and Water Stress.

OBJECTIVE-2: TO KNOW THE PRACTICES WHICH WILL PROMOTE AWARENESS AMONG THE STUDENTS IN SCHOOL.

- **Wall writing:** - Slogans, statements, and utterances maybe use in promoting awareness on Water pollution and Water Crisis this could be carried out in the form of wall writing on walls near a playground in school where students should be able to have a view of it continuously, as well as on boundary of road where people walk often. Quotes from different environmental activists on the importance of water should be presented on the wall; that may have an influential effect on students as well as on local people's minds.
- **Drama and Art Performance:** - Drama and art performance could be performed on the theme of Water pollution and Water Crisis related issue this could be done by the pupils both in the school as well as in the community hall of

the locality. It will open the mind of the people about the danger we are facing at present and what emergencies are waiting for us in the future. It will open up the cognizance of students to show their creativity; and also to be serious about the need and concern related to Water in our daily life.

• **Textbooks on Water Preservation, Conservation, and Safe Water Mission.**

- i. Historical movement and summit and conference-related to Preservation and Conservation of Water at the national and international platform.
- ii. Include agendas of different summits and conferences for Conservation and Preservation of Water.
- iii. Government law and Policies related to Conserving Water and Protecting Water Sources.
- iv. Role of different non-governmental organizations on Water Pollution and Crisis related issues in the 21st century.
- v. Participation of all the authorities and departments that contribute in Water Conserving program.

• **Water preservation and conservation project:** - Project work can play an important role in this aspect. Through the project, students will work collaboratively and collectively this technique may emerge various creative practices among the students. So the school should come up with a Water preservation and Conservation project in the community with the help of local people. It will emphasize first-hand experiences and give maximum scope to practice of Conservation and Preservation of Water-related issue and it's important. This project will ensure a sense of awareness among the people and means to save the water bodies around the world.

• **Parents' Participation:** - Parents should be invited to different programmer at school meanwhile school should conduct Water pollution and Water Crisis related debate and discussion which will promote awareness among the parents, and at the end little bit of flexibility should be provided to parents to ask question-related on topic in their way. It will make the community more engaged with the school activities and schools' aim of spreading Water pollution and Water Crisis related awareness among the community people also gets fulfilled.

• **Education and awareness:** - Education is the panacea for a disease called illiteracy. Education is a very important instrument for change. Through proper education, we can bring awareness among the people. Education help in spreading thought and view of particular ideology. So in this regard we should work in the field of Education and bring possible changes.

• **Eco club:** - Eco-club may be a very important initiative for promoting awareness among the students and this Eco-Club may work for social benefits. School should arrange Eco Club in its premises. Where all the students may discuss environmental issues and they will suggest the best possible way to save the environment. This discussion and activity will help the young mind to save our environment.

• **Climate Change campaign:** - Climate-related campaign can be organized at the village level on a large scale. In this campaign, authority can teach people how to save climate and its origin. How can we live a sustainable life? How can we save Biotic and Abiotic elements?

OBJECTIVE: 3: TO KNOW THE CONSEQUENCES OF WATER CRISIS AND STRESS ON NORMAL LIFE.

- **Food Insecurity:** - For irrigation in agricultural land huge amount of water is required. If the required amount of water is not provided in the irrigation process it gets hamper. This effect directly on food production. Low food production increase food insecurity. Which can increase the global hunger index on a global basis.
- **Water Conflict and Migration:** - Water Crisis increases force migration. Due to a lack of water resources, people are forced to migrate. This might increase dependency on a particular area. Which is a big thread on social security.
- **Financial Instability:** - Financial stability is very much required for the smooth functioning of a country. Financial instability depends on production and consumption. So maintaining the balance between production and consumption is required. Water crisis-related issues might decrease production capacity. Which will directly impact on National GDP (Gross Domestic Product).
- **Desertification:** - Water Stress increases the thread of Desertification. African continent are living under thread for Desertification. Lack of water forces the forest area to shrink. Which is a devastating sign for Environment.
- **Damage ecology and Eco-System:** - Ecology and Ecosystem depend on water sources. If water resources get shrink then Ecology and eco-system might lose their existence. If ecology and ecosystem got disturb then the total environmental system will collapse.
- **Marine life gets affected:** - Water pollution put direct impact on marine life. Increase water pollution even might finish the existence of some flora and fauna in marine life. Which will directly affect life underwater.
- **Increase the chance of drought:** - Drought could be another phenomenon of Water Scarcity. Drought can harm many life both of plants and animals. There are many states in India which is living under the thread of Drought. Recent research data showed that 42% of India's land area is facing drought, with 6% exceptionally dry--four times the spatial extent of drought last year, according to data for the week ending March 26, 2019, from the Drought Early Warning System (DEWS), a real-time drought monitoring platform. Andhra Pradesh, Bihar, Gujarat, Jharkhand, Karnataka, Maharashtra, parts of the North-East, Rajasthan, Tamil Nadu, and Telangana are the worst

hit. These states are home to 500 million people, almost 40% of the country's population. This phenomenon is not limited to India it is the scenario of the world. MENA (Middle East and North Africa) region could face the most challenges. This phenomenon is not limited to India it is the scenario of the whole world. MENA (Middle East and North Africa) region could face most challenges.

- **Increasing Water Scarcity:** Chandigarh was the most water-stressed following by Haryana, Rajasthan, and Uttar Pradesh. Groundwater runs 94.5% of all minor irrigation schemes in India.

5. FINDINGS:

Finding of the research paper as follow-

- Human being with their activities makes water crisis and water pollution.
- Industry uses more water as well they are damaging water sources too.
- Climate Change and Global Warming are the main thread for Water Crisis.
- Lack of data about water pollution and water stress are some of the reasons for people's indifference.
- Education may be the key to deal with water pollution and water crisis.

6. RECOMMENDATIONS:

- Government should promote a nationwide Tree Plantation campaign. Can promote the thought of Rabindra Nath Tagore '**Ekti Gaach Ekti Pran**' (One tree is One life). In this regard, Kabi Guru organize **Brikho Ropan Utsab** (Tree Plantation Programme). So we need to plant trees as much as possible. Which will help in maintaining a sustainable climate and bring rain into the earth. At the same time, it will help in reducing the risk of global warming.
- Big industrialized companies should take responsibility to maintain proper rules and guidelines in their industry. The industry should change their equipments with modern one. They should use the technology which produces less pollution.
- Farmer should use bio-chemical as much as possible instead of pesticide. That will reduce the burden of water pollution. Research say that farmer are using more pesticide for high production those pesticides should be replaced with Bio-pesticides to shorten down pollution level. On the other hand, they can use river water for cultivation and agricultural work that will be very beneficial for preserving groundwater.
- Water harvesting campaigns can be improved by storing rainwater. Authorities can subsidize people for making water preserving instruments. This store water can be used for agricultural purposes for the cultivation of crops. Then we can use this water in the future as per the needs.
- Government should introduce proper policy regarding the problem related to the water crisis and should make a law, take stick action for preserving water. Government has to take a border framework for saving water and reducing the water crisis. Atal Bhujan Yojana could be one of the beat initiatives but it is needed to get implemented on a large scale. Government should organize an awareness program which will help to promote awareness among the people.
- Around the globe, many organizations are working for the Conservation and preservation of Water. But still, the effort is minimal. They should work at an individual level. In this regards the responsibility of Non-Governmental organizations is very important for promoting awareness and preserving the water resources.
- Water desalination is one of the modern technology to deal with the problem related to water crisis in this process seawater is desalinize and made it useable for normal public. But authorities should consider that the wastage of this plant should not hamper marine life.
- Sustainable Agriculture should be incorporated in the national and international level.
- Authority should need to promote Sustainable Development Goals on a large scale for promoting awareness. There are 17 sustainable development goals set by United Nation.

7. GOVERNMENT INITIATIVE FOR PROMOTING WATER CONSERVATION AND SAVE WATER CAMPAIGNS:

Government takes many initiatives to promote awareness of water pollution and the water crisis. Here some of the initiation of Government has mention-

1. Indian government launched the "JAL SHAKTI" project for promoting water conservation. Which focus five aspect-
 - i. Water conservation and rainwater harvesting.
 - ii. Renovation of traditional and other water bodies.
 - iii. Reuse of water and recharging of structures.
 - iv. Watershed development.
 - v. Intensive afforestation.
2. The government launched the "Clean Ganga" Mission for cleaning and maintaining the origin of the river Ganga.
3. Atal Bhujal Yojana one of the recent schemes which government take in this regard.

8. CONCLUSION:

Water is a very important Abiotic element and has a crucial role in the climate. We have to preserve and conserve it to build a sustainable lifestyle. Which will bring a positive environment on the earth and we should follow the guideline for it. Water preservation and Conservation related awareness through the school curriculum provides a good scope to orient for the young minds towards sustainability of the water as well as for the human existence on the planet. The school-going pupils are in the developing stage of their attitude; so it is most suitable time for teachers to groom the budding learners' build positive attitude among them. Exposed them to the knowledge of emergencies regarding water pollution and water crisis so that pupils will spontaneously start campaigning in the locality to protect water sources.

REFERENCES:

1. *NITI Aayog releases Report on the Composite Water Management Index 2.0*. Pib.gov.in. (2020). Retrieved 21 June 2020, from <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1582772>.
2. *Water Index*. Social.niti.gov.in. (2020). Retrieved 21 June 2020, from <http://www.social.niti.gov.in/water-index>.
3. *India faces the worst water crisis: NITI Aayog*. The Hindu. (2020). Retrieved 21 June 2020, from <https://www.thehindu.com/sci-tech/energy-and-environment/india-faces-worst-water-crisis-niti-aayog/article24165708.ece>.
4. Mason, C., Mason, C., & Mason, C. (2002). *Biology of freshwater pollution*. Prentice-Hall.
5. Savic, D. (2005). *Sustainable water management solutions for large cities*. IAHS Press.
6. *Water Pollution: Everything You Need to Know*. NRDC. (2020). Retrieved 21 June 2020, from <https://www.nrdc.org/stories/water-pollution-everything-you-need-know>.
7. *Water Pollution: Causes, Effects, and Solutions*. Thought Co. (2020). Retrieved 21 June 2020, from <https://www.thoughtco.com/water-pollution-causes-effects-and-solutions-1140786>.
8. *Water pollution control*. World Health Organization. (2020). Retrieved 21 June 2020, from https://www.who.int/water_sanitation_health/publications/water-pollution-control/en/.
9. *Around 42% of India's Land Area Under Drought, Worsening Farm Distress In Election Year*. Bloomberg Quint. (2021). Retrieved 4 February 2021, from <https://www.bloombergquint.com/business/around-42-indias-land-area-under-drought-worsening-farm-distress-in-election-year>.
10. *India world's 13th most water-stressed country: WRI – Civildaily*. Civildaily.com. (2021). Retrieved 1 February 2021, from <https://www.civildaily.com/news/india-worlds-13th-most-water-stressed-country-wri/>.
11. *The World Counts*. Theworldcounts.com. (2021). Retrieved 2 February 2021, from <https://www.theworldcounts.com/stories/average-daily-water-usage>.
12. Jalshakti. (2021). Retrieved 1 February 2021, from <https://jalshakti.gov.in>
13. Atal Bhujal Yojana. (2019). Retrieved 9 February 2021, from https://en.wikipedia.org/wiki/Atal_Bhujal_Yojana