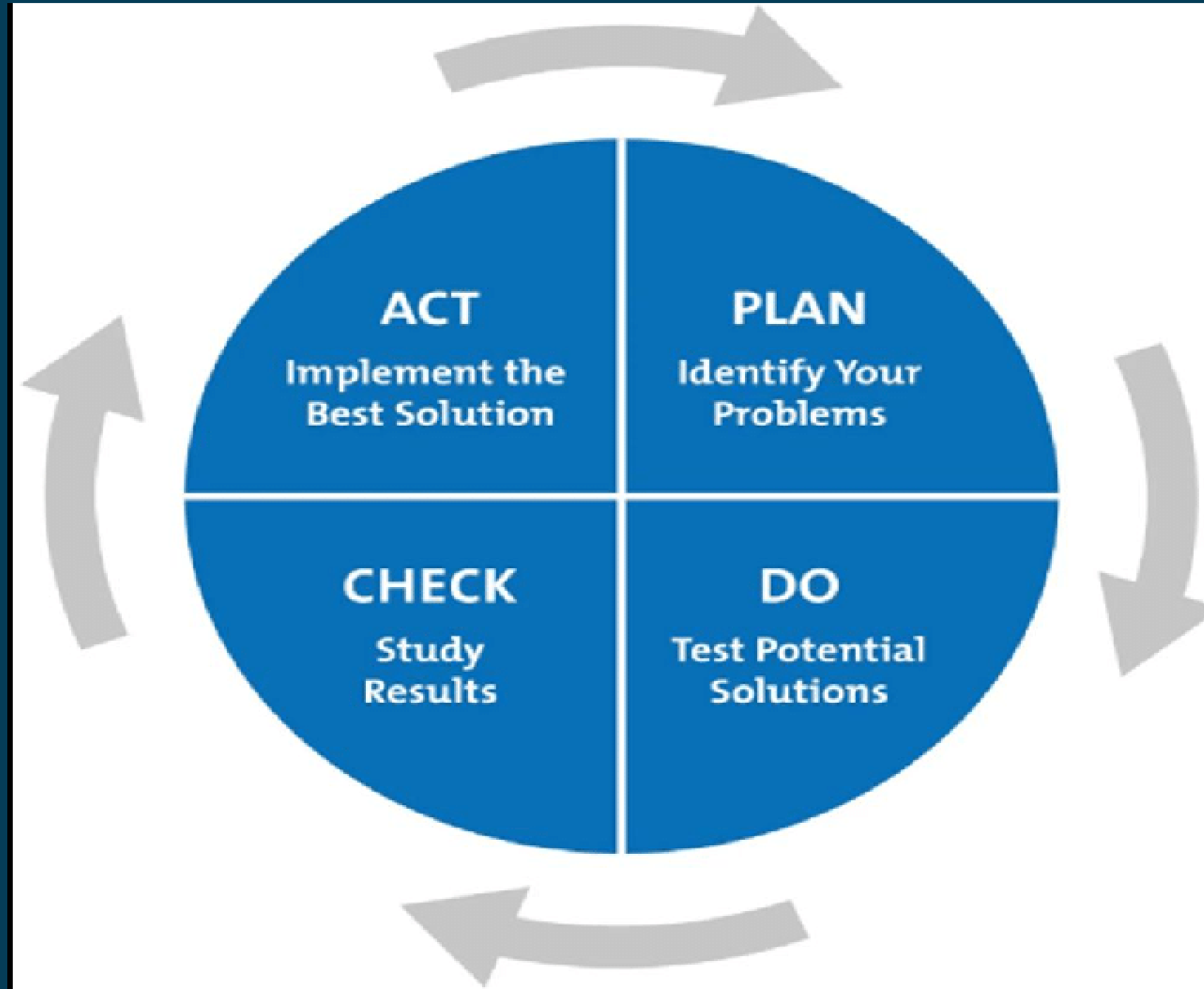


“



TIME MANAGEMENT CHART



Expected



Observed

STEPS/PDCA	Months	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July-Sept.	Oct.
PLAN	Identification of the topic										
	Approval of the theme and Literature Review										
	Finalizing the theme selection and determining the road										
	Cause and Affect Analysis-determining the main reasons										
	Sending the fishbone to Dr H.Köksal for the approval										
	Probabable solutions, preparation of data collection tools										
	Strategies, getting the approval of data collection tools										
DO	Collecting data and doing the planned activities										
CHECK	Data Analysis, Pre and post-test results										
ACT (Mid of March to end of March)	Web page and PPT design, conclusion and standard formation										
	Finalize the project, deliver the web page address/PPTs. For 2-year projects preparing the report of the 1st year.										
	Self-assessment of the team members										
ASSESSMENT (April)	Peer and judge assessment										
AWARD (Beginning of May)	Announcing award-winners and sending E-certificates										

NOTES

- New Registration period is between 1st Nov. & 1st March.
- Each team / SQC will determine the «Virtual Project Design Training» Seminar day with Dr. Köksal.
- Every month a common Zoom meeting will be conducted. Thus, every team will learn from each other.
- It is recommended to start the 2-year projects earlier.
- Web-page design and PPT preparations are recommended to start.
- Award winners will be announced on 4th October and then e-certificates will be sent through e-mails.
- WE STAND TOGETHER. COLLABORATION IS THE KEY TO IMPROVEMENT.

“

PROBLEM NUMBERS

PROBLEMS	Life after the pandemic	Paris agreement	Women's right	Improving the education system	Solving the water problem
Manya	3	2	4	5	6
Prassiddhi	4	6	2	5	7
Mishty	5	5	6	6	7
Priyanshu	3	6	4	5	6
Molli	2	3	5	4	5
Devishi	4.5	6.5	2	6	6
Amartya	4	2	3	5	6
Vanya	2	5	6	4	3
Jiyanshi	3	2	4	5	6
Giri	6	5	6	2	7
Total	36.5	42.5	42	47	59

The Problem



**How would we
solve the water
problem as the
future leaders of
the world?**

WHY DID WE CHOOSE THIS PROBLEM?

Water, one of the most essential resources of the Earth, is indispensable for all life. One cannot live without it, regardless of how wealthy one is. Water helps perform essential life processes in all organisms, and has a major presence everywhere from home to industry. But extremely unfortunately, this precious resource is critically endangered. Irresponsible exploitation and unconstrained contamination by human beings has wrecked water scarcity and manifold water problems.

A quarter of the world's population faces high levels of water stress and lack water for satisfying their basic needs. Water contamination has threatened the survival of several aquatic animals. Depletion of water has caused crop failure and caused detriment to tree cover around the world. If this trend continues, then greenery should disappear soon and be replaced by deserts all over. If the situation is not brought under control then wars might very well be fought for water.

Now is the time for the humanity to respond to the wake up calls of nature and take immediate action to solve the global water crisis. Else, this entire planet shall be heading for an impending apocalypse. Hence we the Aqua Strategists, as the future leaders of this world, see devising pertinent solutions to overcome this crisis as our utmost responsibility.

MAIN CAUSES OF THE PROBLEM

■ ENVIRONMENT

Climate change is disrupting weather patterns, leading to extreme weather events, unpredictable water availability, exacerbating water scarcity and contaminating water supplies. Such impacts can drastically affect the quantity and quality of water.

■ HUMAN BEHAVIOUR

Our water resources face a host of serious threats, all of which are caused primarily by human activity. They include sedimentation, pollution, climate change, deforestation, landscape changes, and urban growth.

■ **ECONOMIC FACTORS**

The consumption rate of water is directly dependent upon the economic status of the consumers. Rich and upper class people generally consume more water due to their better standard of living.

■ **POLLUTION**

Water pollution happens when toxic substances enter water bodies such as lakes, rivers, oceans and so on, getting dissolved in them, lying suspended in the water or depositing on the bed. This degrades the quality of water.

■ URBANISATION AND INDUSTRIALISATION

Large industrial houses consume very much water from the river ocean and other water resources for making raw material into finishing goods and dirty water is directly thrown into the river or ocean.

Most of our cities overpopulated in urban areas. overpopulation leads to overutilization of water and dirty that water resource.

LITERATURE REVIEWS

Plastic Pollution in the World's Oceans: More than 5 Trillion Plastic Pieces Weighing over 250,000 Tons Afloat at Sea

**Marcus Eriksen,
Laurent C. M.
Lebreton, Henry S.
Carson, Martin Thiel,
Charles J. Moore, Jose
C. Borerro, Francois
Galgani, Peter G. Ryan,
Julia Reisser**

2014

In 2014, the researchers conducted a quantitative research to estimate the total number and weight of plastic particles floating in the world's oceans from 24 expeditions (2007–2013) across all five sub-tropical gyres, costal Australia, Bay of Bengal and the Mediterranean Sea. The researchers collected samples from these seas and oceans, and analyzed them by using various scientific techniques. They also carried out visual survey transects of large plastic debris. The study found that at least 5.25 trillion plastic particles weighing 268,940 tons were floating at sea. It also stated that the Northern Hemisphere Ocean regions contain 55.6% of particles and 56.8% of plastic mass compared to the Southern Hemisphere, with the North Pacific containing 37.9% and 35.8% by particle count and mass, respectively. Another key finding of the study is that in the Southern Hemisphere the Indian Ocean appears to have a greater particle count and weight than the South Atlantic and South Pacific oceans combined. One major drawback of this research is that it does not quote many solutions to solve the issue of severe plastic pollution.

Endangered Water Spread Area: A Case - Study in Kiliyar Sub - basin in Palar River Basin, Tamil Nadu, India Using Remote Sensing and GIS

**A Jayaseelan, L
Kalpana, G Ravi, S.P.
Mohan**

2014

The researchers conducted a quantitative research to assess the changes that have occurred in water spread areas of Kiliyar sub-basin of Palar river basin, Tamil Nadu. The purpose of this exercise was identifying the influence of expanding urbanisation and understanding the transition of common property resources (such as surface water bodies) into private property. Open source softwares were used for studying geospatial processes, while GIS and Remote Sensing techniques were used to prepare thematic maps, base map, and drainage map (for years 1973 and 2014). The study showed a 6.19% reduction of surface water bodies between the span of 39 years. Growing population and developments in the field of real estate were recognised as major causes. It concluded that in the issue regarding surface water bodies, the government is as much responsible as private agencies in terms of visionary policy formulation, legislation, and implementation. A shortcoming with this research is that it did not involve or interview the local population of the area, and did not take their position into account.

Informal Water Markets and Willingness to Pay for Water : A Case Study of the Urban Poor in Chennai City, India

L. Venkatachalam
2014

L. Venkatachalam, the researcher conducted a quantitative research to analyze the role of informal water markets in fulfilling the water requirements of poorer households in Chennai. The research targeted the population of Chennai, and laid special emphasis on urban poor households. The researcher conducted field visits, and interviewed local political leaders on the basis of which 302 households were selected using stratified random sampling. The study described the important role of informal water markets in fulfilling poor households' drinking water requirements. It suggested the government agencies to make adequate efforts to improve the public supply that would satisfy the poor, and emphasized the need for appropriate governmental regulation on informal water markets to ensure fairness. The study used stratified random sampling, which usually makes the statistical enquiry time consuming and tedious, and also makes evaluating results difficult.

Ground Water Arsenic Contamination: A Local Survey in India

Arun Kumar, Md. Samiur Rahman, Md. Asif Iqubal, Mohammad Ali, Pintoo Kumar Niraj, Gautam Anand, Prabhat Kumar, Abhinav, Ashok Kumar Ghosh

2016

In 2016, the researchers conducted a quantitative research to analyze arsenic poisoning contamination in the ground water and its impact on the health of the village population residing in middle Gangetic plains. The research targeted Simri village of Buxar district, a major flood plain region of the Ganges. 322 water samples were collected for arsenic estimation by using scientific techniques. Additionally, a survey was conducted utilizing a questionnaire method in order to estimate the per capita consumption of drinking water through hand pumps by the village people. The research found high prevalence of arsenic contamination in ground water, and concluded that the village people of Simri village are at very high risk as they are consuming drinking water having high-arsenic concentration. It called for an immediate proper strategy to cater the health-related problems caused by arsenic poisoning. This study does not give solutions to the problem of arsenic contamination in ground water, which is a considerable drawback.

Assessing the Impact of Oil Spills on Marine Organisms

Deng Yuewen, and Linda Adzigbl

2018

Deng Yuewen and Linda Adzigbli, the researchers, conducted a qualitative research to review the lasting impacts of oil spills on marine organisms and possible remediation methods. The researchers collected information from various previously conducted researches, previously authored reports, and other sources. This information was then compiled and written in the main paper. The study found that oil spills have several adverse impacts on vertebrates (animals such as fish, birds, mammals, and turtles), and may lead to impaired reproduction, developmental defects, respiratory diseases, impaired immunity, tumor growth, liver and lung disease, and sensory inhibition. The impact of oil spills on invertebrates (animals such as crustacean, mollusks, echinoderms, and polychaetes) is not certain. However, it was projected that oil spills may have lethal or sub-lethal impact on the latter as well. The research emphasized the need of developing improved ways and response plan considering the overall environmental benefits and risks to the marine ecosystem. This research would have been better had it been quantitative in nature, and the authors would have collected the data on their own with the help of research tools.

Water Quality Assessment Using Overall index of Pollution in Riverbed-mining Area of Ganga-River Haridwar, India

**Nitin Kamboj &
Vishal Kamboj
2019**

Nitin Kamboj and Vishal Kamboj conducted a quantitative research to study the impact of mining activities on the water of the Ganges river in Haridwar, India. The research targeted the religious city of Haridwar in the Uttarakhand state of India. Several water samples were collected and 24 samplings were collected. Surface water quality was analyzed in the laboratory by using various scientific instruments. The study found that the river water was most polluted during the monsoon season, slightly less polluted during the summer season, and the least polluted during the winter season. The water quality of the Ganga River recorded more pollution in monsoon season because of the high turbid runoff discharge in Ganga River as compared to summer and winter seasons. It noted that the water was unfit for drinking in the monsoon season. It was concluded that the riverbed mining practice had a negative influence on the surface water quality of the Ganga River in the selected region, and hence should be given special attention to maintain ecological sustainability. A shortcoming of this research is that it does not state many solutions to the problem.

Wetland Distribution Trends in Central Asia

**Nora Tesch & Niels
Thevs
2020**

Nora Tesch and Niels Thevs, the researchers, conducted a quantitative research to examine wetlands in Central Asia, and fulfill the gap of lacking information about the spatial distribution of wetlands in Central Asia. The researchers used remote sensing technology and also conducted field work. Several wetlands were studied such as those in Kyrgyzstan and Kazakhstan. A drawback of this research is that search methods were not adequate to provide satisfying results for the classification of wetlands in the northern part of the study area, i.e. northern Kazakhstan. Moreover, the study did not present any solutions for mitigating the decrease in wetlands.

Shape of a Water Crisis: Practitioner Perspectives on Urban Water Scarcity and 'Day Zero' in South Africa

**Zachary Bischoff-
Mattson, Gilian Maree,
Coleen Vogel, Amanda
Lynch, David Olivier, and
Deon Terblanche**

2020

In 2020, the researchers conducted a quantitative research to examine the structure and content of perspectives on urban water scarcity among South African water management practitioners. The researchers employed the Q method, and used an online survey tool to lead participants anonymously through the process of mapping their viewpoint by responding to a series of 23 statements pertaining to urban water scarcity in urban South Africa. Participants were identified according to a semi-targeted sampling method, and the participants were encouraged to share a link to the survey with their colleagues. The research found poor leadership and corruption, inter-governmental co-ordination failures, and urban population growth to be significant barriers to effective water management, especially in times of scarcity. The researchers stressed upon the need of ensuring trust and engagement (integrity and transparency, stakeholder engagement, and reliable monitoring and evaluation) and effectiveness (clear roles and responsibilities, policy coherence, and functional inter-agency and inter-governmental relations). The authors did not establish a mechanism to validate and establish the credibility of the testimonies of those who participated in the survey, which is a considerable shortcoming.

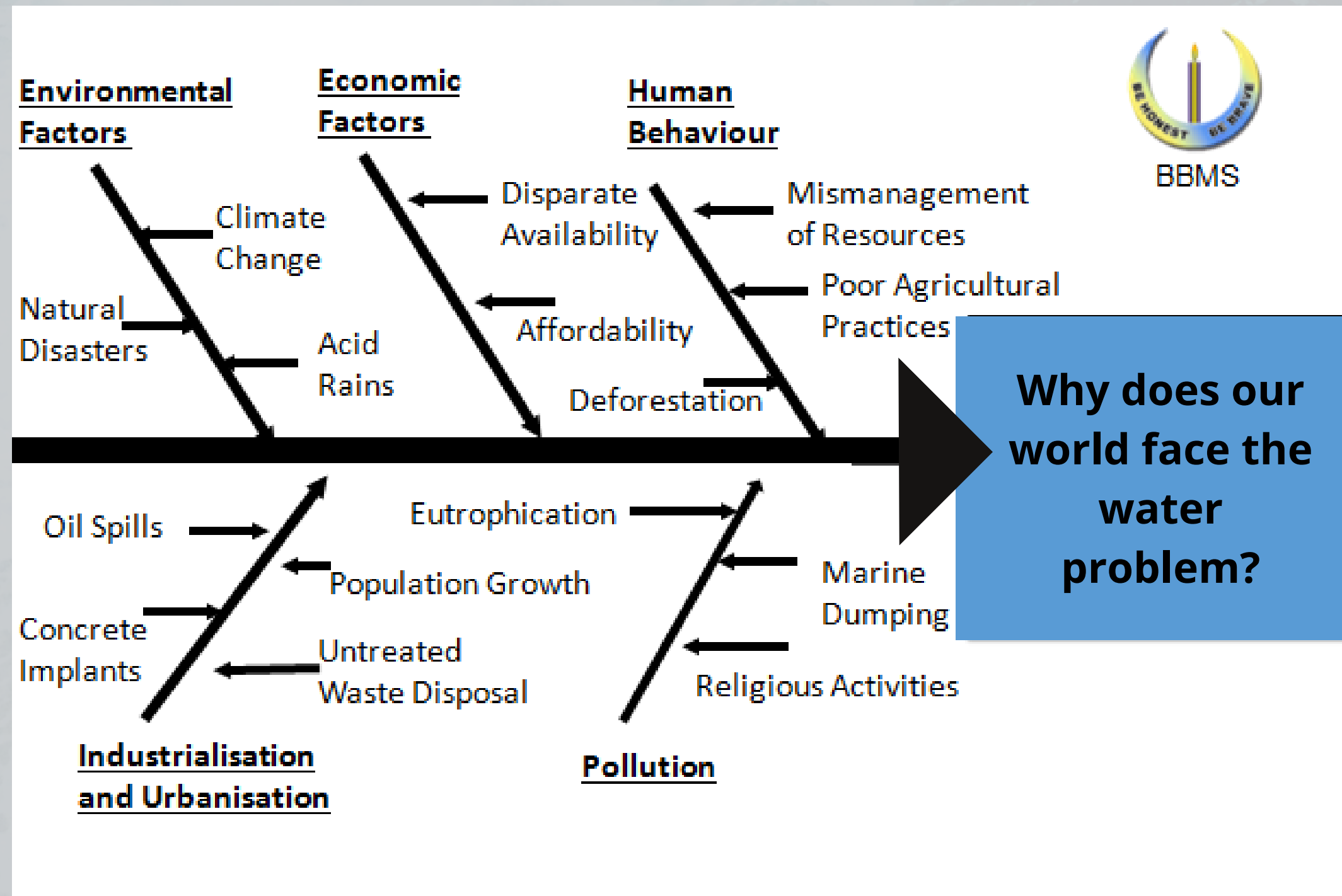
Understanding Water Use Conflicts to Advance Collaborative Planning: Lessons Learned from Lake Diefenbaker, Canada

**Jania S. Chilima, Jill
Blakley, Harry P.
Diaz, Lalita Bhardwaj**

2021

The researchers conducted a quantitative cum qualitative research to explore the conflicts around the use of multi-purpose water uses of Lake Diefenbaker (LD) in Saskatchewan, Canada. Through this research, the researchers sought to find ways for advancing collaborative planning as a means for improving the current water governance and management of the lake. A methodology that employed a wide participatory approach was used to collect data from 92 individuals. These individuals are part of a normative community of water users. A total of nineteen (19) focus groups and two (2) interviews were conducted with ninety-two (92) member community of water users in the LD region. Individuals had several conflicting views in seven areas, namely: (a) irrigational usage, (b) industrial usage, (c) recreational usage, (d) reservoir water level for flood control and hydroelectricity production, (e) fish farm operation, (f) regional water development projects, and (g) wastewater and lagoon management. The research suggested making improvements in water allocation and regulatory instruments, and developing a comprehensive LD water use master plan, as a shared vision to improve participation in governance. The research would have been more fruitful had the researchers laid down some guidelines for developing a master plan, and suggested ways for improving participation in governance.

THE FISH-BONE DIAGRAM



■ Environmental Factors

Water shortages may be caused by climate change, such as altered weather patterns including droughts or floods, increased pollution, and increased human demand and overuse of water.

■ Human Behaviour

Human activity is a major cause of water scarcity due to the use of fossil fuels that alter climate and weather activity, as well as the rapid increase in global population consuming more water. In order to provide for a growing population, dams and irrigation systems are built to supply fresh water to remote areas.

■ Economic Factors

Economic water scarcity is caused by a lack of investment in infrastructure or technology to draw water from rivers, aquifers, or other water sources, or insufficient human capacity to satisfy the demand for water.

■ Industrialisation and Urbanisation

The establishment of various industries has resulted in the further exploitation of water resources. Industries use water in large quantities. This has degraded the quality of water and has resulted in water scarcity.

■ Pollution

Water pollution may result in severe water scarcity for people who rely on those water bodies for the water supply.

The Health Crisis

Water borne
Diseases

Diseases causing
genetic
abnormalities

Damage to biodiversity

Food Chain
Deterioration

Other lethal Diseases

Threat to the
Marine life

Population Imbalance of
the fauna

WHY WE MUST SOLVE THE
WATER CRISIS?

Groundwater
Depletion

Disharmony

Domestic Issues

Poverty

Water Divide

Education

Global Issues

Peace

Climate Crisis

■ Global Issues

Water problems cause intense international conflicts (such as the water conflict among Turkey, Syria, and Iraq over the Euphrates-Tigris basin; the international dispute over the Nile basin; and water disputes between Iran and Afghanistan). Water problems can also deter the global advancement in education and poverty eradication by afflicting the well being of people across the globe.

■ Domestic Issues

Water scarcity leads to intra-national conflicts (like India's Cauvery water dispute, Canada's Lake Diefenbaker conflict, and Yemen's water conflict etc.) Water problems often induce a water divide between a country's rich and poor, further widening the socio-economic divide. Groundwater depletion diminishes the domestic water reserves and may result in severe nationwide droughts and famines.

■ Damage to Biodiversity

Industrial pollution, plastic pollution, eutrophication, and oil spills inflict severe detriment on aquatic life. Eutrophication produces a large amount of carbon dioxide thus acidifying the ocean. Discharge of hot water and other pollutants from industries threaten the survival of aquatic life, oil spills cause severe diseases to marine animals, and plastic pollution critically endangers animals such as sea turtles.

■ Health Crisis

Contamination of water by metals and oil spills can cause several lethal diseases and ailments (such as cardiovascular disorders, neuronal damages, renal injuries, cancer, and diabetes) in human beings. Additionally, consumption of polluted water can lead to genetic impairment and several water borne diseases.

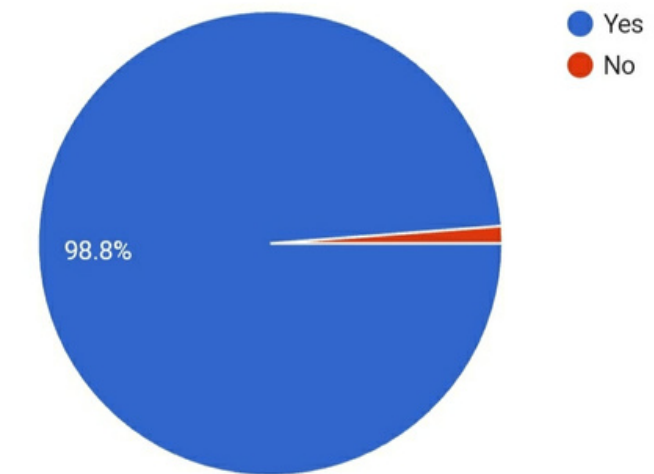
PLAN

Data Collection



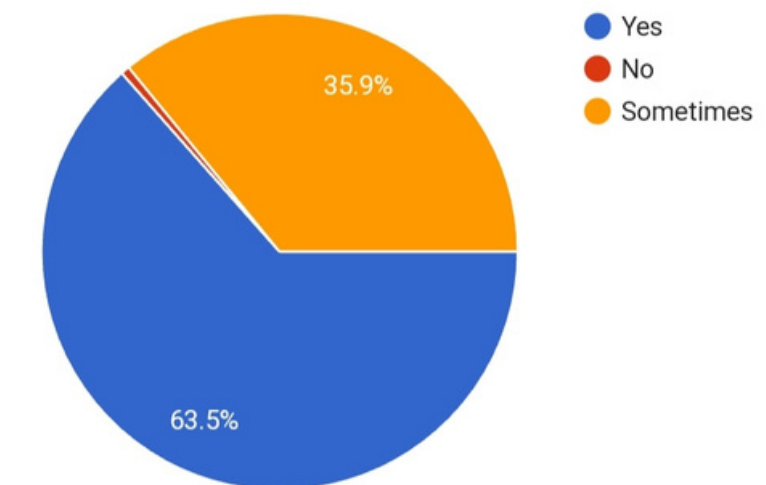
Are you aware of the water crisis
faced by the world today?

167 responses



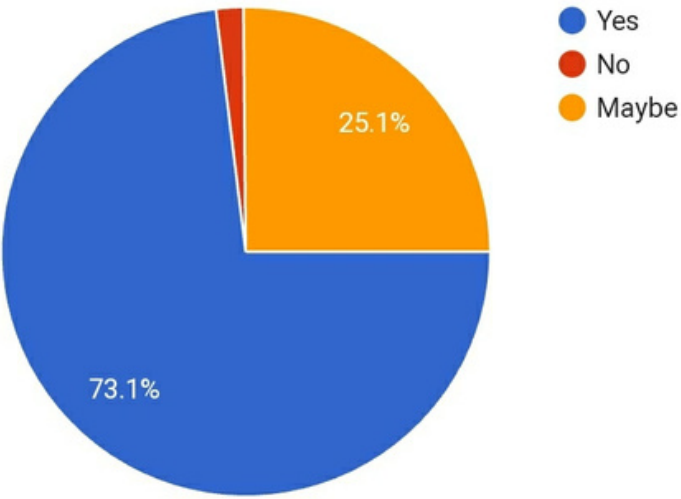
Do you play your part in
conserving water?

167 responses



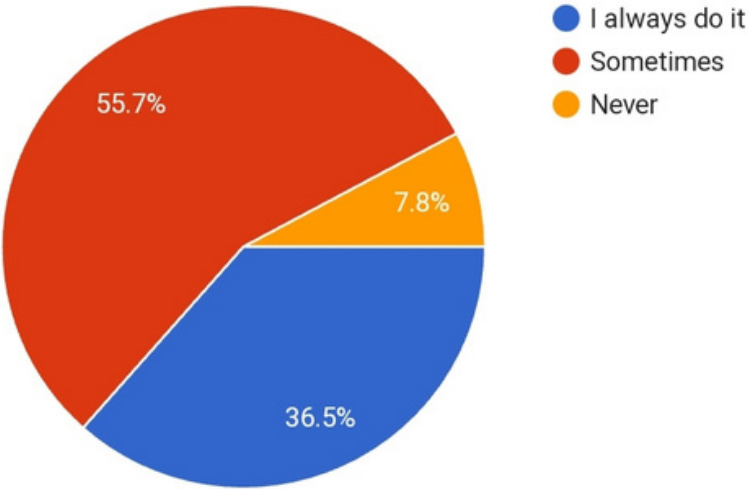
If the government imposes harsh rules on the use of water for the sake of water conservation, would you be ready to cooperate?

167 responses



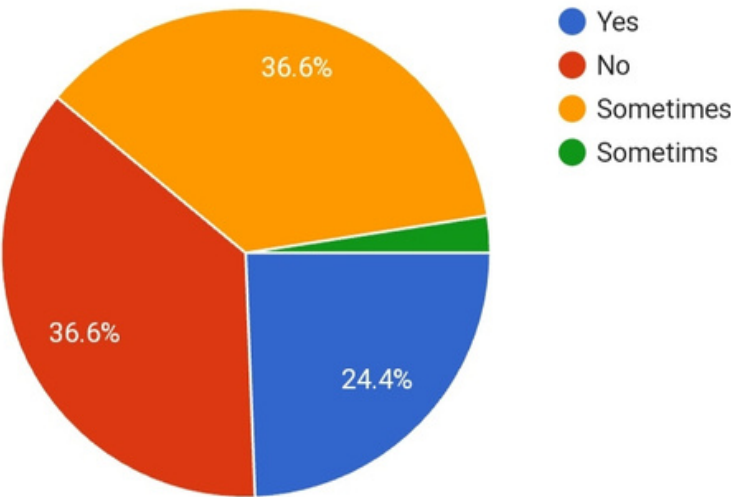
Have you ever tried to educate more people about the existing water problem in your country?

167 responses



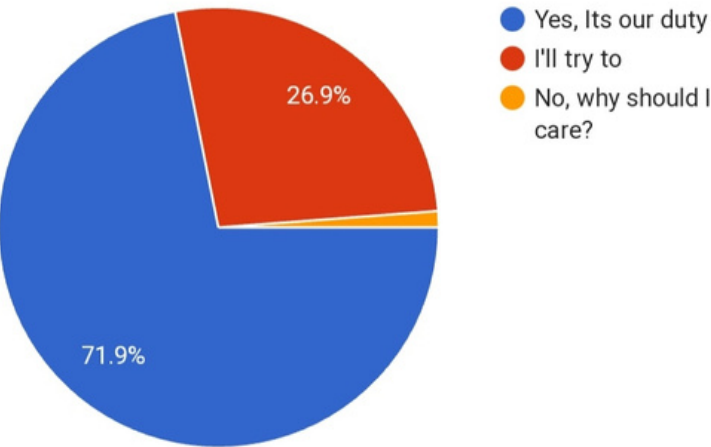
Do you face any problem regarding the management of your community water resources?

164 responses



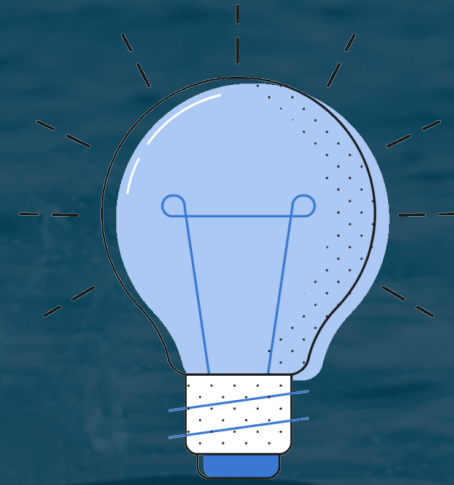
Do you ensure to take care and make other people aware of not wasting water?

167 responses



SOLUTIONS

- **Education policies to include courses that impart sensitivity towards water crisis, starting from the primary level.**
- **Trying to implement rainwater harvesting on a domestic level, while reusing the water to the extent we can.**
- **Usage of smart appliances like sensory water taps and waterless urinals.**



STRATEGIES

Imparting a compulsory subject in the primary level of education that teaches environmental sensitivity and involves children in indoor and outdoor activities.

How we plan to implement it:

Step one: Select a group of students from our school randomly (of mixed age groups) .

Step two: Quiz them on the topic of water conservation.


Step three: Apprise them about the water crisis and it's solutions through fun activities and workshops for a week.

Step four: Again take the same quiz.

Step five: Compare the results

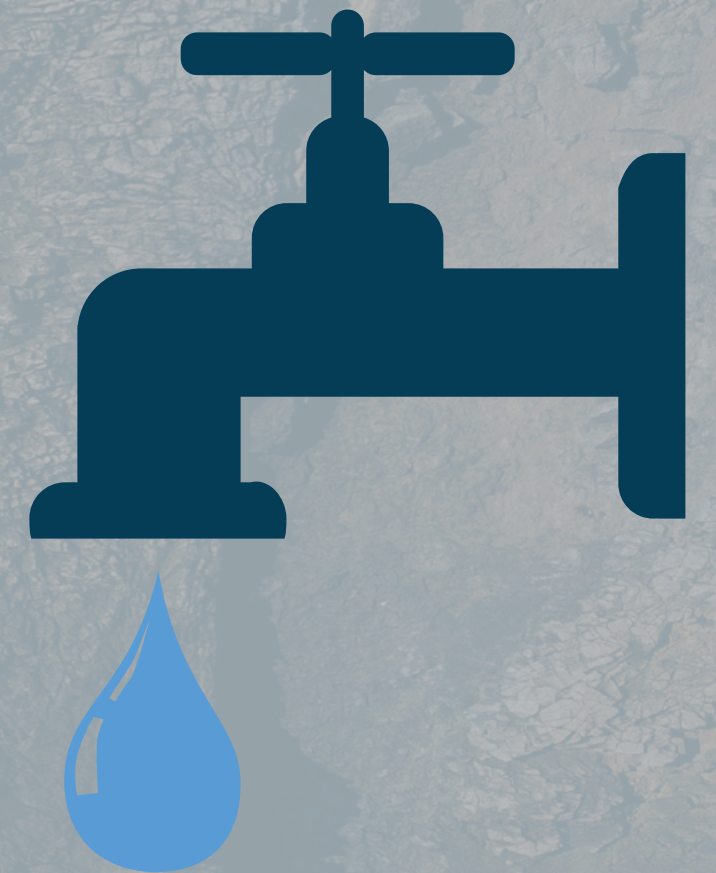
We would consider our solution successful if we are able to increase the accuracy of the quiz by 40 - 50% and are able to induce water sensitivity in the children



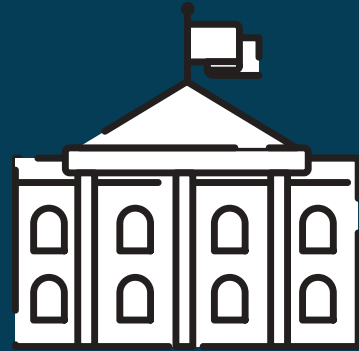


Compulsion to install a rainwater harvesting system while building any new building. Just like it was implemented successfully in Tamil Nadu. In 2003, the state government's order mandated that all buildings in Tamil Nadu fix rainwater harvesting structures immediately and store water.

Installing waterless urinals and sensory water taps in the public washrooms and making them affordable for domestic purposes by encouraging the people having new ideas to create environment friendly appliances. Like the Peeschute by Siddhant Tawarawala which uses a waterless technology for urination, which is easy to use and affordable.



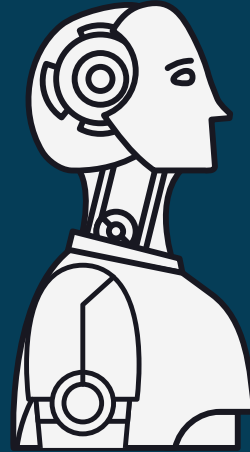
Some other suggestions



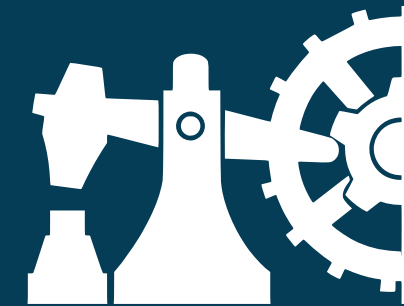
Government
Initiatives



Awareness



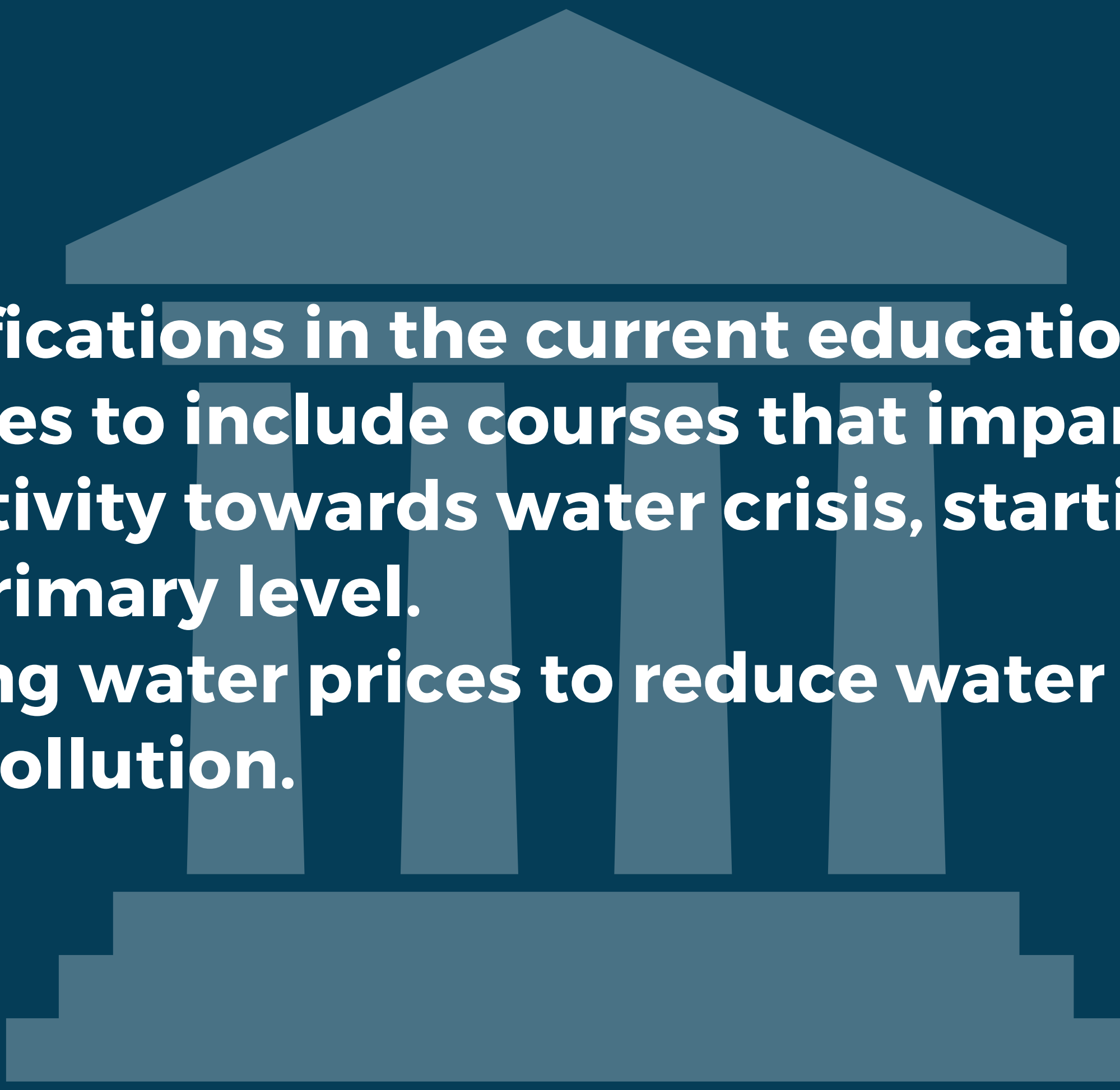
Science and
Technology



Industrial Reforms

Government Initiatives

- **Formation of government agencies to ensure the application of schemes and programs to manage water, frame policies to ensure better coordination among governmental agencies.**
- **Investment in Science and technology for creating environment friendly technology at affordable prices, with special emphasis on agriculture and farming as they consume the majority of the water.**

- 
- **Modifications in the current education policies to include courses that impart sensitivity towards water crisis, starting from the primary level.**
 - **Raising water prices to reduce water wastage and pollution.**

Awareness

Public:

- **Adopt a river bank: Motivating societies to adopt river banks in their vicinity, to imbibe a collective culture in the societies, and to ensure the proper management and sanitation of these water bodies.**

Community:

- **Self-Help Groups: Promotion of SHGs in rural areas to involve the group in our fight against the water crisis.**
- **Imparting the idea of water conservation and sensitivity through legends and cultural references, as people are emotionally attached to their mythological beliefs.**

Individual:

- **Planting saplings like Cattails, Bulrush, Citronella, Canna Indica, Hibiscus, Fountain grass, flowering herbs, Tulsi and Ashwagandha, that are known to purify water.**

Science and Technology

- Upgrading the water purifying systems by introducing solar desalination, which majorly relies on natural renewable sources of energy.

Industrial Reforms

- **Treatment of the chemical waste generated by industries before disposing into water bodies to prevent water contamination, and safeguard water life.**
- **Operate sewage treatment plants while pursuing partnerships with clean energy producers to use wastewater to fertilise algae and other biofuel crops.**

An aerial photograph of a rugged coastline. Dark, turbulent waves are crashing against a rocky shore, creating white foam. The rocks are dark and jagged, with some areas appearing more eroded. The overall tone is dark and dramatic, with the white foam of the waves providing a stark contrast.

STRATEGIES FOR THESE SOLUTIONS

An aerial photograph of a dense forest, showing a mix of green and brown tree canopies. A large, dark blue semi-transparent rectangle is centered over the image, serving as a background for the text.

GOVERNMENT INITIATIVES



Creating an independent body for each state to monitor the implementations of government created schemes and initiatives as there are a number of schemes created to conserve water at different levels but are being poorly implemented.

The background of the image is a close-up, high-angle shot of water with a textured, rippling surface. The water is a deep teal or dark blue color. Overlaid on this background is a large, solid, dark teal rectangle that covers the central portion of the image. The word "AWARENESS" is written in white, bold, uppercase letters across the center of this rectangle.

AWARENESS

Adopting a river bank: Motivating societies to adopt river banks in their vicinity, to imbibe a collective culture in the societies, and to ensure the proper management and sanitation of these water bodies. Creating a volunteer based program for involving the community into the cause. Retired government officers can lead these teams as they have the understanding and the contacts. The motive of these teams would be to make decisions for the maintenance and activities they want to do on their adopted river banks.



Promotion of SHGs in rural areas to involve the group in our fight against the water crisis. A SHG is a community-based group with 12-25 members. Members are usually from similar social and economic backgrounds, all voluntarily coming together to save small sums of money, on a regular basis. Encouraging the people residing in villages and cities facing water scarcity to form these groups not just for financial purposes but for social causes. They can propagate awareness in their villages regarding practises like rain water harvesting.



Imparting the idea of water sensitivity through light and sound shows , theatre and plays.

How we plan to implement it:

Step one: Prepare a play on on water conservation.

Step two: Present it in an assembly.

Step three: Compare the pre and post quiz results (similar to the previous one).

We would consider our solution successful if we are able to increase the accuracy of the quiz by 40 - 50% and are able to induce water sensitivity in the children





SCIENCE AND TECHNOLOGY



INDUSTRIAL REFORMS

The independent body (ref: slide35) would be responsible to supervise the treatment of industrial waste being treated before the disposal into the water bodies through audits. They would also have to present proper reports and fine the factories not following the rules.

