

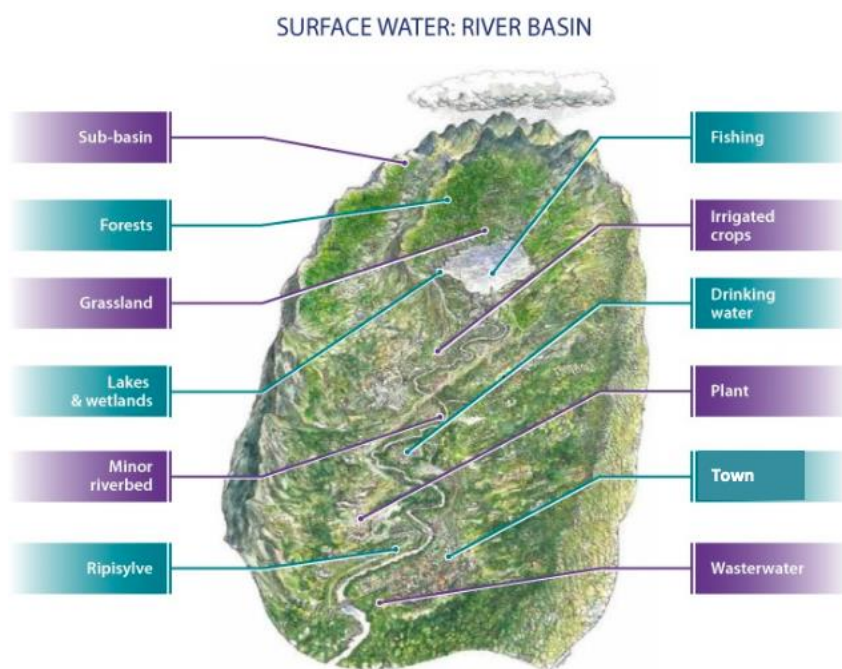
REGIONAL SOPs FOR CLIMATE RESILIENT WATER INFRASTRUCTURE

Level 2 Training – Module 1: IWRM & WEAP

Part 1. Integrated Water Resources Management (IWRM)

Integrated Water Resources Management

Integrated Water Resources Management (IWRM) is a participatory way of sustainable management of water resources which involves all water users. For surface water, planning is done within a river basin or “catchment”; and for groundwater, the below-ground aquifers.



Where does your water come from?

Your water comes from the catchment sources (either treated river waters, natural springs, wells, boreholes). All this water, including groundwater, comes from the rain, or rivers flowing other countries. Sometimes, sea water is used as a source of drinking water, which is then purified through desalination to remove the salt and minerals.

What does a water utility do?

Your water utility manages your water resources: it protects your water sources; treats them if the water quality is not adequate for drinking purpose or other specific uses; checks its quality and distributes them to the consumers in their distribution networks. Sometimes, water utilities are also in charge of treating your wastewater (the water that has been used) before release to the environment.

Where does your water go after you use it?

After using it, your water goes to a sewer system to the wastewater treatment plant if your house is connected to a sewer system. This treated water is then released back into the environment or sea. Otherwise, it goes to an individual septic tank. Some tanks need emptying when they are full, others slowly drain by themselves. This can impact the quality of the groundwater.



Upstream/Downstream Approach

Activities such as bathing, fishing, irrigation, use of pesticides, etc. that happen upstream have an impact on the river, which might mean that downstream, human activities are affected. For example, if an irrigation upstream uses too much water from the river, there might not be enough water left for the drinking water treatment plant downstream. Or use of pesticides or laundry detergents upstream might affect fishing and bathing downstream, if the water quality goes down.

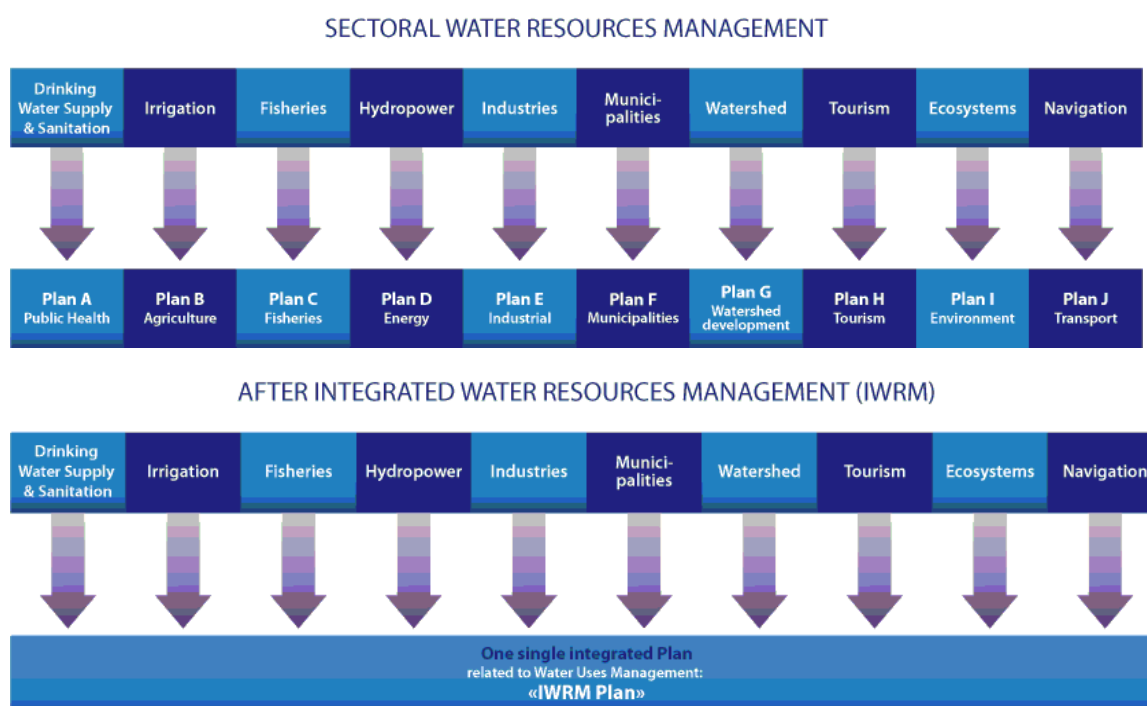
IWRM Four Dublin Principles

To better support the basics of IWRM, the Dublin principles were adopted at the International Conference on Water and the Environment in Dublin, Ireland from 26 to 31 January 1992. These are:

1. Fresh water is a **finite** and vulnerable resource, essential to sustain life, development and the environment.
2. Water development and management should be based on a **participatory approach**, involving users, planners and policymakers at all levels.
3. **Women** play a central part in the provision, management and safeguarding of water.
4. Water has an **economic value** in all its competing uses and should be recognised as an economic good.

From Sectoral to Integrated Water Resources Management

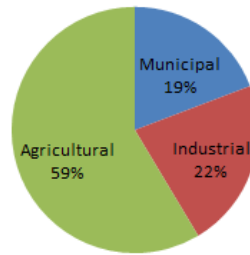
In the sectoral approach, water management plans are prepared for each water use (such as farmers, drinking water, fisheries) without looking at how these water users influence each other. In the integrated (IWRM) approach, one single plan (an "IWRM plan") is prepared, looking at all the water uses for a particular catchment. This results in a comprehensive plan for dividing available water resources between all water uses in the catchment.



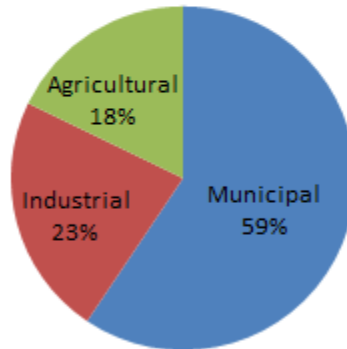
Water Withdrawal per Sector

These pie-charts show the ratio of water withdrawals by sector (municipal, industrial, and agricultural). The ratio of municipal water is three times higher in the Lesser Antilles than in the Greater Antilles and double in Lesser Antilles than in Central America. The agricultural water withdrawal ratio is similar in the Greater Antilles and Central America, three times higher than in the Lesser Antilles.

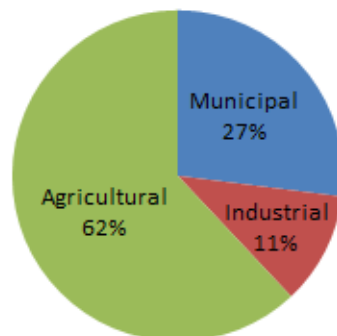
**Water Withdrawal per sector, around 2010
Caribbean - Greater Antilles**



**Water Withdrawal per sector, around 2010
Caribbean - Lesser Antilles & Bahamas**



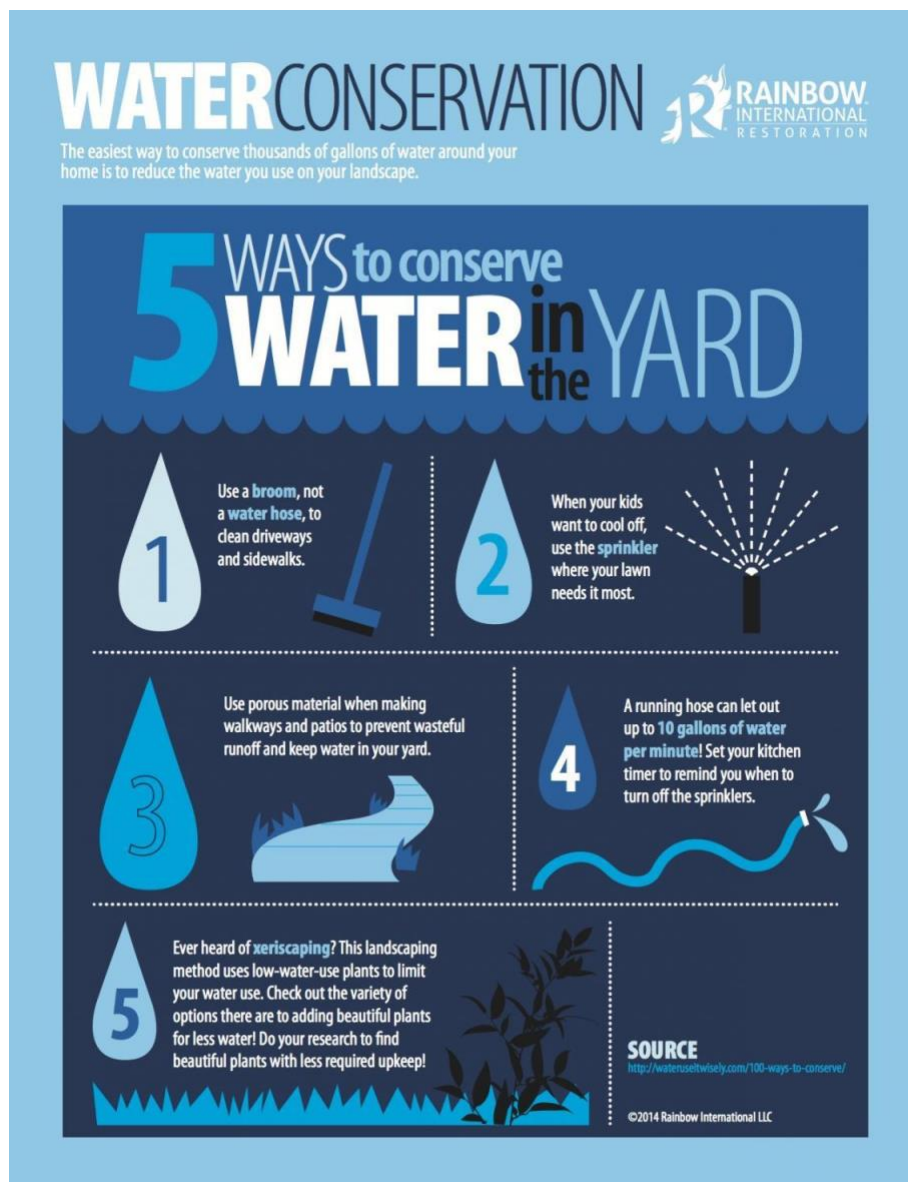
**Water Withdrawal per sector, around 2010
Central America**



Source: FAO, Aquastat, 2010

Water Conservation

In order to prepare for water scarcity, several options are available for improving water conservation in the local communities.



Tips on saving water in the house

There are few ways to conserve water at home and lower your water bill:

- Install Rainwater harvesting
- Repairing leaking taps
- Reuse water from washing and cooking, such as vegetables and rice, for plants
- Taking showers instead of baths
- Taking short showers
- No running water for brushing teeth
- Putting bucket under shower to catch the running water while you wait for the water to warm up
- Use drought-resistant plants in your garden

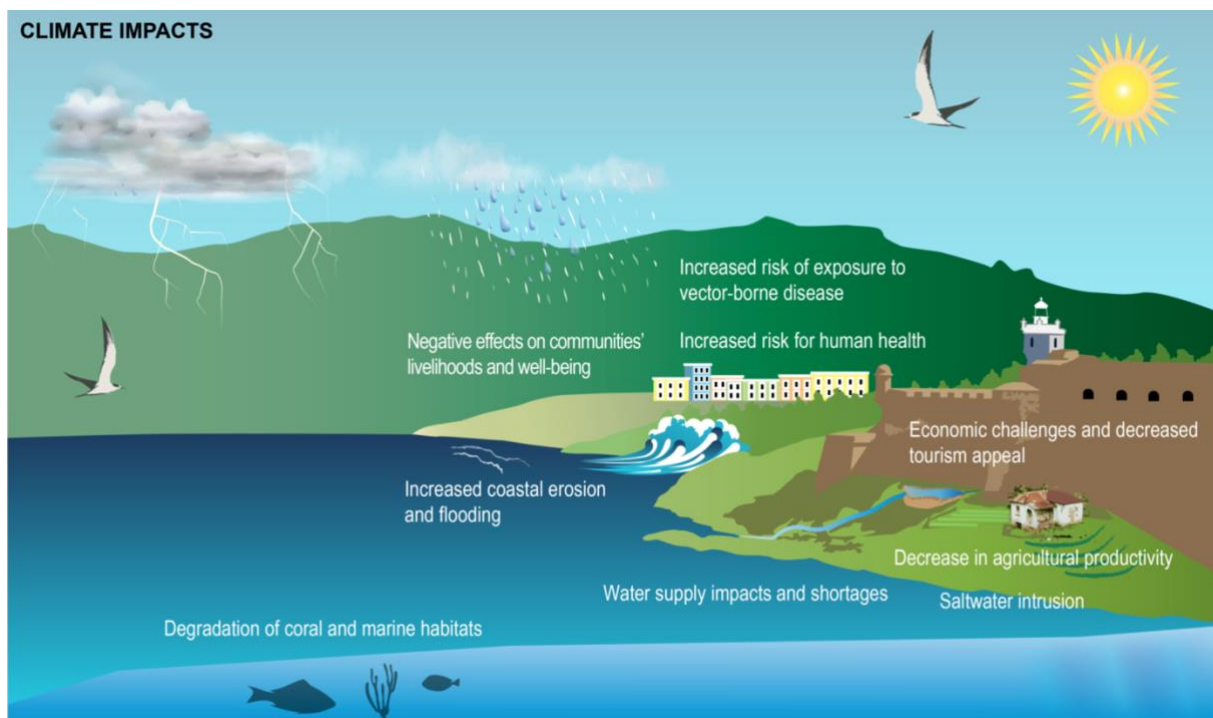
- Etc.

Part 2. Climate Risk Management

Impacts of Climate Change

A mostly tropical geography, the Caribbean climate is greatly shaped by sea temperatures and precipitation, with the hurricane season regularly leading to natural disasters. Because of its tropical climate and mainly low-lying island geography, the Caribbean is vulnerable to several climate change impacts, including storm intensity, saltwater intrusion, sea level rise and coastal erosion, and precipitation variability.

However, more natural disasters, more drought, higher sea-level etc. will occur in the future due to climate change. For example, the standpipe in some villages might become unusable because the water will be too salty. This means the water has to come from another source.



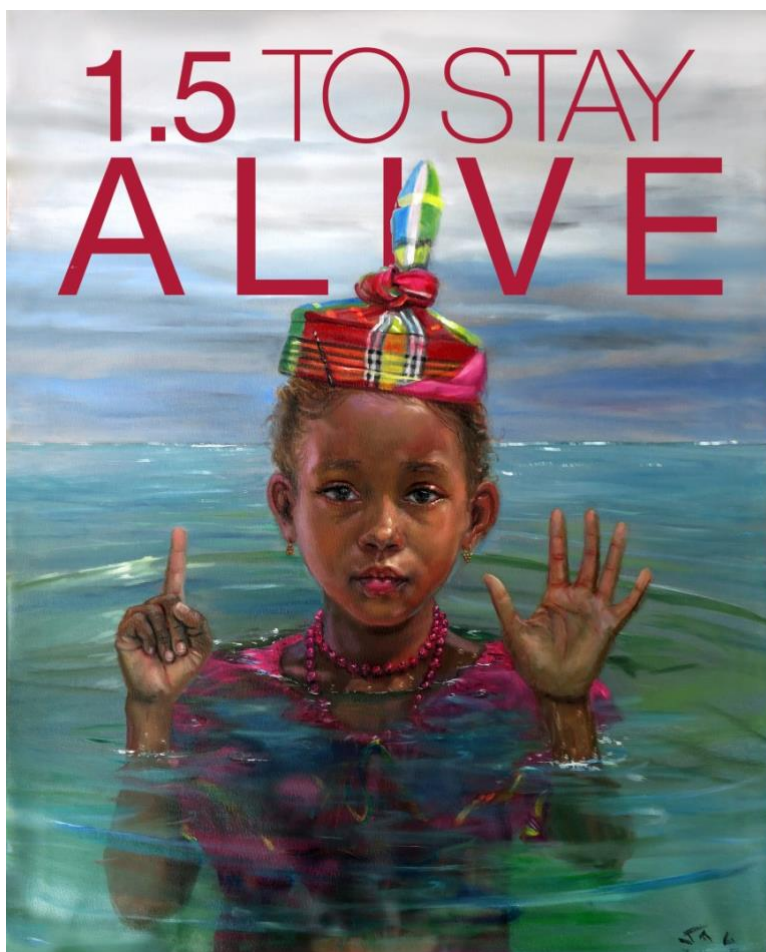
Source: <https://cgtc-usvi.com/climate-change>

Climate change has differentiated impacts. It affects people differently, depending on their gender, sex, age and socio-economic status. Women and girls are impacted more drastically from natural disasters and extreme climatic events than are men and boys.

Current and Possible Future Situation

Perhaps the most dangerous hazard is sea level rise. The sea level may rise up to 0.6 meters in the Caribbean by the end of the century, according to the Intergovernmental Panel on Climate Change (IPCC).

The Paris Agreement is a global agreement of countries to maintain average global temperature below 1.5°C of pre-industrial time levels by 2050.



Climate Risk Management

The climate risks have been well identified by climate scientists and other water management specialists and responses are being proposed to Caribbean countries. According to the Sendai Framework for Action, resilience is built together with vulnerable communities.

For example, within this Project, several Standard Operating Procedures (or SOPs) have been drafted to strengthen water utilities and governments' operational processes to deal with the impacts to climate change. Climate resilience is also addressed by the development of a dialogue between water sector technicians and local communities to share technical and traditional knowledges.