

# DAMS, LAKES, WATERFALLS



## Hydroelectric Power Projects

- Multipurpose Project

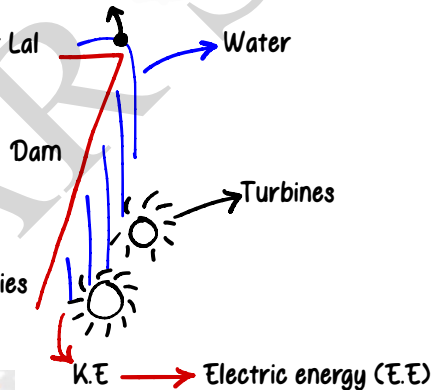
Purpose: Flood control, hydropower generation, irrigation, tourism

- $M.E = P.E + K.E$

- Potential Energy (P.E): P.E is the energy that is stored in an object in an object due to its position relative to some zero position

- Kinetic Energy (K.E): form of energy that shows an object or a particle has by reasoning of its motion

Water when stored gains P.E



- Mentioned as "Temple of Modern India" by Jawahar Lal Nehru

### 1. Damodar Valley Project

- India's first river valley project (1948)
- It is based on the Tennessee River of USA
- There are 8 dams built on Damodar and its tributaries

Maithon	Jharkhand	Borakar River
Tilaiyah	Jharkhand	Borakar River
Panchet	Jharkhand	Damodar
Konar	Jharkahnd	Konar

- Another type of Dam: Earthen Dam

### 2. Bhakra Nangal Project

- Constructed during First Five Year Plan
- Built on Sutlej river
- Made of two dams:
  - Bhakra: Himachal Pradesh (Govind Sagar Lake from Bhakra Nangal Dam)
  - Nangal: Punjab
- Highest Gravity Dam → bears forces on its own
- Largest Dam of India in terms of area
- Nathpa Jhakri Dam is also built on Sutlej in Himachal Pradesh

## Dams

### 1. Rihand Dam

- Built on Rihand river (Tributary of Son)
- Govind Ballabh Pant Sagar Lake created from this dam
- Largest Artificial Lake of India

### 2. Hirakud Dam

- In Odisha, Sambalpur district
- Built on Mahanadi river
- Longest dam of world/India (4.8 km/25 km)

### 3. Tehri Dam

- In Uttarakhand
- Built on Bhagirathi river
- Highest Dam of India (261 m)

• Sunderlal Bahuguna

↓  
Chipko Movement: against deforestation

Anti-Tehri Movement

### 4. Farakka Dam

- In West Bengal, built on Ganga river
- This dam was built to provide water to the Hooghly river

### 3. Vyas River Project

- Harike Dam was built through this project in Punjab (Kapurthala)
- Sutlej and Vyas meets here
- An Indira Gandhi Canal was constructed from it

↓  
Has the largest irrigation facility

## State-wise

### Jammu and Kashmir

- Dulhasti Hydroelectric Project
- Salal Hydroelectric Power Station

All on Chenab river

→ Chenab Rail Bridge

↪ highest railway bridge is constructed on Chenab river near Salal hydroelectric project



- Baglihar Hydroelectric Project → On Chenab river

- Kishan Ganga
  - Tulbul
  - Uri
- All on Jhelum river

### Himachal Pradesh

- Pong Dam (Maharana Pratap Sagar): Beas river
- Chamera Dam: Ravi river

### Uttar Pradesh

- Matatila Dam
  - Lakshmibai Dam
- Betwa river
- Rihand Dam: Rihand river (Govind Ballabh Pant Sagar Reservoir)

### Gujarat

- Ukai Dam: Tapi river
- Kakrapar Dam: Tapi river
- Sardar Sarovar Dam: Narmada river

### Madhya Pradesh

- Tawa Dam: Tawa river (tributary of Narmada)
- Ban Sagar Dam: Son river
- Omkareshwar Dam: Narmada river
- Indira Sagar Dam: Narmada river
- Gandhi Sagar Dam: Chambal river

### Rajasthan

- Mahi Bajaj Sagar Dam: Mahi river
- Bilaspur Dam: Banas river
- Rana Pratap Sagar Dam: Chambal river
- Jawahar Sagar Dam (on Chenab river)



### Maharashtra

- Jayakwadi Dam: Godavari river
- Dhom Dam: Krishna
- Koyna Dam (largest dam of Maharashtra): Koyna river
- Panchet Dam: Damodar river

### Chhattisgarh

- Indravati Dam: Godavari river

### Karnataka

- Jog/Mahatma Gandhi Dam: Sharavati river
- Linganamakki Dam: Sharavati river
- Shivsamudram Dam: Kaveri river
- Almatti Dam: Krishna river

### Kerala

- Periyar/Mullaperiyar/Idukki Dam: Periyar (life line of Kerala)

Many dams are  
constructed on it

### Telangana

- Pochampad/Sriram Sagar/Kaleshwaram Lift Irrigation Project : Godavari river

### Tamil Nadu

- Pykara Dam: Pykara river
- Mettur Dam: Kaveri river

### Andhra Pradesh

- Srisailem Dam
- Nagarjuna Sagar Dam

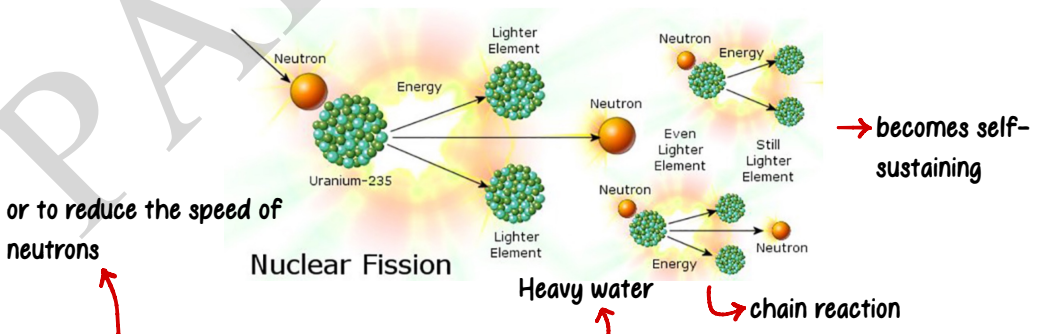
Krishna river

## Waterfalls in India

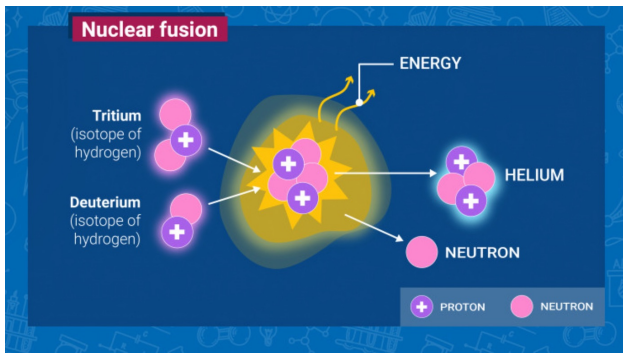
### Some Important Waterfalls of India भारत के कुछ महत्वपूर्ण जलप्रपात :-

Name (नाम)	River (नदी)	State (राज्य)
Kunchikal (Highest waterfall 455 m)	Varahi	Karnataka
Jog / Gersoppa / Mahtma Gandhi / 2nd highest waterfall in India	Sharavati	Karnataka
Shivsamundram	Kaveri	Karnataka
Chulia	Chambal	Rajasthan
• Dhuandhar • Kapildhara	Narmada	Madhya Pradesh
Hundru	Swarnrekha	Jharkhand
Dudh Sagar	Mandvi	Goa

- Highest waterfall in the world: Angel waterfall in Venezuela
- 2nd highest in the world: Niagara Falls (in USA-Canada border)
- Niagara of India: Chitrakote waterfall in Chhattisgarh
- Nuclear Power Plants: where energy is generated through Nuclear Fission, in which Uranium and Thorium atoms are used, during nuclear fission, a neutron collides with such atoms and splits it, releasing a large amount of energy in the form of heat and radiation



- Moderators later used to control chain reactions:  $D_2O$ , Graphite
- Coolant: typically liquid to reduce or regulate the temperature of a system, for example:  $H_2O$ ,  $D_2O$ , liquid Sodium



- Concept used in making Hydrogen Bombs
- Homi J. Bhabha is known as the "Father of Indian Nuclear Programme"/"Father of Atomic Energy"
- India's first nuclear power reactor: Apsara (Trombay, Mumbai, 1956)
- 1st completely indigenously built nuclear power plant: Kalpakkam

### Nuclear Power Plants of India भारत के परमाणु ऊर्जा संयंत्र :-

$^{232}_{92}\text{U}$   
(Uranium + Thorium)

Name	Location	Capacity
Tarapur Atomic Power Station – 1969	Maharashtra	1,400
(Rwatbhata)Rajasthan Atomic Power Station – 1973	Rajasthan	1180
(Kalpakkam) Madras Atomic Power Station – 1984	Tamil Nadu	440
Narora Atomic Power Station- 1991	Uttar Pradesh	440
Kakrapar Atomic Power Station – 1993	Gujarat	440
Kaiga Nuclear Power Plant -2000	Karnataka	880
Kudankulam Nuclear Power Plant – 2013	Tamil Nadu	2000

1st

1st indigenously built

- Chernobyl Disaster: 26 April 1986

## Lakes of India

- An artificial lake named Govind Sagar was created in 1976 by a huge hydroelectric power dam in Bhakra on the Sutlej river
- Pushkar Lake is situated in Ajmer, Rajasthan
- Lake that is the result of Asteroid impact: Lonar Lake in Maharashtra
  - Crater lake
- Wular Lake: largest freshwater lake in India, also the result of tectonic activity
- Barapani Lake: Also known as Umiam Lake, in Shillong, Meghalaya
- Tsomgo lake is a glacial lake located in Sikkim
- Bhushi lake is in Maharashtra
- Bhojtal, formerly known as Upper lake is situated in Madhya Pradesh
  - constructed by Raja Bhoj (Parmar Dynasty's most famous and powerful ruler) → Also established Bhopal city
- Anchar lake is in Jammu and Kashmir
- Kolleru lake is located in Andhra Pradesh, situated delta that is formed between Godavari and Krishna
- Pulicat lake: b/w Andhra Pradesh and Tamil Nadu, India's 2nd largest Brackish water lake
- Largest Brackish water lake: Chilika Lake
  - 1st Ramsar site
  - fresh water + salt water
  - largest saline water lake
- Largest Inland Salt water lake: Sambhar lake, Rajasthan
  - salinity more than Chilika but area less than Chilika
  - Odisha
- Renuka lake located in Himachal Pradesh
- Loktak lake: world's only floating lake in Manipur



- Suryadhar lake is located in Uttarakhand
- Pangong Tso, Tso kar, Tso Moriri: Salt water lake  
↓  
in Aksai Chin border
- Sur Sarovar, also known as Keetham lake, is a man-made reservoir added to list of Ramsar Site in the year 2020
- Kanwar Tal in Bihar: Ramsar Site, 2022  
↓  
largest Ox bow lake
- Thol lake, Gujarat: Ramsar Site, 2021
- Wadhvana wetland, Gujarat: Ramsar Site, 2021
- Nizam Sagar Dam located in Telangana on Manjira river  
↓  
by Hyderabad Nizam
- Nagarjuna Sagar Dam is on Krishna river
- Barrage/Dam closest to India-Bangladesh border: Farakka Barrage
- Maithon Dam in Jharkhand constructed over Barakar river
- Diamer Basha Dam is constructed by Pakistan on Indus River
- Tawa Dam: Madhya Pradesh
- Ujjani Dam: Maharashtra
- Isapur Dam is in Maharashtra on Penganga river
- Tehri Dam is multi-purpose rock and earth-fill embankment dam on the Bhagirathi river
- Ramsar, Iran Convention in 1971 on wetlands
- Schemes launched for Wetland and Mangrove Conservation on World Environment Day:
  1. Amrit Dharohar Yojana
  2. MISHTI (Mangrove initiative for Shoreline Habitats and Tangible Incomes)



- Thein Dam is on Ravi river, also called as Ranjit Sagar Dam
- Hundru waterfall in Subarnarekha river
- Kunchikal waterfall, highest waterfall in India is on Varahi river
- Dudhsagar waterfall is in Goa
- Bhambavli Vajrai Waterfall is located in Maharashtra, Satara district
- Khandadhar waterfall: Odisha
- Chulia waterfall is situated on Chambal river in Rajasthan
- Duduma waterfall is in Odisha
- Gokak waterfall is in Ghatprabha river (tributary of Krishna) in Karnataka

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