

5 Case Studies on Environment

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Case Studies on Environment

Pristis Microdon (Large-tooth Sawfish) Critically Endangered Species in India

Learning Outcomes from the Chapter

- What is the case regarding Bhopal gas tragedy?
- Case regarding Coco- Cola factory at Plachimada.
- Case regarding Uttarakhand landslide.

Case regarding Tsunami on 26th December.

- Case regarding Endosulfan tragedy.
 - Case regarding Bhuj earthquake

Analysis of the Chapter

This chapter includes case studies explaining how the environmental hazard and damages man made construction have created devastation in very short time period. This chapter also includes impacts and lessons which should have been learned by the government and conscious groups to mitigate such hazards in the coming times.

Issues to Ponder

- Chilly wind Impact on specific habitat.
- Methyl Isocynate Impact on environment
- Residual environment Impact on environment
- Utilization act Provisions related to environment
- Pesticide Consequence of it on environment
 - environment

Endosulfan

Rehabilitation

Excessive mining

Commercial capital

ENVIRONMENTAL DISASTERS AND ITS IMPACT ON THE SOCIETY

We all know that disasters strike on vulnerable societies. It can be manmade or natural. Various natural hazards such as earthquakes, flood, droughts, fires etc. are part of the natural cycles on earth. However when such hazards happen to a certain section of our society which is susceptible to such hazards, it can have major consequences on the individuals, families and society on a whole. Hence the impacts of disasters whether natural or man-made have both environmental and human dimensions. Hence human intervention in the form of deforestation, agricultural processes, forest management practices etc. can at times have a negative impact on the society in the form of storm, floods, landslides, silting, ground water contamination etc.

We all know that one needs to have an harmony between Environment and society for a healthy life and growth of civilization. Our natural resources need to be protected and nurtured so as to create a balance between one and all Disasters are some form of calamity which may strike the human race at any time and leave a lasting impact. They can be Natural or Man -made. Hence an earthquake is simply an event in nature and not a disaster unless it causes injury or destroys property or thousands are killed due to it. From the above, it is clear that Disasters can be defined as an occurrence which can be natural or man-made causing severe damage, injury or loss of life or property and causing disruption in the society and affecting the natural environment adversely.

In lieu of the above, due to disasters striking very often, Disaster management has become the in-thing now in the present day scenario, since calamities whether it is landslide, floods, tsunami, earthquake etc. keep on striking one after another. Hence a need has been felt for an effective organization, direction and use of various means to counter the disaster effectively and these frequent disasters calls for an effective disaster management strategy. Hence the role of disaster managers has become very pertinent because any miscalculation at their end can play havoc with the lives of the unprepared disaster victims and in turn have a negative effect on the environment on a whole.

We would be covering few of the important Natural and Manmade disasters in the history of human kind through various case studies.

CASE STUDY 1

Bhopal Gas Tragedy, Bhopal, Madhya Pradesh, India

3rd December , 1984 – This tragedy is known as the worst man made tragedy in the history of mankind which had an adverse effect on the environment in the long run. This tragedy happened in the factory of Union Carbide of India Ltd. (UCIL), a subsidiary of the multinational company Union Carbide Corporation (USA) due to the leakage of Methyl Isocyanate gas.

During a chilly windy December night when the city of Bhopal was almost asleep, the tragedy struck at around mid-night. In the factory the workers of night shift around 11.30 am realized that something was wrong in the factory since their eyes were itching badly. The Methyl Isocynate tank was under heavy pressure to release the gas since the same was not designed to withstand the increased pressure. This finally forced the emergency venting of pressure from the MIC holding tank and releasing large volume of toxic gases in the atmosphere.

Impact of the Bhopal Gas Tragedy

Since this gas had high density, the gas clouds formed stayed close to the ground and this caused coughing, vomiting and severe eye irritation and a feeling of suffocation. Thousands of people died immediately form the effects of the gas and many died in panic. There were mass cremations and funerals in the following days. It is estimated unofficially that around 20,000 died due to effect of this gas and an another 1,00,000 to 2,00,000 people were estimated to have permanent injuries. The leaves of the trees of the nearby areas turned yellow and withered away.

Even today the after effects of the tragedy loom large over Bhopal.

Hence what do we learn from this tragedy or what are the lessons we have learnt?

Lessons learnt from Bhopal Gas Tragedy

One lesson which we as human civilization has learnt is that 'Prevention is always better than cure'. This tragedy was something which could have been averted had there been adequate precautionary measures in place. This tragedy was more about negligence and ignoring safety measures by reducing cost to the company. Hence there was infact no backup plan which could have averted this tragedy. If the precautionary measures would have been in place, thousands of lives could have been saved.

This disaster served as an eye opener to the bureaucrats and politicians across India. The Department of Environment (DoE) was converted to a full fledged Ministry of Environment and Forests (MoEF) in the year 1985 and this is a primary Central Government agency for co-ordinators, planning and promoting the environmental programmes across India.

The Company's profits seemed more important than investing on the safety measures, it is also surprising to note as to how permission was granted to having such a hazardous plant in the Bhopal city. Hence dear learners, red tapism needs to end if one needs to create a society which is sustainable for future generations.

A study conducted by Greenpeace revealed that various residual environmental aspects still lingers on in Bhopal even after so many years of the tragedy. The contamination of underground water, soil and effects on human body pose serious threats to the future generations. Hence dear learners, this disaster is one of its kinds in the history of mankind which has left a lasting impact on the environment and society and its after effects are still visible on the coming generations as well.

Now let us study another interesting case study showing the unsustainable strategy used for establishment of industry at the cost of Environment and society.

CASE STUDY 2

COCA COLA FACTORY AT PLACHIMADA

The Coca Cola factory at Plachimada is a classic example of industrial development at the cost of harming the environment by unsustainable means of extraction of natural resources

This factory was established in the year 1999 and its operations started in Kerala on 8th October, 1999 when the company officially applied to Perumatty Grama Panchayat for permission to setup a bottling unit in Plachimada and thus successfully acquired 40 acres of Marshy lands area which is legally not permitted for industrial purposes under the Kerala Land Utilization Act, 1967. The company utilized large amounts of ground water of the said area. The soft drinks like Coca cola, Miranda, Seven-up, Sprite, Fanta and Kinley soda were produced at this plant. The coming up of this plant provided various employment opportunities to the locals of the area The wastewater from the plant after treatment was used for recharging the ground water reservoir and the sludge from the factory was sold to the nearby farmers as fertilizer.

However the reality was different from what was said by the management. There was no Environmental Impact Assessment by the Government or the Factory management before its establishment. As the production began, a series of environmental issues came up like water scarcity, contamination of soil, health hazards etc. There was also no real mechanism to estimate the actual volume of the water extracted by the Company.

Hence what was the impact of the Coca-cola plant at Plachimada, the impact was multi-fold and is as follows.

Impact of the Coca-cola Plant at Plachimada

There was a scarcity of drinking water in the area and major sources of drinking water dried up in the region. The groundwater quality analysis exposed high levels of hardness, salinity, alkalinity and presence of various unwanted chemical components etc which was not suitable for drinking.

The solid waste or sludge which was distributed as fertilizer contained high levels of heavy metals. Hence the once fertile land had become a graveyard of industrial waste and thus got polluted in the due course of time.

The polluted water and soil resulted in serious health problems amongst the residents of plachimada. The health hazards were like cough, burning eyes, pain in abdomen, low birth weight etc. Due to reduction in agriculture, there was a steep fall in the employment opportunities in the region and people started leaving the area in search of work and better opportunities.

Lessons learnt from the Plachimada Case

A proper Environmental Impact Assessment needs to be carried out whenever any such company is established in any area.

The solid waste needs to be disposed off in a sustainable manner so as to not to harm the environment.

Over exploitation of resources needs to be avoided and this can only be done by effective monitoring mechanisms in place by the Government machinery.

Thus the Plachimada case study has shown the need for suitable sustainable strategies so as to make future projects environment friendly, economically feasible and socially viable in the interest of future generations.

CASE STUDY 3

ENDOSULFAN TRAGEDY

Endolsulfan is a man-made insecticide used to control a number of insects in the agricultural fields.

The Plantation Corporation of Kerala (PCK) a Public Sector Undertaking under the State Government owned some cashew plantations in Kasargod District, Kerala. As per media reports, Endosulfan was aerially sprayed in these plantations for 24 years (1976 to 2000) around three times a year These uninterrupted spraying of the pesticide has had a disastrous impact on the health and environment of the local people residing in the areas surrounding these plantations. Various villages nearby also had been severely affected since this spraying resulted in chronic health complications. By 1990s various health disorders were reported from the residents of this area.

Impact of the Endosulfan tragedy

The impact of this tragedy was multifold and is considered to be one of the worst pesticide tragedies of the world.

In the early 1979, it was reported that stunted growth and deformed limbs were noticed amongst the infants born in this area.

By 1990s, serious health disorders were noticed amongst residents of the nearby areas especially children who had congenital anomalies, mental retardation, physical deformities, cerebral palsy, epilepsy,etc. Even today people are dying from the after-effects of this pesticide.

Lessons learnt from the Endosulfan tragedy

This tragedy received wide media coverage and was banned in Kerala in 2001 after a report by the National Institute of Occupational Health which showed the debilitating effects of this pesticide.

Since this tragedy got wide media coverage, people have become more conscious about usage of pesticides and the concept of organic farming and kitchen/terrace garden is gaining popularity in and around Kerala.

This pesticide is presently banned in many countries across the world, however in India, this pesticide is only banned in Kerala and Karnataka. After this tragedy, awareness levels amongst the residents of Kerala about the benefits of organic farming have increased. People have started cultivating vegetables and fruits in the space available in their houses for consuming pesticide free foods.

Thus these are some of the debilitating effects of pesticide in our daily food and how the same is detrimental towards our overall wellbeing.

CASE STUDY 4

The Tsunami on 26Th Dec, 2004

Dear learners let us now try to understand what a tsunami means and what is the impact of tsunamis on the environment and society? The word 'tsunami' is derived from the Japanese words *tsu* means 'harbor' and *nami* means 'wave' or 'series of waves' in the ocean which can be hundreds of miles long and can rise upto 34 ft. These are like walls of water which

can travel at a massive speed and cause lots of destruction especially along the coastal lands. Hence it is very important for you to know at this juncture that one of the most common causes of tsunamis are underwater earthquakes.

On December 26, 2004 at 7.58 am due to a fault rupture which was initiated at the west coast of northern Sumatra, Indonesia gave trigger to a devastating tsunami in the Indian ocean. Apart from Sumatra, Indonesia, the earthquake affected the northern Indian

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Ocean in India, Sri Lanka, Thailand, Malaysia and Bangladesh.

In India, there was extensive devastations of the environment and society of the populated Andaman-Nicobar Islands and the coastal States of Andhra Pradesh, Tamil Nadu and Kerala along the mainland coastline of India. The earthquake which generated the tsunami in the Indian ocean was 9.0 on the Ritcher scale which is one of the largest recorded earthquake in the human history.

Impact of the earthquake and tsunami

Due to impact of the massive earthquake generated tsunami, as per media reports, there was serious damage across the coastlines of around 10 countries and killing more than 1,50,000 people.

In India, the earthquake was largely felt around the northern Indian ocean in India. In Port Blair, many roads were cracked and buildings damaged within the Indian Air Force base while in the coastal towns and ports within Tamil Nadu, a few buildings developed cracks. The tremors of this underwater earthquake were also felt in Bangkok, Thailand while in Malaysia, several high-rise buildings trembled and the residents were evacuated. In Bangladesh the tremors were felt in the city of Dhaka as well as across the entire country. Sand deposits as a result of tsunami have damaged various standing crops and affected the soil fertility.

Sea water intrusion was less in areas which was covered with thick vegetation when compared to those with bare lands.

Lessons learnt from this disaster

Few of the lessons which we can learn from the above disaster is as follows.

The buildings, houses which need to be built in future need to be earthquake resistant so as to have the ability to withstand a earthquake.

A proper disaster management system needs to be in place so as to reduce the causalities involved in such a large scale disaster.

A proper rehabilitation strategy is required for reducing the after-effects of the disaster.

Thus dear learners through the above case study you must have understood that a proper disaster management mechanism and rehabilitation strategy needs to be in place to reduce the impact of such natural disasters.

CASE STUDY 5

The Uttarakhand Landslide, June 2013

We all have heard about Landslides but have you ever wondered why and how they happen?

Hence what do you mean by the term landslide? It is basically a rapid downslope movement of soil or rock due to gravitational pull. Landslides cause great distress as they damage property, crops and also endanger life.

On June 15th, 2013 the India Meteorological Department (IMD), Delhi had predicted that the State would receive 'rather heavy rainfall. On June 15th and June 16th, 2013 the IMD had warned the State of Uttarakhand of 'extremely heavy rainfall. The IMD's Dehradun centre then issued a news to the State Government saying that five places in the State i.e. Joshimath, Badrinath, Kedarnath, Yamunotri and Gangotri would receive 'rather heavy' to 'extremely heavy' rainfall in the next 72 hours. However as per media reports, no concrete precautionary steps were taken to avert this tragedy.

There was a cloudburst around the Uttarakhand region which resulted in devastating floods and massive landslides on 16th June, 2013 As per media reports, the Chorabari Lake exploded when clouds burst over it and this led to severe landslides in the region and causing extensive damage in the region.

Impact of the Uttarakhand Landslide

The landslide caused a great loss to human life and property in the area. Several houses, shops, hotels around the Kedarnath township were destroyed resulting in severe damages to all. The famous Kedarnath temple however was not damaged but its base was covered with water, muds and boulders from the landslide.

The roads connecting the hills were severely damaged affecting the rescue operations in the area.

Various tourists were caught unaware and thousands were stranded without food, water and shelter.

Thousands of human lives was lost and their bodies washed away in this natural fury.

According to Wikipedia, it is estimated that around 608 villages covering a population of 7,00,000 in 23 Districts were affected by the flood and landslide.

Hence the lessons which we have learnt from the disaster areas given below.

Lessons Learnt from This Disaster

Excessive mining on the riverbanks and indiscriminate construction of Hydropower projects gave way to this disaster. We all know that dams are quite essential for meeting the energy requirements of the society, however this should not be done at the cost of our natural resources. Hence a proper need assessment needs to be done before initiating new Projects in such eco-sensitive areas.

Further exploitation of natural resources of Uttarakhand like water, forests and minerals to develop infrastructure, without assessing the vulnerability of natural resources led to this disaster.





The thriving real estate business on the hills led to increased mining in the hills. The State machinery needs to take concrete steps to preserve the natural cover and needs to be more cautious while granting sanctions and permissions to build hotels and other structures.

A proper disaster management system needs to be in place for providing timely assistance and for building awareness in such eco-friendly areas.

A timely rehabilitation mechanism needs to be in place when such disasters strike.

Hence the main lesson which one can learn from this disaster

is that this is a man-made disaster due to exploitation of natural resources which in the long run has a debilitating effect on the environment. A proper and effective operational 'Disaster Management System' can go a long way in saving hundreds of life and property when such a disaster strikes.

After going through the above mentioned case studies you must have got an idea about the types of natural disasters we have and how they impact our natural environment in various forms.

Let us now study about one more form of natural disaster - the earthquake which causes rampant destruction to the human life and property.

