

# **Nalanda Open University**

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## **E-CONTENT 11**

for

Part-I Examination, 2020

### **SHORT DESCRIPTION OF THE SUGGESTED TOPICS**

#### **THEORY PAPER**

#### **PAPER – V**

#### **(NATURAL RESOURCES AND THEIR CONSERVATION)**

**(Concluding part of Paper – V)**

#### **10. Need of Energy Conservation; Measures that can be taken for Conservation of Energy?**

##### **Why is Energy Conservation needed?**

For the comforts and well - being of an individual and overall development of a nation the importance of energy can be easily understood. It is required in one form or the other in carrying out all our activities. Energy consumption has become synonymous with socio-economic development of an individual and a nation. Energy demand is increasing fast. Nearly four times more energy is being consumed in the world now as compared to the energy consumption only 4 – 5 decades back. The demand is likely to double or even treble in the next 40 – 50 years.

The important reasons for need to conserve energy are as given below:

- i. Today, nearly 80% of the world energy demand is fulfilled by burning fossils fuels – Coal, Petroleum and Natural Gas. The use of fossil fuels as world's main source of energy cannot sustain for long partly because of their overutilization and mainly because of the reason that they are non – renewable. Once exhausted they cannot be replenished in nature for thousands and thousands of years to come.
- ii. Burning of fossil fuels produce huge quantities of pollutants of air, water and soil. Pollution is a monstrous problem of modern world causing health problems of various kind.
- iii. Development of techniques to trap alternative and renewable energy sources which are environmentally benign are yet to become economically viable.

##### **Measures that can be taken for conservation of Energy**

Conservation never means “no use of resources”. Rather it is a positive practice of using resources rationally and fairly keeping in mind the needs of the future generations.

### **Energy Conservation can be achieved through the following measures:**

- a. By changing our life styles and by cultivating habits which avoid wasteful use of energy in day – to – day life and promote use of alternative energy sources.
- b. By adopting technological measures to enhance energy efficiency in the domestic sector, transport sector and power generation. This may include technological up-gradation of production system, vehicular engines and domestic appliances such as CFLs and LED lighting devices.
- c. By adopting measures to reduce loss of energy resources during transportation from the point of production to point of consumption.

### **Let us elaborate these points in more detail:**

- i. Some simple measures that can be adopted regarding changing life styles and cultivating habits are given below:
  - ❖ Walk, ride a bicycle or use public transport system instead of driving automobiles. Automobile emissions account for fifty to sixty percent of air pollution in cities.
  - ❖ Install CFLs and LEDs that consume less energy and last longer than incandescent light bulbs.
  - ❖ Buy energy efficient appliances. The appliances may be more costly but energy saving will make it a profitable purchase in the long run.
  - ❖ Switch off the lights, fans, radio, television and music systems when they are not in use.
  - ❖ Don't leave the computer in stand-by mode.
  - ❖ Don't open the door of your refrigerator too often and don't keep it open for a long time.
  - ❖ Develop a habit of switching off lights and fans in public places when they are not in use.
  - ❖ Get your automobiles regularly tuned and serviced. It saves fuels and reduces emissions of pollutants.
- ii. **Use of non-conventional/renewable energy sources:**
  - ❖ Use solar cookers, solar heaters and solar lanterns and save energy (electricity).
  - ❖ Work for setting up of a community energy park to promote the use of non-conventional energy sources such as solar, wind and biomass energy.

Every unit of electricity conserved saves fossil fuels and reduces the environmental impacts of fossil fuels as energy source.

### **Some examples showing positive effects of the measure taken for Enhancing Energy efficiency in power production (Thermal power plants), Industrial Sector, Transport Sector and in domestic use.**

- ❖ Over the years a number of innovations have been made to improve the efficiency of thermal power plants and make them environment friendly through beneficiation of coal and technological improvement, such as Fluidized bed

Combustion (FBC) and Integrated Coal Gasification Combined Cycle System (IGCC). Use of super critical steam turbine has greatly improved power generation efficiency and has lowered the emission of pollutants.

❖ Enhancing energy efficiency in transport sector:

- With the introduction of unleaded petrol one major air pollutant, lead is nearly gone from our air.
- Due to improvement in internal combustion engines and body weight of vehicles, one mid – 1960's motorcar generates the same amount of air pollutant as is generated by 20 of today's new cars. In the next 10 years the number will rise to 30 to 35 due to new technologies.
- In recent years much attention is being centered on the prospects of using ethanol as a fuel for light vehicles including cars and three and two wheelers. Ethanol is already being used as a fuel additive. Bio alcohol and other bio-fuels have an important role to play in near future as they are renewable energy sources and are less polluting than the conventional fossil fuels.

❖ Enhancing energy efficiency in domestic use.

As against conventional chullahas in which wood is burnt as fuel and which generate much smoke and ash which are serious health hazards to women who spend long hours in the kitchen, improved chullahas have been developed. The improved chullahas are much energy efficient and generate smoke and ash in lesser quantities.

**Fuel Cells:**

Fuel cells are a promising technology for widespread use as a source of electricity in buildings and as an electrical power source for vehicles. Fuel cells developed so far are fuelled with hydrogen. But in near future they are likely to be fuelled with natural gas, methanol or even with gasoline.

**Planning and Management of Energy: Need of the hour:**

The energy sector is one among a few priority sectors of a national government. This sector touches and influences almost every aspect of a nation's life. It plays a pivotal role in the overall development of the economy. Therefore, in each country national level short term as well as long term management strategies are being adopted with the following focal points in consideration:

- ❖ Efficient control over energy resources, energy demand and supply.
- ❖ Improvement in the existing infrastructure.
- ❖ Research and Introduction of new technologies to increase energy efficiencies.
- ❖ Reduction in energy – related pollution.

**Note:** Study Learning Material (SLM) Part – 1, Paper – V (Natural Resources and Their Conservation) provided by Nalanda Open University, Patna may also be consulted.

11. **Mineral resources of India, needs and methods of conservation of mineral resources.**
12. **Types, Distribution and Utilization of Marine resources. Effect of the utilization of marine resources on the environment.**

**Note:** For answers of Q. No. 11 and Q. No. 12 SLM provide by NOU, Patna should be consulted; The SLM contains enough of Study Learning Material to answer these type of questions. Suitable website study materials may also be consulted.

13. **Meaning of equitable use of Natural resources. Role of various components in the conservation of natural resources.**

#### **Meaning of Equitable use of Natural Resources**

Life on the earth is possible because it has all the essential resources that are needed for the life and growth of different life forms. Everything from the nature which organisms use to fulfill their needs is called a natural resource.

It is a matter of ethics as well as practicality that the benefits and costs of the resources we use and environmental conservation, which is an essential component of sustainable use of resources, should be shared equitably among different communities- between the poor and the rich, and between our generation and the generation after us.

In the last 60-70 years the consumption of resources in the society has increased many folds. However, a critical survey on the trend of present resource utilization reveals that there is a big gap in the consumers lifestyle between developed countries and developing countries. Some facts in support can be cited as follows:

- It has been estimated that More Developed Countries (MDC) of the world constitute only 22% of world's population but they use 88% of natural resources.
- More Developed Countries use 73% of energy resources and command 85% of income and in turn they contribute very big proportion of pollution.
- Contrary to the above stated estimates Less Developed Countries (LDC) have moderate industrial growth.
- They (LCD) constitute 78% of world's population and use only 12% of natural resources, 27% of energy, and have only 15% of global income.
- Even in developing countries urbanization has changed the lifestyle of middle class population creating more stress on the use of natural resources. City dwellers consume more goods, more water and burn more fuels than rural people for cooking, transportation, cooling and lighting. Today, the consumption pattern has become the reflection of affluence.
- As things stand today there is a huge gap between rich and poor. In this age of development the rich have gone richer and the poor is becoming more poorer. This has led to unsustainable growth.
- Two major causes of unsustainability are over population in poor countries and over consumption of resources by rich countries.

### **The Global Concern:**

There is an increasing global concern about the management of natural resources. The solution to this problem is to have more equitable distribution of resources and income.

A global consensus has to be reached for balanced distribution of natural resources. For equitable use of natural resources more developed countries/rich people have to lower down their level of consumption to bare minimum so that these resources can be shared by poor people to satisfy their needs. Time has come to think that it is need of the hour that rich and poor should make equitable use of resources for sustainable development of mankind.

It may be noted that sustainable uses of resources never mean 'no use of resources'. Rather "It is the use of goods and services that respond to basic needs and bring a better quality of life, while minimizing the use of natural resources, toxic materials and emissions of wastes and pollutants over the life cycles, so as not to jeopardize the needs of future generations."

### **Role of various components in the conservation of Natural Resources:**

Various programmes, practices and technologies can be used to ensure resource conservation. More importantly, the instinct of conservation must emerge from within and should shape mindset so that we reorient our activities in a manner that causes minimal damage to the environment while deriving continuous benefits from its resources.

Three components which have to play their role in the conservation of Natural Resources are:

1. The Government
2. Non-Governmental organizations, and
3. Community

A pragmatic approach to the problem demands the following:

- Preventive measures through enactment of laws, framing of policies and programmes by the government and involvement of Non – Governmental Organizations and Community members to act in unison for conservation of resources and their proper utilization.

In the past few decades there has been a noticeable change in the attitude of individuals, community and the nations all over the world towards the environment and the natural resources. Popular opinion is gradually building up in favor of the proper utilization of natural resources, prudence in the consumption of goods and release of wastes and checks on population growth.

**Role of the Government:** India being historically and culturally respectful to environment and natural resources (sacred groves, rivers, animals etc.) is recognized and visualized the significance of legal provisions for environmental protection and resource conservation even before the first international meet on environment, the famous United Nation Conference on Human Environment held in Stockholm,

Sweden in June, 1972. A few important Acts, enacted by the Indian Government for conservation of resources and allied environmental issues are as given below:

- The wild life (Protection) act, 1972 and amendments.
- The Forest Conservation Act, 1980, amended in 1988.
- The Biological Diversity Act, 2002.

India has had a full-fledged Union Ministry of Environment and Forest since 1985 (now renamed as Union Ministry of Environment, Forests and Climate Change). The Ministry is responsible for formulating strategies and policies, enacting laws and executing/sponsoring programmes related to the protection of Environment, Prevention of pollution, conservation of natural resources etc.

### **Role of Non-Governmental Organizations:**

Non –Governmental Organization are formed by like-minded people from the community who work together for certain social and humanitarian causes.

Depleting natural resources and deteriorating environmental conditions have prompted many people to form nature clubs and environmental societies (Non – Governmental Organizations) under different names and work for sustainable and equitable use of resources. Community participation through NGOs and Nature Clubs are becoming a common practice, which is a welcome development in recent times. Community members, NGOs and Eco club Members can organize education campaigns and awareness programmes through media or School, or even go door to door to make people aware of the present scenario of the natural resources and the environment, and take up environmental friendly programmes aimed at ecological restoration and conservation of natural resources.

### **Role of individuals and the community**

Individuals are the building blocks of the community and nation. The cumulative efforts of many individuals can bring about a miracle if done with a sense of commitment. There is a need for a positive change in our attitude towards the natural resource and the environment. Many small things which we do in daily life, if properly planned and performed with determination, can produce excellent results. We must remember that many momentous environmental movements began with a small group of enlightened individuals. Many of the environmental movements such as ‘Chipko Movement’, ‘Silent Valley Movement’, ‘Beej Bachao Andolan’ (Save Seed Movement) etc. are now role models to emulate.

Here are given some important areas where the individuals and the community can make significant contribution to conserve natural resources for a better and healthy environment.

#### **1. Tree plantation and protection of trees:**

Trees are true friends of mankind. They give us oxygen to breathe in and remove carbon dioxide from the atmosphere. They give us fruits, timber and many other plant products.

A few tips for individuals are as follows:

- Plant a tree and get a friend forever.
- Plant a tree on your birthday and nourish it.
- Organize a plantation drive or participate in one launched by eco-lovers in your locality or institution.
- Organize a group of like-minded individuals to protect plants and trees from stray animals by putting fences around them or by other such measures.
- If someone cuts down a green tree or harms greenery, put up a humble resistance your resistance will surely influence him/her to desist from doing so again in future.

The Chipko Movement is a notable example of a community movement which began as a local grass roots movement and developed into a broader national movement. It influenced the Government to change its policies and make decisions about the protection of trees and the forests.

## **2. Water Conservation:**

Numerous measures can be adopted at the individual and community levels to reduce the extravagant consumption of fresh water and to augment water conservation.

A few tips for individuals are as given below:

- To minimize the evaporation losses of water, irrigate the crops, the plants and the lawns in the evening.
- Improve water efficiency by using only required amount of water in washing machines, car washing, brushing teeth and other domestic activities using fresh water.
- Check for water leaks in domestic pipe connections and repair them properly.
- Don't keep water taps running while they are not in use.
- Install rainwater harvesting structure to lessen burden on water supply from ground water aquifers.

## **3. Energy Conservation:**

- Develop the habit to turn off all electric appliances such as lights, fans, computers, televisions etc. when not in use.
- Community members can work for the development of community energy parks to promote the use of non-conventional energy sources such as Solar, Wind and Biogas as substitute for fossil fuel based thermal energy.
- Design your house with provision for sunspace to keep the house warm and to provide more light.
- Avoid misuse of vehicles for transportation by forming a car pool and by using public transport system rather than personal vehicles.

- An individual can adopt walking or cycling for short distance travels, proper tuning of personal scooters and cars etc.
- Minimize the use of air conditioner to save energy.
- Save LPG (Liquid Petroleum Gas) by using solar cookers for cooking etc.

#### **4. Protection of Soil health:**

- Use organic manure/compost and avoid chemical fertilizers to maintain soil fertility.
- Avoid irrigation of plant by using fast flow of water which causes soil erosion.
- Use sprinkler irrigation to conserve the soil.
- Provide vegetation cover by growing of ornamental plants, herbs and trees in your garden.
- Use vegetable waste to prepare compost to use in kitchen gardening etc.

#### **5. Promotion of sustainable agriculture:**

- Cultivate need based crops.
- Make minimum use of chemical fertilizers, pesticides and other chemicals for production of agriculture products.
- Work for gradual replacement of chemical fertilizers and pesticides by Organic manure/compost and bio-pesticides.
- Improve indigenous breeds of milch animals for sustainable dairy production systems.
- Adopt postharvest technologies for value addition etc.

**Note:** Answer may be shortened keeping in view the language of the question asked to answer, and the availability of time with the examinee. SLM provided by NOU, Patna may also be consulted.