

population growth, technological advancements, city expansions, highways, dams, and other engineering research, and the natural body has changed dramatically as a result of these activities.

The growing concern for the environment has created tensions between planners, engineers, and some members of the public who are opposed to all engineering structures, particularly dams. Construction of the aforementioned factories and buildings, on the other hand, becomes unavoidable to improve the country's wealth through accomplishing socio-economic and technological improvements.

### **Dam and environment**

Dams play a critical role in the efficient use of water resources. They began construction many years before current knowledge of hydrology and hydromechanics became available. Aside from the benefits of managing stream regimes and so preventing floods, acquiring residential and irrigation water from stored water, and generating energy, dams have a variety of good and negative environmental effects.

Dams play a critical role in the efficient use of water resources. They were built many years before current knowledge of hydrology and hydromechanics were available. These aren't your typical engineering structures. Dam projects have played a significant role in the evolution of civilization, as they help meet the demand for water at specific times and regulate stream regimes.

Dams, which benefit the national economy in a variety of ways, including irrigation, drinking water supply, flood control, energy generation, fishing, and tourism, are also successful in raising the living and cultural standards of the region in which they were built. In the meantime, the dam's new habitat

encourages the emergence of new species in the area. Dams are crucial not only for economic development but also for general economic and moral development. Dams have played an important part in the development of impoverished areas in many developed countries.

### **Positive effects of the dam on the environment**

#### **❖ Water Supply for Domestic and Industrial Use**

One of the fundamental requirements for socio-economic development in the world is the availability of an adequate quantity of water with the appropriate quantity. Properly planned, designed, constructed and maintained dams contribute significantly toward fulfilling our water supply requirement. The primary source of freshwater supply is precipitation. To accommodate variation in the hydrologic cycle, dams and reservoirs are needed to store water and then provide a consistent yearly supply.

#### **❖ Meeting the Agriculture Demand for Food Supply**

Agriculture irrigation is one of the most important uses of water on a global basis. Since the early 1990s, less than a fifth of the world's arable land has been irrigated, contributing roughly a third of global food output. The majority of irrigated lands are in dry zones, which make up a large share of developing countries. Even with extensive water conservation measures such as advancements in irrigation technology, more reservoirs and dams will be needed.

#### **❖ Flood Control**

Dams and reservoirs can be utilized to effectively control river levels and flooding downstream by temporarily storing flood volume and releasing it later. Many multipurpose dams

strategically situated in river basins provide the most effective technique of flood control. The dams are controlled by a unique water management strategy that allows floods to pass through the basin without causing harm.

❖ Recreation

In addition to the main purposes of dams, the attractiveness of reservoirs and dams for tourists is frequently a considerable benefit. This is a critical area where natural water surfaces are scarce or non-existent. The recreational benefits of lakes, such as boating, swimming, fishing, bird viewing, and nature walks, are considered early in the planning stage, together with the other objectives to establish a balanced project. Dams and reservoirs can be used to boost tourism.

❖ Hydropower

The availability of energy is critical for the nation's socio-economic progress. It is beneficial to employ clean, efficient, dependable, and renewable energy. Hydropower satisfies all of these criteria. Renewable energy sources are frequently in good condition in countries that still have a lot of growth ahead of them. Hydropower is the most technologically advanced and cost-effective form of electricity. Hydropower projects generate electricity with high efficiency and without polluting or wasting future generations.

❖ Inland Navigation

Inland navigation is the transportation of ships between inland ports by inland water. The great load-carrying capacity, ability to handle freight with large dimensions and fuel savings are all advantages of inland transportation over highway and rail.

Comprehensive basin planning and development utilizing dams have resulted in improved inland navigation.

### **Negative effects of dams on the environment**

#### ❖ Atmospheric system

Microclima associated with region topography is distinguished by variations in moisture percentage, temperature, and air body motions generated by a large stationary water body. Climate change on a regional scale can also be detected. These changes may not appear to be harmful to human health, but they are visible in a variety of plants and animals. Their secondary consequences have an impact on humans.

#### ❖ Territorial biological systems

The river's biological life changes rapidly, both in the reservoir and downstream. The irrigated parts of the ecosystem on the coast are the parts of the biosystem that are affected by the dam. The land part of the region reduces during the dam filling activities since the lands remain underwater. The water-land divide, on the other hand, continues. As a result, plant, animal, and human settlement regions shift. Forests and agricultural areas may be flooded.

#### ❖ Aquatic ecosystems

Decomposing organisms create a rise in nutritional compounds in water in a short amount of time at first. As a result, the value of water's Biological Oxygen Demand rises. The stationary layers along the reservoir depth are used to execute anaerobic decomposition media. As a result, a dark-colored lake with a foul odour emerges. Following that, massive growth in phytoplankton is noticed, which is fed by the increasing amount of nutrients. Macro flora grows up on the water surface, in