

Sustainable Development

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Sustainable development concept and concerns

The world commission on environment and development (WCED) was set-up with Gro Harlem Brundtland as its head. The commission latter known as the " Brundtland commission "published a report in 1989 entitled "our common future " which gave definition in many of the issues of environment and sustainable development.

'Sustainable Development as a development that meets the needs of the present without compromising the ability of future generations'.

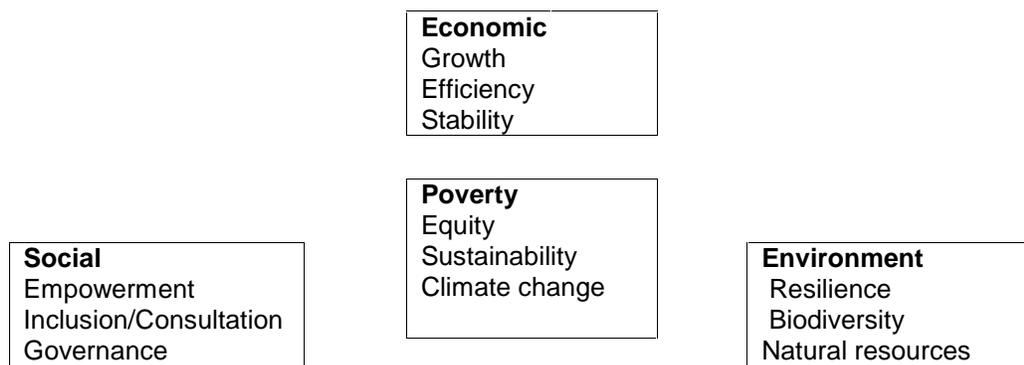
Sustainability is a long term result of environment degradation is the inability of sustain human life. Such degradation on a global scale could imply extinction for humanity .It allows individuals, organization and society to flourish as members of their ecological communities.

Lacking of sustainability is a great problem for the world today. Consequently environment pollution has become great threat.

'Unsustainable situation' occurs when natural capital (the sun total of natures resources) is used up faster that it can be replenished, Sustainability requires that human activity only uses natures resources at a rate at which they can be replenished naturally. The concept of sustainable development is intertwined with the concept of carrying capacity. Sustainability development contains within it two key concepts.

1. The concept of needs in particular the essential needs of the world's poor to which overriding priority should be given and .
2. The idea limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.

The elements in the diagram below shows three pillars of sustainability that is social, environmental and economic. They are very interdepends and mutually reinforcing. Hence, the goal of sustainability development is to bring into balance the elements of these components:



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Terminology

The term '**environment complex**'

The environment of an organism has two components abiotic and biotic. The first includes the atmosphere(air) hydrosphere (water) and lithosphere(soil). The abiotic components are characterized by physical and chemical factors such as temperature, rainfall, pressure, P^H, the content of oxygen and other gases, and so on. These factors exhibit diurnal, nocturnal, seasonal and annual changes.

The biotic component includes all living organism which interact with each other and with a biotic components.

The term '**ecology**'.

Ecology is a study of the households of the planet earth, these households consist of non living matter such as soil and water, and living organisms such as micro-organisms, plants, animal and man. Organisms depend upon each other for their survival, existence and continuance .Besides, living organisms depend upon the non living matter found their surroundings for their functioning the living body is made up of non living matter. Thus ecology is the study of the relationships of living organisms among themselves and with their environment.

The term '**weather, 'climate.'** '**climate change**'. Weather is the day to day condition of the atmosphere.

Climate is the overall pattern of weather usually based on an average over 30 years.

Elements of climates

Temperature, wind speed, humidity, wind, direction ,air pressure, cloud cover, precipitation·sunshine and, solar radiation.

Climate change is a long term shift in weather conditions identified by changes in temperature.

The term '**Hazard**' '**Disaster**' '**Vulnerability**' '

Hazard

A dangerous phenomenon, Substance, human activity or condition that may cause loss of life ,injury of other health impacts, property damage loss or livelihoods, and services social and economic disruption or environment damage.

Disaster

A serious disruption of the functioning of a community or a society involving widespread human ,material, economic or environmental losses and impacts which exceeds the ability of the affected community or society to cope using own resources

Vulnerability

The characteristics and circumstances of a community ,system or asset that make it susceptible to the damaging effects of a hazard.

Environmental Degradation, Disaster and Sustainable Development

Every single element of our daily lives is part of the environment, including the air we breathe, the condition of our bodies, every single item in our homes and every bit of food and water we consume. Environment includes two basic parts of the earth, first the interactions among the living systems and second all the planets living and non-living resources. Human being is the central player because human welfare and activities are foremost in our attention. The earth systems have different component which encompass interaction and interference with each others. The lands is also called lithosphere, it is the solid rocky layer covering the entire surface of the planet. The atmosphere is a layer of gases which surrounds the entire earth. It consists many gases, these layers around the earth are to prevent excessive amounts of radiation from reaching the earth, thereby allowing animals/planets to survive. A hydrosphere can be liquid vapor or ice. The biosphere is composed of livings organisms plants, animals and one-celled organisms are all part of the biosphere and ecosystem comprising the entire earth and the living organisms that inhabit it.

Environment Degradation

The components of the earths systems are intricately intertwined. If one part of the earth changes, other parts will be affected often in ways that are not immediately obvious. For example, removing vegetation from an area of land decreases that lands absorption of ground water, resulting in possible drinking water shortage for the inhabitants.

Environmental degradation is significant factor that reduces the capacity of societies to deal with disaster risk in many countries around the world. Environmental degradation is generally includes the following areas:

- Degradation of atmosphere,
- Degradation of lithosphere,
- Degradation of hydrosphere
- Degradation biosphere.

How sustainable development be hampered

Bangladesh is very seriously facing the problems like lost of soils original fertility, deforestation, pollution etc due to lack of sustainable development.

Pollution are the hindrance for sustainable development

The large scale use of fossil fuels (coal, gas ,petrol etc.) made transportation cheaper and helped spread industrialization using electricity which generated and burned by the coal. Man developed new technologies and utilized the resources of the earth for creating better living conditions. As populations are increasing there was a need for increase in food production. Man cleared forest and introduced chemicals in to the environment to step up agricultural productivity. These chemicals called pollutants, ,have created problems which man did not face before. These pollutants have altered the carbon dioxide content of the atmosphere on a global scale and have destroyed fish and other aquatic organisms on a massive scale. These pollutants have now appeared in migratory birds and human beings and pose a health hazard. What dose pollution mean? pollution of the environment is an undesirable change in the physical, chemical and biological characteristics of air, water and soil due to the addition to the environment of material or energy(heat, sound, radioactivity,etc.) in quantities and at a rate which are harmful to living organism, including man, materials introduced in to the environment cause to types of pollution (I) some materials remain unchanged for a very long time in the environment these are not easily degradable and are called persistent pollutions(e,g plastic, pesticides and nuclear wastes). Many of these persistent pollutants are toxic and get incorporated in to the food chain. (ii) Some pollutants breakdown in to simpler substances in a short time and ultimately get mixed with or incorporated in to the soil. These substances do not persist in the environment and are therefore termed non persistent (e.g., agricultural waste and garbage). Some of these are biodegradable, since some living organisms utilize as food substrate.

Pollutants can be (a) Gases (b)Metals and their salts (c) Pesticides and agrochemicals (d) Drugs and pharmaceutical products (e) Organic matter (f) Radioactive substances (g) Heat and (h) Noise. On the basis of the environmental component ,they can also be classified as air pollution ,water pollution, soil pollution and so on.

How pollution affect biotic and abiotic organism Degradation of the Atmosphere

Air pollution

Air is precious natural resources and life can't sustained on this planet without it. Without oxygen aerobic life is not possible. Human activities can be interfered by the pollution of this vital resource. It is only in recent time that making has become aware of the extent to which this interference is sustainable.

Sources of Air pollution

Air gets polluted largely due to smoke produced by automobiles, power plants a kitchens and due to the large-scale burning of fossil fuels. Such as coal, diesel, petrol. Kerosene and so on.

1. The burning of fossil fuels produces carbon dioxide, carbon mono oxide, sulpher dioxide, oxide of nitrogen, hydro carbons, particulate matter and metallic traces.
2. Most power plants are coal based. The pollutants are fly ash, soot, and sulpher dioxide
3. Fertilizer plants produce oxide of sulpher, particulate matter and fluorine.These pollutants come from sulphuric and phosphoric acid units. Ammonia Nitrogen Oxide and hydrocarbon come to the atmosphere from Nitrogen based plants.
4. The major pollutants from the textile industry are cotton dust, nitrogen oxide chlorine, naphtha, vapors, smoke and sulpher dioxide.
5. There are thousand of chemical plants and pesticides plants which prepare costic soda and produce chlorine gas.
6. Steel plants produces carbon monoxide ,Carbon dioxide, Sulpher dioxide and dust .
7. Cements factory produces huge dust. Tanneries industries emit heavy foul odor from purifying new hides and solid waste. Foul odder also come from open drainage channels, Sedimentation pits and wastes dumped inside the tannery premises
8. Automobiles contribute 60% of the air pollution by releasing compounds. Incomplete combustion produces 3-4 benzopyrene. One an average, every 1000 gallons of petrol after combustion produce 3200 pound of Carbon mono oxide 300 of hydrocarbons, 45 of nitrogen oxide, 17 of Sulpher dioxide and 2 of organic acid and o.3 pound of Carbone particles,18 of aldehyde. Among the world how many automobile vehicles' discharging the above pollutants. Astronist and strange.

Effects of air pollution

Air pollution badly affects the respiratory tract. Causes irritation, headache, fatigue, asthma, high blood pressure, heart diseases and even cancer. The development of mental faculty of children would be impaired by lead pollution that could also affect central nervous system, cause renal damage and hypertension. Excessive lead in the blood of children could damage their brain and Kidney, public exposure to air pollution in Dhaka City is estimated to cause 15000 premature deaths and several million cases of sickness every year, said a recent world Bank report. Carbon mono oxide is also destroyed at the surface of the earth Soil fungi and higher plant absorb Carbon mono oxide. Depending upon the availability of solar energy, the mechanism of carbon mono oxide absorption and destruction by plant varies. Toxic effect of carbon mono oxide combines with haemoglobin and reduces its oxygen-Carrying Capacity, thus affecting respiratory activity and metabolism. It causes blurred vision, headaches and in acute toxicity, may cause unconsciousness and even death.

The worst air pollution affected area in Dhaka city include: Hatkola, Manic Main Avenue, Tejgaon, Framgate, Motijheel, Lalmatia and the interdistrict-bus terminals, surveys conducted between December 1996 and January 1997 showed that the concentration of suspended particles goes up to as high as 2465 micrograms per cubic meter as against the allowable limit of 400 micrograms per cubic meter at Farm Gate.

Air pollution inflicts damage on land and water systems: on agricultural crops, forests, rivers and lakes, buildings and human health. Such airborne pollutions damages crops vegetation by injuring the plant tissue, which increases susceptibility to disease and drought.

As primary pollutants react to secondary pollutants, acidic compounds and other multiple pollutants damage the foliage and the soil, forests decline and die. Pollutants in the air are also dissolved in water droplets and held clouds. Sometimes moving long distances before falling back to earth in acid rain, snow, dew or fog.

Ozone depletion

Ozone is a rare form of oxygen. It is concentrated in the upper atmosphere located 11 to 24km above the earth. This ozone layer, which protects life from the damaging rays of the sun is being thinned by the release of chloro fluoro carbone (CFCs), chemicals used refrigeration, foam products and aerosol propellants.

Global Warming (greenhouse effect)

Carbon dioxide is a very useful gas for plants because of its role in photosynthesis in producing glucose. Carbon dioxide constitutes only about 0.03% of the gases in air and absorbs solar radiation. But now there is evidence that the concentration of this gas has been increasing slowly in the atmosphere since the year 1900. Data Collected from many places indicate that there is a constant increase of approximately 1.0 mg/kg/ year at the atmospheric Carbon dioxide concentration. This increase is largely due to the burning of coal and petrol and its products. Presently world 60% power generated and burned by the coal. In future 59 countries will establish 1 thousand and 2 hundred coal burned unit. Around 1900, the concentration of carbon dioxide in air was 290 ppm. In 1960, it was 315 ppm, at present (2014) it is about 400 ppm. The increasing reasons for this situation are:

- i. Forests with a huge living plant biomass, remove a lot of carbon dioxide in photosynthesis. Since the forest cover has been depleted significant the carbon dioxide content has increased.
- ii. Since now there are more living organisms, their metabolic output is enormous. The burning of fossil fuels produce a lot of Carbon dioxide and this additional carbon dioxide is neither utilized in photosynthesis, due to lack of adequate vegetation, nor absorbed in the ocean.

Although oceans are the main reservoirs of carbon dioxide, they are essentially a carbonate and bicarbonate buffer system and thus a large increase in the partial pressure of carbon dioxide in air is necessary to cause a relatively small increase in the carbon dioxide concentration in oceans. Carbon dioxide was not formerly a pollutant but in recent times it has become one because of its increasing concentration. It is affecting the hit balance of the earth,. When solar radiation falls on the atmosphere containing carbon dioxide much of the heat passes down to the earth and some is reflected back to the sky. Heat from the earth enters the atmosphere, some of which is reflected back to the earth. This process continues and the surface of land water gets heated up. Since the amount of Carbon dioxide has increased the net gain of heat has become higher than in used to be. In this process, the earth is being warmed up. This is called the greenhouse effect. It has been estimated that with the current rate of increase in Carbon dioxide concentration in atmosphere, it will double within 100 years, which will cause an average temperature increase of 3 to 8 degree centigrade. This increase in temperature will affect plant and animal life and their distribution. It will severely affect agriculture and cause of food problem.

The snow caps in the polar regions will melt and increase the sea level. Thus may submerge many coastal areas and cities like New York and much of Calcutta, London, Glasgow, Tokyo, Osaka, Stockholm and Florida and southern part of Bangladesh could be under water. Naturally if the temperature is lowered, it will affect agriculture and animal and plant life. On the other hand suspended particles will prevent enough sun rays from reaching the earth, cooling it down. It is believed that there are 50,000 nuclear bombs in the hands of the super power and if these were to be used in an unfortunate war, the amount of smoke and soot generated would cover the atmosphere for a considerable period (may be a few hundred years) and prevent solar radiation from reaching the earth's surface. The earth would remain in a cold winter condition, called nuclear winter, of course all intelligent life on this planet would be wiped out in such a situation, temperature rise and fall cause change in weather. Ultimately these manmade air pollution changing climates resulting several types of hazard in the form of heavy rainfall drought, cyclone, Katrina, suname, Aila, cold wave, heat wave, fog, dew, snow, flood, water logging, river erosion, salinity that creates disaster which impact loses of life and damage property. Effect of these vulnerability creates and increased poverty. Some instances of recent disaster and damaging picture in the following.

Table present below the major past disaster happened in Bangladesh.

Year	Disaster	Death	Economic loss(USD)
1970	Cyclone	300000	- -
1988	Flood	2773	1.2 billion
1989	Drought	800	- -
1991	Cyclone	138868	- -
1996	Tornado	545	- -
1997	Cyclone	550	- -
1998	Flood	1050	2.3 billion
2004	Flood	747	2.3 billion
2007	Flood	1071	1.1 billion
2007	Sidor	3406	2.1 billion
2009	Aila	191	- -

source: CDMP-11

Degradation of hydrosphere

Marine pollution

Due to their enormous volume, oceans are frequently used as disposal areas for human societies garbage. Raw sewage, consisting of human excreta and domestic waters, is the major source of ocean pollution, sewage, livestock waste and fertilizer run off also make bodies of water over-rich in dissolved nutrients, a process called eutrophication, this phenomenon depletes the water of oxygen, killing fish and other marine life. Other causes of degradation; litter dumped from ships, petroleum spills, and the dumping of radioactive substances.

Water pollution

The sources of water on this planet are (a) rain water (b) surface water (c) ground water and (d) the sea. The sources of fresh water are ponds, wells, lakes and rivers. Pollution on fresh/natural water, implies that it contains a lot of inorganic and organic substances introduced by human activities, which change its quality and are harmful for many living organisms, including man. Water pollution is now one of the most serious problems in the world, particularly in developing countries. Many of the thickly populated urban areas dump their sewage and garbage into water bodies. These wastes deplete the oxygen, making the aquatic ecosystems unsuitable for fish. The polluted waters carry germs of typhoid, cholera, diarrhoea, jaundice, and hepatitis thus besides oxygen depletion, the consumption of this water creates health hazards.

Eutrophication

Fertilizers are rich in nitrates and phosphates are washed into water bodies from agricultural lands. In this way the mineral and salt contents of water bodies increase. These nutrients load greatly increases the productivity of water and algal bloom occurs in such water bodies. The entire water body becomes green. The growth of algae and other organic promotes that of a large & decomposers population, which breaks down dead algae and other organic matter using oxygen from the water, living organism and the algal bloom also consume oxygen at night for respiration. In this way the oxygen is greatly depleted from water bodies and this causes problems for fish and aquatic. This problem of excessive nutrient load in water bodies is called eutrophication.

Industrial wastes as water pollution

Many industries, such as steel and paper industries, are situated on the Bank of rivers because they require huge amounts of water in their manufacturing process. These industries dump their wastes, containing acids, alkalies, dyes and other chemicals into rivers. Many of these materials are poisonous for living organisms and cause serious water pollution problem which affect aquatic biota. When people consume vast amounts of water for drinking, domestic use irrigation and industry the possibility increases that water shortages will occur in the future. Pollution of water by sewage industrial waters pesticides, discharge textile chemicals and fertilizers increases the odds that supplies of clean water will not be adequate. Example Madunaghat water treatment plant become obsolete due to the above pollution and supply for capital drinking water project is being shifting Mawagat and Singair.

In Bangladesh, the economic growth and development has been highly influenced by water due to regional and seasonal availability as well as the quality of surface and groundwater. Spatial and seasonal availability of surface and ground water is highly responsible to the monsoon climate and physiography of the country. Availability also depends on upstream flow and withdrawal for consumptive and non-consumptive uses.

The largest use of water is made for irrigation. Besides agriculture, Some other uses are for domestic and municipal water supply, industry, fishery, forestry and navigation in addition, water is fundamental importance for ecology and the wider environment, Bangladesh has two problems with water i.e scarcity of water for agriculture, industrial and domestic uses in the dry season and some time, abundance of water in monsoon causes flood and natural hazards. But people treat normal flood as boon rather than bane. It is viewed that the country would face serious scarcity of fresh water for agriculture, industry, fisheries and other livelihood activities in near future. The increasing urbanization and industrialization of Bangladesh have negative implications for water quality. The pollution from industrial and urban waste effluents and from agrochemicals in some water bodies and rivers, like Buriganga, Turag, Balu, , Shitalakha, Bangsi, Rupsha has reached alarming levels. The long term effects of this water contamination by organic and inorganic substances, many of them toxic are incalculable. The marine and aquatic ecosystems are affected and the chemicals that enter the food chain have public health implications. Water quality in the coastal area of Bangladesh is degraded by the intrusion of saline water that has occurred due to lean flow in the dry season. This affects agriculture significantly as well as other consumptive uses of the water.

Thermal pollution

Nuclear reactors, electric power plants, petroleum refineries and steel melting factories require huge amounts water for their cooling processes. The heated water is discharged into water bodies, usually a lake, river or sea. This cause thermal (high heat) pollution and results in an increase in temperature of the water. The high temperature depletes oxygen and is very injurious to fish and other aquatic organism.

Pollution by spilled oil

Big tankers carry petrol, diesel and their derivatives on the high seas. If there is an accident or leakage, the sea water gets polluted. In the above degradation of hydrosphere, how sustainable development is possible. The Ganga has become very polluted because numerous industries are located on its banks. Many important and thickly populated cities such as Haridwar, Kanpur, Allahabad, Banaras, Patna, Calcutta etc, are also located on its banks. The industries dump their wastes into the Ganga. Apart from this sewage and municipality garbage of these cities is dumped into the river. Considering its importance. The government of India has taken up a Ganga action plan to clean the river.

Degradation of lithosphere

Degradation of the Land

Human settlement, particularly in urban areas, cover the land with concrete, and other building materials, building and roads in urban areas reflect light and generate heat. Since such ground covers prevent the land from absorbing water, drains and other means must be employed for collection of water run off sewage and of other toxic materials. In developing countries according to the world resource institute 57% of the population will inhabit urban areas by the year 2025, a sharp surge from 34% in 1990. Bangladesh is a country of about 143999 sq.km including inland and estuarine water surfaces and has a population estimated at about 132 million in 2000. Although the country is predominantly a plain surface, it is crisscrossed by a very high density of river systems. This gives the country a riverine nature. Being a densely populated country, there has been serious competition for access to and control over land. Over 53-57% of people are functionally landless in Bangladesh. About 17.8 million acres are cultivated land and average household farm size is 1.5 acre. Thus, land is the most important resource in Bangladesh and it is under intense use threatening its carrying capacity. The pressure of population on land is a crucial factor in the management of land resources in the country. Availability of land is a major constraint in Bangladesh as virtually all available land is utilized for crop production, homestead commercial establishment, road network, urban development, forestry, fishing etc. There have been many driving forces compelling people of Bangladesh to over exploit land. These are high population density, poverty, improper land use, absence of land policy and ineffective implementation of laws and guidelines. Unplanned agricultural practices (use of agro chemical) and encroachment of forest areas for agriculture and settlement also put pressure on scarce land resources. Further unplanned and unscientific rural infrastructure development and the growing demand for increasing urbanization are devouring productive land. Natural processes such as river bank erosion, siltation also cause to degrade land. On the other hand pollutants make the soil acidic and toxic.

Deforestation:

The forest of the world trees and other vegetation are being destroyed to make land available for agriculture and to meet demands for lumber and fuel. The state of the environment report of Bangladesh (2001) listed the following factors of degradation of forest resources.

- Shifting cultivation (jhum) and inappropriate utilization of forest resources .
- Overgrazing, illegal felling and fuel wood collection.
- uncontrolled and wasteful commercial exploitation of forest resources.
- Monoculture and commercial plantation.
- High population pressure of forest land.
- conversion of forests and wetlands for agriculture use.
- Poverty and unemployment in the rural areas and encroachment into forest land.

The following table gives some basic statistics of Bangladesh agriculture.

Issues	Value
Total cultivated land	17.8 million acre
Irrigated area	8.6 million acre
Small farmers	9.42 million (80%)
Medium farmers	2.08 million (18%)
Large farmers	0.3 million (2%)
No. of farm households	11.80 million
No. of agri-labour household	6.40 million
Cropping intensity	(1996-97) (174%)
Agricultural growth rate	(1998-99) (5.0%)
Contribution to GDP	(1998-99) (31.6%)

Source: Webpage (2002) of sustainable development networking program (SDNP) of the Government of Bangladesh under SEMP.

It is to be mentioned here that all the post independence government were committed to increase food production through encouraging modern agro-input such as seeds, irrigation, fertilizer and pesticide. Farmers also were very productive to take the immediate benefits. All those efforts increased food production in the country's sustainability and the country achieved some sorts of autarchy in rice production in the recent years. But on the other hand the sustainability of agriculture is questioned, because of many farmers have already experienced the bad effect of the law of diminishing return. Though the total productivity of the sector has increased but the real productivity of land has decreased. The health of soil is greatly affected by the increasing uses of chemical fertilizer. The biodiversity in major agro-ecological zones is under serious threat due to unplanned and excessive use of chemical and pesticides. In recent times the pollution of soil in rural, urban and industrial areas has become a serious problem. Many herbicides are used to get rid of weeds. Some of these dinitro compounds hormones (DNOC) Simazine, Monuron, a long lasting synthetic, organic herbicide remain for a long time in the Soil, affecting the activities of soil organisms and creating problems for wild life and man.

Toilet facilities should be provided in village area and people should be educated about the harmful effects of open latrine. According to the statistics given by the World Health Organization and United Nations Fund, Some 15 million children in developing countries die every year before they reach the age of five ,partly due to the absence of sanitation facilities. The threat mainly comes from human waste and animal excreta that are infected with the germs of cholera and typhoid fever. Since Soil is extremely precious and vital to the survival of mankind, all care should be taken to protect it from pollution and degradation. There is a great instances occurs in India which polluted soil in the following (Sources Prothom Alo 9-10-10) .

1. 50% population in India discharged human waste in open space.
2. 10% female pupil has no toilet facilities in India.
3. In every year 68 million ton municipal waste stored in different cities of India.
4. 38 billion ton effluent discharged in different cities. These scnerio affected soil normal condition. Even the (horizon)people of Moydhaprodes, Guzrat, Utterprodes and Maharashtra carring human waste on head. It is a indignity of mankind.

Degradation of Biosphere.

The part of earth where ecosystems operate is called biosphere. The biosphere include many distinct biomes such as tropical evergreen forests, and other forests, grassland, large freshwater bodies etc, the biosphere is a narrow sphere of earth where the atmosphere (air)by hydrosphere (water) and lithosphere (soil) meet, interact and make the existance of life possible.

The degradation of atmosphere, the hydrosphere and the lithosphere often led to the degradation of the biosphere. Urban development and deforestation seriously affect the ecosystems of plant, birds, animals. Tropical forest are in the greatest danger, but other fragile ecosystems exist including wetland coral reefs, islands temperature lost mangrove Swamps. Some estimates claim losses of 100 species per day. Loss of species unquantifiable in monetary value.

Toxic chemical contamination

The multitudes of toxic chemicals all over the world have led to degradation of ecosystems where those chemicals have been dumped or sprayed. Pesticides herbicides and fertilizer, in particular, each into soil and water and affect, the entire food chain. Industrial effluents pumped into lake, rivers and ocean, affecting the growth and reproducing cycle of aquatic organisms.

Fisheries

The people of Bangladesh largely depend on fish to meet their protein needs, especially the poor in rural areas, several decades ago there was an abundance of fish in this country. But recently, capture fish production has declined to about 50% with a negative trend of 1.4 percent per year. Despite the constant depletion of the river, canal and flood plain areas. Physical construction have also changed or damaged to the local ecosystems and hydrological features, resulting in irreparable damages to the fisheries resources. Studies done under the FAP declared that FCD and FCDI project contributed to the decline of fish stocks and fisheries by creating obstacles in the fish migration routes. As a consequences, fish production have declined, Discharge of pollutants into water bodies from industries, and over fishing are highly responsible for the destruction of fish species throughout the country.

Bio-diversity.

Bangladesh possesses good terrestrial and aquatic environment that provides habitat for large number of plants, animals and birds, the country has been very rich in biodiversity. The rivers and other inland water bodies provide habitats for 266 indigenous fish species and 150 birds 22 species of Amphibians have been recorded by the IUCN-B 2000. Some of these are economically important and thus are being exploited commercially. Until the early eighties many traders in the country were exporting frog legs in large quantities. Most of the frogs were collected from the wild and exported as a frozen food item. This practice also causes insect and predator populations to be affected.

The Sundarbans is the largest mangrove forest in the world which combination of terrestrial and aquatic ecosystems. The mangrove forest serves as a natural fence against cyclone storms and tidal surges, stabilize coastlines, enhance land accretion and enrich soil near the aquatic environment. The mangrove forest is very rich in biodiversity. It is also famous Royal Bengal tiger. Now threatened wild life species including python, king cobra, white bellied sea eagle. The Sundarbans is also home to thousands of spotted deer. Both flora and fauna are threatened by the loss of habitants resulting from unwise human interventions and resources uses. The unplanned and rapid urbanization and industrialization degrade the ecosystems and thus affect the bio diversity.

Human dimension of environmental change

Population growth.

Population is an important source of development, yet it is a major source of environment degradation when it exceeds the threshold limit of the support systems. Poverty is said to be both cause and effect environment degradation, the circular link between poverty and environment is an extremely complex phenomenon. A growing population poses some serious environmental threats. More people less forest, water, soil and other natural resources.

Economic growth

Environmental degradation is a necessary cost of economic growth. Growing economic activity requires larger inputs of energy and material and generates larger quantities' of waste by products. Increased extraction of natural resources, accumulation of waste and concentration of pollutants will therefore overwhelm the carrying capacity of the biosphere and result in the degradation of environmental quality and a decline in human welfare, despite rising incomes. Degradation of the resources base will eventually put economic activity itself at risk.

Urbanization

Rapid urbanization has led to a dramatic change in vulnerability. While the global population has doubled over the past 40 years, the number of people living in urban areas has increased five-fold. And this trend is continuing, Most of the new citizens in urban environments end up in various slums more often than not areas most prone to the devastation caused by natural hazards such as earthquakes, flooding and tropical storms.

Noise/Sound pollution

Sound is caused by the vibration of matter. These vibrations are transmitted in a continuous material medium as waves. These waves are received by the human ear and interpreted by the brain as sound signals. The unit of measurement of sound is decibel, (DB) Sounds of intensity ranging from zero to 100 DB are considered pleasant. Higher causes physical dies and discomfort. Thus 130 DB is the upper limit of the threshold of hearing, Beyond this, physical damage to the ear may occur, The sound is being polluted by the hydraulic horns of vehicles, microphone and cassettes. In Bangladesh see a reverse scenario. Instead of combating the sound pollution are exposing millions of people to a number of fatal diseases from deafness to heart attack. It causes high blood pressure, heart beat, headache, indigestion, peptic ulcer and also affects sound sleep. Registered sound DB from different sources are telephone sound 70 DB, motorcycle 110-120 DB, Siren,130-150 and a jet plane on take-off may produce about 160 DB. The sound of the noise of any busy street in Dhaka has been estimated 60 to 80 DB with the sound of vehicle 95DB, microphone 90 to 100 DB, mills and factories 80 to 90 DB, festivals 85 to 90DB, motor bike 87-92DB. Truck bus 92-94DB. But our desired sound measure is 25DB in bed room. 40DB in dining or drawing room 35-40 in office, 30-40DB in class room,35-40DB in library, 20-35DB in hospital, 40-60DB in restaurant and 45DB in city in during night. When the sound exceeds this limit it becomes polluted and sound pollution beyond this limit destroys our audible power,that might even led to the losing of ones mental balance. Affect lungs, hampers the intellect of the children and make them apathetic towards their studies.

Control of pollution or measures to mitigate pollution for sustainable development

Noise pollution:

1. Industrial areas, aerodromes and highways should be located outside city limits.
2. Plants are efficient absorbers of noise, especially noise of high frequency.
A dense evergreen hedge can reduce the noise of microphones by up to 20DB, Hence, plantations on both sides of streets or highways are effective in curbing noise. In urban areas, a green vegetation belt and open space in general may work as a safety device for bringing down the noise level. It also declining green house gasses and reduce disaster due to climate change.
3. Adequate laws should be enacted to restrict excessive noise from transportation and microphones particularly during sleeping hours in the vicinity of hospital, educational institutions, and residential areas. Public awarness needs to be created through newspapers, radio and television.

Control of water pollution

Water pollution treatment is carried out in three stages primary, secondary and tertiary.

- 1.a In primary treatment, the solid objects are separated by coarse screens or sieves. The liquid material passes into the settling tanks. The suspended materials settle down in the tanks and form sludge.
- 1.b. In secondary treatment, the effluent is filtered through a bed of rocks, after which the bacterial decomposition of organic materials begins. To hasten this process air is bubbled to increase the oxygen content. This process removes about 90% of the biodegradable materials present in the water.
- 1.c. Tertiary treatment is applied to remove detergents, metal ions, nitrates and pesticides, as these are not removed in the earlier treatment. In this process the effluents from the secondary treatment are passed through activated charcoal to absorb the pollutants.
2 An alternative and less expensive method is to use this water for irrigation to raise crops or to grow algae and aquatic plants for use in biogas plants.

Controlling Air pollution.

Industrial pollution can be minimized by using improved equipment design and smokeless fuels.

Particular matter produced by industries can be controlled by precipitators, scrubbers and filters.

- 1.The amount of smoke produced by industries, households, etc can be minimized by the use of some recent devices like smokeless chulhas and solar cookers and of biogas.
- 2.Sulphur dioxide may be controlled by several methods, it is largely produced by coal based industries. One possibility is to shift from high sulphur containing coal fuel to a low sulphur fuel like natural gas, and other energy sources. The second is to remove sulphur from the fuel before use
3. Plants remove pollutants, people should be educated. By the mass media to motivate people about the importance of trees and plantations.
- 4.Photo chemical smog and pollution from exhaust pipes of automobiles need to be minimized or stopped. Vehicles should be fitted with anti-pollution devices so that pollutants are filtered.

Natural Resource Management.

Conservation of natural resources means the wise use of the earth's resources by humanity.

Conservation is the optimum rational use of natural resources and the environment, having regard to the various demands made upon them and the need to safeguard and maintain them for the future. It is the protection, improvement and use of natural resources according to principles that will assure their highest economic or social benefits.

Local knowledge to conserving natural resources

The importance of local indigenous knowledge and its potential in facilitating the sustainable use of conservation of natural resources have been repeatedly emphasized in international discourse on sustainable development in the past two decades. Agenda 21 of the Rio Earth Summit highlighted the importance of historic traditional knowledge of land, natural resources and the environment developed over many generations by local indigenous people.

The communities in the areas of Bangladesh is used variety of innovative, effective and in some cases unique indigenous knowledge approaches to environmental conservation. The government of Bangladesh also initiated to address and consider the mechanism of local knowledge to conserving natural resources, The main objectives of this initiatives are to:

- Facilitate sustainable conservation and management of natural resources and habitats through strengthening of community based management of the resources.
- Introduce various economic and community welfare activities which are operated and managed by their community organizations.
- Assist the communities to empower themselves in order to collectively address their problems and needs.
- Some major initiatives to consider the mechanism of local knowledge for conserving natural resources are described below:
 - Integrated protected area co-management
 - Community based natural resources management
 - Village common forest management
 - Environment flow assessment protocol for Bangladesh
 - Protected area management.

Pollution create hazard and hazards create disaster like storm, surge, cyclone tornado, drought cold wave, erosion arsenic contamination and salinity etc.

The impact of disaster on development can be categorized in four ways. Loss of resources. Interruption of programs and switching of crucial resources, the negative impact of invest climate, disruptions on of non-formal sector.

Mitigation and adaptation programs

Disasters risk reduction (DRR) and climate change adaptations programs many be undertaken. Unsustainable development measures have destroyed many of our potential resources. Some instances are given below.

Table -1 Fresh water fish production:-

Item	1965	2009	
Variety fishes	100	20	
Fish production	1000 level	1 level	

Table -2. Sources of water.

Item	1965(nos)	2009(nos)
Rivers	02	01
Cannels	07	03
Tanks	400	100
Long pools	6	Nil
Deep tube well	Nil	16
Shallow Tube well	200	300
Flood water	The whole area	No area

Table-3
Changes in agriculture

Item	1965	2009
Crops	Jute, rice, spring harvest vegetables	rice ,jute, wheat
Jute	Major	Non major
Rice	Second in position	First in position
Wheat	No wheat cultivation	Third in position
Lost of items	No item lost	Many item lost
Spring harvest	About 15 types of spring harvest	Almost absent in spring harvest

Table -4
Changes in fruit products

Item	1965	2009
Mango	1000 times	one time
Date tree	Lot of Date trees and their juice	Almost abolished
Palm tree	Lot of	very few
Boroi	Lot of	very few
Black Berry	Lot of	very few
Gab	Lot of	Almost nil
Belate gab	Lot of	Almost nil
Amloki	Available	Nil
Amgum	Lot of	Nil
Harretoki	Available	Nil
Water chestnut	Lot of	Nil
Kludi jam	Lot of	Nil
Kaw	Lot of	Nil
Dalim	Lot of	Nil
Ata	Lot of	Nil

These changes scenario and data collected from the villages kha khadda, Pukhuria, Barman kanda, Nazirpur, under the District, Faridpur of Bhanga upazilla , consisting of four villages. Population contain 2509 and 6745 in 1965 and 2009 respectively.
(source local union porishod)

From the analysis it is very clear that Bangladesh at present facing severe challenge of environment pollution. This is creation of unsustainable process of the nation.

Every development efforts needs both natural and man made inputs. When both the inputs are mixed together and undergo a process it produces output which we call development.

Sustainable development is a process of positive change of physical and mental satisfaction which takes place with equitable distribution of factors and output among all members without disturbing nature friendly environment and ecological balance of the earth. It attempts to maximize social benefit and minimize social cost.

Reference:

1. Denoting changes comprehensive Disasters Management programs (CDMP-11) Ministry of Disaster Management and Relief.
2. Fundamental of ecology, Mc Dash,1993 Tata Mc-Grew-Hill publishing company, Delhi.
3. Bangladesh state of Environment Report 1998.
4. Sustainable Development Networking program of the government of Bangladesh, web page(2002)
5. Sustainable Development- A case study of four villages in Bangladesh,M.Azizur Rahman, Bangladesh Economic Association periodic,1st volume. 2012
6. Porartha Vabna, Mir Yousuf Ali, Kashbon publication,Dhaka.

