

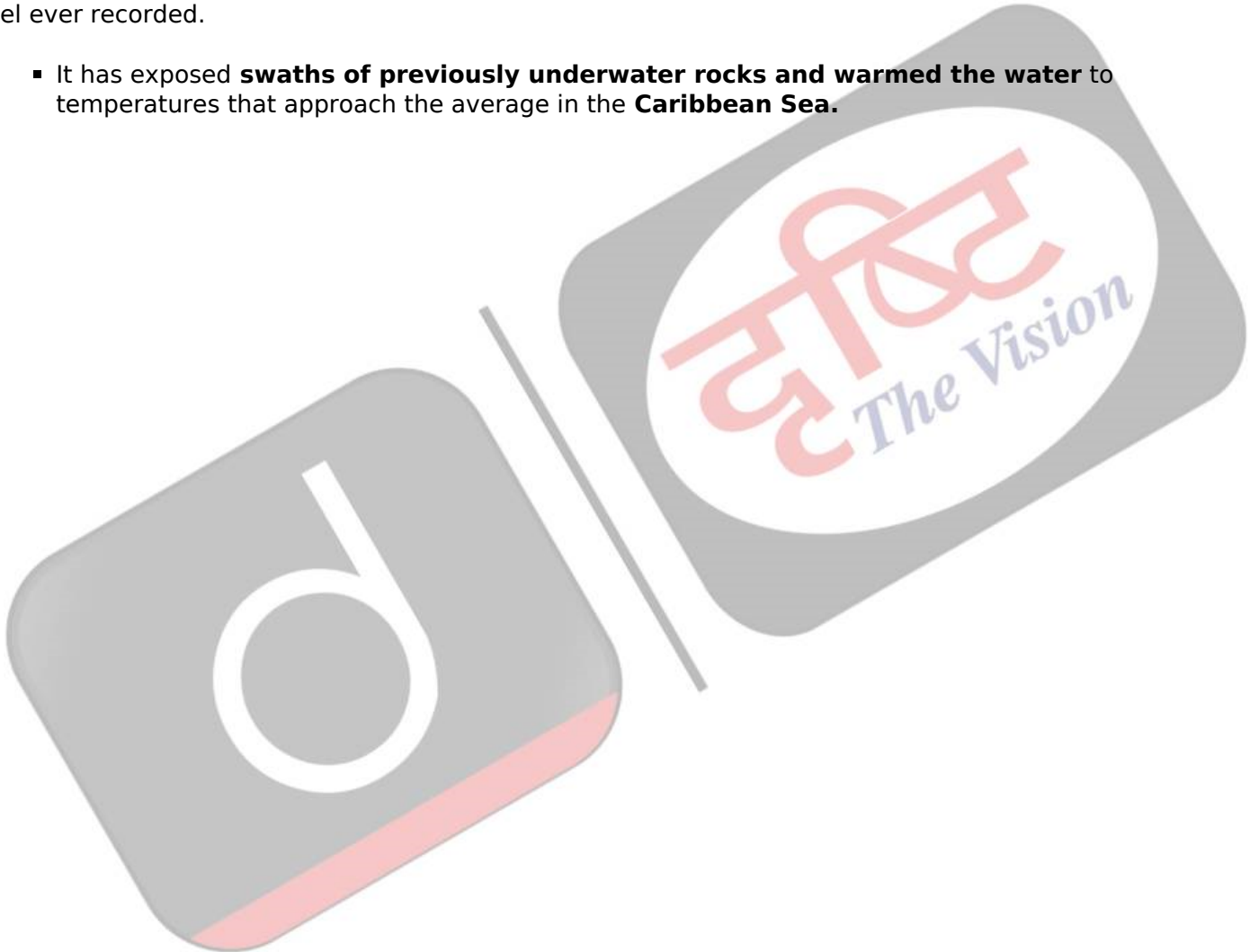


Italy's Lake Garda

Why in News?

Italy's worst [drought](#) in decades has reduced **Lake Garda**, the country's largest lake, to near its lowest level ever recorded.

- It has exposed **swaths of previously underwater rocks and warmed the water** to temperatures that approach the average in the **Caribbean Sea**.





What do we need to know about the Shrink of Lake Garda?

- **Northern Italy** saw significantly **lower rainfall for months**, and **snowfall in 2022 was also down 70%**, drying up important rivers like the Po, which flows across Italy's agricultural and industrial heartland.

- The **parched condition** of the Po, Italy's longest river, caused billions of euros in losses to farmers who normally rely on it to irrigate fields and rice paddies.
 - To compensate for the loss, **authorities allowed more water from Lake Garda** to flow out to local rivers.
 - But in late July 2022, **they reduced the amount to protect the lake** and the financially important tourism tied to it.
 - With huge amounts of **water being diverted to rivers, the lake recorded its lowest level.**

What do we need to know about Drought?

- **About:**
 - **Drought** is generally considered as a **deficiency in rainfall/precipitation** over an extended period, usually a season or more, resulting in a **water shortage** causing adverse impacts on **vegetation, animals, and/or people.**
- **Types:**
 - **Meteorological Drought:**
 - It is based on the degree of dryness or rainfall deficit and the length of the dry period.
 - **Hydrological Drought:**
 - It is based on the impact of rainfall deficits on the water supply such as stream flow, reservoir and lake levels, and ground water table decline.
 - **Agricultural Drought:**
 - It refers to the impact on **agriculture** by factors such as rainfall deficits, soil water deficits, reduced ground water, or reservoir levels needed for irrigation.
 - **Socioeconomic Drought**
 - It considers the **impact of drought conditions** (meteorological, agricultural, or hydrological drought) on supply and demand of some economic goods such as fruits, vegetables, grains and meat.
- **Causes:**
 - The **variability in rainfall is a major cause of drought.** The percentage of variability is inversely related to the total rainfall.
 - A deviation in the route of monsoon winds, or an early withdrawal of the monsoon too can also lead to drought conditions in an area.
 - Drought can also be caused due to **forest fires**, making the soil **unsuitable for cultivation and making the soil water deficit.**
 - **Land degradation** in addition to **Climate change** results in an increase in droughts.
- **Way to Tackle:**
 - **Water management:**
 - Saving, reuse of treated water, rainwater harvesting, desalination, or direct use of seawater for salt-loving plants.
 - **Farmer Managed Natural Regeneration (FMNR)**
 - Enabling **native sprouting tree growth** through selective pruning of shrub shoots.
 - The residue from pruned tress **can be used to provide mulching for fields** thus increasing **soil water retention and reducing evaporation.**
 - **Other Measures:**
 - **Buttressing** the soil through sand fences, windbreaks etc.
 - Need for **enriched** and **hyper fertilization of soil.**
 - Install **irrigation devices that are the most water efficient** for each use, such as **micro** and **drip irrigation**, and **soaker hoses.**
- **Indian Government's Initiative:**
 - **[Integrated Watershed Management Programme](#)**
 - **[National Mission on Green India](#)**
 - **Desert Development Programme**
 - launched in 1995 to minimize the adverse effects of drought and to rejuvenate the natural resource base of the identified desert areas.

Prelims

Q. Consider the following pairs: (2014)

Programme/Project Ministry

1. Drought-Prone: Ministry of Area Programme Agriculture
2. Desert Development: Ministry of Programme Environment and Forests
3. National Watershed: Ministry of Rural Development Project Development for Rainfed Areas

Which of the above pairs is/are correctly matched?

- (a) 1 and 2 only
(b) 3 only
(c) 1, 2 and 3
(d) None

Ans: (d)

Exp:

- **The aim of Drought-Prone Area Programme** is to minimise the adverse effects of drought on production of crops and livestock and productivity of land, water and human resources, ultimately leading to drought proofing of the affected areas. It comes **under the Department of Land Resources, Ministry of Rural Development. Hence, pair 1 is not correctly matched.**
- **The objective of the Desert Development Programme** is to minimise the adverse effect of drought and control desertification through rejuvenation of the natural resource base of the identified desert areas. **It comes under the Department of Land Resources, Ministry of Rural Development. Hence, pair 2 is not correctly matched.**
- **National Watershed Development Programme for Rain fed Areas (NWDPA)** is a programme for the conservation, development and sustainable management of natural resources and enhancement of agricultural productivity and production in a sustainable manner. It comes under **Department of Agricultural Cooperation and Farmer Welfare (Ministry of Agriculture and Farmers' Welfare).** Hence, pair 3 is not correctly matched.
- **Therefore, option (d) is the correct answer.**

Q. With reference to agriculture in India, how can the technique of 'genome sequencing', often seen in the news, be used in the immediate future? (2017)

1. Genome sequencing can be used to identify genetic markers for disease resistance and drought tolerance in various crop plants.
2. This technique helps in reducing the time required to develop new varieties of crop plants.
3. It can be used to decipher the host-pathogen relationships in crops.

Select the correct answer using the code given below:

- (a) 1 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2 and 3

Ans: (d)

Exp:

- Chinese scientists decoded rice genome in 2002. The Indian Agricultural Research Institute (IARI) scientists used the genome sequencing to develop better varieties of rice such as Pusa Basmati-1 and Pusa Basmati-1121, which currently makes up substantially in India's rice export. Several transgenic varieties have also been developed, including insect resistant cotton, herbicide tolerant

soybean, and virus resistant papaya. **Hence, 1 is correct.**

- In conventional breeding, plant breeders scrutinize their fields and search for individual plants that exhibit desirable traits. These traits arise spontaneously through a process called mutation, but the natural rate of mutation is very slow and unreliable to produce all the plant traits that breeders would like to see. However, in genome sequencing it takes less time, thus it is more preferable. **Hence, 2 is correct.**
- The host-pathogen interaction is defined as how microbes or viruses sustain themselves within host organisms on a molecular, cellular, organism or population level. The genome sequencing enables the study of the entire DNA sequence of a crop, thus it aids in understanding of pathogens' survival or breeding zone. **Hence, 3 is correct.**
- **Therefore, option (d) is the correct answer.**

Mains

Q. The process of desertification does not have climate boundaries. Justify with examples. **(2020)**

PDF Refernece URL: <https://www.drishtias.com/printpdf/italy-s-lake-garda>

