

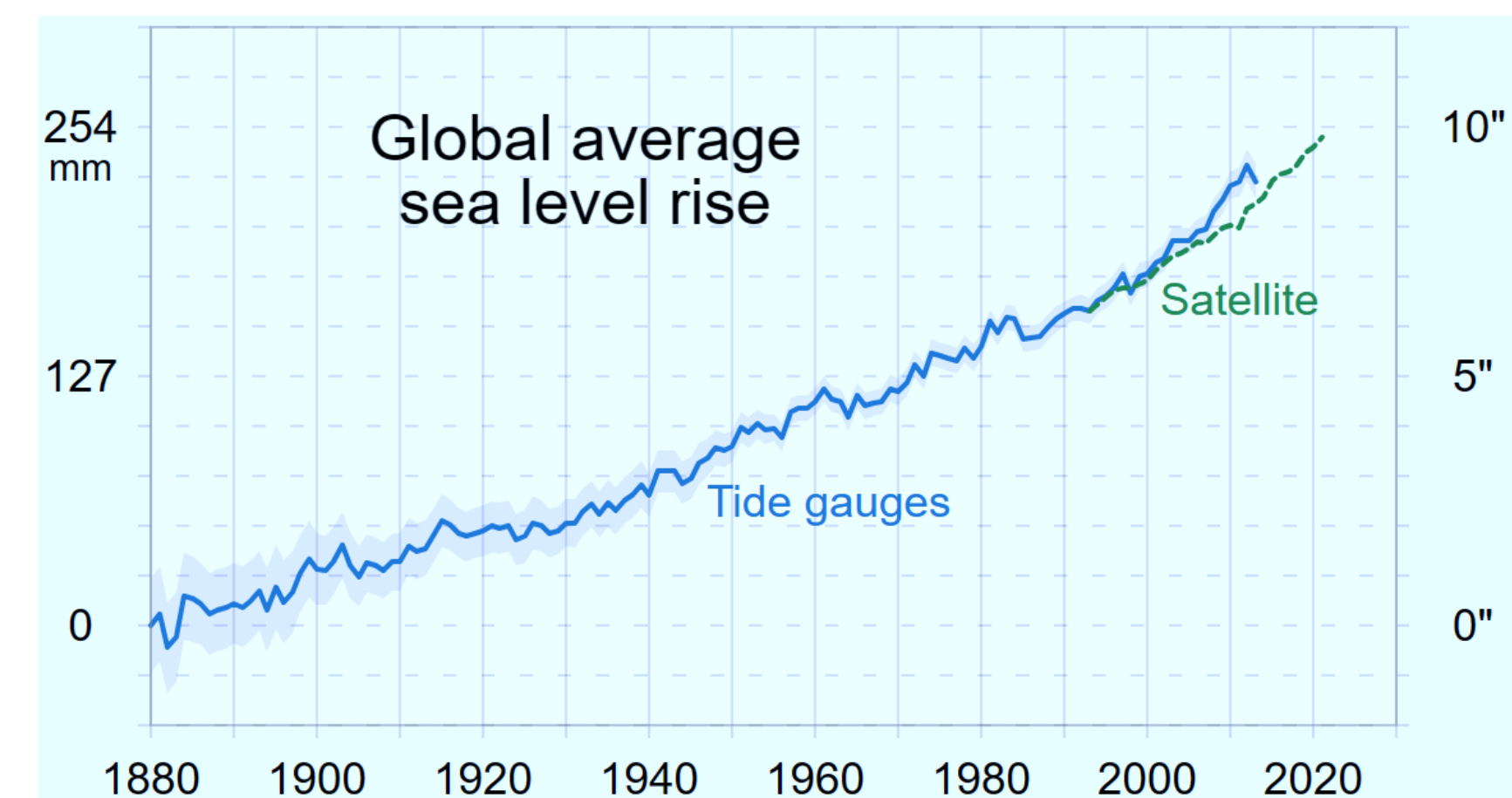
# Reviewing Climate Resilience in Water, Sanitation and Hygiene (WASH) Services- Mitigation and Adaptation

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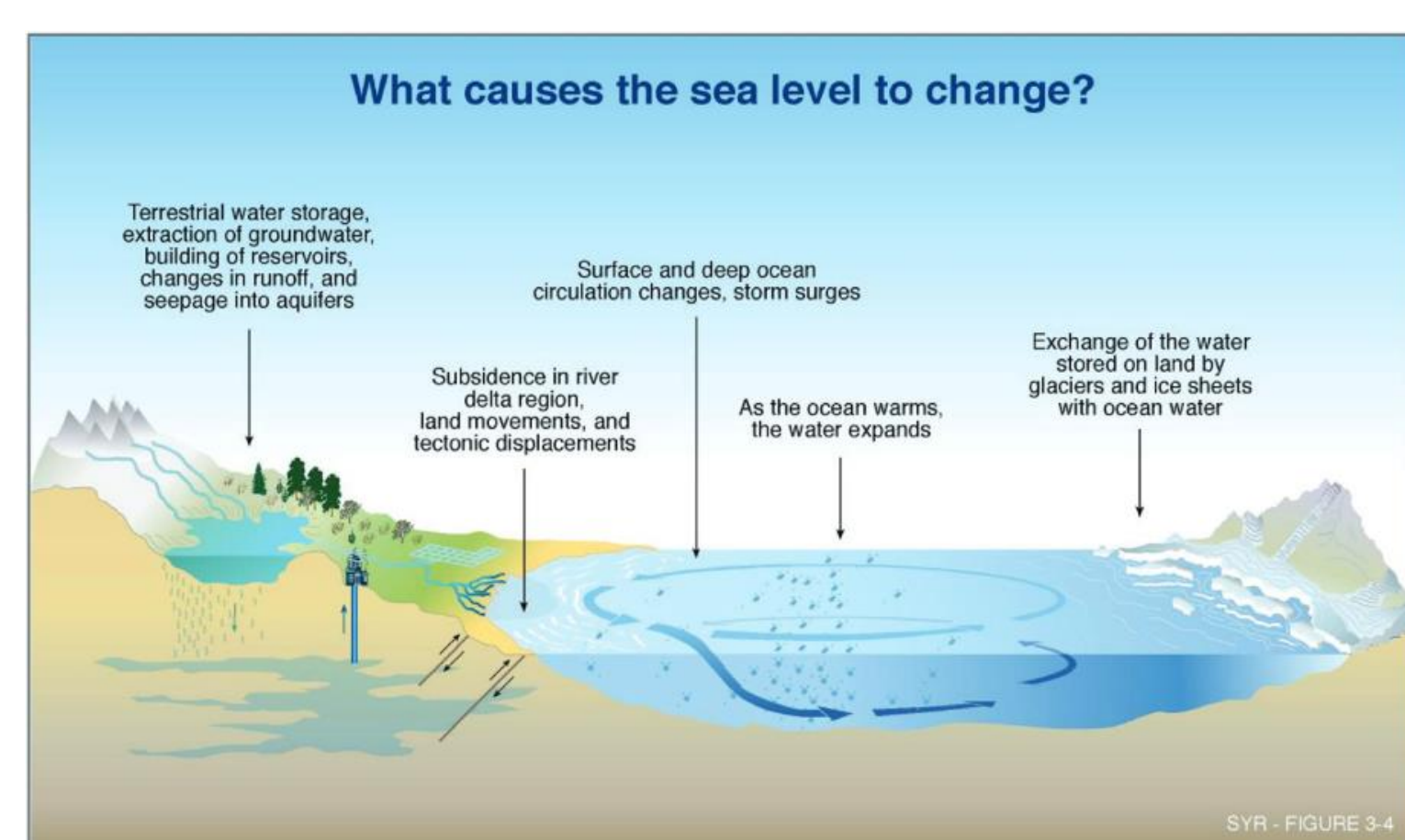
## Introduction

- IPCC report on Climate Change and water (2008)
- Freshwater sources are vulnerable and are impact by Climate Change.
- Precipitation will increase in high latitudes and part of tropics, resulting in increase in the risk of flooding.
- Global Mean sea level increase.
- High water temperatures and changes in extremes including floods and droughts.
- Changes due to heating of the ocean, and changes in ocean circulation
- Changes in the volume of water in the ocean due to the melting of land ice in glaciers, ice caps, and ice sheets, as well as changes in the global water cycle (IRC, 2008)



Climate Change Indicators: Sea Level / Figure 1. Absolute Sea Level Change.

EPA.gov. U.S. Environmental Protection Agency (EPA) (July 2022)



Sea Level 101, Part Two: All Sea Level is 'Local' – Climate Change: Vital Signs of the Planet (nasa.gov)

## Climate Change impact on WASH service delivery

- Globally, 1 billion people on earth are currently without access to improved water supply and 2.6 billion have no form of improved sanitation services majority belong to Asia and Africa.
- Disparities exist both in rural and urban areas
- Urban Areas like informal, overcrowded, squatter and peri urban
- Causes are overextraction of water for agriculture and manufacturing both in rural and urban areas resulting in decline of water table.



At 732 Million, India Tops List on Number of People Without Access to Toilets: Report (thewire.in)

## Mitigation



As mentioned by water aid, water WASH services can support various users during times of water scarcity, such as in times of drought, through various measures such as **Water storage**



GIZ states -In Chennai, GCC recently began restoring 210 water bodies to be used for water storage and eventually drinking water supply.

### Nature based solutions

- Managing aquifer recharge with waste water and storm water
- Maintenance of aquifers infiltration capacity
- Strengthen various institutions to support different users through community-based water resource management.
- Stakeholders involvement is an important aspect.
- Integrated Water Resource Management (IWRM).

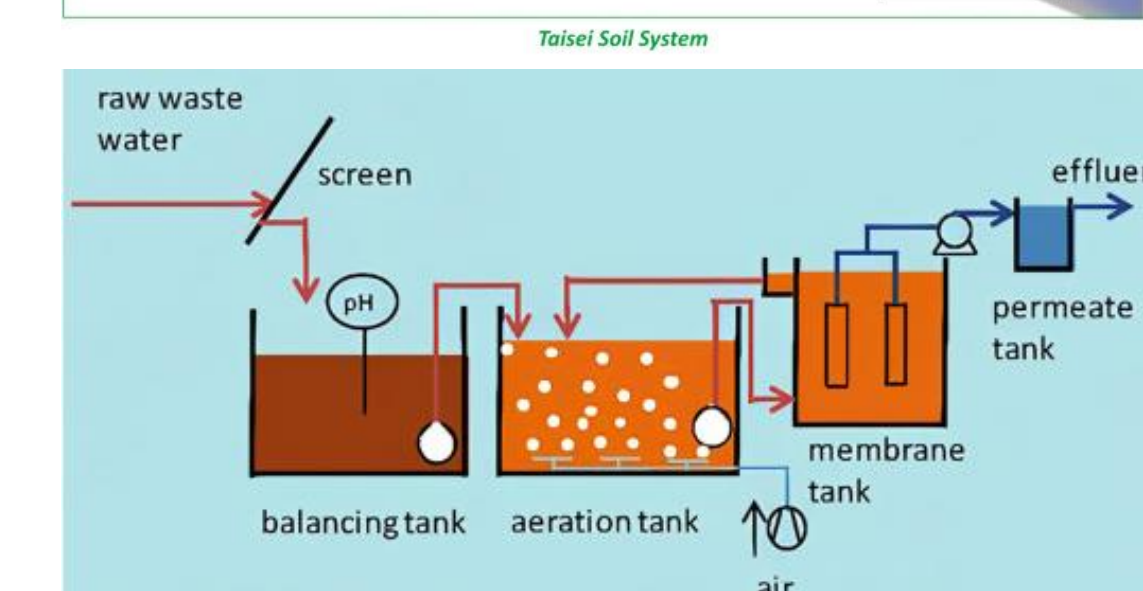


### Smart Water Choices



- Increased regulation
- Water restrictions
- Sensitization campaigns
- Increased tariffs
- Reducing the pressure in the networks

Source: Mission Paani



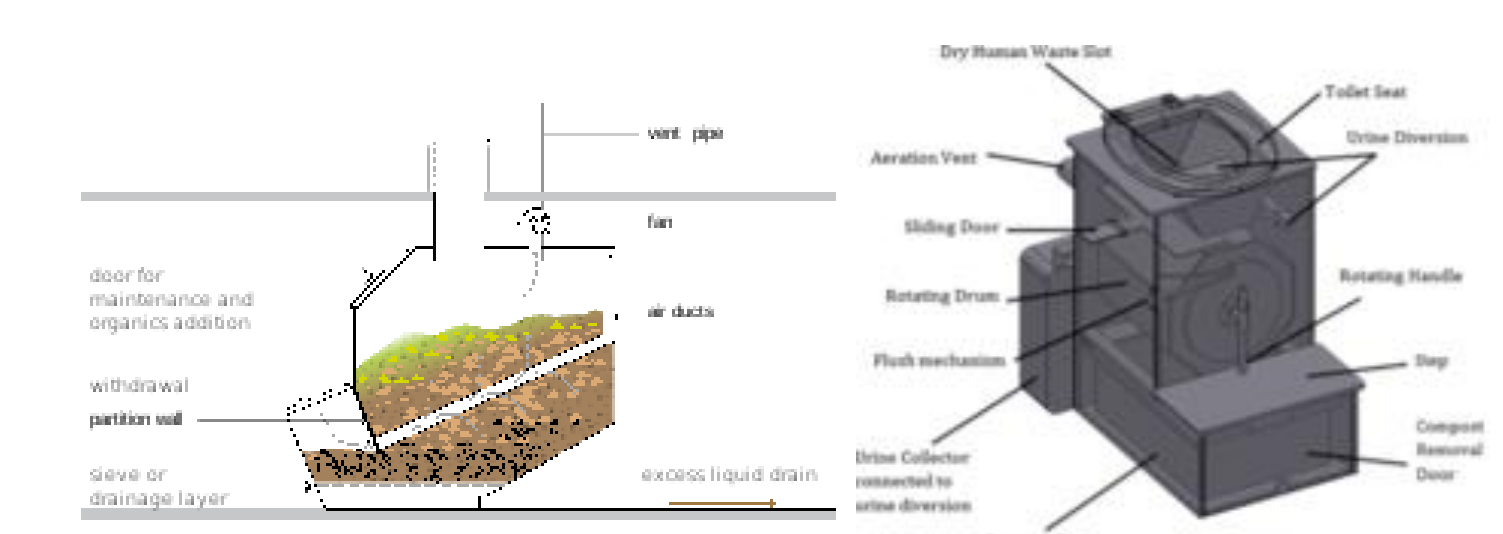
### Household level adaptation

- Low flow taps and water efficient shower heads
- Waste water recycle made mandatory
- Selling of treated waste water to industries
- Adopting DEWATS system

Source: Climate resilient urban sanitation-GIZ

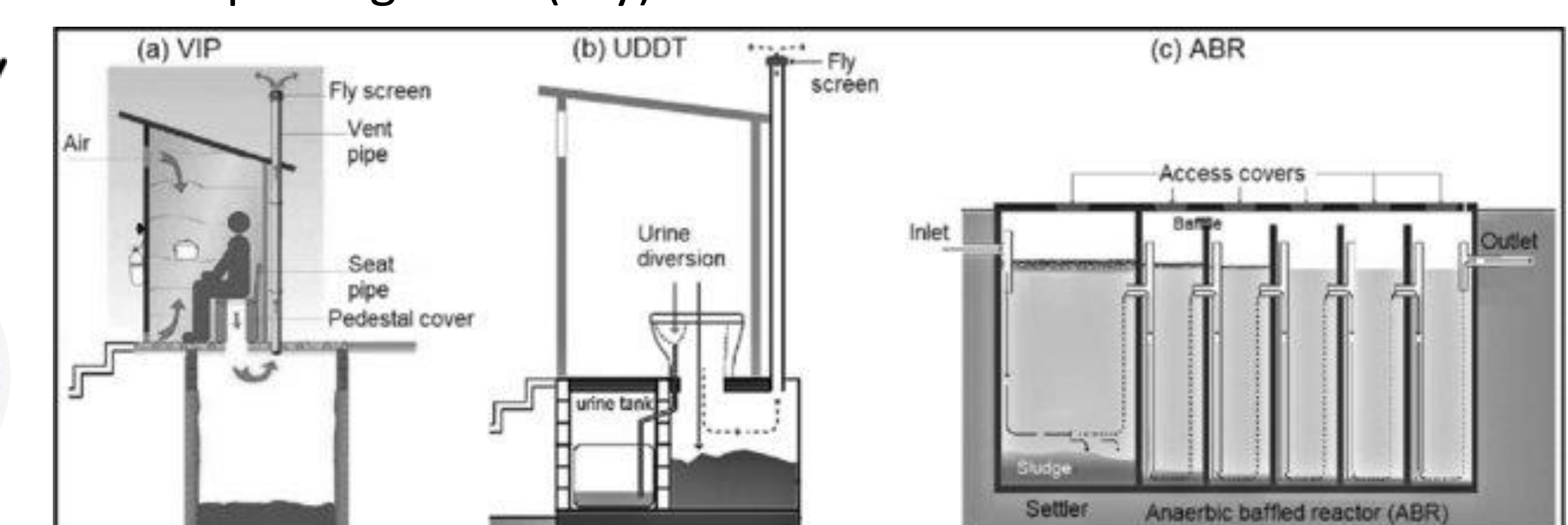
## Adaptation

- Using recycled water
- Investing in water saving sanitation technologies
- Collaborative approach from various stakeholders developing city wide assessment
- Onsite sanitation technologies can be designed and constructed
- Vulnerability Mapping
- Development Partners.
- Water user committees to be formed.
- Bulk water meters in slums to be installed



### Types of toilets

- Improved:** Improved toilets are designed to hygienically separate excreta from human contact. These include both wet systems and dry systems, such as:
- Flush or pour-flush toilet (wet).
  - Ventilated improved pit latrine (dry).
  - Pit latrine with slab/without slab/open pit (dry).
  - Composting toilet (dry).



- (a) Ventilated Improved Pit (VIP) latrine, (b) Urine Diversion Dry Toilet (UDDT) (Strande and Brdjanovic, 2014), and (c) Anaerobic Baffled Reactors (ABR) (Tilley, 2014).
- PPP is required for poor customer base
  - Encourage informal small entrepreneurs
  - Boost micro financial mechanisms (e.g. micro insurance, micro finance) to support the most vulnerable group



- Institutions can help in building community microfinance institution for delivering WASH services
- Government, service providers and financial institutions can join hands together for implementing WASH services