

Basic of Environmental studies

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- French word “**Environmer**” which means in encircled or surrounded.

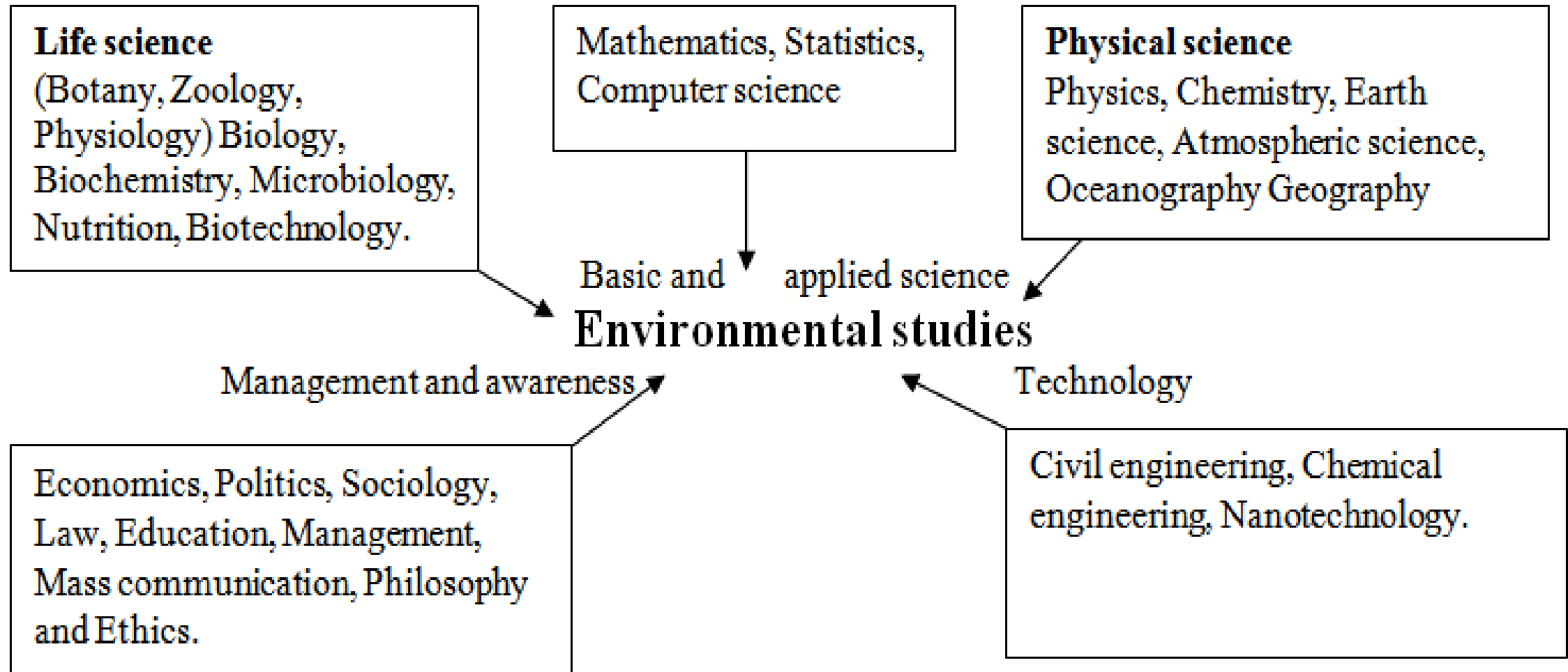


- Environment treated as our **motherland**.
- Everything around us from our environment and our lives depend on keeping its vital system as interact as possible.

All the biological and non biological entities around us are including in environment. The sum total of water, air & land and interrelationships that exist among them and with the human beings, other living organisms and materials.

পরিবেশ বলতে পরস্পর ক্রিয়াশীল উপাদান গুলির মাধ্যমে গড়ে ওঠা সেই প্রাকৃতিক ও জীবমন্ডলীয় প্রণালীকে বোঝায়, যার মধ্যে মানুষ ও অন্যান্য সজীব উপাদানগুলি বেঁচে আছে এবং বসবাস করে।

Environment studies multidisciplinary in nature



The scope of Environmental Studies

- 1. Natural resource: their conservation and management.
- 2. Ecology and biodiversity (knowledge).
- 3. Environmental pollution and control.
- 4. Social issues in relation to development and environment.
- 5. Human population and environment.

The scope of Environmental Studies

6. Several career option

- a. Research and development (**R and D**) in environment (Pollution control law that reduce pollution).
- b. **Green advocacy** (acts and laws related to environment).
- c. **Green marketing** (international organisation for standardization (ISO) mark that remark environment friendly).
- d. **Green media:** Environmental awareness can be spread through mass media (TV, radio, newspaper, internet, magazine, hoarding, advertisement).
- e. **Environmental consultancy:** Many NGO (non government organization), industries and government bodies are engaging environmental consultant for environment related problems.

Importance of environment

- It is most essential to understand the basic of environment.
- If we control this condition for long time:
 1. Dealing with safe and clean drinking water,
 2. Hygienic living condition,
 3. Clean and fresh air,
 4. Fertile land,
 5. Healthy food,
 6. Sustainable development.

Environmental values

Environmental values

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graph TD; A[Environmental values] --> B[Direct value]; A --> C[Indirect value]; B --> B1[1. Consumptive use]; B --> B2[2. Productive use]; C --> C1[1. Indirect use]; C --> C2[2. Existence value within generation.]; C --> C3[3. Aesthetic value]; C --> C4[4. Bequest value of future generation.];
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Direct value

1. Consumptive use

Fuel wood,
Food or medicine from plant,
Commercial fisheries.

2. Productive use

Timber for construction.
Lake used for fishing and boating.

Indirect value

1. Indirect use

Wetland as food buffer,
Forest as carbon sink.

2. Existence value within generation.

3. Aesthetic value

(a beautiful sunrise, cool beach)

4. Bequest value of future generation.

Need for public awareness

- 1. **Rapid changing technologies** leads to who abandoned waste.
Latest production of technology.
Changing car, bike, scooty, mobile, phone.
Create vast e waste (electronic waste).
- 2. **Our fast and energy demanding lifestyle** pollutes the environment.
Dependent on machines to get work done fast and make life more comfortable for us.
- 3. Crazy consumerism or **over consumption** leads to environment degradation.
- 4. **The earth has a definite capacity** to tolerate pollutants and sustain populations.

- **5. Cultural heritage**

- a. Indian culture is based on principle of environmental conservation.

- b. Ethnic practice.

- c. ***Ginkgo biloba***

Early Jurassic living species in the division of Ginkgophyta. "Medienhair tree".

"Fingernail of Buddha" Buddhism call for non violence, use minimal resources and conserved *Ginkgo biloba* for retention of Buddha.

Environmentally significant days

World wetland day - 2 February

National science day - 28 February

World forest day - 21 March

World heritage day - 18 April

Earth day - 22 April

International biodiversity day - 22 May

Anti tobacco day - 31 May

World Environment day - 5 June

World ocean day - 8 June

World population day - 11 July

World ozone day - 16 September

World car free day - 22 September

Green consumer day - 28 September

World habitat day - 3 October

World animal welfare day - 4 October

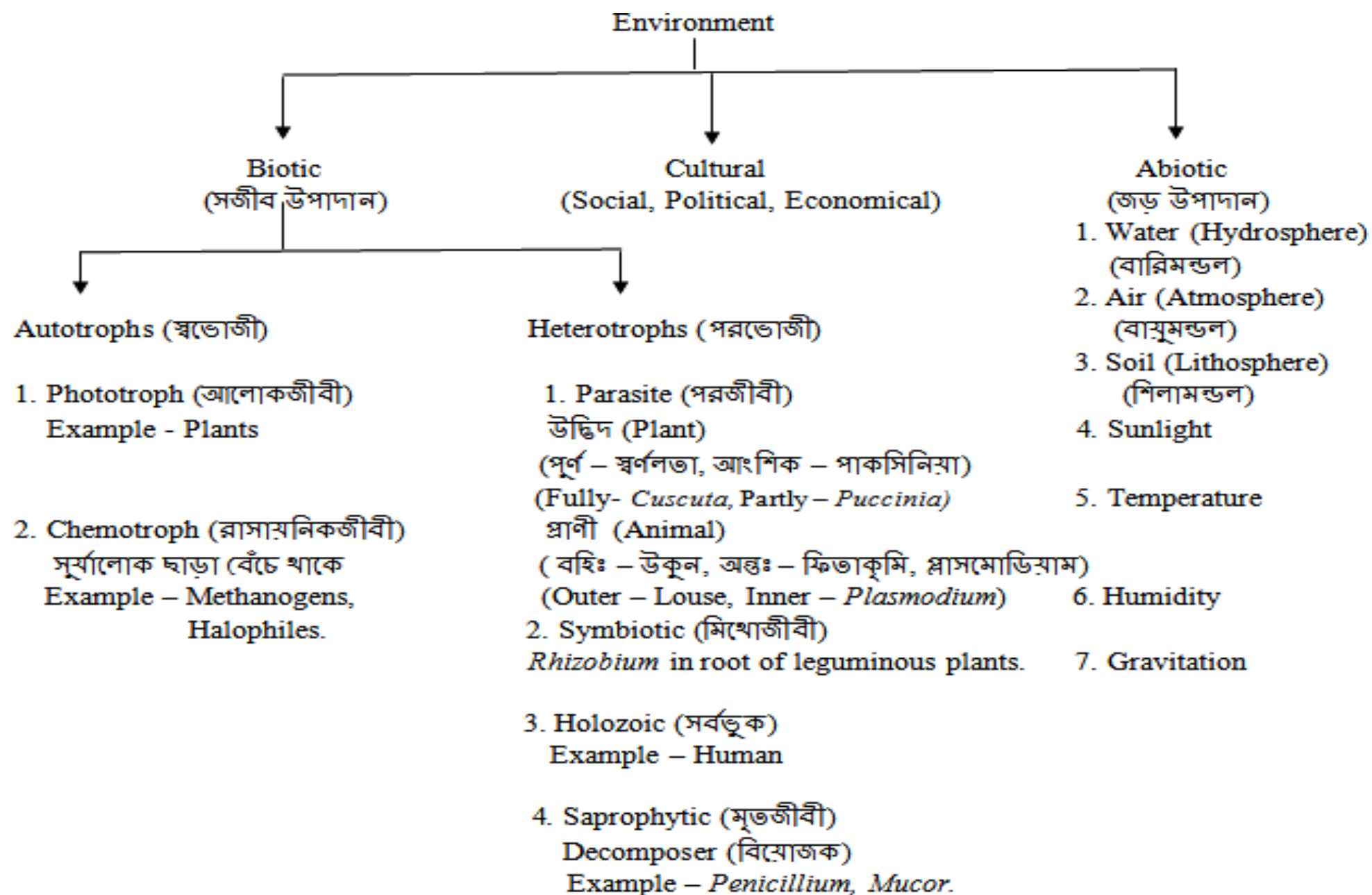
Wildlife week - October (1 - 7) World

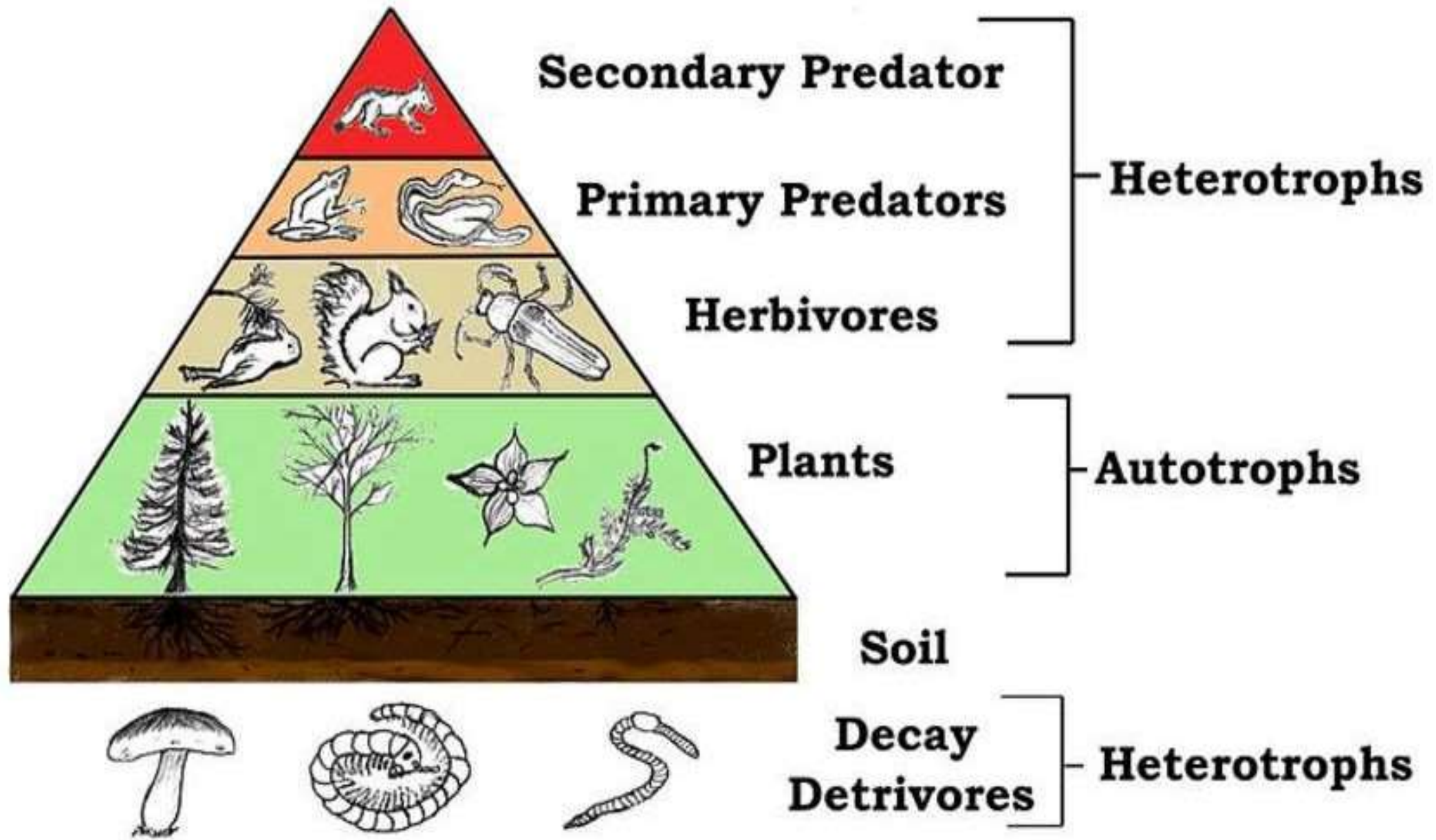
conservation day - 24 October

Bhopal tragedy day - 2 December (3 December at 12:00 am)

International day for biological diversity - 29 December.

**Components
of
Environment**





Component of Environment

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graph TD; A[Component of Environment] --> B[Natural]; A --> C[Human]; A --> D[Human Made]; B --> B1[1. Land (Lithosphere)]; B --> B2[2. Water (Hydrosphere)]; B --> B3[3. Air (Atmosphere)]; B --> B4[4. Biosphere  
(Thin layer on earth  
in which life can exist)]; C --> C1[1. Family]; C --> C2[2. Community]; C --> C3[3. Religion]; C --> C4[4. Education]; D --> D1[1. Road]; D --> D2[2. Building]; D --> D3[3. Parks]; D --> D4[4. Bridge]; D --> D5[5. Public factories];
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Natural

1. Land (Lithosphere)
2. Water (Hydrosphere)
3. Air (Atmosphere)
4. Biosphere
(Thin layer on earth
in which life can exist)

Human

1. Family
2. Community
3. Religion
4. Education

Human Made

1. Road
2. Building
3. Parks
4. Bridge
5. Public factories

Atmosphere

- A layer or a set of layers of gases surrounding a planet or other material body, that is held in place by the gravity of that body.
- The atmosphere of Earth is composed of
 - Nitrogen (about 78%),
 - Oxygen (about 21%),
 - Argon (about 0.9%),
 - Carbon dioxide (0.03%) and
 - other gases in trace amounts.
- The atmosphere helps to protect living organisms from genetic damage by solar ultraviolet radiation, solar wind and cosmic rays.

Layer of Atmosphere

- **Troposphere** (0 – 12 KM)

The average surface temperature on Earth is approximately **14°C / 15°C** (NASA)

- **Stratosphere** (20 – 50 KM)

- Contain a layer of **sulphate** which is important for the formation of rain, it also contain a **layer of ozone which absorbs the UV rays** temperature minus 40 degree centigrade (-40 °C).

- **Mesosphere** (50 – 90 KM)

- **Thermosphere** (90 – 500 KM) 1500°C

- **Exosphere** (520 – 1000 KM) 2000°C

Layers of the Atmosphere

Exosphere

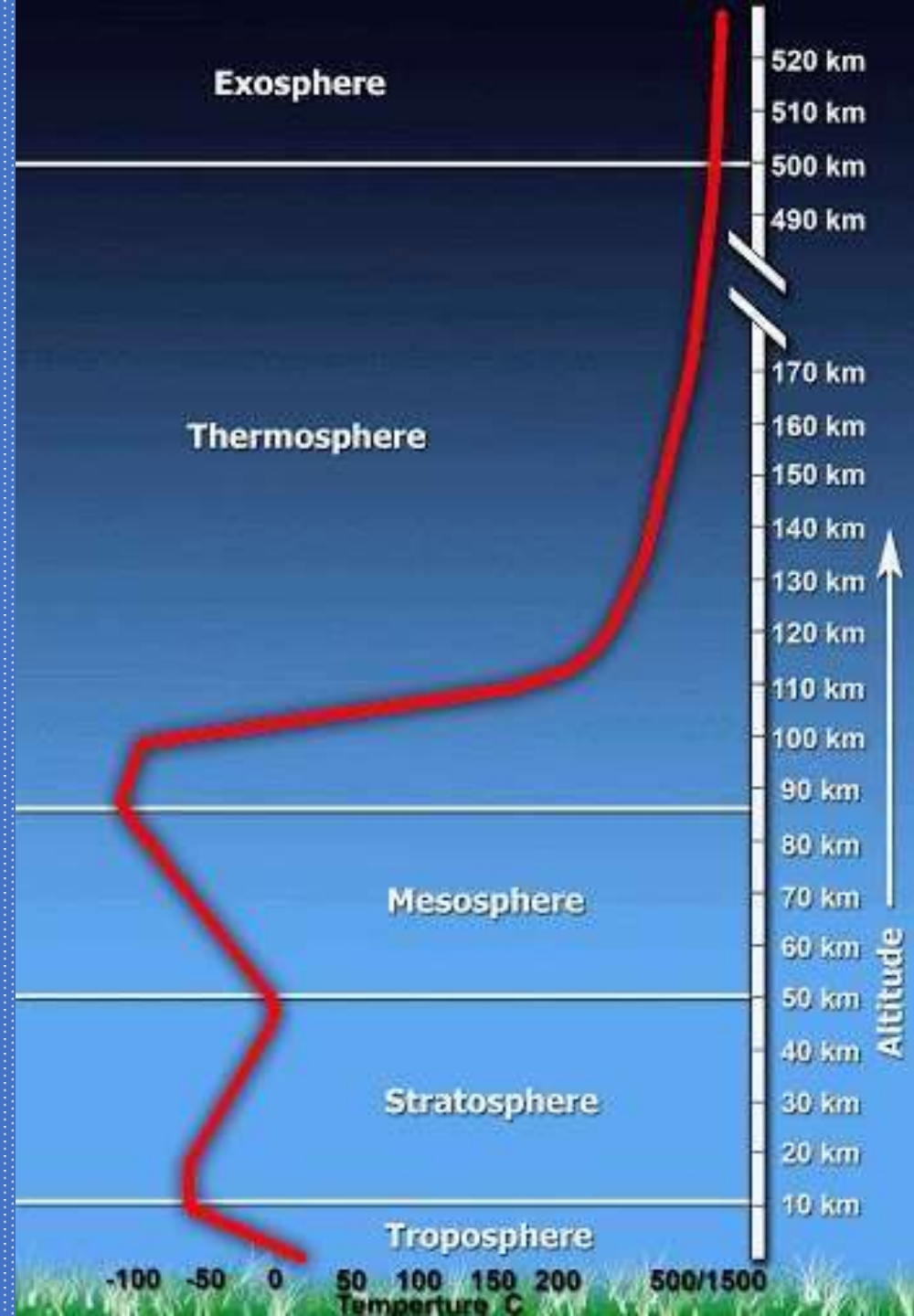
Thermosphere

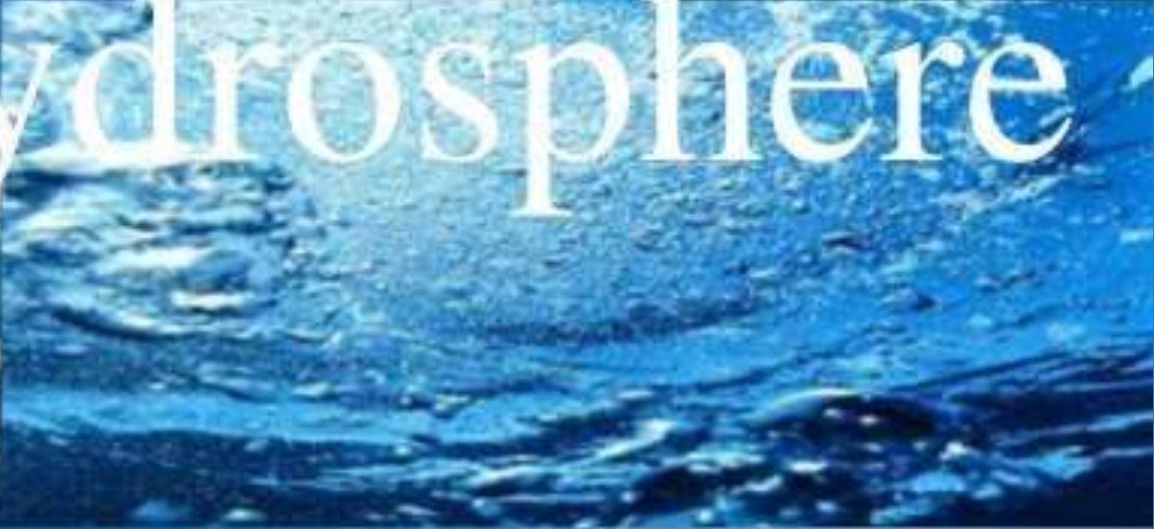
Mesosphere

Stratosphere

Troposphere







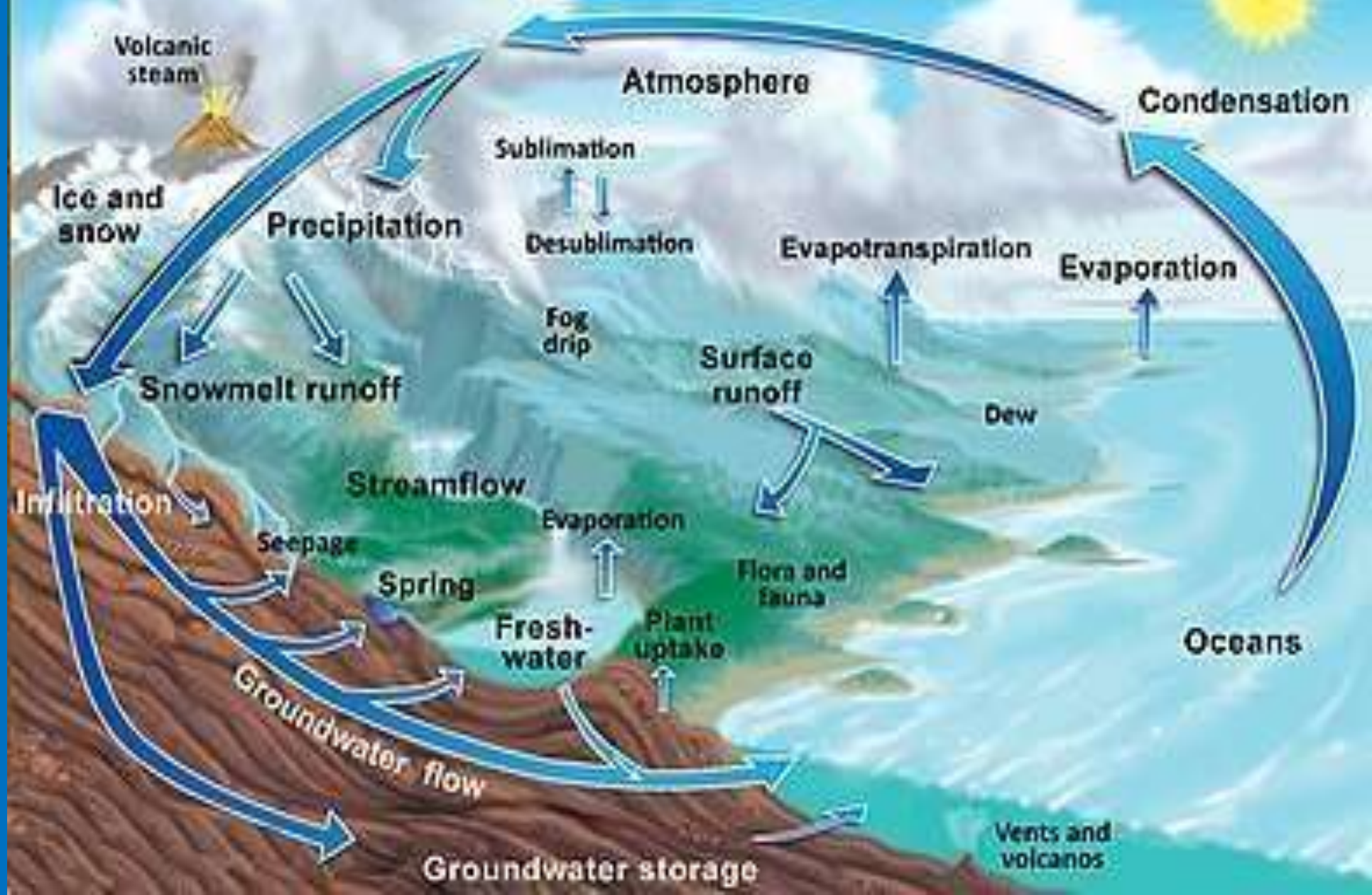
The Hydrosphere



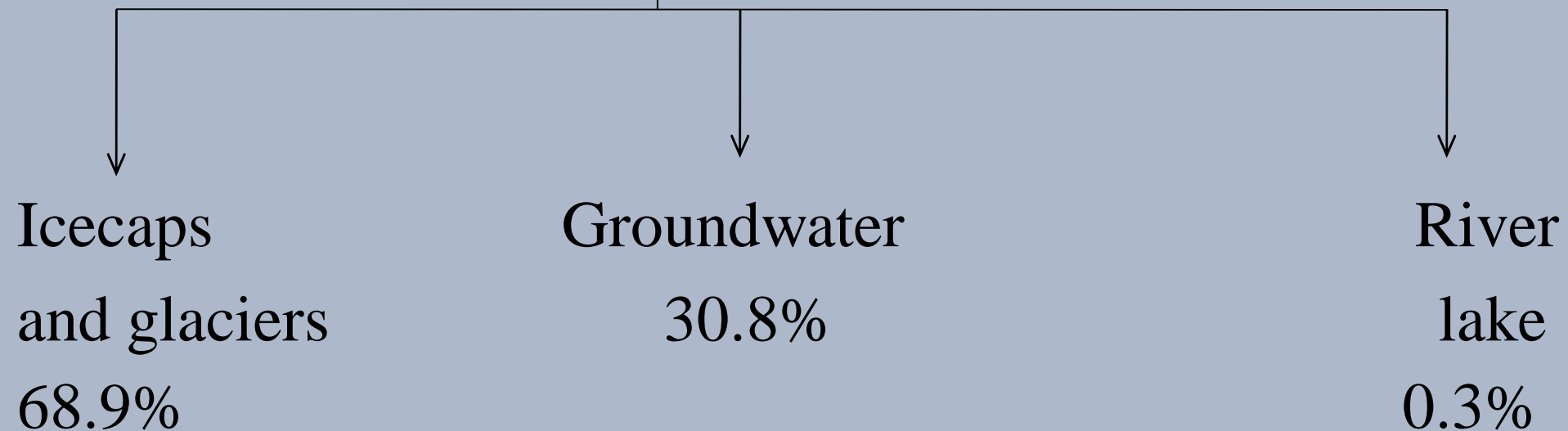
Hydrosphere

- A **hydrosphere** is the total amount of water on a planet. The **hydrosphere** includes water that is on the surface of the planet, underground, and in the air. A planet's **hydrosphere** can be liquid, vapor, or ice. On Earth, liquid water exists on the surface in the form of oceans, lakes and rivers.
- Covers third quarter ($3/4$) of the Earth surface (70%).

The Water Cycle



- A major part of Hydrosphere is made in the ecosystem in the ocean (**96% or 97.5%**) while only small part in freshwater (4% or 2.5%)
- **Freshwater (4% or 2.5%) (Total 100%)**

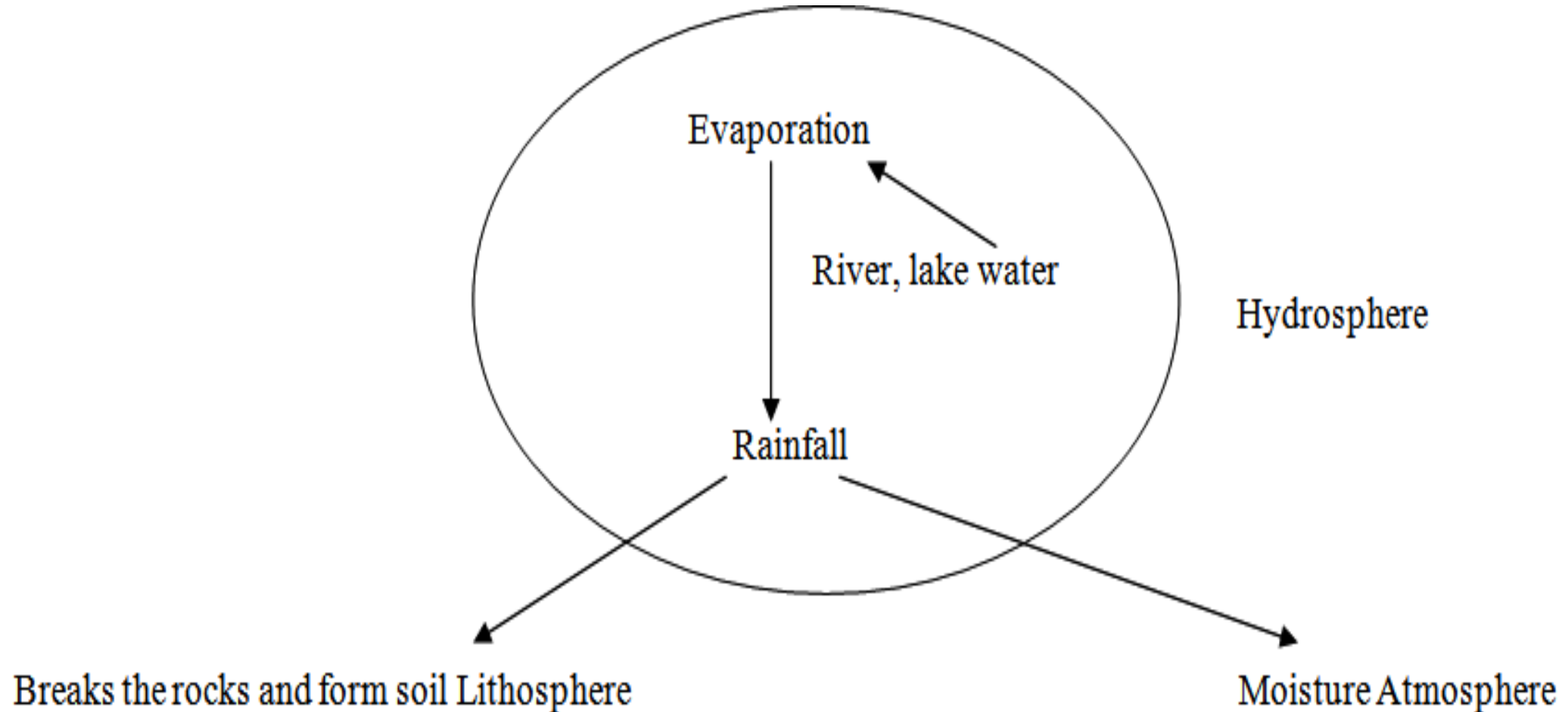


- Rainfall water is also a freshwater which store in underground aquifer.

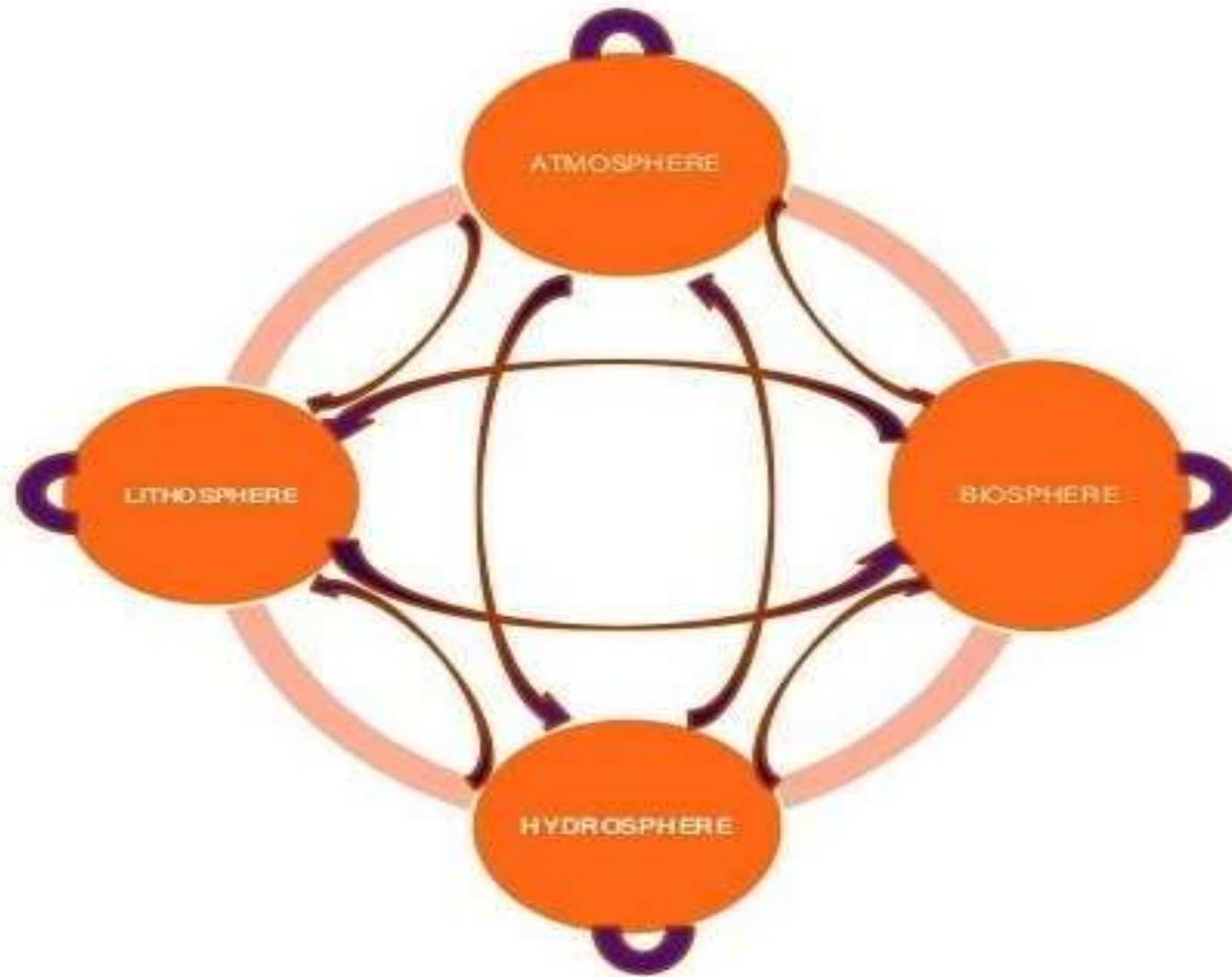
Lithosphere

- Lithosphere is outermost shell of a terrestrial-type planet.
- The earth formed about **4.6 billion years** ago.
- About **3.2 billion years** ago the earth cools down considerably and very special event took place - **life begin on our planet.**
- 92 elements are present in the lithosphere.
- Only eight element common of Crystal rocks O₂ 47%, Si 28%, Al 8%, Fe 5%, Na 3%, Mg 3%, k 3%, Ca 3%.
- Rocks when broken form soil on which human are dependent for agriculture.

Interrelationship between various components of environment



INTERACTION BETWEEN DIFFERENT COMPONENTS OF ENVIRONMENTAL



Environmental education

- Environmental education **increase public awareness and knowledge about environmental issues or problems.**
- Environmental education is a process that allows individual to explore environmental issues engage in **problem solving and take and action to improve the environment.** As a result individual develop a deeper understanding of environment.

- **The components of environmental education are**
- **1. Awareness and sensitivity** to the environment and environmental challenges.
- **2. Knowledge and understanding** of the environment and environmental challenges.
- **3. Attitudes** of concern of the environment and motivation to improve or maintain environmental quality.
- **4. Skill** to identify and help resolve environmental challenges.
- **5. Participation** in activities that lead to the resolution of environmental challenges.

Let's do it

1. Stop wastage of water

2. Food management for sustainable development. You reduce the amount of plastic (plastic bags, toys, plastic balls, pens)

3. You reduce your consumption of fossil fuels, petrol, diesel, natural gas.

4. Paper (reuse)

3R (Reduce, Reuse, Recycle)

4R (Reduce, Reuse, Recycle, Recovery)

5R (Reduce, Reuse, Recycle, Recovery, Repurpose)

**People in
Environment
(Environmentalist)**

Charles Darwin

- Charles Darwin wrote **“The origin of species”**



Ralph Emerson

- **Ralph Emerson** spoke of the danger of Commerce to our environment way back in 1840.



Devid Henry Thoreau

- **Devid Henry Thoreau** articulated a philosophy based on environmental and social responsibility.



John Muir

- **John Muir** is remembered as having saved the great ancient **sequoia tree** in California forest.



Aldo Leopold

- **Aldo Leopold** designed the early policies on wilderness conservation and wildlife management.



Rachel Carson

- **Rachel Carson** she wrote a well-known book **Silent Spring** which eventually led to change in Government policy and public awareness.



EO Wilson

- **EO Wilson** is an entomologist who envisioned that biological diversity was the key to human survival on earth he wrote “**Diversity of life**” in 1993.



Indian

Environment Lover

(Environmentalist)

Indira Gandhi

- Third Prime Minister played a very significant role in the preservation of India's wildlife.



- Mrs. Gandhi was introducing the concept of environmental protection in constitution of India as a **fundamental duty**.
- The network of **Protected areas grew from 65 to 298**.
- **Wildlife Protection Act 48(A)** was formulated during the period when she was Prime Minister.

Salim Ali

- **Ornithologist** (পক্ষীবিজ্ঞানী)
- Book **“The book of Indian birds”** , **“The Fall of a sparrow”** (his autobiography).



MS Swaminathan

- Agricultural scientist. (**Father of Green Revolution in India**)
- He founded the **MS Swaminathan Research Foundation** in **Chennai** which does work on the conservation of biological diversity.



Madhav Gandgil

- **Ecologist**
- Developing community Biodiversity Register and conserving sacred groves to studies on the **behaviour of mammals, birds and insects.**
- In 2010 he said at least a part of **the problem in Kerala was Manmade.**
- Industrial and mining activities (developing works), Thermal power plants, highly polluting Industries were **banned.**

MC Mehta

- **Environmental lawyer.**
- **Justice Kuldeep Singh ordered Environmental studies as a compulsory course to all students.**
- He is most famous and long drawn Battles supported by Supreme Court include:
 - **i. Protecting the Taj Mahal.**
 - **ii. Cleaning up the Ganga River.**
 - **iii. Banning intensive shrimp farming on the coast.**
 - **iv. Urging the government to implement Environmental education in school and college.**

MC Mehta



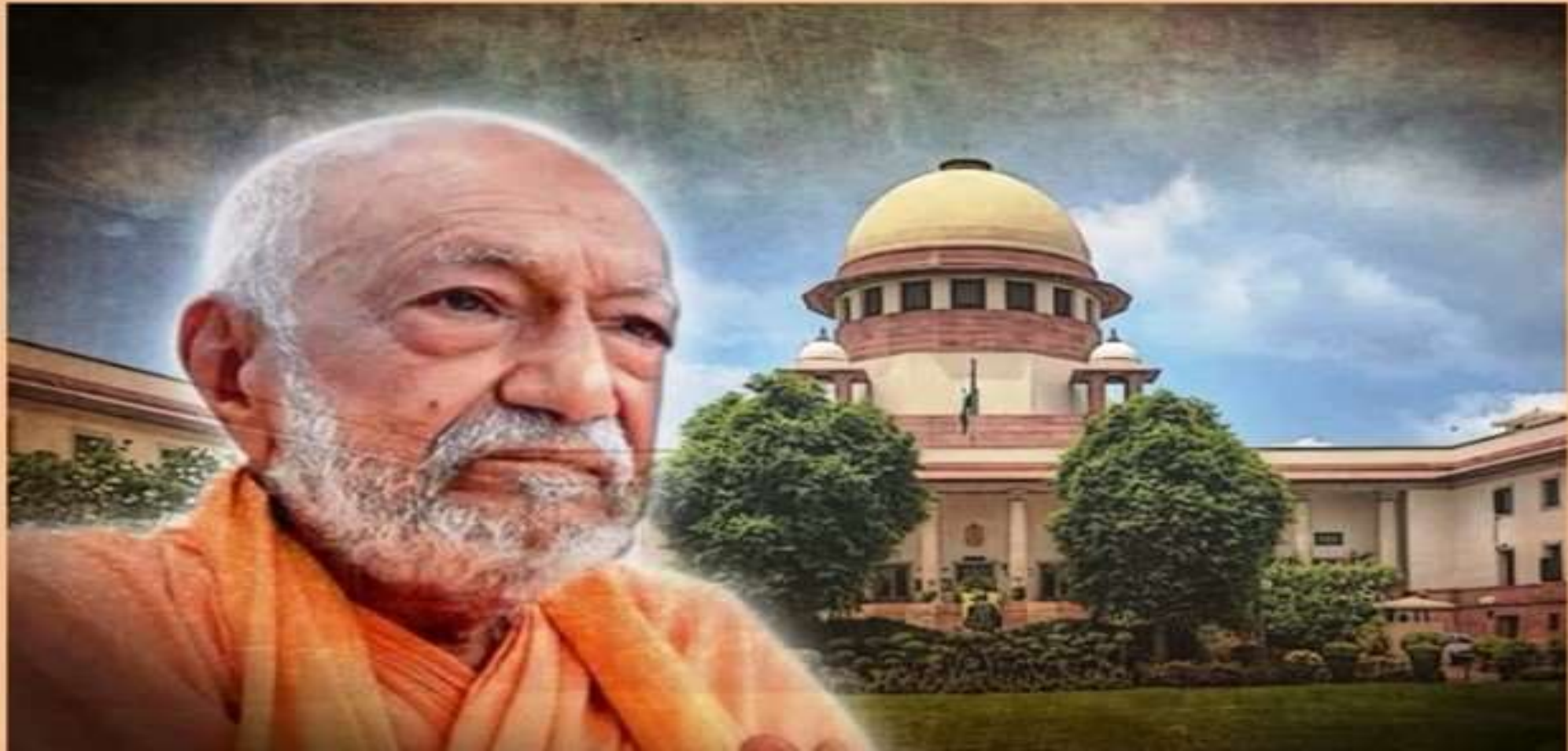
Anil Agarwal

- **Journalist**
- He wrote the first report on the state of India's Environment in 1982.
- He founded **Centre for Science and Environment (CSE)** an **active NGO** that supports various environmental issues.



GD Agarwal

- “Member of CPCB”.
- “Ganga Bachao Andolan”.



Ramesh Agarwal

- He was awarded the **Goldman environmental prize** in 2014.



Medha Patkar and Arundhati Roy

- “Narmada Bachao Andolan” 1985.



Rajendra Singh

- **“Water man of India”**
- He runs an NGO called **'Tarun Bharat Sangh'** (TBS).
- TBS helped build **water conservation** structures to collect rainwater for the dry seasons, Rajasthan.



Sunderlal Bahuguna

- **“Chipko Movement”** (U.P. 1973)
- **“Theri Bachcho Movement”** (Uttarakhand 1980 to 2004)



Goldman environmental prize

- The Goldman environmental prize is a prize awarded annually to grassroots environmental activities one from each of the world Geographic regions Africa, Asia, Europe, Island, America (North, South)
- **Indian winner**
- 1992 - **Medha Patkar**
- 1996 - **MC Mehta**
- 2004 - **Rashida Bee and Champa Devi Shukla** (struggle for justice for those who survived the 1984 Bhopal disaster, 2000 - people were killed by methyl iso cyanate gas leak).
- 2014 - **Ramesh Agarwal**
- 2017 - **Prafulla Samantara** (protected The Niyamgiri Hills, Orissa from a massive open Pit aluminium ore mine).

International conference

- 1. **Stockholm conference** held on 5th June 1972 celebrate World Environment Day on 5th June.
- 2. **Rio de Janerio** in 1992 known popularly as Earth summit.
- 3. In **2002** World summit on Sustainable Development Johannesburg.

Eco mark

- **Eco mark** is a certification mark issued by the Bureau of Indian Standards (**BIS**) (the national standards organization of India) to products conforming to a set of standards aimed at the least impact on the ecosystem.
- Logo ‘**Earthen pitcher**’



Institution in Environment

BSI (Botanical Survey of India)

- In 1787 **Connell Robert** established **Company Bagan**. He was an officer with the British East India Company, the main purpose of establishing the garden was to cash in on the **commercial value of the plants and grow spices of commercial value**.
- The garden was also known as **Calcutta Botanical Garden**, **Indian Botanic Garden**, and **Royal Botanic Garden**. Established 1890 Culcutta (**Sibpur**).
- After Independence, the garden was renamed as **Indian Botanic Garden in the year 1950**.
- The present title was given on June 25, 2009, to honor the Bengali genius and scientist, **Acharya Jagdish Chandra Bose**.

THE GREAT BANYAN TREE

The Great Banyan Tree is one of the greatest attractions and landmark of Acharya Jagadish Chandra Bose Indian Botanic Garden. The tree, *Ficus benghalensis* L. (Family: Moraceae) is more than 250 years old and spreaded over an area of about 1.6 Hectares With about 3618 prop roots. A wonder in plant kingdom, the tree occupies its position in the "Guinness Book Of World Records" for its massive canopy which covers the greatest area.



- **Function:**

- Encourage taxonomic **research** to accelerate scientific expertise for the preparation of a comprehensive list of the flora of the country under the "**Flora of India**" project.
- Exploration of land resource
- **Listing of endangered species.**
- Publication of national flora.
- Preparation of **National Data Bank on Herbarium** and plant distribution and nomenclature.
- **Ethnobotanical** study.
- Modernization and maintenance of herbaria and museums.
- **Creating interest among the botanist** and the public in general.

Bombay Natural History Society (BNHS)

- Established 1883 Mumbai by 6 members.
Oldest conservation research based NGO.



Contribution in wildlife research:

- It influence on wildlife policies building, research, popular publication and people action has been a unique feature of the multifaceted society.
- Published magazine **Hornbill**
- Published journal **Natural History**.

Publication

- **Salim Ali handbook on birds.**
- JC Daniel's book of Indian reptiles.
- SH Prater's book of Indian mammals.
- PV Bole's books of Indian trees.

Centre for science and environment (CSE), New Delhi

- It is a **NGO**.

Activity

- Organizing campaigns.
- Holding workshops.
- Conference.
- Producing environment related publication.
- Magazine **Down to Earth**.



Central Pollution Control Board (CPCB)

- The Central Pollution Control Board (CPCB) of India is a statutory organisation under the **Ministry of Environment, Forest and Climate Change (MoEFCC)**.
- **Head office New Delhi.**
- There are 22 state pollution control board or Pollution Control committee which are responsible for regulating and implementing environmental protection and pollution control within the state.

કેન્દ્રીય વાયુમાન પ્રદૂષણ નિયંત્રણ બોર્ડ
CENTRAL POLLUTION CONTROL BOARD



- It was established in 1974 under the **Water (Prevention and Control of pollution) Act, 1974.**
- The CPCB is also entrusted with the powers and functions under the **Air (Prevention and Control of Pollution) Act. 1981.**
- It serves as a field formation and also provides technical services to the Ministry of Environment and Forests under the provisions of the **Environment (Protection) Act, 1986.**

CPR Environmental Education Centre (CPREEC), Chennai

- Established in **1988**.
- C.P.R. Environmental Education Centre (CPREEC) is a Centre of Excellence of the Ministry of Environment, Forests and Climate Change (**MoEFCC**), Government of India, **established jointly by the Ministry and the C.P. Ramaswami Aiyar Foundation.**
- The Centre has been a pioneer in environmental education efforts in South India and has conducted a variety of programmes to spread awareness and interest among the masses.

C.P.R. INSTITUTE OF INDOLOGICAL RESEARCH

THE C.P. RAMASWAMI AIYAR FOUNDATION

Mission Statement

C.P.R. Environmental Education Centre (CPREEC) strives to **increase awareness and knowledge** of key target groups (school children, local communities, woman etc.) about the various aspects of environment.

Understanding the major environmental issues facing India today and developing innovative solutions.

Promoting conservation of nature and its resources by emphasizing on the conservation of ecological traditions of India.

Centre for Environment Education (CEE) Ahmedabad

- The Centre for Environment Education (CEE) in India was established in August **1984** as a Centre of Excellence supported by the **Ministry of Environment and Forest**. The organisation works towards **developing programmes and materials to increase awareness about the environment and sustainable development**.
- It has a wide range of programme on the environment and produced a variety of educational material for various target of groups.

Ministry of Environment and Forest

- **Ministry of Environment and Forest (MoEF) or The Ministry of Environment, Forest and Climate Change (MoEFCC)** was formed in **1985**.
- MoEFCC is the nodal agency in the administrative structure of the **Central Government** for the planning, promotion, co-ordination and overseeing the implementation of India's environmental and forestry policies and programmes.
- The primary concerns of the Ministry are implementation of policies and programmes relating to conservation of the country's natural resources including its lakes and rivers, its biodiversity, forests and wildlife, ensuring the welfare of animals, and the prevention and abatement of pollution. While implementing these policies and programmes, the Ministry is guided by the principle of sustainable development and enhancement of human well-being.



सत्यमेव जयते



**Ministry of
Environment,
Forests &
Climate Change**

Government of India

- **The broad objectives of the Ministry are:**
- **1. Conservation and survey of flora, fauna, forests and wildlife.**
- **2. Prevention and control of pollution.**
- **3. Afforestation and regeneration of degraded areas.**
- **4. Protection of the environment and**
- **5. Ensuring the welfare of animals.**

• **Authorities under MoEF**

- 1. **Central Zoo Authority of India**, New Delhi.
 - 2. **National Biodiversity Authority**, Chennai.
 - 3. **National Tiger Conservation Authority**, New Delhi.
-
- As a part of MoEF planning of environmental policies, the **Environmental Information System (ENVIS)** was established in **1982** by the Government of India. These center have been set up on areas such as pollution control toxic chemical central and offshore ecology, environmentally sound and appropriate technology, biodegradation of waste and environment management.

Madras Crocodile Bank Trust (MCBT)

- **First crocodile conservation breeding centre in Asia** was founded in **1976**.
- MCBT maintain over 1500 crocodile.
- MCBT started the first **sea turtle** survey and conservation programme in India, including a sea turtle hatchery.
- Supplies all **Indian snakes** and **scorpion** venom needed for the production of anti venom and for medical use.



Salim Ali Centre for Ornithology and Natural History (SACON), Coimbatore

- It is established in 1990.
- The institution was **Salim's Ali dream**.
- It has instituted a variety of field programmes that has added to the country information on our threatened biodiversity.

World Wild Fund for Nature

- WWF's logo **giant panda** originated from a panda named Chi-Chi,
- In 1961 WWF became established (Morges, Switzerland).



- The World Wide Fund for Nature (WWF) is an international NGO founded in **1961**, working in the field of the wilderness preservation, and the reduction of human impact on the environment.
- WWF is the world's largest conservation organization with over five million supporters worldwide, **working in more than 100 countries**, supporting around 1,300 conservation and environmental projects.
- They have invested over \$1 billion in more than 12,000 conservation initiatives since 1995.

World Wild Fund for Nature India (WWF I)

- WWF-India set out with the aim of reducing the degradation of Earth's natural environment and building a future in which humans live in harmony with nature.
- In 1987, the organization changed its name from the World Wildlife Fund to World Wide Fund for Nature-India.
- WWF-India is a science-based organization which addresses issues such as the conservation of species and its habitats, climate change, water and environmental education, among many others.

- **Mission Statement**

- To stop the degradation of the planet's natural environment and build a future in which humans live in harmony with nature, by:
 - 1. **Conserving** the world's biological diversity,
 - 2. Ensuring that the use of **renewable natural resources is sustainable,**
 - 3. Promoting the **reduction of pollution** and wasteful consumption.

Wildlife Institute of India (WII), Dehradun

- The WII is an autonomous institution **under the Ministry of Environment Forest and Climate change**, Government of India.
- Established in May 1982.
- The founder director was **V. B. Saharia** while the first Director was **Hemendra Singh Panwar** who remained the director from 1985 to 1994.
- WII carries out **wildlife research** in areas of study like Biodiversity, Endangered Species, Wildlife Policy, Wildlife Management, Wildlife Forensics, Spatial Modeling, Eco development, Habitat Ecology and Climate Change.

- WII has a research facility which includes **Forensics**, Remote Sensing and **GIS**, Laboratory, Herbarium, and an Electronic Library.
- **Trained personnel** from WII have contributed in **studying and protecting wildlife** in India.
- It has trained a large number of Forest department officials and staff as wildlife managers.

Publication

- Planning and wildlife protection area network for India (Rodgers and Panwar, 1988).

Zoological Survey of India (ZSI)

- ZSI was established on 1st July, 1916.
- Initially, the Zoological collections of more than a century old from former Museum (1814 -1875) of the **Asiatic Society of Bengal** and Zoological Section of the Indian Museum(1875-1916) in Calcutta.
- The Survey has established so far 16 Regional and Field Stations, and has developed into a major National Institution.
- It functions as the guardian of the National Zoological Collections, containing over a million identified specimens from all animal groups ranging from Protozoa to Mammals.

ZOOLOGICAL SURVEY OF INDIA
GOVERNMENT OF INDIA
ESTD-1916



Thank You!