



Unnat Bharat Abhiyan Webinar on Water Security in Hilly Areas

28th MAY 2020

PREPARED BY

Indian Institute of Technology Delhi,
National Coordinating Institute - Unnat Bharat Abhiyan



IIT Delhi, the National Coordinating Institute of MHRD's flagship programme Unnat Bharat Abhiyan, organized a Web Seminar on **28th May 2020**. The seminar was conducted by the experts of **Department of Water Resources Development and Management - IIT Roorkee (Regional Coordinating Institute (RCI, UBA))** through the Cisco Webex virtual meeting platform from **3:00 PM to 4:30 PM**.

In view of the rapid increase in population, urbanization, and industrialization, the demand for water for meeting various requirements is continuously increasing. Since water management is a composite area with linkage to various sectors of Indian economy including the agricultural, industrial, domestic and household, power, environment, fisheries and transportation sector, this UBA webinar was centralized on the fact that water resources management practices should be based on increasing the water supply and managing the water demand under the stressed water availability conditions, specifically seeing the critical scenarios in the hilly areas of the nation.

The purpose of this webinar was to encourage the **Participating Institutions of Unnat Bharat Abhiyan** present in the hilly regions to address relevant issues pertaining to the development and management of water resources in India through sustainable technologies. The role of water conservation, water harvesting and water management in the Himalayan region was broadly discussed in this web seminar. The experts also discussed how to prevent water contamination from Coronavirus during COVID-19 crisis. The seminar included the presentations by famous researchers, and innovators across this field followed by an interactive question and answer session.

The inaugural session was addressed by **Prof. Ajit K. Chaturvedi** (Director, IIT Roorkee). It session continued with an address by **Prof. M. Parida** (Deputy Director, IIT Roorkee), and Prof. M.L. Kansal (Head, WRDM, IIT Roorkee).

The major areas covered during this session were -

1. **Water Security & Indian Himalayan Region (IHR)** by *Prof. Ashish Pandey (Regional Coordinator, UBA-RCI, IIT Roorkee)*
2. **Nature-Based Solutions for Water Security in Hilly Areas** by *Padma Bhushan Dr. Anil P. Joshi (Founder, HESCO)*
3. **Issues of Safe & Adequate Drinking Water under COVID-19 for Hilly Rural Areas** by *Prof. M.L. Kansal (Head, WRDM, IIT Roorkee)*

Prof. Vivek Kumar congratulated everyone on successful completion of the webinar and proclaimed all the experts as **Jal ke Sipahi**. He also encouraged everyone to be Jal ke Sipahi and contribute to the nation's prosperity.

The webinar was attended by **159 Coordinators** of the Participating Institutes of **12 hilly States/UTs** (Arunachal Pradesh, Assam, Himachal Pradesh, Jammu & Kashmir, Manipur, Meghalaya, Mizoram, Nagaland, Puducherry, Sikkim, Tripura, Uttarakhand, etc.) and field experts from across the nation.

Issues of Safe & Adequate Drinking Water under COVID-19 for Hilly Rural Areas



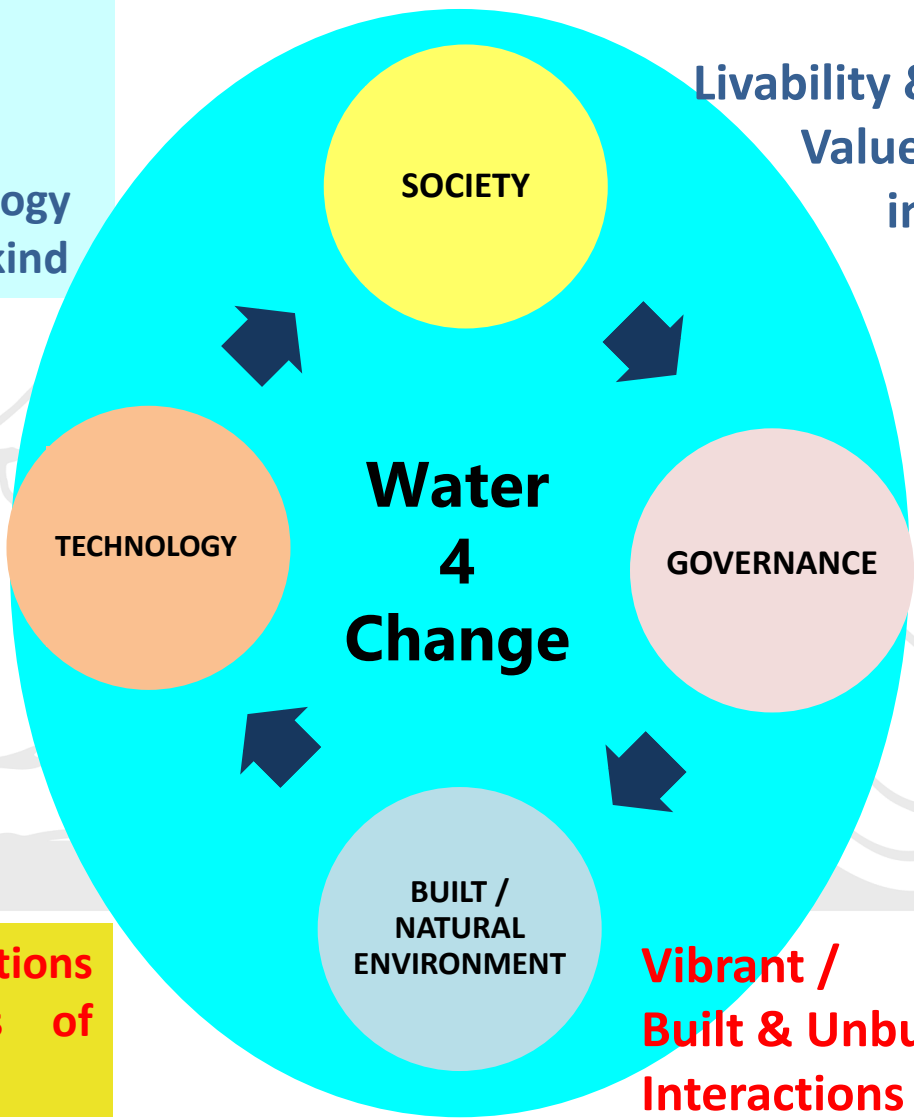
M. L. KANSAL
Professor & Head

May 2020



Water 4 Change

Synergic Relationship among Society, Governance, Build Environment & Technology from the dawn of mankind



Livability & Health
Value Change
in Society

Political/Administrative
System Thinking
Resource
Management/
Economics

Vibrant /
Built & Unbuilt
Interactions

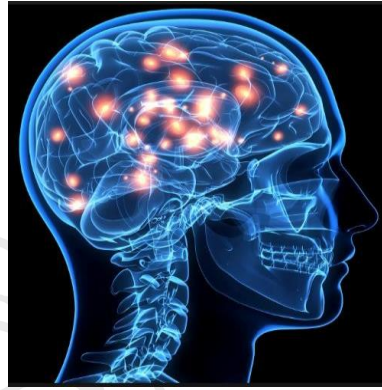
Technology
Transfer & Sharing
Appropriate &
Economical

World over, civilizations flourished on banks of waterbodies.

Importance of Water



60% of our body by wt.



73% of our brain



90% of our blood

While one can go at most **a month** without food



Our body can not survive even for **a week** without water

Background Issues

- **Water & Health** are inter-linked;
- Per capita income is increasing but per capita water availability is reducing (**India about 1400 m³ less than 1700 m³ hence water stressed**).
- Water is a universal solvent – Good for living being growth at the same time it works as carrier of pollutants (chemicals, toxic as well as bacteria, virus and protozoa).
- **Safe & Adequate** Drinking Water to all are the key issue.
- Supply & Demand are **inversely correlated**;
- Water a basic necessity of life as well as it is an economic good. Also, it is a State subject & hence the inter-state issues
- 6 % of GDP goes in WR still **accessibility, efficiency, equity** and **affordability** are the issues
- **Hilly & isolated areas** have different type of problems as compare to urban areas.

World Water Scenario



2.7 billion



Water Water Everywhere, Not a Drop to Drink!!

(only **0.007 %** of the planet's water for **7.8 billion** people.)

2.4 billion

are exposed to diseases, such as cholera and other water borne illnesses.

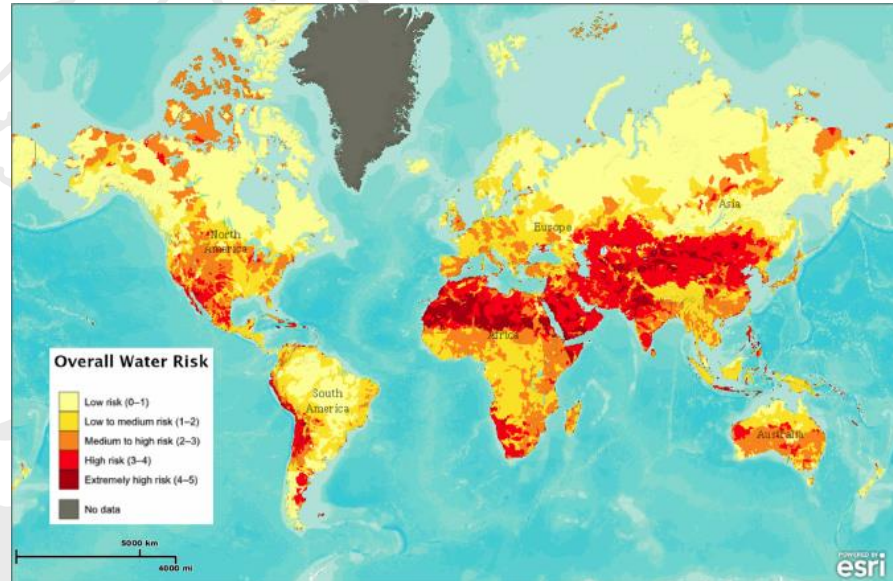


face **water scarcity** for at least **one month** of the year

1.1 billion



1 in 6 people **lack access** to clean water



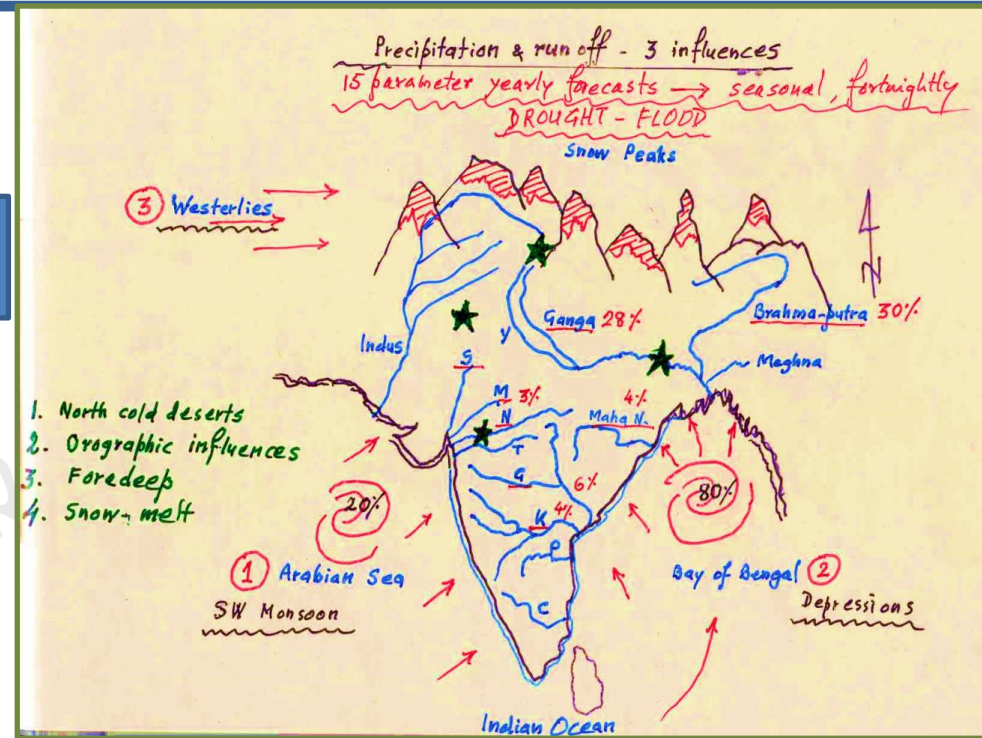
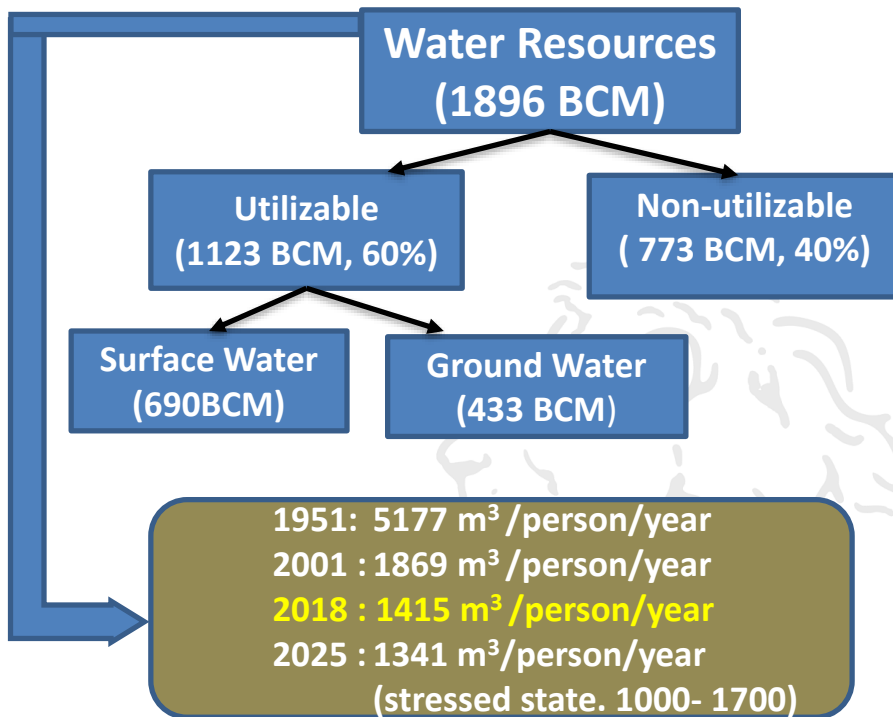
Water scarcity in Ethiopia

2 million

Children die each year from **diarrheal disease alone**

Water Resources in India

(www.cwc.nic.in)



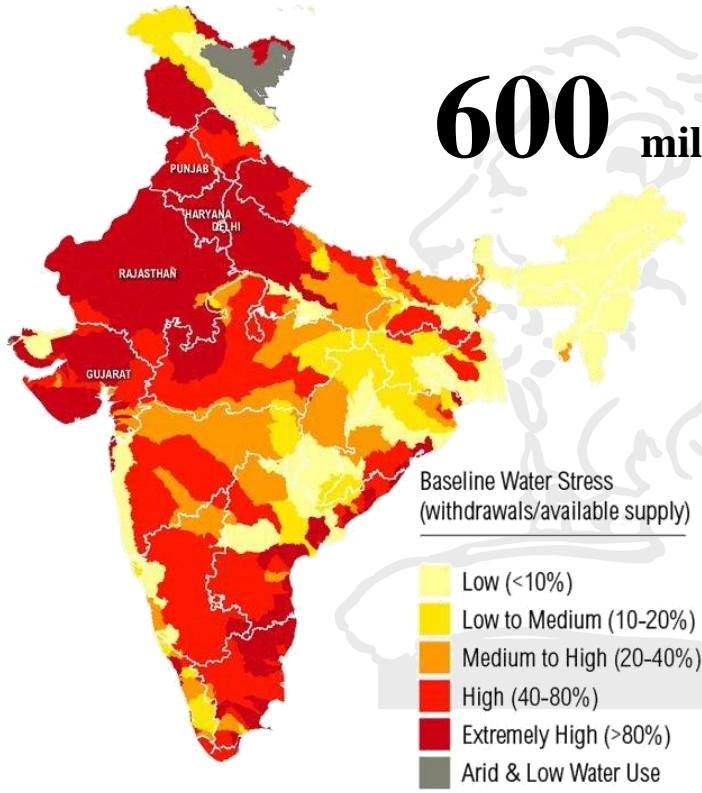
- ✓ **4% of fresh WR & Non Uniform.**
- ✓ Rainfall 100-12000 mm
- ✓ Annual Avg. 1190 mm
- ✓ 67% available in Indo Gangetic plain
- ✓ Balance 33% in remaining geographical area.
- ✓ **85% population is dependent on GW as drinking water source.**

- ✓ Highly Uneven in Space and Time
- ✓ Brahmaputra - Barak - Ganga System accounts for about 60% of total surface water resources
- ✓ Western and Southern regions experience severe deficit in water availability

Indian Water Scenario



India - world's second largest population but only **4% potable water**



600 million



People face **high to extreme water stress**

163 million

People **lack access** to clean water

0.1 million

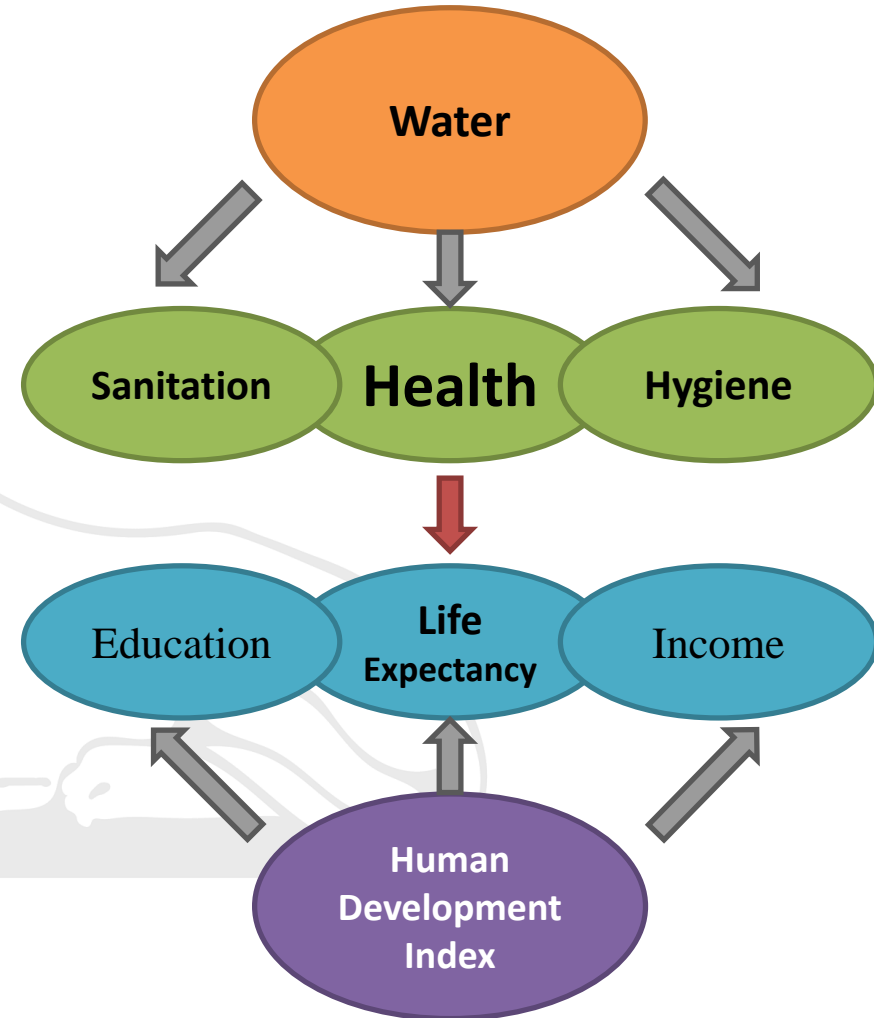
Children die of **diarrhea** annually

Human Development Index (HDI)

India's HDI is **0.640** and its rank in the world is **129th** among **189** (**Medium**)

WASH an important component that affects the HDI.

- 80 % of all diseases and 1/10 of each person's productive time goes in getting freshwater.
- 1/3 of deaths in developing countries.



Importance of WASH under COVID-19 Pandemic

- COVID-19 – a virus – transmits fast from one person to another.
- Mainly air-borne/ through water droplets.
- Water can be a potential carrier ?? (needs research). Hence need special attention.
- **WASH** maintains public health and hence plays active role in reducing the spread of Covid-19.
- Issues involved are :

[Safe & Adequate Water Availability,](#)

[Water Contamination & Disinfection](#)

[Hand Washing & Sanitization](#)

[Sanitation facilities](#)

[Hygiene](#)

Conclusions - Water management under COVID 19 Pandemic



ACCESSIBILITY AND AVAILABILITY OF SAFE WATER

CONTINUITY OF SERVICES: (with minimal disruption, particularly for low-income households)

REDUCING RISKS: **Hand washing, Social distancing & Wearing Mask.**

SYSTEM STRENGTHENING AND SAFETY: (stronger & affordable WASH systems – Right leadership, governance & coordination for sustainable use).

Rework WASH Management Program – Efficient use of *IT & Digitization* (*Aarogya Setu*) to manage the pandemic.



THANK YOU !

Example water scarcity in Ethiopia

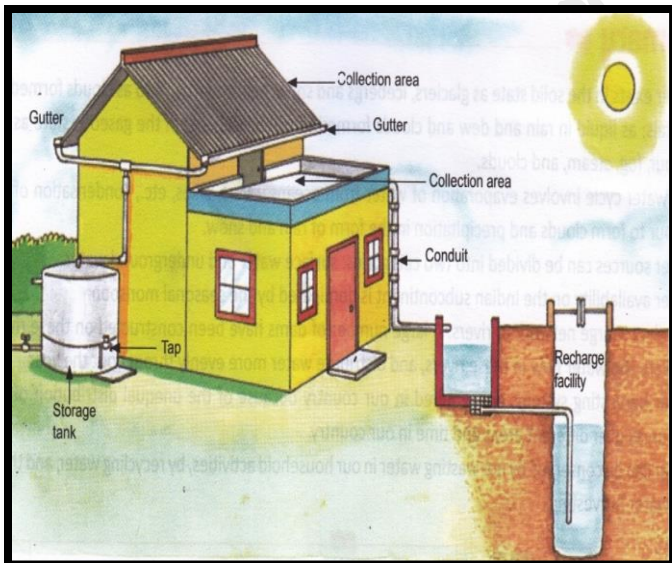


<https://data.unicef.org/country/eth/#>

<https://www.charitywater.org/our-projects/africa/ethiopia>

Sources of Water Supply in Hilly regions

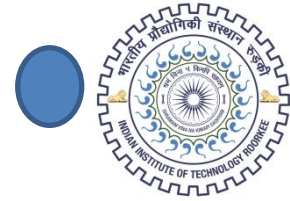
- Springs
- Open-Wells
- Hand pumps
- Lakes
- Rainwater
 - Roof top
 - Surface/ sub-surface runoff
 - Sand dams



Water supply in Rural Hilly isolated areas



Water management under COVID 19 Pandemic



- Accessibility



- Availability



- Potability



- Physical Distancing



Water Contamination

Water source may be contaminated :

- Leaking septic tanks and latrines.
- Contaminated surface water run-off entering wells and springs.
- Collecting water with unwashed hands and/or dirty containers.

Clean water collected from a source can be contaminated due to un-hygiene practices:

- Transporting water from the source to the house in dirty water containers.
- Storing water in open and/or dirty water containers.
- Handling water at home with dirty utensils or hands.



Every step in the chain presents an opportunity for water to be contaminated.

Household Drinking Water Treatment

• Boiling filter



Solar Radiation



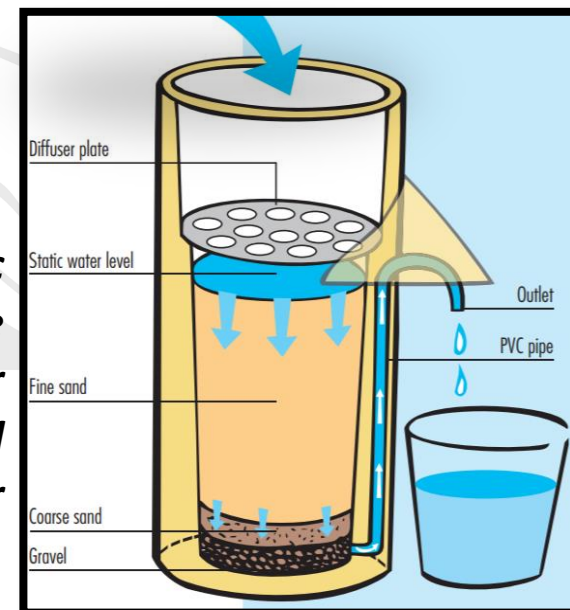
Straining (Cloth filtration)



Common Chemical disinfectants

- Chlorine Tablet or Bleaching powder or Chlorinated Lime. (Rs. 15 to 30 per kg)
- Na or Ca hypochlorite (NaOCl or Ca (OCL) (Rs. 500/- per L)
- KMnO_4 (Potassium permanganate) or Lal Dawai or Pinkie or Condy's fluid (Rs. 200 per kg)
- Iodine Tincture (2 drops for 1 l water) (Rs. 15 of 200 ml)
- Fitkari or Potassium Alum ($\text{KAl}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$) (Rs. 15 per kg)

Ceramic candle or Bio-sand Filter



Chemical Disinfection of Drinking Water at Home



Wash your hands with water and soap or ash.



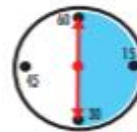
Is your water clear?

x1



Put 1 tablet in the container. Close container.

30 minutes



Wait 30 minutes.



Water is now ready.



Is your water dirty looking?



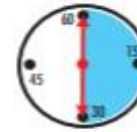
Filter the water through cloth.

x2



Add 2 tablets to the container. Close container.

30 minutes



Wait 30 minutes.



Water is now ready.

Caution: Always follow the manufacturer's instructions for use

Hand Washing & Sanitisation

Wash your hands with soap and water always to protect yourself and others from diseases like Coronavirus.




Wash Your Hands!

- 1 Wet Hands**
- 2 Soap**
- 3 Wash for 15 seconds**
- 4 Rinse**
- 5 Dry**
- 6 Turn Off Water with Paper Towel**

Interior Health

Provided by University of Nebraska-Lincoln Extension in Lancaster County and the Lincoln-Lancaster County Health Department

823234 Sept 24-09



Sanitization Tips Against COVID-19

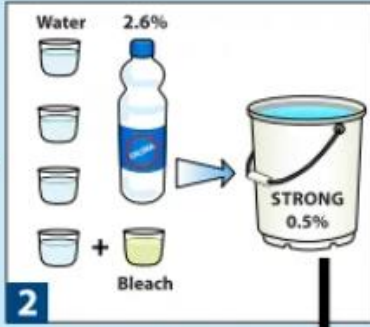
Making cleaning solution from 2.6% liquid bleach

Use the **STRONG** chlorine water to clean floors, latrines, tables, and mats touched with blood, vomit, poo-poo, pee-pee, snot, spit, or sweat. Make new **STRONG** chlorine water every day.



1

Before starting, put on your gown, mask, face shield, and two pairs of gloves.



2

Mix 4 parts water with 1 part household bleach (2.6% chlora) every day.



3

Pour **STRONG** chlorine water onto clean cloth.



4

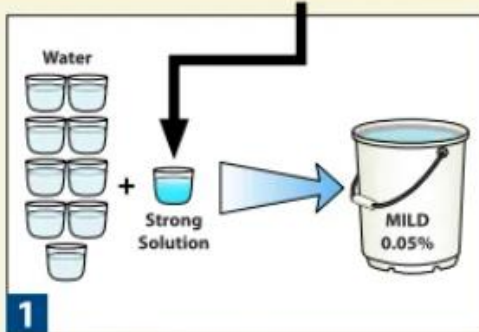
Put soaked cloth on top of spill. Let sit for 15 minutes. Then clean up and throw in waste bag.

5

6

Making hand washing solution from liquid bleach

Use the **MILD** chlorine water to wash hands. Make new **MILD** chlorine water every day.



1

This **MILD** solution can be made from mixing 1 part **STRONG** solution with 9 parts water every day.



2

Use the **MILD** chlorine water to wash hands.

Do NOT drink chlorine water.
Do NOT put chlorine water in mouth or eyes.





- ❑ **Hydrogen peroxide:** Hydrogen peroxide is effective against a whole army of microorganisms, such as bacteria, yeasts, fungi, viruses and spores. A solution of **at least 3%** will kill germs — including the cold virus — after **6 to 8 minutes of exposure**.
- ❑ **Isopropyl alcohol (rubbing alcohol):** This chemical compound has proven disinfecting qualities when left on surfaces for at least **30 seconds**. Since rubbing alcohol is water-soluble, it can be diluted, but the **concentration needs to be at least 70%** to kill coronaviruses.

CAUTION ! Be sure to perform a spot test first as it could discolor some plastics

Don't count on distilled white vinegar, vodka or distilled spirits

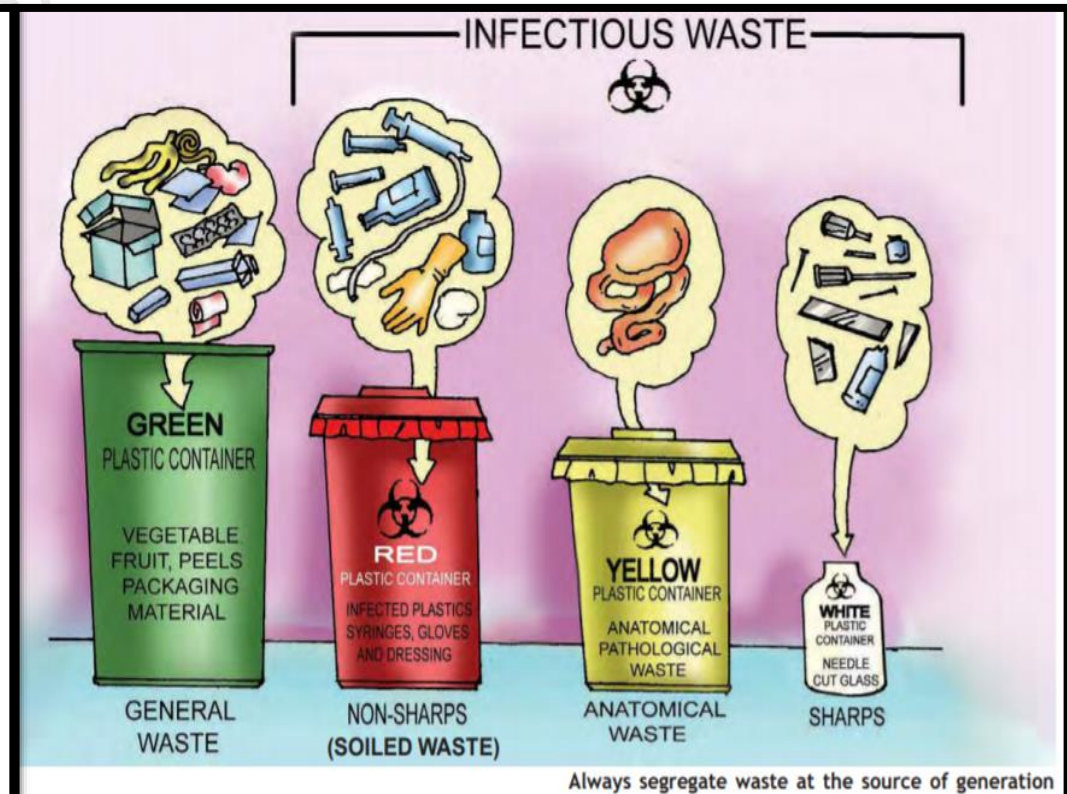
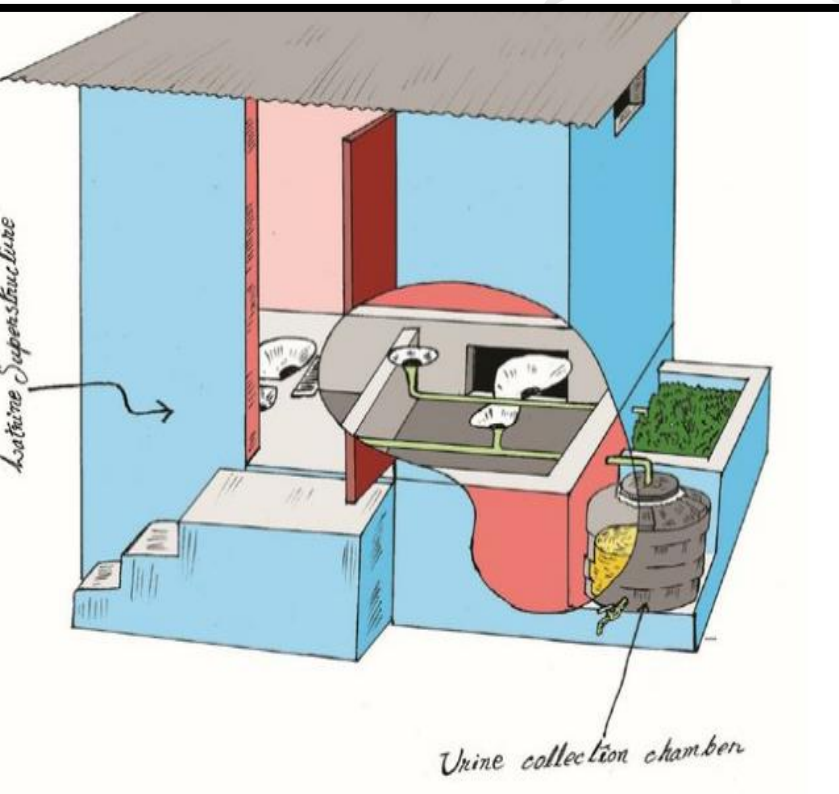
- Many people clean with vinegar. *“There is no evidence that they are effective against coronavirus.”*
- Vodka is also not effective at sanitizing, nor are any other types of distilled spirits. The concentration of alcohol in vodka is not high (**40 %**) enough to kill viruses.”
- It's important to wash with soap and water for removal of dirt/ grease

Sanitation facilities



Sanitation includes measures that promote:

- Areas to be **ODF**.
- Use and **proper maintenance** of toilets & **soak pits**.
- Proper **disposal** of human and animal excreta (solid as well as liquid wastes).
- Disposal of **hazardous wastes** like (from hospitals/industries/mask etc.)



Hygiene

