MODULE 9 – DAMS: BOON OR CURSE

OBJECTIVES

After a study of this e-content module the learner will be able to

1. Define nature.
2. Name five elements present in the nature.
3. Describe need of water.
4. Establish relationship between water and human civilization.
5. Define nomadic life.
6. Describe impact of agriculture.
7. Describe the reason behind the existence of a dam.
8. Define dam.
9. Describe the scenario of dams in India.
10. Describe the uses of dams.
11. Describe and differentiate the four categories of dam.
12. Explain the concept of multipurpose river valley project.
13. Give examples of multipurpose river valley projects.
14. Describe negative impacts of dams.

SUMMARY

Water is one of the natural resources which is required by man for drinking, washing, irrigation and other purposes. There are a number of ways to manage water for irrigation. One of them is by building dams. Along with retaining water, dams are useful for other purposes like hydroelectricity etc. There are mainly four categories of dam- Storage Dams, Diversion Dams, Detention Dams, Overflow Dams. Multipurpose River Valley Projects also helps to manage water resources. Although dams are useful for mankind but they are also responsible for creating some negative impacts like soil erosion, extinction of species, spread of diseases, change in the Earth's rotation, effects on human population and effect on Earth itself. Therefore it is suggested that the unbiased and balanced use of resources can yield positive results. This principle applies to the Dams also.

TRANSCRIPTION

Introduction-

“Nature is a mutable cloud which

is always and never the same.”

It is an infinite sphere whose center is everywhere and circumference nowhere.

Five Elements of Nature-

There are 5 elements present in nature. They are Air, sky, Fire, Earth and Water. All these elements play an important role in a synchronized way to maintain the survival of life. Although water is one of the most important gifts of nature sometimes it becomes a curse.

Need of Water-

We need water for drinking, washing, for irrigation so on. It is essential for the production of grains, vegetables, fruits etc.

Nearly, all great civilizations of the world like the Roman Civilization, Egyptian Civilization, Indus valley civilization and many other civilizations grew up around water bodies that have provided not only assisted fresh water but also trade, transport, defense and agriculture.

Nomadic Life-

Before practicing agriculture men survived by hunting and food gathering. They used to move from one place to another in search of food. This type of life is called “NOMADIC LIFE”.

Need of Dams-

But, after the invention of farming methods, stability came into the lifestyle of people. Agriculture has had a major impact on the expansion of population and its growth.

For agriculture and farming the basic necessity is irrigation. There are a number of ways to manage water for irrigation. One of them is by checking the river water flow and protecting the water from flowing into the sea.

This can be done by constructing **DAMS.**

Concept of Dam-

"**DAMS"** are massive barriers built across rivers and streams to confine and utilize the flow of water for human uses such as irrigation, drinking and generation of hydroelectricity.

Dams have been built on many rivers over the last many years. Since the 1930's many large dams have been built, particularly between the 50's and the 70's.

Dams generally serve the primary purpose of retaining water, while other structures like flood gates also known as dikes are used to manage or prevent water flow into specific land regions. Hydropower and pumped storage hydroelectricity are often used in conjunction with dams to provide clean electricity for millions of consumers.

Categories of Dam-

There are basically 4 categories of dams.

The first type of dam is called **THE STORAGE DAM.** The specialty of this dam is that it is constructed to impound water during periods of surplus supply for later use during in periods of deficiency. They may store water for hydroelectric power generation, irrigation or for a flood control project.

DIVERSION DAM is the second type of dam. It provides sufficient pressure for pushing water into ditches and canals. This dam is used for diversion from a stream to a distant storage reservoir.

The next type of dam is known as the **DETENTION DAM** . It minimizes the effect of sudden floods and traps sediments.

And, the last type of dam is the **OVERFLOW DAM**. They carry water discharge over their crests and are constructed by the materials that will not be eroded by such discharge.

Multipurpose River Valley Project-

Now, let's talk about **"MULTI PURPOSE RIVER VALLEY PROJECTS".**

Since independence our country has been engaged in planned economic activities to achieve self-reliance and improve the standard of living of its people.

Among the several measures adopted for this purpose, managing our water resources is one of them. "MULTI PURPOSE RIVER VALLEY PROJECTS" helps to solve the purpose of managing the water resources.

It is either of a huge single dam or a series of small dams built on a river and its tributaries. In the first place these man-made lakes help in impounding huge amounts of rain water and

Secondly, they also help in controlling flood and protecting soils.

There are various projects which set an example for managing our water resource. The Damodar Valley Project, The Bhakra Nangal Project, The Kosi Project, The Hirakund Dam, The Tungabhadra Project, The Chambal Project and The Nagarjuna Sagar Project are a few of the important river valley projects in our country.

As everything else, dams also have their pros and cons:

Environmental Impacts of Dams-

The construction of large dams has completely changed the relationship of water and land, destroying the existing ecosystem balance which, in many cases, has taken thousands of years to create. Throughout the past few years, the negative impacts of dams have become so well known that most countries have stopped building them altogether and are now forced to invest their money in fixing the problems created by the existing dams.

Some of the impacts of the Dam are:-

- SOIL EROSION
- EXTINCTION OF SPECIES
- SPREAD OF DISEASES
- CHANGE IN THE EARTH'S ROTATION
- EFFECT ON HUMAN POPULATION
- EFFECT ON THE EARTH ITSELF

Soil Erosion

One of the major problems related to dams is the erosion of land. Dams hold back the sediment normally found in a rivers flow, depriving the downstream of this. In order to make up for the sediments, the downstream water erodes its channels and banks.

Species Extinction:

As fisheries become an increasingly important source of food supply, more attention is being paid to the harmful effects of dams on the many fish & marine mammal population. The vast majority of large dams do not include proper bypass systems for these animals, interfering with their lifecycles and sometimes even forcing species to extinction.

Spread of Disease

Dam reservoirs in tropical areas, due to their slow-movement, are literally breeding grounds for mosquitoes, snails and flies, the vectors that carry malaria, schistosomiasis, and river blindness.

Change In the Earth's Rotation:

Due to the number of dams which have been built, the earth's rotation has apparently sped up by eight-millionths of a second since the 1950's.

Effect on Human Population

While dams are helpful to humans, they can also be harmful as well. One problem of dams is the fact that the artificial lakes created by them become breeding grounds for diseases. Another disadvantage is that if built close enough to human habitation, relocation is imminent. Dam related relocation affects society in three ways-an economic disaster, human trauma, and social catastrophe".

Effects on The Earth Itself

Dams have been found to alter the climate of the earth. This is due to the fact that dams generate methane gas, a greenhouse gas. Methane is emitted from reservoirs that are stratified and where the bottom layers are anoxic, leading to degradation of biomass through anaerobic processes.

It is accepted that the un biased and balanced use of resources can yield us positive results. The same principle applies to the construction of dams.

GLOSSARY

1. **Nature** - Nature, in the broadest sense, is equivalent to the natural world, physical world, or material world. "Nature" refers to the phenomena of the physical world, and also to life in general. It ranges in scale from the subatomic to the cosmic.

2. **Civilization** - It is the process of civilizing or becoming civil. A civilized society is often characterized by advanced agriculture, long-distance trade, minimal government, occupational specialization, and urbanism.

3. **Nomadic Life** – Nomadic Life show the movements of man from one place to another in search of food.

4. **Dams** – Dams are massive barriers built across the rivers and streams to confine and utilize flow of water for human uses.

5. **Multipurpose River Valley Project** – It is either a huge single dam or a series of dams built on a river and its tributaries.

FAQ's

1. What are the five elements present in nature?
   Ans. Five elements present in nature are: - Air, Sky, Fire, Earth and Water. All these elements play an important role in a synchronized way to maintain the survival of life.

2. What are the uses of water?
   Ans. We need water for drinking, washing, for irrigation so on. It is essential for the production of grains, vegetables, fruits etc.

3. Name the human civilization which have grown up around water bodies?
   Ans. Nearly, all great civilizations of the world like the Roman Civilization, Egyptian Civilization, Indus valley civilization and many other civilizations grew up around water bodies that have provided not only assisted fresh water but also trade, transport, defense and agriculture.

4. What is Nomadic Life?
   Ans. Before practicing agriculture men survived by hunting and food gathering. They used to move from one place to another in search of food. This type of life is called "NOMADIC LIFE".

5. How is agriculture related with water?
   Ans. After the invention of farming methods, stability came into the lifestyle of people. Agriculture has had a major impact on the expansion of population and its growth.
   For agriculture and farming the basic necessity is irrigation.

6. What are dams?
   Ans. DAMS are massive barriers built across rivers and streams to confine and utilize the flow of water for human uses such as irrigation, drinking and generation of hydroelectricity.

7. What are the purposes of constructing dams?

Ans. Dams generally serve the primary purpose of retaining water, while other structures like flood gates also known as dikes are used to manage or prevent water flow into specific land regions. Hydropower and pumped storage hydroelectricity are often used in conjunction with dams to provide clean electricity for millions of consumers.

8. What is a Storage Dam?
   Ans. Storage Dam is a dam which is constructed to impound water during periods of surplus supply for later use during in periods of deficiency. They may store water for hydroelectric power generation, irrigation or for a flood control project.

9. What is a Diversion Dam?
   Ans. Diversion Dam is a dam which provides sufficient pressure for pushing water into ditches and canals. This dam is used for diversion from a stream to a distant storage reservoir.

10. What is a Detention Dam?
    Ans. Detention Dam is a dam which minimizes the effect of sudden floods and traps sediments.

11. What is an Overflow Dam?
    Ans. Overflow Dams carry water discharge over their crests and are constructed by the materials that will not be eroded by such discharge.

12. What is a Multipurpose River Valley Project?
    Ans. MULTI PURPOSE RIVER VALLEY PROJECTS helps to solve the purpose of managing the water resources. It is either of a huge single dam or a series of small dams built on a river and its tributaries. In the first place these man-made lakes help in impounding huge amounts of rain water and secondly, they also help in controlling flood and protecting soils.

13. Give few examples of Multipurpose River Valley Project?
    Ans. There are various projects which set an example for managing our water resource. The Damodar Valley Project, The Bhakra Nangal Project, The Kosi Project, The Hirakund Dam, The Tungabhadra Project, The Chambal Project and The Nagarjuna Sagar Project are a few of the important river valley projects in our country.

14. What are the impacts of dams?

Ans. The construction of large dams has completely changed the relationship of water and land, destroying the existing ecosystem balance which, in many cases, has taken thousands of years to create. Throughout the past few years, the negative impacts of dams have become so well known that most countries have stopped building them altogether and are now forced to invest their money in fixing the problems created by the existing dams.
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  EFFECT ON THE EARTH ITSELF

15. How are dams responsible for soil erosion?
    Ans. One of the major problems related to dams is the erosion of land. Dams hold back the sediment normally found in a rivers flow, depriving the downstream of this. In order to make up for the sediments, the downstream water erodes its channels and banks.

16. How are dams responsible for extinction of species?
    Ans. As fisheries become an increasingly important source of food supply, more attention is being paid to the harmful effects of dams on the many fish & marine mammal population. The vast majority of large dams do not include proper bypass systems for these animals, interfering with their lifecycles and sometimes even forcing species to extinction.

17. How are dams responsible for spread of disease?
    Ans. Dam reservoirs in tropical areas, due to their slow-movement, are literally breeding grounds for mosquitoes, snails and flies, the vectors that carry malaria, schistosomiasis, and river blindness.

18. How is a dam responsible for change in the Earth's Rotation?
    Ans. Due to the number of dams which have been built, the earth's rotation has apparently sped up by eight-millionths of a second since the 1950's.

19. How does a dam affect the Human Population?
    Ans. While dams are helpful to humans, they can also be harmful as well. One problem of dams is the fact that the artificial lakes created by them become breeding grounds for diseases. Another disadvantage is that if built close enough

to human habitation, relocation is imminent. Dam related relocation affects society in three ways-an economic disaster, human trauma, and social catastrophe".

20. How does a dam affect the Earth's Climate?

Ans. Dams have been found to alter the climate of the earth. This is due to the fact that dams generate methane gas, a greenhouse gas. Methane is emitted from reservoirs that are stratified and where the bottom layers are anoxic, leading to degradation of biomass through anaerobic processes.