Maharashtra State Board of Technical Education, Mumbai.

Part[B]

A report on

“Impact of natural disaster and man-made hazards”

Under the subject

ENVIRONMENTAL STUDIES (22447)

Submitted by:

2212	Sakshi Santosh Shete	2100100010
2226	Samiksha Santosh Salunkhe	2100100024
2231	Shweta Sunil Kashid	2100100029

Under the guidance of :

Prof. K. K. Gaikwad

Department of Computer Engineering

Government Polytechnic, Karad

MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI.

Certificate of Completion

Microproject Assessment at the end of Semester
(By respective Head of the Department & Head of the Institute)

This is to certify that,

Sr. No	Roll No	Enrollment No	Name
1	1212	2100100010	Sakshi Santosh Shete.
2	1226	2100100024	Samiksha Santosh Salunkhe.
3	1231	2100100029	Shweta Sunil Kashid.

Have successfully completed **"Impact of natural disaster and man-made hazards"** Micro-project of the fifth semester Diploma in Computer Engineering of subject ENVIRONMENTAL STUDIES (22447) from Government Polytechnic Karad Institute with Institute code (0010).

Prof. K. K. Gaikwad (Project Guide)
Prof. S. B. Patil (Head of department.)
Prof. Mr. R. K. Patil (Head of Institute)

Seal of the Institute

INTRODUCTION

Environmental studies are the study of human interaction with the environment and in the interests of solving complex problems. Environment includes which we are directly or indirectly dependent for our survival, whether it is living component like animals, plants or non living component like soil, air and water. Importance of environmental studies are people have to clarify modern environmental concept like how to conserve biodiversity. Usage of natural resources more efficiently. Try to know the sustainable way of living. The field encompasses study in basic principles of ecology and environmental science, as well as associated subjects such as ethics, geography, policy, politics, law, economics, philosophy, environmental sociology and environmental justice, planning, pollution control and natural resource management.
The main factors influencing environmental behaviors: There is waste management behaviors like waste reduce, reuse, recycle and recycling processes.

Reduce: People should make a simple habit to reduce waste by avoiding disposable items like paper products, straws, plastic covers and single serving containers. Pack your lunch or snacks in a box and it does not involve throwing anything away. Avoid food wastes to your trash it prevents lost of nutrients.

Reuse: when we use something again is called reuse. Clothes are used to reuse for the same purpose by washing dirty. People make a habit of donating clothes or unused items to the orphanages or oldage homes.

Recycle: It involves collecting processing and selling products from old materials. Cereal box made with 100% recycled paper and aluminum can only be made from 40% recycled content.

ACKNOWLEDGEMENT

We take this opportunity to thank all those who have directly and indirectly inspired, directed and assisted us towards successfully completion of this project report.

We express our sincere thanks to **Prof. R. K. Patil** Principal of Government Polytechnic, Karad and the Head of computer Department **Prof. S. B**. **Patil** for having us allowed to submit this report as a part of our academic learning.

We express our sincere thanks to **Prof. K. K. Gaikwad** Lecturer in Computer Engineering, Government Polytechnic, Karad for encouragement throughout the project report and guideline in designing and working out this project. We are also grateful to team of "**Impact of natural disaster and man-made hazards**".

Place: Government polytechnic karad.
Date:

Yours Sincerely,

1212-Sakshi Santosh Shete
1226-Samiksha Santosh Salunkhe
1231-Shweta Sunil Kashid

MICROPROJECT REPORT

TITLE:-

"Impact of Natural disaster and man-made hazards"

- **RATIONALE:**

Natural and manmade hazards include, for instance, droughts, desertification, floods, fires, earthquake and dispersion of radioactive gases in the atmosphere. They have significant social, environmental and economic impacts. The JRC carries out extensive work to continuously monitor the situation, assess risks and potential impacts, and forecast future events as accurately as possible in order to help prevent these phenomena from happening or to limit their impact. The JRC provides the knowledge base that helps EU countries and international partners prepare for a respond to natural and manmade disasters. An import part of this work is the development of methods and tools to monitor the situation, assess risks and predict future developments.

- **AIM AND BENEFITS:**

1. To reduce, or avoid, the potential losses from hazards, assure prompt and appropriate assistance to victims of disasters, and achieve rapid and effective recovery.
2. To reduce the impact of disasters, react during an immediately disasters, and take steps to recover after disasters has occurred.
3. To develop an awareness of chronological phases of natural disasters response refugee relief operations.

- **COURSE OUTCOME:**

a) Develop Public awareness about environment.
c) Conserve Ecosystem and biodiversity.
d) Apply techniques to reduce Environmental Pollution.
e) Mange social issues and environmental ethics as life long learning.

- **ACTUAL PROCEDURE FOLLOWED :**

Details of activity	Started date	Finished date	Names of responsible team members
Selection of topic	26/07/2023	02/08/2023	All team members
Completion of proposal	04/08/2023	18/08/2023	All team members
Preparation by abstract	20/08/2023	23/08/2023	All team members
Collection of data/ experiment	26/08/2023	14/09/2023	All team members
Discussion and Outline	18/09/2023	26/09/2023	All team members
Ending and proof reading of content	29/09/2023	10/10/2023	All team members
Completion of report and presentation	19/10/2023	25/10/2023	All team members

- **ACTUAL RESOURCES USED :-**

Sr. No	Name of Resources	Specification
1.	Computer System	**Device Name:** DESKTOP – SUS0KGR **Processor:** 11th Gen Intel(R) Core (TM) i5- 1135G7 @ 2.40GHz 2.42 GHz System. **Type:** 64-bit operating system, x64based processor **Version:**21HP
2.	Office S/W Package	Microsoft word

➢ OUTPUT OF THE MICRO-PROJECT :

Natural Disasters:

When disasters occur due to natural forces they are called natural disasters, over which man has hardly any control. Some common natural disasters are earthquakes, landslides floods, droughts, cyclones, etc. Tsunamis, volcanic eruptions and wildfires are also included under natural disasters. These disasters cause enormous loss to life and property.

Man-made disasters: When the disasters are due to carelessness of human or mishandling of dangerous equipment's they are called man-made disasters. Common examples of these disasters are train accidents, aero plane crashes, collapse of buildings, bridges, mines, tunnels, etc.

Natural Disasters:

Some of the common natural disasters, their impact on environment, and their prevention, control and mitigation are discussed below:

1. Earthquake

An earthquake is the shaking of the earth's surface caused by rapid movement of the earth's crust or outer layer. Ever since it came into existence 4.6 billion years ago, the earth has been a dynamic, evolving system. The position of the different continents and oceans that we see today, has changed a number of times in the earth's history.

Impact of Earthquake on the environment:

The destruction, an earthquake causes, depends on its magnitude and duration or the amount of shaking that occurs. In the last 500 years, earthquakes around the world have killed several million people. Earthquake is one of the most catastrophic natural disasters. Massive loss of life and property occurs due to collapse of buildings. Besides, roads, bridges, canals, electric poles, etc. are severely damaged. Certain regions of the earth are more prone to earthquakes.

These are places located in the unstable regions of the earth crust, which are subjected to tectonic activities. Countries like Japan, parts of Southeast Asia, Turkey, Iran, Mexico, etc. are affected by severe earthquakes. In India, the entire Himalayan region, parts of the Gangetic Plain, Kutch and Andaman and Nicobar islands are in the earthquake hazard zone.

The major impacts of earthquakes are as follows:

- Shaking of the ground and surface rupture:
  This is the main cause of destruction in which buildings, bridges, roads, canals and other structures are damaged.

- Liquefaction:
  Earthquakes make sands and silts to transform from a solid to liquid state. This also results in building collapse.

- Landslides:
  Earthquakes of high intensity often trigger many landslides in the hilly regions.

- Fires:
  It is a major hazard associated with earthquakes. The shakings of the ground and building damage often break the gas pipes and electric lines that cause fires.

2. Tsunami

It is a Japanese term meaning 'harbour waves'. Tsunamis are massive sea waves that are mainly caused due to earthquakes in the ocean floor or possibly due to an undersea landslide or volcanic eruption. When the ocean floor is tilted or offset during an earthquake a set of waves is created similar to the concentric waves generated by an object dropped into the water.

These waves are massive in size and gain height as they approach the seashore. Tsunamis up to the height of 30 m are recorded. Tsunamis are the most catastrophic among natural disasters as they affect a very wide geographical area. The tsunami of 26 December, 2004 killed around three lakh people and affected parts of Indonesia, Andaman and Nicobar Islands in India, Sri Lanka and even Somalia.

Prevention and Mitigation:

Despite the advances made by modem science, the exact time and place where an earthquake may strike cannot be predicted. Hence, the occurrence of an earthquake cannot be prevented. However, there are certain regions that are earthquakes prone and so the administration must work before hand to minimize the damages due to occurrence of earthquakes in such areas. The control and mitigation measures in earthquake prone regions include hazard reduction programmes, development of critical facilities and proper land use planning.

Hazard reduction programmes:

i. Earthquake education and evacuation plans.
ii. Use of proper construction material that is not injurious even if the structures collapse.
iii. Construction of quake resistant buildings having proper structural design.

Development of critical facilities:

i. Establishment of earthquake regulatory agencies for fast relief.
ii. Establishment of specific health care units for treating earthquake injuries Proper land use planning.
iii. Mapping of faults and weak zones in earthquake prone areas.
iv. Buildings such as schools, hospitals, offices, etc. should be in areas away from active faults.

3. Flood

Floods refer to the 'inundation of large parts of land which otherwise remain dry by water for some duration of time'. Floods are one of the most common natural disasters occurring in many parts of the world every year. Floods occur due to heavy rainfall within a short duration of time in a particular region which causes the rivers and streams to overflow.

Since most of the precipitation occurs within span of two to three months during the rainy season, most floods occur during that time. The floods in the mountainous regions due to cloudbursts or damming of streams are referred to as flash-floods. In flash-floods, the water drains away quickly but only after causing extensive damage. The plain areas of a region which are drained by a number of rivers, are the places most affected by floods.

In India, states like Assam, Bihar and parts of Gangetic Uttar Pradesh are quite prone to floods during the rainy season. The Ganga and Brahmaputra rivers and their tributaries are most susceptible to floods. However, heavy rains cause occasional floods in parts of Gujarat, Maharashtra, Karnataka and Tamil Nadu.

Flooding, in India, is a major problem and some part or the other is affected by the fury of floods usually during the months from July to September. Floods cause untold miseries to the affected regions in the form of huge losses of life and property. There is great damage to agriculture and livestock. Flood affected areas face acute shortages of food and drinking water. Besides, floods cause a number of water borne diseases such as diarrhea, gastroenteritis, jaundice, malaria, etc.

Impact on the Environment:

Though the lives lost in floods may not be as high as in case of earthquakes or cyclones, the damage to the environment is immense. The problem is further aggravated if the floods last for a longer duration of time.

Floods not only damage property and endanger if lives of humans and animals, but have other effects as well, such as:

1.Floods cause the spread of many epidemic diseases.

2.Rapid runoff causes soil erosion.

3.Wildlife habitat and forests are often destroyed.

4.Manmade structures like buildings, bridges, roads, sewer lines, power lines, etc. are damaged.

5.Floods cause widespread damage to the standing crops and degrade the agricultural land.

6. Flood affected areas are faced with acute shortage of food and drinking water.

Prevention, Control and Mitigation:

Though floods are a natural hazard, it is sometimes intensified due to undesirable human activities. The measures that can be taken to control the extent of flood damage include land use planning, building of physical barriers, preventing human encroachment and use of technology for relief.

Land use planning:

Proper land use planning in flood prone areas includes:

1. Demarcation of the flood-prone areas that are first inundated during floods.
2. Construction work and concentration of human population should be avoided in the floodplains.
3. Afforestation on the upper reaches of the river (catchment areas) to control soil erosion and excessive runoff.

Building of physical barriers:

Flood can be prevented by building certain structures, such as:

1. Embankments along the banks of rivers in densely populated areas.
2. Building of reservoirs to collect excess water during floods.
3. The construction of channels that divert floodwater.

Preventing human encroachment:

Human encroachment should be avoided in the following areas:

1. Floodplains and catchment areas.
2. This would control deforestation and soil erosion which would prevent excessive runoff.

Use of technology for relief:

Advanced technology can be used in the following ways:

1. Advanced communication techniques for flood forecasting and warning.
2. Fast evacuation of people.
3. To provide relief in temporary shelters.
4. Immediate supply of medicines, drinking water, food and clothes.
5. Epidemic diseases must be controlled through spraying, vaccination, etc.

4. Drought

Drought is a condition of abnormally dry weather within a geographic region. Drought refers to the lack or insufficiency of rain for an extended period of time in a specific region. During droughts, rainfall is less than normal causing a water imbalance and resultant water shortage. It occurs when the rate of evaporation and transpiration exceeds precipitation for a considerable period. Drought should not be confused with dry climate, as in the Sahara or Thar Desert. It is marked by an unusual scarcity of water and food for the humans as well as animals.

Certain regions of the world, such as parts of Central Africa, are characterized by low amount of rainfall resulting in perennial drought-like conditions. Some part of India is often affected by drought even during the rainy season. As India is primarily an agricultural country, droughts cause untold miseries to the common people.

Many Indian farmers are still totally dependent on rainfall for irrigation and because of abnormally dry spells there is extensive crop damage. The main drought prone areas of the country are parts of Rajasthan, Maharashtra, Karnataka, Orissa, Tamil Nadu and Chhattisgarh. However, sometimes drought-like conditions also prevail in the Gangetic Plain also.

Impact on the Environment:

The severity of the drought is gauged by the degree of moisture deficiency, its duration, and the size of the area affected. If the drought is brief, it is known as a dry spell or partial drought.

Drought causes serious environmental imbalances, which are summarized below:

1. Water-supply reservoirs become empty, wells dry up and there is acute water shortage.
2. Groundwater level is also depleted because of less recharge.
3. Soil degradation and erosion occurs. Soil cracks because of shrinkage during desiccation.
4. There is extensive crop damage.
5. People become impoverished and there are diseases due to malnutrition.
6. Widespread damage to flora and fauna air including domestic animals.

Prevention, control and mitigation:

Rains are caused by a number of natural factors like air currents, wind direction, etc. Thus, droughts are a natural phenomenon, beyond human control and prevention. Though, global warming may have changed the pattern of rainfall in the recent times. In modem times, by the use of satellites, we can predict the weather pattern over a particular area. Drought-like conditions can be overcome by better water harvesting techniques. Certain precautions can be taken in drought prone areas, which relate to management of water resources, proper agricultural techniques and relief by different agencies.

Management of water resources:

1. Conservation of water through rainwater harvesting, building check dams, bunds, etc.
2. Construction of reservoirs to hold emergency water supplies.

Proper agricultural techniques:

1. Increased use of drought resistant crops.
2. Proper irrigation techniques, such as drip and trickle irrigation that minimize the use of water.
3. Over-cropping and overgrazing should be avoided.

Relief measures:

Immediate relief to the drought-affected people should be provided in the form of:

1. Employment generation programmes, like 'food for work' in the drought affected areas.
2. To provide fodder for domestic animals.

Man-made Disasters:

Man-made disasters are the result of carelessness or human errors during technological and industrial use. The disasters are in the form of accidents, which occur all of a sudden and take a huge toll on life and property. Mostly such disasters cause injuries, diseases and casualties where they occur.

Man-made disasters are mainly of two types:

i. **Local disasters:**

These are small-scale disasters such as train accidents, plane crashes and shipwrecks.

ii. **Industrial and technological disasters:**

These are much larger in scale and are the result of technology failures or industrial accidents. Such disasters affect both local population and may even cover a much larger area. Industrial disasters result due to accidental leakage of water or air pollutants. Many of the chemicals are extremely toxic and carcinogenic which affect the human population in an adverse way. Some people die instantly while others are crippled for whole life in the form of blindness, paralysis and many other chronic diseases.

Impact on the environment:

Leakage of toxic chemicals from the industries and accidents in the nuclear reactors has short-term and long-term effects on the environment and human health. Short-term effects on human health relate to casualties and diseases like blindness, cancer, paralysis, heart trouble, gastric and respiratory abnormalities. Long-term effects include genetic imbalances in humans and its impact on the future generations. Soil and water sources also remain polluted for long durations of time.

Prevention, control and mitigation:

Man-made disasters can be minimized to a large extent by adopting the following measures:

1. Proper training of personnel working in the hazardous industries.

2. Proper maintenance and care of safety measures.

3. Removing human encroachments around hazardous industries.

5. Making the people aware about the first-aid methods in case of accidents.

6. Applying wet cloth over the mouth and nose in case of gas leakages minimizes the health hazards.

7. Remaining indoors in case of radioactive accidents.

8. Providing the people with proper medical care, in some cases throughout their life.

9. Providing adequate compensation to the affected people by way of money and employment.

- **Bhopal Gas Tragedy(BGT)**

The most serious industrial disaster occurred on December 3, 1984 at Bhopal, India, which is known as the Bhopal Gas Tragedy (BGT). The Bhopal gas tragedy occurred due to leakage of methyl isocyanide (MIC) gas from the factory of Union Carbide of India Ltd. MIC gas is used as an ingredient in pesticides.

It leaked from the factory and formed the deadly cloud over Bhopal. People living in slums in the vicinity of the factory were the most affected and more than 5000 people were killed, half of them due to direct exposure and other half due to after affects. MIC is a colourless gas which causes severe irritation, violent coughing, swelling of the lungs, bleeding and death due to direct inhalation. It also caused loss of eye-sight in more than 1000 people. More than 50,000 people were affected with respiratory, eye, gastric, neurological and gynaecological problems.

Another technological disaster is due to the potential damages of nuclear fallout. An example is the Chernobyl Nuclear Disaster.

- **Chernobyl Nuclear Disaster**

This nuclear disaster occurred at the Chernobyl Nuclear Power Plant, which was one of the largest power plants in the Ukrainian Republic of erstwhile USSR, on April 26, 1986. It is the worst nuclear disaster recorded in a nuclear power plant. This nuclear power plant had four reactors of 1000 megawatt each for electricity generation. A sudden power surge resulted in two explosions, which destroyed the reactor core and blasted a large hole in the roof of the reactor building.

The Radioactive debris moved up through that hole to heights of 1 km. Approximately 100 to 150 million curies of radiation (radioactive isotopes of iodine and caesium) escaped into the atmosphere. To reduce emissions, the rescue team bombarded the reactor with 5,000 metric tonnes of shielding material consisting of lead, boron, sand and clay. Soviet officials placed the toll of human lives to 31.

However, according to western estimates, 2000 people were killed. Large areas of the Ukrainian, Byelorussia Republics of the USSR and even parts of Poland, Denmark and Sweden were contaminated. Around 200,000 people had to be evacuated and resettled. The after affects lasted for many years and a rise in the incidence of thyroid and blood cancer has been observed in a wide group of people. Other affects on the human health included skin diseases, hair loss, nausea, anemia, respiratory and reproductive diseases.

➢ Applications of this Micro-Project:

1) Provides decision support system in disaster management.
2) Useful for hazard zone mapping and duration emergency conditions.
3) Provide awareness about natural disasters.

➢ Skill Developed/Learning outcomes:

We learned how to manage the situation after the disasters occurred. We understand the basic impacts of natural as well as man-made disasters impacts on environment. We learned the mitigation and prevention controls for the various disasters. We also understand the causes for the disasters.

➢ Conclusion:

In this Microproject we learned about Impact of Natural Disasters and Man-Made Hazards, Different Type of Disasters and more!