Gokaraju Rangaraju Institute of Engineering and Technology

(GRIET)

Centre for Continuous Excellence in Life Skills (CEL)

Centre for Sustainable Technologies for Eco-Social Resilience to Global Climate Change (CST-ERG)

Centre for Water Resources Engineering and Management (CREAM)

THEME PAPER ON UNITED NATIONS WORLD WATER DAY 22 MARCH 2023

We are happy to inform you all that GRIET is now accredited with the highest grade NAAC A ++

The vision of GRIET is to be among the best of the institutions for engineers and technologists with attitudes, skills and knowledge and to become an epicenter of creative solutions.

This is possible only by higher order learning in Knowledge, Skills and Attitudes (Attitudes-Affective domain – Feeling domain – Five higher levels of Krathwohl's domain ; Skills- Psychomotor domain – Doing domain-Five higher levels of Dave's Taxonomy; Knowledge – Cognitive domain – Thinking domain – Six higher levels of Bloom's Taxonomy) and effective implementation of twelve Programme outcomes (NBA Graduate attributes)

United Nations World Water day – March 22, 2023

(Theme : Accelerating change to solve water and sanitation crisis)

(www.unwater.org, www.worldwaterday.org,

www.un-ihe.org,www.worldwatercouncil.org,www.waterfootprint.org, www.iwmi.cgiar.org)

United Nations World Water Day 2023(Theme: Accelerating Change to solve water and sanitation crisis)
Video Links :
https://www.youtube.com/watch?v=pUkj3uwCPSE

https://www.youtube.com/watch?v=_uMcYZbWKRQ

Message of UN Chief on World Water Day 2023 Conference :
https://www.youtube.com/watch?v=Jx6lXb9epXE

UNICEF on World Water Day 2023:
https://www.youtube.com/watch?v=BPXfBh3tfy0

Water changes everything : World Water Day 2023
https://www.youtube.com/watch?v=X6SnTQI7JwM
Eight actions we can all take to save water :Food and Agriculture Organization (FAO)
https://www.youtube.com/watch?v=rPlHV0skHy0&t=15s

The following are the water facts downloaded from the web site www.unwater.org and other web sites

Effects of Water Scarcity

- 3.2 billion people live in agricultural areas with high to very high water shortages or scarcity, of whom 1.2 billion people – roughly one-sixth of the world's population – live in severely water-constrained agricultural areas. (FAO, 2020)
- Over 2 billion people live in countries experiencing high water stress. (UN, 2018)
- It is estimated that by 2040, one in four of the world's children under 18 – some 600 million in all – will be living in areas of extremely high water stress. (UNICEF, 2017)
- 700 million people worldwide could be displaced by intense water scarcity by 2030. (Global Water Institute, 2013)
- About 4 billion people, representing nearly two-thirds of the world population, experience severe water scarcity during at least one month of the year (Mekonnen and Hoekstra, 2016)
- With the existing climate change scenario, by 2030, water scarcity in some arid and semi-arid places will displace between 24 million and 700 million people. (UN, 2009).
- A third of the world's biggest groundwater systems are already in distress (Richey et al., 2015).
- Nearly half the global population are already living in potential waterscarce areas at least one month per year and this could increase to some 4.8–5.7 billion in 2050. About 73% of the affected people live in Asia (69% by 2050) (Burek et al., 2016).

Effects of waste water

- Globally, it is likely that over 80% of wastewater is released to the environment without adequate treatment (UN WWDR, 2017).
- The opportunities from exploiting wastewater as a resource are enormous. Safely managed wastewater is an affordable and sustainable source of water, energy, nutrients and other recoverable materials. (UN WWDR, 2017).
- Several water-related diseases, including cholera and schistosomiasis, remain widespread across many developing countries, where only a very small fraction (in some cases less than 5%) of domestic and urban wastewater is treated prior to its release into the environment (UN WWDR, 2017).
- The costs of wastewater management are greatly outweighed by the benefits to human health, economic development and environmental sustainability – providing new business opportunities and creating more 'green' jobs. (UN-Water, 2011)
- Water availability is also affected by pollution. Most problems related to water quality are caused by intensive agriculture, industrial production, mining and untreated urban runoff and wastewater. (UN-Water, 2011)
- By 2050, close to 70% of the world's population will live in cities, compared to 50% today. Currently, most cities do not have inadequate infrastructure and resources to address wastewater management in an efficient and sustainable way. (UNDESA, 2014)
- 1.8 billion people use a source of drinking water contaminated with faeces, putting them at risk of contracting cholera, dysentery, typhoid and polio. (WHO/UNICEF 2015)
- Since the 1990s, water pollution has worsened in almost all rivers in Africa, Asia and Latin America (UNEP, 2016a).

- The greatest increases in exposure to pollutants are expected to occur in low- and lower-middle income countries, primarily because of higher population and economic growth in these countries, especially those in Africa (UNEP, 2016a), and the lack of wastewater management systems (UN WWDR, 2017)

Effects of Overstressed Ecosystems

- Water pollution has worsened since the 1990s in almost all rivers in Latin America, Africa and Asia, with severe pathogen pollution affecting around one third of all river stretches in these regions. (UN Environment, 2016)
- It is estimated that fewer than 20% of the world's drainage basins exhibit nearly pristine water quality. (UNESCO, 2009)
- Naturally occurring arsenic pollution in groundwater now affects nearly 140 million people in 70 countries on all continents. (UNESCO, 2 009)
- The world has lost 70 per cent of its natural wetland extent, including a significant loss of freshwater species, over the last 100 years. (United Nations, 2018)
- Ecosystems across the world, particularly wetlands, are in decline in terms of the services they provide. Between US$4.3 and US$20.2 trillion per year worth of ecosystem services were lost between 1997 and 2011 due to land use change. (Constanza et al. 2014)
- Globally, the number of lakes with harmful algal blooms will increase by at least 20% until 2050. (UN DESA, 2012)
- An estimated 20% of the world's aquifers is being over-exploited leading to serious consequences such as land subsidence and saltwater intrusion. (Gleeson et al. 2012)
- Ecosystem valuation has demonstrated that benefits far exceed costs of water-related investments in ecosystem conservation. The 2011 economic value of ecosystem services has been globally estimated at US$124.8 trillion. Global GDP was estimated at US$75.2 trillion in the same year. (Constanza et al. 2014).
- Soil erosion from croplands carries away 25–40 billion tonnes of topsoil every year, significantly reducing crop yields and the soil's ability to regulate water, carbon and nutrients, and transporting 23–42 million tonnes of nitrogen and 15–26 million tonnes of phosphorus off land, with major negative effects on water quality (FAO/ITPS, 2015a).
- Naturally occurring arsenic pollution in groundwater now affects nearly 140 million people in 70 countries on all continents. (WHO, 2018)

Effects on Water, Food and Energy

- 72% of all water withdrawals are used by agriculture, 16% by municipalities for households and services, and 12% by industries. (UN-Water 2021)
- It typically takes between 3,000 and 5,000 litres of water to produce 1 kg of rice, 2,000 litres for 1kg of soya, 900 litres for 1kg of wheat and 500 litres for 1kg of potatoes. (WWF).
- While almost 800 million people are currently hungry, by 2050 global food production would need to increase by 50% to feed the more than 9 billion people projected who live on our planet (FAO/IFAD/UNICEF/WFP/WHO, 2017).
- Water-harvesting and water conservation techniques could boost rainfed kilocalorie production by up to 24% and, if combined with irrigation expansion, by more than 40%. (FAO 2020)
- In sub-Saharan Africa, irrigated areas are expected to more than double by 2050, benefiting millions of small-scale farmers. However, it has been estimated that 41% of current global irrigation water use occurs at the expense of environmental flow requirements. (FAO 2020)
- The food production and supply chain accounts for about 30% of total global energy consumption. (FAO, 2011)
- 90% of global power generation is water-intensive. (UN, 2014)
- Power plant cooling is responsible for 43% of total freshwater withdrawals in Europe (more than 50% in several countries), nearly 50% in the USA, and more than 10% of the national water cap in China. (UN, 2014)
- Global water demand (in water withdrawals) is projected to increase by 55% by 2050, mainly because of growing demands from manufacturing (400% increase). (OECD, 2012)

- By 2035, water withdrawals for energy production could increase by 20% and consumption by 85%, driven via a shift towards higher efficiency power plants with more advanced cooling systems (that reduce water withdrawals but increase consumption) and increased production of biofuel. (IEA, 2012)

Effects on Water, Sanitation and Hygiene

- Today 1 in 3 people or 2.2 billion people around the world lack safe drinking water. (WHO/UNICEF 2019)
- Over half of the global population or 4.2 billion people lack safe sanitation. (WHO/UNICEF 2019)
- 673 million people still practise open defecation. (WHO/UNICEF 2019)
- Achieving universal access to safely managed sanitation by 2030 will require a four-fold increase in current rates of progress. (UN-Water 2021)
- Almost half of the schools in the world do not have handwashing facilities with soap and water. (WHO/UNICEF 2020)
- Approximately 50 litres of water per person per day are needed to ensure that most basic needs are met while keeping public health risks at a low level. (WHO, 2017)

- 207 million people spend over 30 minutes per round trip to collect water from an improved source. (WHO/UNICEF 2019)
- Globally, at least 2 billion people use a drinking water source contaminated with faeces. (WHO 2019)
- 297,000 children under five years old – more than 800 every day – die every year from diarrhoeal diseases due to poor sanitation, poor hygiene, or unsafe drinking water. (WHO 2019)
- Under-fives living in countries experiencing protracted conflict are 20 times more likely to die from causes linked to unsafe water and sanitation than from direct violence. (UNICEF, 2019)
- 1 million deaths each year are associated with unclean births. Infections account for 26% of neonatal deaths and 11% of maternal mortality. (WHO/UNICEF 2019)
- Hygiene promotion is the most cost effective health intervention. (World Bank 2016)
- 2 out of 5 people or 3 billion people around the world lack basic handwashing facilties at home. (WHO/UNICEF 2019)
- Loss of productivity to water- and sanitation-related diseases costs many countries up to 5% of GDP. (WHO 2012)
- Universal access to safe drinking water and adequate sanitation and hygiene would reduce the global disease burden by 10%. (WHO 2012)
- Investment in water and sanitation services generates a quantifiable, positive return on investment through saved medical costs and increased productivity:
  Urban basic drinking water: $3 return for every $1 invested.
  Urban basic sanitation: $2.5 to $1
  Rural basic drinking water: $7 to $1
  Rural basic sanitation: $5 to $1
  (Hutton et al. 2015)

Effects on Urbanisation

- The number of city inhabitants lacking safely managed drinking water has increased by more than 50% since 2000. (UN-Water 2021)
- The global urban population is estimated to grow from 3.9 billion people today to 6.3 billion in 2050. (UNESCO, 2012)
- Today, 55% of the world's population lives in urban areas, a proportion that is expected to

increase to 68% by 2050, adding another 2.5 billion people to urban areas with close to 90% of the increase taking place in Asia and Africa (UN DESA, 2018).

- In urban areas, the main challenge is often a lack of access to basic services in informal settlements, or high prices and a lack of quality control of water from private vendors. (WHO, 2017)
- Four out of five people in urban areas use piped water supplies (two out of five people in rural areas). (WHO/UNICEF, 2017)
- 39% of the global population (2.9 billion people) use a safely managed sanitation service. Most of these people (3 out of 5) live in urban areas. (WHO/UNICEF, 2017)
- In sub-Saharan Africa, three out of five people with basic handwashing facilities live in urban areas. (WHO/UNICEF, 2017)

Effects on Human Rights

- The human right to safe drinking water was first recognized by the UN General Assembly and the Human Rights Council as part of binding international law in 2010. (UN, 2010)
- The human right to sanitation was explicitly recognized as a distinct right by the UN General Assembly in2015. (UN, 2016)
- Only 14 countries report high levels of community and user participation for collaborative management and decision-making. (UN-Water 2021)

Effects on Transboundary Waters

- There are 263 transboundary river basins and approximately 300 transboundary aquifers. (UNECE/UNESCO 2015)
- 145 states have territory within transboundary lake or river basins, and 30 countries like entirely within them. (UNECE/UNESCO 2015)
- Since 1948, history shows only 37 incidents of acute conflict over water, while during the same period, approximately 295 international water agreements were negotiated and signed. (UNECE/UNESCO 2015)
- Around two-thirds of the world's transboundary rivers do not have a cooperative management framework. (SIWI)

Effects on Gender

- Fewer than 50 countries have laws or policies that specifically mention women's participation for rural sanitation or water resources management. (UN-Water 2021)
- Women and girls are responsible for water collection in 8 out of 10 households with water off premises, which means reducing the population with limited drinking water services will have a strong gender impact. (WHO and UNICEF, 2017)
- 1 million deaths each year are associated with unclean births. Infections account for 26% of neonatal deaths and 11% of maternal mortality. (WHO/UNICEF 2019).
- While supplying almost half of all agricultural labour in low and middle-income countries, women's agricultural productivity is on average 20–30% lower than male farmers'. (FAO, 2017)
- About 44 million pregnant women have sanitation-related hookworm infections that pose a considerable health burden in developing societies. (UNICEF)

Effects on Financing

- 80% of countries report insufficient financing to meet national WASH(Water, Sanitation and Hygiene) targets. (GLAAS 2017)
- Over 50% of countries say that household tariffs are insufficient to recover operation and maintenance costs, leading to an increase in disrepair and service failure. (GLAAS 2017)
- While international aid spending on WASH increased from US$6.3 billion to US$7.4 billion between 2012 and 2015, future commitments declined from US$10.4 billion to US$8.2 billion in the same period. (GLAAS 2017)
- Over 70% of countries use data when deciding how and where to allocate funds, though only one-third have financial plans that are defined, agreed and consistently followed. (GLAAS 2017)
- 70% of countries have specific plans to reach low-income communities with WASH. However, only 25% of WASH aid was spent on basic systems , which is a proxy for aid targeted to the unserved, particularly in rural areas. (GLAAS 2017)

UN World Water Development Report 2023 available in the following link : https://www.unwater.org/publications/un-world-water-development-report

Water Facts , Figures and Examples of UN World Water Development 2023 available in the following link: https://unesdoc.unesco.org/ark:/48223/pf0000384659