Water Supply

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Presentation Outline

- Water
- Facts about Water
- Important Statistics
- Importance of Water
- Importance of Water in Health
- Water Supply Systems

Water

- Water is a colourless, tasteless, and odourless substance that is essential to all forms of life that we know of.

- Water is the major constituent of the fluids of organisms including man. Water makes up about 70% of human mass and covers about 70% of earths surface.

- Water is the only substance that exists naturally on earth in all three physical states of matter. It is always on the move among them through the water cycle.

Water

- Through evaporation, precipitation and runoff, water is continuously flowing from one state to another, in what is called the ***Water Cycle***.

Facts About Water

- If water covers about 70% of earth’s surface. Why is it scarce?

Facts About Water

- How much water is required by a person every day for drinking and domestic use? Per capita demand?

- How long can a person survive without drinking water?

Water and sanitation was declared a human right by United Nations Assembly in 2010. WHO and UNECE (2013)

Key Aspects: Sufficient and continuous; Safe and acceptable; Physically accessible and within safe reach; Affordable to all

Important Statistics

Global Statistics

- 748 million people lack access to safe drinking water sources.

- About 2.4 billion people lack proper sanitation facilities. Developing countries in Sub-Saharan Africa are the most affected.

- Only 61% of the people in sub-Saharan Africa have access to improved water supply sources compared with 90% or more in Latin America and the Caribbean, Northern Africa, and large parts of Asia. (UNICEF and WHO, 2014)

Important Statistics

Zambia Statistics

- About 65% people have access to safe drinking water and 43% people have access to sanitation (WASHWATCH, 2016)

Rural vs Urban Zambia

- Access to improved water sources in rural and urban areas of Zambia is about 50% and 80% respectively.

- Access to improved sanitation is about 33% and 57% in rural and urban areas of Zambia respectively.

Important Statistics

- Disparities within the urban areas?

- There are also inadequacies in the provision of sanitation and water, especially for households in peri-urban and low-income areas leading to outbreaks of diseases (NWASCO).

MDGS goal 7 and SDGS 6 on water and sanitation?

Importance of Water

Water is vital for economic and social development; it is essential to maintain health, grow food, manage the environment and create jobs.

1. Household (Domestic)
2. Community (Public)
3. Trade
4. Agriculture
5. Recreation

Importance of Water in Health

- Every year more than 3.4 million people die as a result of water, sanitation and hygiene related diseases, making it the leading cause of disease and death around the world.

- Most of the victims are young children under five(5) in developing countries.

- Every year an estimated 801, 000 children younger than five(5) years of age die due to diarrhoea (WHO/CDC, 2016)

Importance of Water in Health

- This amounts to 11% of the 7.6 million deaths of children under the age of five (5) and means that about 2,200 children are dying every day as a result of diarrheal diseases.

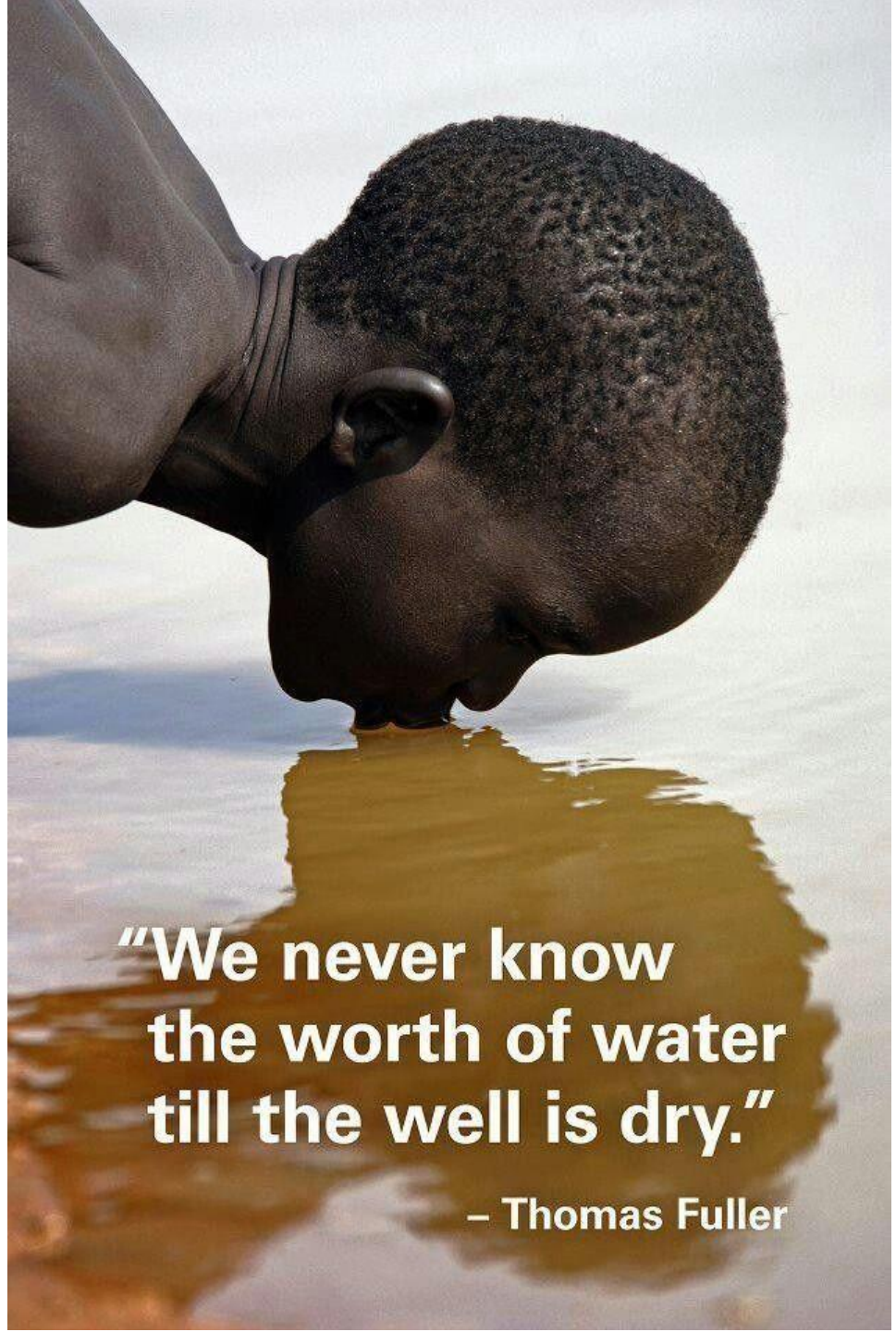
- Unsafe drinking water, inadequate availability of water for hygiene, and lack of access to sanitation together contribute to about 88% of deaths from diarrheal diseases (WHO/CDC, 2016)

Importance of Water in Health

- Diarrhoeal diseases are on the list of the top 10 causes of deaths in Zambia.

- An estimated 40 Zambia children die everyday from dehydration caused by severe diarrhoea (WHO/CDC, 2016)

- Diseases related to water, sanitation and hygiene can be classified as water-borne, water-washed, water-based and water-related insect vectors diseases.


“We never know
the worth of water
till the well is dry.”
– Thomas Fuller

Water Supply Systems

Water supply:

Refers to provision of treated water through pipes and other conduits by public and private water suppliers, such as municipal water works for household, community, trade, agriculture and other uses.

Water Supply System:

Refers to infrastructure for the collection, transmission, treatment, storage, and distribution of water for use to the consumers.

Water Supply Systems

Objectives of water supply systems:

- To supply safe and wholesome water to the users
- To supply water in adequate quantity
- To make water readily available to the users, in order to encourage personal and household hygiene

Water Supply Systems

Five components of water supply systems:

- Abstraction
- Treatment
- Transportation
- Storage
- Distribution

Water Supply Systems

Abstraction:

- Raw water collection point. These points are surface, underground and rainwater
- Surface sources : Lakes, rivers, streams, storage reservoirs etc
- Underground sources: Wells, boreholes, springs, infiltration wells and galleries etc.

- Raw water is transferred using water pipes or tunnels to water treatment facilities.

Water Supply Systems

Treatment:

- Abstracted raw water is treated using different processes depending on the sources and contamination of water to make it suitable for use.

- Surface water undergoes a number of treatment processes including: screening, coagulation/flocculation, sedimentation, filtration, disinfection and water storage.

Water Supply Systems

- Surface water undergone all the above treatment processes as it is contaminated with a number of contaminates such as sewage, animal wastes, pesticides, industrial wastes and many other organic and inorganic materials.

- Ground water does not undergo a lot of treatment processes as it is naturally filtrated as it percolates through the soil.

- However, groundwater contains most of the contaminants such as microorganisms from ground sanitation facilities such as pit latrines and other contaminants found in surface water because of its many sources of recharge.

Water Supply Systems

- Ground water mainly contains dissolved minerals that gather while the water moves through the soil.

- Water that contains dissolved minerals, such as calcium and magnesium above certain levels is considered “Hard Water”.

- Because of the interconnectedness of groundwater and surface water, contaminants may be shared between the two sources.

- Neither water source can ever be entirely free from water contaminants.

Water Supply Systems

Transport:

- Treated water is conveyed using pipes mostly underground to the storage facilities.

Water Supply Systems

Storage:

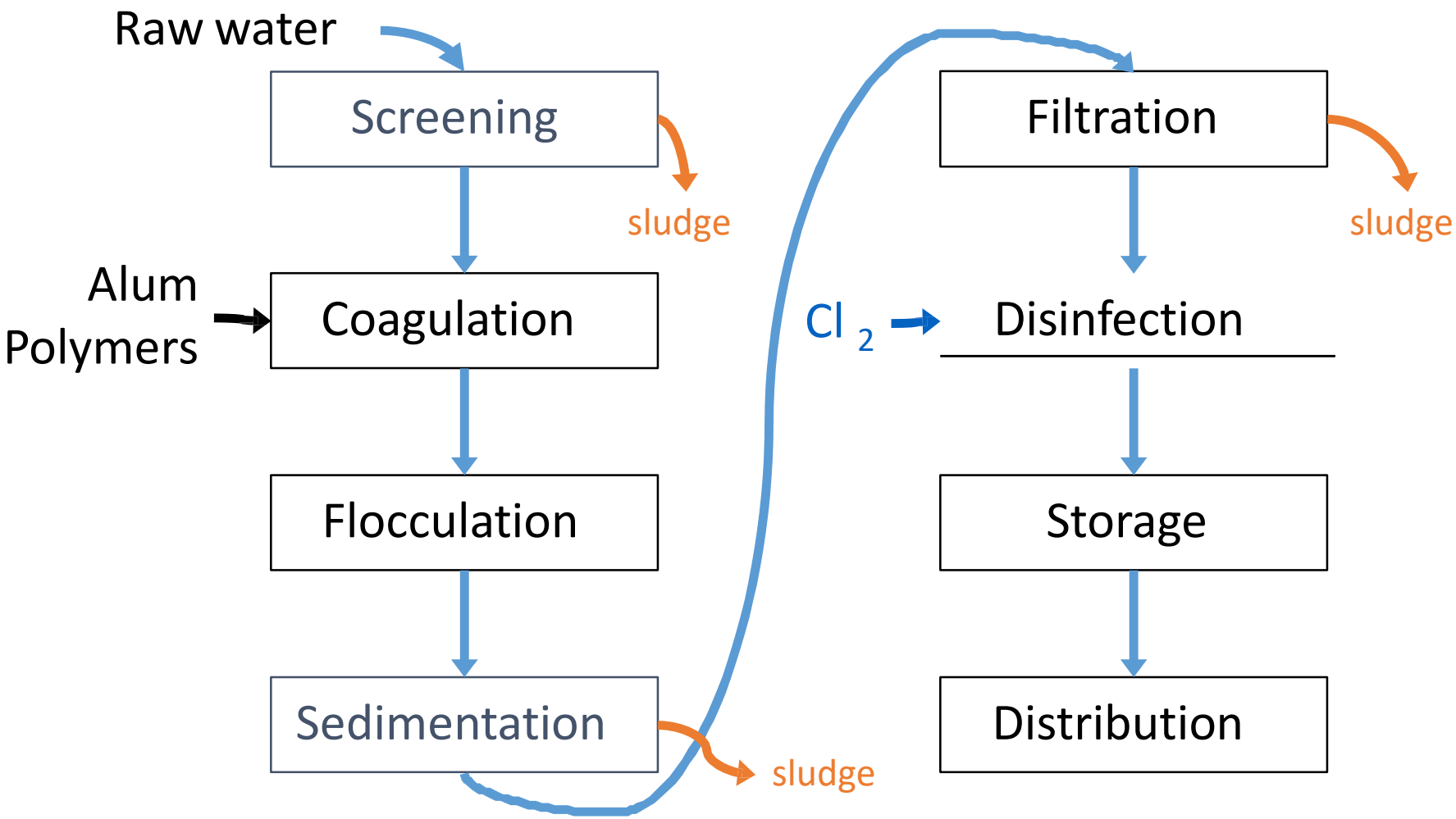
- Water storage facilities or reservoirs such as tanks and water towers are provided in the distribution system to store treated water before it is dispatched to the consumers.

- These facilities are important in creating suitable pressure, provide water during shut down and emergency situations.

Distribution:

- Stored water is then distributed to the final consumers such as household, institutions and commercial places through pipes.

Conventional Surface Water Treatment



Articles To Read

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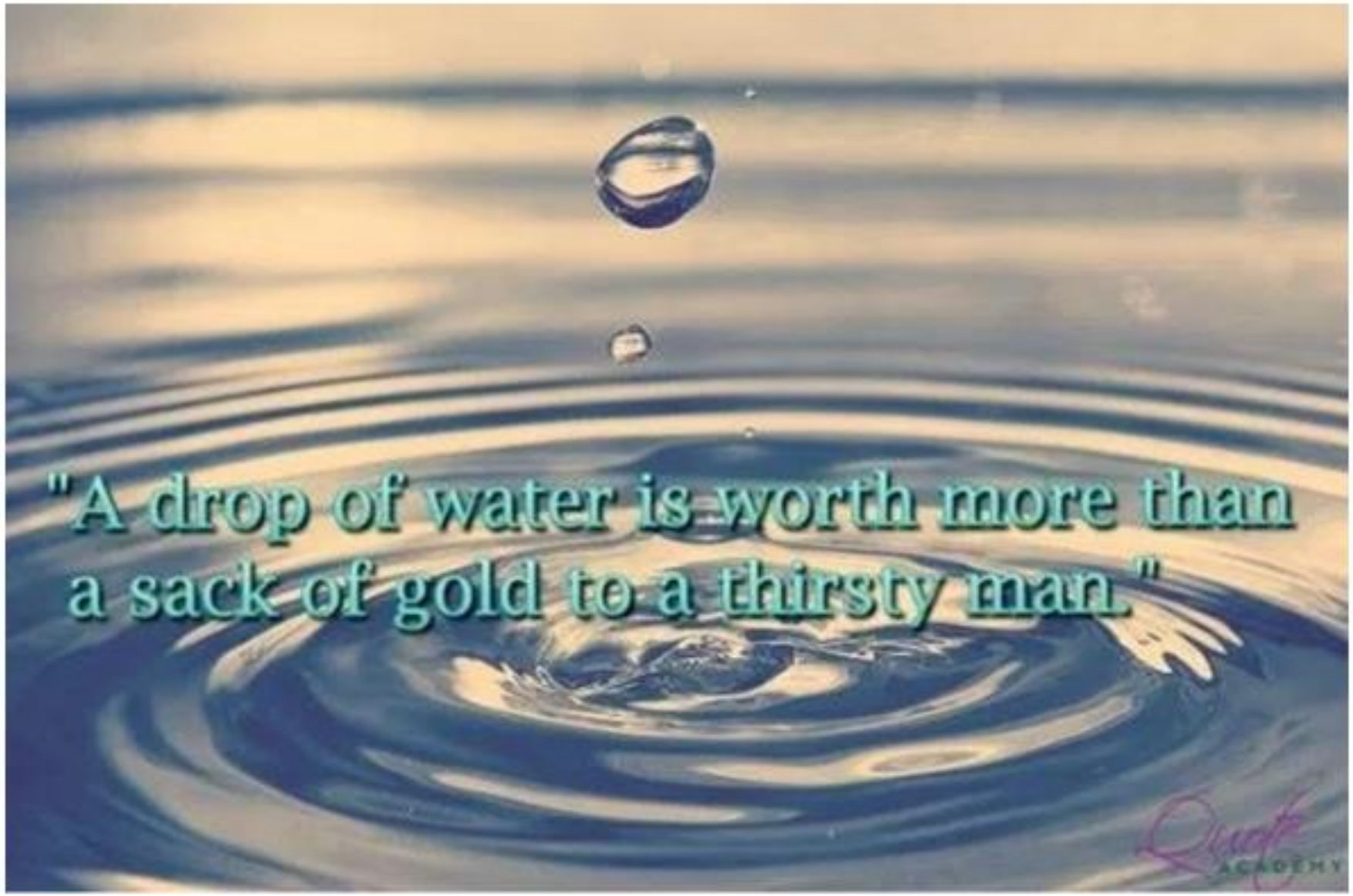
"A drop of water is worth more than
a sack of gold to a thirsty man."


THANKS!