Sustainable Planning and Architecture

Lecture 4

Ecological Footprint

This presentation covers different footprints which are created by humans and ecology for our livelihood. So as you seen in this picture like food which is been using different types of elements which causing footprint for the humans so what footprint is how much natural resources we are taking up from this environment to create a livelihood.

Over your lifetime, 12,000 oranges will travel 23 million miles to reach you, it's all s part of your human footprint. Which everything is not what we get is not locally available whatever we get is been transported and which is been build in different place and then brought to us which consumes a lot of energy which is usually not noted bias.

The simplest way to define ecological footprint would be to call it the impact of human activities measured in terms of the area of biologically productive land and water required to produce the goods consumed and to assimilate the wastes generated. More simply, it is the amount of the environment necessary to produce the goods and services necessary to support a particular lifestyle.

As we said before ecological footprint is the amount of ecology which is like plants and natural resources which is available in these planet. We are consuming to produce our goods and service we are cutting down the tree for our buildings and we are using different western grown plants are vegetables which is been transported and imported from different countries to reach us. So we are using some incredible amount of energy to get all these to us so which is called ecological footprint.

Think about what you use, consume, and discard in an average lifetime. Calculate this for every American and then for every person on Earth. Humans have left their mark on 83% of Earth's surface. What can we do to reduce our environmental impact?

As we discussed in the previous presentation an American produces a lot of these ecological foot print to have their livelihood it's their goods and services so we have to start thinking to reduce the ecological footprint because whatever we have, has a natural resources is very less and very finite amount it takes over long duration to produce for our later generation to come.

" Human influence on earth can be positive or negative, benign or catastrophic. Recognizing these responsibilities is the first step each of us can take to transform the human footprint and save the last of the Wild". These is been said by **Columbia University** of wildlife conservation it says we need to start acting now to reduce and say some of the wildlife which is becoming very existing and save the resources which is available to us.

And these reports also produce by the Columbia University which takes into account of average American. Over an average lifetime, each American will Burn 31,350 gallons of gasoline to fill their cars and transport were ever they want as we know America is the one of the country which uses lot of cars and they read 5,054 newspapers on daily basis which is been cut down 43 trees and discard 64 tons of garbage so what are they consume will become as like a waste and which accounts to 64 tons of garbage and they use 1.8 million gallons of water.

What is Ecological Footprint?

With its theme of 'Protecting our home', offers a number of resources to understand and study the concept of ecological footprint. Together with Redefining Progress, it measures how much is needed to produce the resources we consume and dispose of our waste.

As we seen in this picture Ecological footprint is different levels which happen from Bioproductive land, Bioproductive Sea, Energy Land, Built Land and Biodiversity. We known the land to stay and create our buildings and livelihood which we are destroying some natural resources which already present in the land and then we are using sea and other energy lands to produce other of our resources like coal and different gasoline we are using sea to transportation for navy and we are been occupying all natural resources and then built land and biodiversity. So biodiversity forms an collective of all these categories which have seen now.

A measure of sustainability

An interesting way to look at ecological footprint is how much nations consume versus how much they actually have.

Which of our activities influence the state of the Earth?

Built environment: we are constructing houses, roads, and infrastructure and energy plants. Which takes all the raw materials from the natural resources which is been process by different stages. This becomes the entire built environment as we seen in the list.

Agriculture:

Food, animal feed, bio-fuel, textiles all these also forms a textile raw material from the natural resource available.

Fishing: yield from the ocean and rivers, so over fishing we may come across term over fishing. When you take out all the fishes from the sea which is been present already with more than a specific number it affects the ecosystem. Over breeding of fishes

Forest use: logging, construction, furniture, paper and fire wood. To make our built environment we are dependent on the forest from which we are taking trees for construction, furniture, papers etc.

Grazing Land: To meet our daily requirements like meat, dairy products, leather and wool. To create a worm environment and livelihood we been using different types of dairy products, leathers and wool which is been dependent on the animals.

Fossil Fuels: Production, transportation, heating, cooling etc. when you built a home you need some comfort level which is given by air conditioner and room heater which in turn depends on fossil fuels which is been in the planet.

Due to over usage of all the resources there is a lot of climate change been happening. We discussed in the previous presentation.

CLIMATE CHANGE:

Many people make Climate Change and Global Warming a scary and difficult thing to understand, but it's not.

Scientists have warned that the world's climate has changed a lot, and has affected many living and non-living things.

Many places that were warmer are now getting colder, and many colder regions are getting much colder or even warmer (Know as Global Warming). So climate changing Global Warming is interconnected again this climate change due to over usage and due to our ecological footprint in human footprint which we were been living on the planet. They are saying lot of places becoming very colder and lot of places which were colder now becoming colder or warmer. Say for example Himalayas there is lot of ice gaseous which is been melting which is due to the global warming of the different gases which we will be discussing later on.

There are lot of places which were colder are also now becoming colder because of this water were melting. Which it increasing the water level in seas as we known in the Andaman Nicobar islands which is only 3 meter from the highest points from the sea level. This is also said that in 3-4 years this island may not be there because it might be completely sunken within the ocean due to the increasing melting ratio of ice gaseous.

For example, between 1901 and 2012, it is believed that the earth's temperature has risen by 0.89'C. Rainfall amounts have also risen in the mid-latitudes of the northern hemisphere since the beginning of the 20^{th} century. It is also believed that sea levels have risen up to about 19cm globally, with lots of glaciers melting in addition.

Comparing from 1901-2012 there is been increasing temperature of 0.89'C which might look very less accounts in melting of gracious which is increasing the sea level by 19cm which is a lot actually so when you see the primary thing it might be very smaller when you look at the result is very maximum.

Some people do not believe these are caused by human activities. They think it is all political and falsehood intended to cause panic among humans.

So there is lot of discussion which is been going on this UN (United Nations) which forms both and they discussed about climate change and the lot of other arguments are also there which is been said that these are all not caused by human activities but human activities are important part all these thing to happen ventrally. Well, whatever it is, we would like to know more, and take a few good points from this confusion, and use them to make our world a better place to live.

Whatever it's we need to take some action to protect all this happening even though not be depending completely on his we are the ones get affected.

Climate Change Terms

Climate

This describes the total of all weather occurring over a period of years in a given place. It is the average weather condition of the place. Climate tells us what it's usually like in the place where you live.

As we know the climate is like a weather condition which is happens for prolong period. When you look at this picture it contain four different categories one is rainy and sunny and then snowy and then windy. These are different climates.

For example, some countries like Cameroon, Ghana and Liberia are all in the tropical wet region of Africa. They have a very sunny, hot and wet climate all year round. However, there may be very different day-to-day weather conditions in each village or town in these countries.

In countries such as Ghana, Liberia throughout the year it's very sunny and hot and wet climate. So you cannot completely defined climate for different countries it may depend on each country on specific region a climate might change within India usually we notice winters are very hash we go to northern regions and we come to southern region minimum ally affected and even during summers even though radiation is high in southern part of India as hashes. Northern part like Delhi and Chandigarh

Weather

Weather is all around us. Weather may be one of the first things you notice when you wake up. Weather describes whatever is happening outdoors in a given place

at a given time. It can change a lot within a very short time. For example, it can be windy at night, rainy in the morning, hot and sunny at noontime, and even back to windy before sunset. It includes daily changes in rainfall, temperature and wind in a given location. Even if it is a summer month we might have few rainy days in between that is like weather whatever it happens in a day similar on to day-to-day life so suddenly it might be windy on a rainy day or suddenly chilly on a rainy day it depends on day-to-day activities.

GREENHOUSE

- Have you ever seen a **greenhouse**? In some countries, people build a small glass house to plant crops in it. It is built to keep the sun's heat from escaping from the glasshouses.
- In a way, the earth is like a glasshouse. The earth has some very important gasses in the atmosphere that keeps us warm

  We must have seen in hill stations in our country we might have seen this glasshouse it will be green house effect in which they were built glasshouse within they were keep their planets to keep some of the important gases which is usually keep us warm. Some of these gases are **Water vapour, carbon dioxide, nitrous oxide and ethane.** These are some of gases which forms the greenhouse effect these are present on the environment which usually keep us warm.
- When the sun heats the earth. These gases keep the heat on the earth's surface, without these gases, heat would escape back into space and Earth's average temperature would be about 60'F colder.

So because of these gas when the sunlight hit the Earth it traps the sunlight and keeps within the environment to keep us warm these gases were isn't present it completely will bonus back and then the earth will be completely colder like 60 degree were it need which is not make the planet liable. So these gases are important

How does green house effect happen?

The earth's atmosphere is all around us. it is the air that we breathe. when we come out and see open land around us whatever see their air, the clouds and everything around us and create the atmosphere.

Sunlight enters the Earth's atmosphere, passing through the blanket of greenhouse gases.

In this picture, the sun emits the radiation which is fall on the grass land on a water body which is passed by the blanket of greenhouse gases which is been surround over the environment and this greenhouse which protect these radiation.

As it reaches the Earth's surface, the land and water absorbs the sunlight's energy. As you seen these picture when these radiation keeps falling due to this greenhouse Heat energy is absorbed. Without the greenhouse usually it will be bounds back. Because we have this greenhouse gases the radiations is absorbed and different path of the end.

Once absorbed, the energy is sent back into the atmosphere in the form of infra-red rays.

As the radiation is been absorbed by the environment some of the race is sent back by the infra-red keeps everything which is been falling down and again it will be getting hard it emits due to the difference between the grassland which it falls air outside and usually cold due to the convection process and due to different temperature transferring which is been happening so these became an even temperature. Radiation which is been absorbed by the Greenland it sent out in the form of infra-red rays.

Some of the energy passes back into space, but much of it remains trapped in the atmosphere by the greenhouse gases, causing our globe (earth) to warm up.

So these radiation is passed by infra-red rays there is some of radiation which is been trapped and been preserved within the environment these greenhouse gas effect. So energy is trapped here by greenhouse gases, Earth's surface warms up

This warming is what we call Global Warming, and it is caused by the greenhouse effect.

The greenhouse effect is important. Without the greenhouse effect, the earth would not be warm enough for humans to live. But if the greenhouse effect becomes stronger, it could make the earth warmer than usual. Even a little extra warming of the earth may cause problems for humans, plants and animals. There has been

some limits for this greenhouse effect to happen so when it's more than that it usually results in Global Warming which is extreme for humans, plants and animals.

What brings about more Greenhouse gases?

In this era (the age of industrialization), the earth is full of industries. Millions of vehicles, aero planes and engines are produced every year. A lot of artificial things have been produced and have ended up in waste dumps. Humans produce much more waste than ever before.

As we over livelihood our stand of living has been increasing over the generation. If we talk to our grandparents tell they used only bi-cycle and very emission less bikes which is been used now a days we using different cars and lot emissions and we use aircrafts and we are building more and more industries, technologies which is been producing different gases and which it causes greenhouse effect more and more which results in Global Warming.

What did you notice in the sketch? What do all those activities have in common?

They all produce a lot of smoke, fumes and water vapor!

Energy production is still a major driver of GHG (greenhouse gas) emissions, For instance, in 2010, the energy sector emitted approximately 35% of GHG, followed by Agriculture, forest and other land uses (24%), Industry (21%), Transport (14%) and Building sector (6.4%).

Simply put, humans reliance on artificial things, including all the things that make us comfortable at home, has contributed immensely to the emission of more greenhouse gases than before. These gases in the atmosphere have trapped more heat on the earth's surface and made it warmer. This is Global Warming.

These are the different appliances like electronic items that we use on our day-to-day life all this makes our life simpler but on Global scale this been used by very individual and now we have to imagine how much of greenhouse gases it might be emitting and how much heat it must be producing in the environment.

YOU and I also produce and other greenhouse gases in the way, by things we use at home. Do you have some of these items in your house?

Obviously, we have all these and we been producing lot of these greenhouse gases.

HOW TO CONTROL THIS INCREASE IN GLOBAL WARMING?

It is very IMPORTANT that you turn off all electrical appliances when they are not in use. This good practice and you end up saving some money too. So we have to be very conscious when we use these products which is producing lot of energy so only when we need it we have to use and whenever not in use we should try to stopping the usage and reduce the usage basically to reduce the heat produce because of this appliances.

Everything humans have at home or workplace need power to work. This power comes from burning fossil fuels and other natural sources. The more fuels are burnt; the more are produced into the atmosphere.

This means each time your dad drives his car, or you turn on electric appliance, you are indirectly adding to the greenhouse gases in the atmosphere.

So whatever we are using make our life simpler is adding lot of greenhouse gases which has been taken into the account and we have to try reducing it and try using more of public transportation like car pooling which is been becoming very famous lately to reduce the amount of greenhouse gases which is been produced.

EFFECTS OF CLIMATE CHANGE

Let's see these 4 effects.

Global warming causes thermal expansion of land and water. It also causes ice sheets to melt in icy regions of the world and mountain tops.

Large volumes of melted ice (water) than flows down into streams, rivers, lakes and seas. The results are raising sea and water levels, causing floods and massive destruction to low-lying towns and cities along water bodies. Because of this increasing temperature what happens to the ice glassier.

Research shows that global sea level rose about 17 centimeters (6.7 inches) in the last century, and the rate in the last decade is nearly double that of the last century.

Changing climate may also cause the weather to become more extreme, be it droughts or violent storms and heavy rain, due to all the usage of global warming we are also have some natural calamity like floods, rots and heavy rain.

Extreme changes in temperature make people suffer breathing difficulties, headaches, body rashes and other illnesses. Our body adapt to certain temperature limit when you go above the limit due to the Global warming which is been caused by us so it again in turn affect us by different things like headaches, body rehashes and other illness.

Climate changes also distorts the natural habitat and lives if many plants and animals. For example, the survival of polar bears and penguins in icy regions are in danger, as they cannot survive anywhere else. Other plants and animals in hot region will die if the temperatures suddenly become too cold for them. So very animals and different specious as been designed for different environment and temperature, So when you suddenly increasing or decreasing it cannot survive.

These penguins are usually present in Antarctic islands due to lot of Global warming the temperature has been increasing which makes this penguin to die.

The amount of water in the water cycle will not be affected, but its timing, amounts, regularity and distribution will be impacted. Mid latitudes and dry subtropical regions may experience reduction in water flow, whiles high latitudes and humid mid-latitude regions may increase water flow. This how they are saying how drops are coming and we are having sudden increasing rainfalls it’s all due to Global warming.

There may be stream flow uncertainty in many other regions, because of reduced snow and ice storage. Availability of clean water may be affected too, for instance, the quality of lakes used for water supply could be impaired by the presence of algae producing toxins.

In lot of industries waste get usually mixed with drinking in the lakes which affects entire lake water and also eco-system which is present in the lake.

Basically ripple effect

What we can do is?

- Go by bus!
- Walk! Don’t drive.
- Ride! Don’t drive.
- Protect and plant trees.
- Recycle, reduce and re-use items