

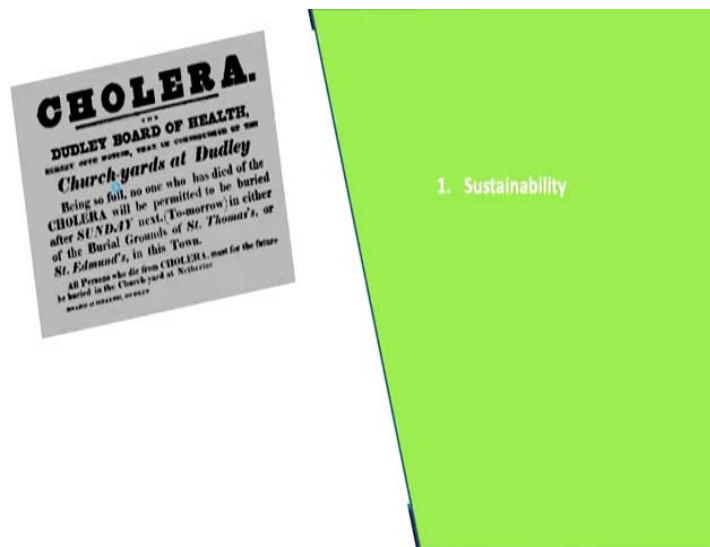
Sustainable Architecture
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Lecture – 04
Historic Origins of Sustainability

Good morning, welcome to the 4th lecture on the online course on Sustainable Architecture. I am your course instructor Doctor Avlokitha Agrawal, assistant professor at Department of Architecture and Planning, IIT, Roorkee. In lecture 3 we discussed about the different definitions of sustainability and how we can understand sustainability. Today in this lecture we will be talking about how we have come to understand sustainability like we have defined in lecture 3.

So, what has been the history the past which has led to this definition of history, why are we talking about sustainability the way we are talking about it as we are. So, before we start looking at the historical perspective, let us look at how the world has changed at least from the industrial revolution, the times when industrial revolution took place.

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So, there were there was a larger focus on human health because there were some new diseases mass diseases which were attacking the mankind and which was a result of industrialization. So, there were outrages of cholera. Ppeople were dying, children were dying, the cities had started to become filthy dirty. People had very poor living

conditions in Europe, almost all over the Europe people were living in very bad conditions because of industrial revolution.

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There were filthy conditions the children had no education, there were no proper education available for the children of these workers of these industries which were there. This photograph apparently is from a street in New York, we just cannot imagine believe that this was the state at one point of time around industrial revolution and that was when and there were different notions of how women should look, how women should conduct.

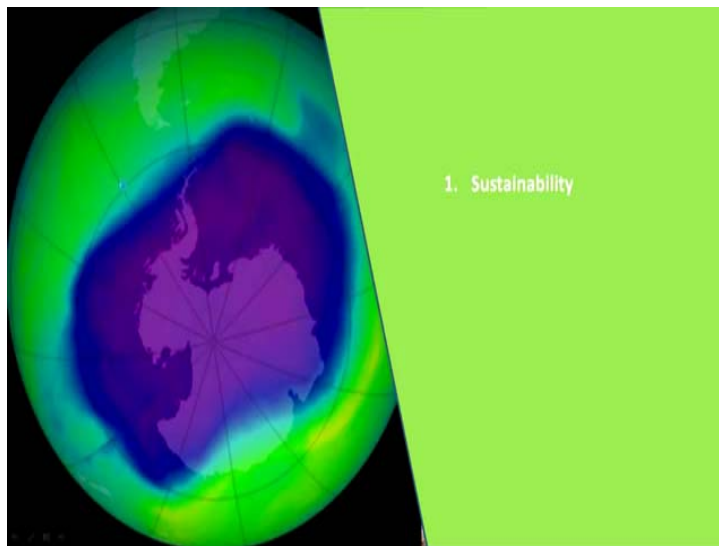
So, there were social problems, there were environmental problems, there were health related problems and then that is when people started talking about. So, there were many more issues that is when people started pointing out the bigger problems; the major problems which were apparently causing a lot of misery to the humankind toward it when we do not even have clean air to breathe.

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So, gradually all these changes have happened and that is why even our response has changed to how we discuss sustainability and what we discuss when we are talking about sustainability. This image shows the ozone hole.

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So, what essentially has been the root cause of our problems if we look at the current situation?

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First of all the population explosion. Now, population explosion itself is a result of several features. First, because of industrial revolution and in those times when there was this outbreak of diseases. The health facilities gradually have become better, there has been a greater research in medical science and that is why the ~~expectancy~~ life expectancy of ~~human~~ humans that has increased. The death rate has decreased there is an increased birth rate and survival rate that is why world over the population has increased it has just exploded.

So, there is automatically even if we were continuing our resource consumption rate was the same as that of the industrial revolution era. We would still be putting a lot of pressure simply because we are so much more in number. So, one major cause is population explosion.

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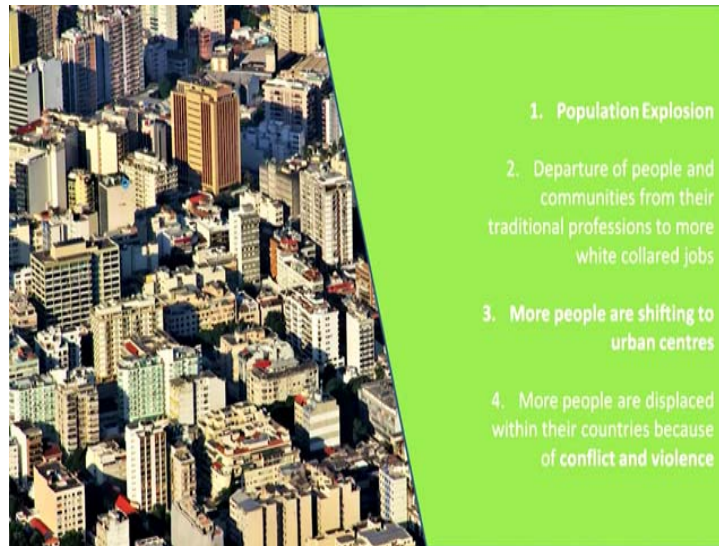


The other one is people have departed from their traditional professions to more and more white collared jobs which has led to creation of certain kind of built environment. Pre-industrial era where more and more people were involved in farming and primary activities, now more and more people are involved in the tertiary sector_ economy.

Now, that itself has implied an enormous pressure on the resource consumption. A farmland which was cultivated by 100 farmers is now being cultivated by just handful of farmers_ say 10. Now, to do that to continue farming they require more and more sophisticated machines. So, they are instead of working by hand manually they are more dependent on machines.

On the other hand, the 90 who have shifted for from farming as an activity to more white collared job office job require more of office space, they consume more energy because of the kind of job they are involved in and things have changed that is the second reason.

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The third is for this reason that there are more people in white collared jobs people are shifting to urban centers because these urban centers are the places where ~~more and more white~~ more and more white collared jobs are available. In villages or in suburban areas in rural areas such white collared jobs are very less in number, the availability is very less. So, the urban centers are becoming more and more dense, it is anticipated that in the time to come almost 70 percent of the world's population will be living in urban areas.

So, our urban areas are going to become denser and hence more and more problems in urban areas are going to emerge. And, because of this shift more and more people are displaced within their countries because of the conflict and violence. Conflict and violence largely because of the conflict of availability of resources, there are less resources available.

So, there is a greater conflict and greater violence when cities the neighborhoods, the residential areas become bigger there is less connectivity between humans and that also leads to larger reasons for conflict and violence. So, these are few major reasons why these problems are happening, these are the root cause.

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more people, producing more, traveling more, consuming more, and excreting more. There is a much faster rate of resource consumption than ever and a much faster pace at which resources are being transformed into waste!!

–Ram Chandra Guha

And as Ram Chandra Guha very aptly puts it. Currently, we are more people who are producing more, we are traveling more, consuming more, excreting more and there is a much faster rate of resource consumption than ever and a much faster pace at which resources are being transformed into waste. So, the effects of these problems are visible.

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There are traffic congestions in urban areas that is one of the problems which is there in urban areas there are so, many more. We are so many people there is hardly any space to breathe.

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There are no green areas, there are no open areas. So, the cities are becoming more and more non-humanized, they are not human cities, humane cities at all.

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There is a pressure enormous pressure on the resources. As Ram Chandra [GhaGuha](#) very aptly discusses in his book how much should a person consume that is one good book that all of us should read. He discusses that this shift towards environmentalism and suddenly people started discussing about environment. It actually did not happen

~~suddenly,suddenly~~; it was because of a lack of the environment clean natural environment which was earlier available to people.

So, people often discuss about things of which they are deprived of for example, it was in the times of industrial revolution that poets like words worth were there. So, the more and more people were getting confined to the built hard cities and they were getting away from the natural environment, on the other hand there were more and more poets like Words Worth who were writing about their love for nature. So, it is always a repercussion, it is always an effect impact of one phenomenaon as seen in the other.

Earlier people did not go to the mountains, the mountains were considered to be hostile they were considered to be wild and people did not go to the mountains. After industrial revolution, people looked at Alps as a beauty natural beauty because that was what was untouched and available to them. So, because of certain problems which have been happening our responses have been changing, that is why it is imperative to look at the historical events, how historical events have ~~ehanged~~..changed.

Though when we are talking about sustainability; sustainability was never talked in literal terms as sustainability or sustainable development. The term was coined much mu₂ch later; however, the discussions around it started happening from very strongly from the year 1962 that was the year when the book named Silent Spring was published.

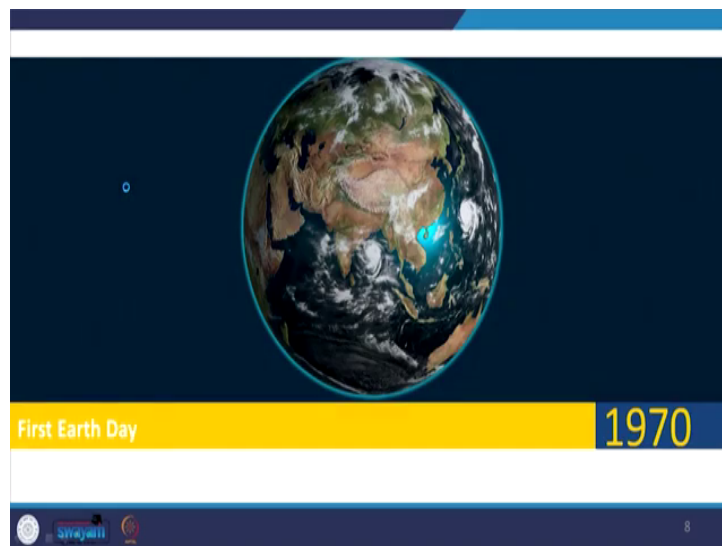
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Silent Spring was written by Rachel Carson, and Rachel Carson was a PhD scholar and she was studying the impact on water bodies. She was studying the water bodies when she came across the impact of ~~large-seale~~large-scale use of DDT. Spraying of DDT in farming fields and how this DDT the eutrophication led to killing of the aquatic life which is what she pointed out, she researched and she published in the book named silent spring.

In 1962 Silent Spring created such an uproar and people started knowing about the harmful effects of DDT from this book and it was one event which triggered world over the impact of the use of such chemicals, and how industrial revolution is changing our lives.

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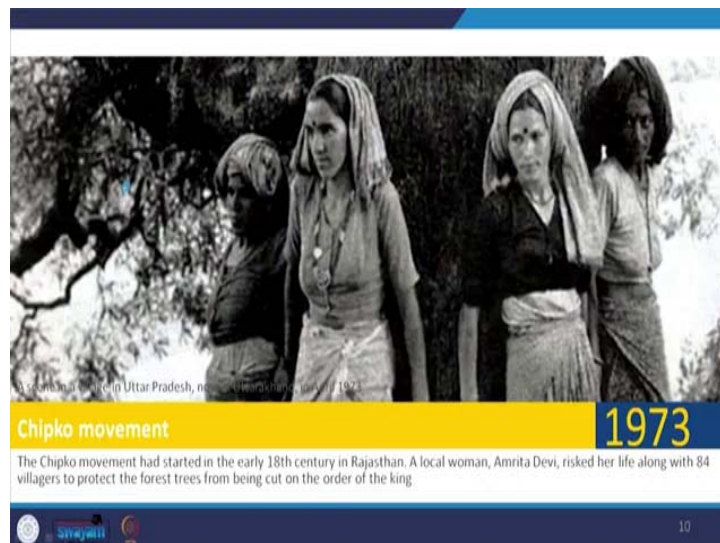
In 1970 the first Earth Day was observed. So, from 1962 the revolutions which started happening people started talking about the negative impacts of the chemical use of chemicals and pesticides and industrial revolution on the environment, that is when for the ~~first-time~~first-time earth was recognized as an entity which is living and first earth day was celebrated it was formulated.

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In 1971, the Green Peace organization was formed, it was the organization was formed as a protest to the nuclear tests which were to take place in Alaska, and two scientists two crew members they set out on a fishing trawler to protest that nuclear test. However, it they still could not stop that the tests were carried out, but the Green Peace as a foundation as an organization it gathered a lot of support from Canada and US and rest of the world gradually.

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At the same time in 1973 Chipko movement happened in India and that was for the ~~first~~ first-time people realize across the world that sustainability talking about sustainability is actually not a full stomach phenomena. As many of the scientists argue, people think prior to 1973 specially people use to think that sustainability or discussions about sustainability are for people who already have the basic amenities in their life.

So, the western world, the developed world who has availability to clean water, clean air and the basic amenities they talk about sustainability because they already have their stomachs full. However, in this village in Uttarakhand and prior to this 1973; in 18th century in Rajasthan similar kind of a movement had started. But, in 1973 this Chipko movement in Uttarakhand came to the forefront and the world knew about it where these women they hugged the trees stopping them to be from being felled and a lot of people died as a protest.

Because, this community had understood realized the importance of natural environment around them and largely, because their life was dependent on it. From economic point of view because they were dependent on forest produce for their economic well-being, from social point of view because their lives revolved around these forests.

And of course, they placed a lot of importance, they placed a lot of emphasis on the natural environment which was around them. ~~A~~ and culturally, socially these trees, these forests placed were placed were regarded very high in their culture. So, Chipko movement for the first time emphasized revealed that everybody could talk about sustainability and it is not just a full stomach ~~phenomena~~ phenomenon.

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In 1973 later, there was this OPEC oil embargo when the oil producing Arab nations refused to export the oil to US as a protest to American military support for Israel. And, that is when for the first time the world realized that when there is no fuel suddenly the lives ~~comes~~come to a halt. And almost the world was paralyzed half of the world specially the developed world was paralyzed because they were so dependent on fuel and the state which was then only for the developed nations is now almost everywhere.

We cannot imagine our lives without electricity, without the de-conventional fuels we cannot imagine our lives without petrol and diesel being there because we thrive on that. When suddenly there was a crisis oil crisis that is when people started exploring the other means that was the first time when people started talking about renewable energy. Till then people had not realized the active or not had not explored the active usage of sun, wind, water for producing electricity, for producing energy not as much, there were researchers which were going on.

So, the use of solar energy, the use of hydro power~~ah~~, the use of wind energy was still being explored, but not as rigorously. Suddenly after this oil crisis the entire developed nation focused it is energies towards exploring the renewable energy sources.

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The environmental impact, the impact on the animals and other life forms the species was gradually being realized. And for the first time in 1973 United States enacted the Endangered Species ACT till then several species had already become extinct or they were endangered. ~~But~~,But there were no laws across the world to protect them culturally, socially in many countries and many places community's people were protecting, but not as a law.

So, for the first time the legislation was enacted and the Endangered Species ACT came into force which led to protection of habitat for this these endangered species, till then humans across the world could build anywhere. And gradually, almost all over the world now the habitat for animals for endangered species they are being protected because we realize that they have an equal right on the environment. So, it was for the first time that 1973 the Endangered Species ACT got enacted in place.

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In 1983, development alternatives as an organization was formed where their vision was a world where every citizen can live secure, healthy and fulfilling life in harmony with nature. Development alternatives started taking up smaller projects for the betterment of people in underprivileged areas underprivileged societies. So, such organizations started coming up where these social needs were being highlighted were being understood. So, gradually from the environmental focus people were also talking about the human life the social focus was there.

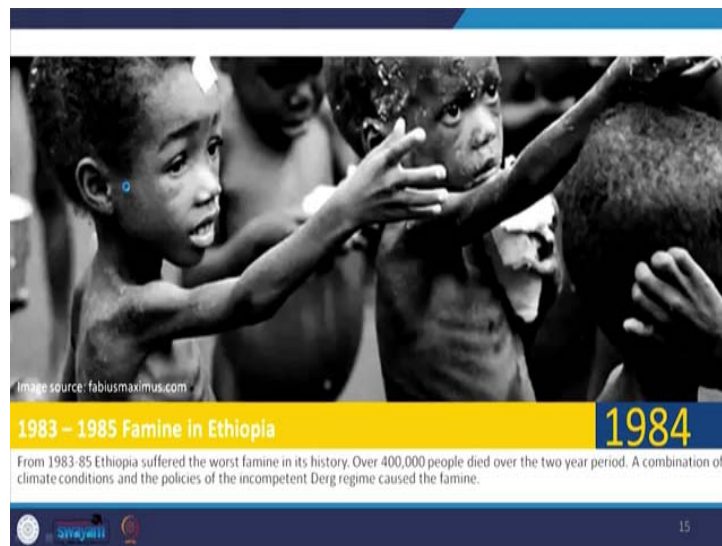
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In 1983, the same year Professor Muhammad Yunus from Bangladesh, he found the Grameen bank. So, the economic dimension of it was also becoming evident. So, so far as we have seen historically gradually the focus which was largely towards the environmental dimension, environmental domain gradually started shifting towards the social and economic domain.

So, this particular was a micro financing idea where this Grameen Bank would facilitate women specially in the underprivileged communities with small loan to set up their own businesses, to set up their own works where they could generate, they could sustain, they could sustain their families and economic income for their families and it was a huge success. There have been several models several discussions after this Grameen Bank was first formulated and lot of other similar models are being worked out across the world.

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From 1983 to 85, there was the deadliest of the Famines in Ethiopia which was there and lakhs and lakhs of people children died suffered and it was for the first time it was realized that the world is connected. The problems the activities happening in one part of the world are actually leading to miseries in some other part of the world and it is connected. There were photographs which were published of the children who were struck by famine, the people who were dying on a large scale and the world became

more aware and sensitive of the untidiness the unity which exists. All this led to our common future the Brundtland Commission Report.

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So, United Nations formed this committee which was headed by Gro Harlem Brundtland Prime Minister of Norway and under her chairmanship. The report our common future was published which for the first time placed on record in black and white what sustainable development is and how should we define sustainable development.

For the first time, the word sustainable development was used in this report Our Common Future in 1987 and from then on we have been discussing about sustainability and sustainable development as commonly as it can be almost every domain of life and development has talked about sustainability some way or the other. So, this was for the first time that we talked about sustainability.

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In 1988 there was a new policy on seed development which was to increase the production food production prior to that there was lesser availability of food, if we look ~~in look~~ at the policy from Indian perspective also there used to be a shortage of food. And, after this 1988 and this new policy on seed development, the world has worked towards developing hybrids and a lot of work in biotechnology and agricultural sciences has taken place which has changed the entire scenario where the world at large from being food deficit has become food surplus.

So, not just India, but in general world at large has become food surplus and there are very rare cases where food is not available; economically, it may be a different story, but as far as availability of food is concerned it is definitely there. Since, all these problems were going on and the environmental problems continue to increase.

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After the Brundtland Commission Report was published in 87 the first Earth Summit of Rio De Janeiro which was held in 1992 was organized.

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It was a large success and a big event where there were representations from all of the world countries and people discussed about the earth environment and development. So, it was the conference on environment and ~~developed~~ development for the first time. The world was a party to it and world together the world leaders together started discussing about the environment and development simultaneously.

So, development cannot be at the cost of environment and environment cannot be compromised was the underlying theme. So, first time everybody together started discussing about this. In 1993, the first session of the commission of sustainable development took place in New York and they started discussing the outcomes of the 1991 Rio de Janeiro conference and to put it in tangible formats as ~~action-oriented~~action-oriented plans.

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In 1995 the World Summit for Social Development was held in Copenhagen and it was realized that we just cannot talk about environment and people need to be put at the center of the development. So, the social dimension of sustainability started becoming stronger where it was already there as an underlying current. So, it had come to the fore for the first time in 1995 and placed on record.

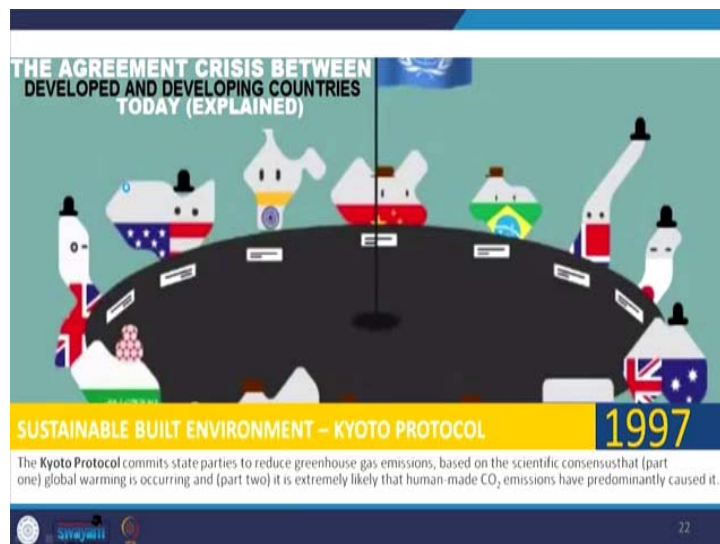
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In 1996, ISO 14001 the Environmental Management Standard was introduced which helped organizations to minimize how their operations or processes could be improved could be improvised. So, that they have least negative impact on the environment.

So, there was a guideline in place which would help people. So, people were discussing, the world at large was discussing about reducing, minimizing the negative impact on the environment. This was this standard was made available in 1996 where it would help guide people to achieve the aim.

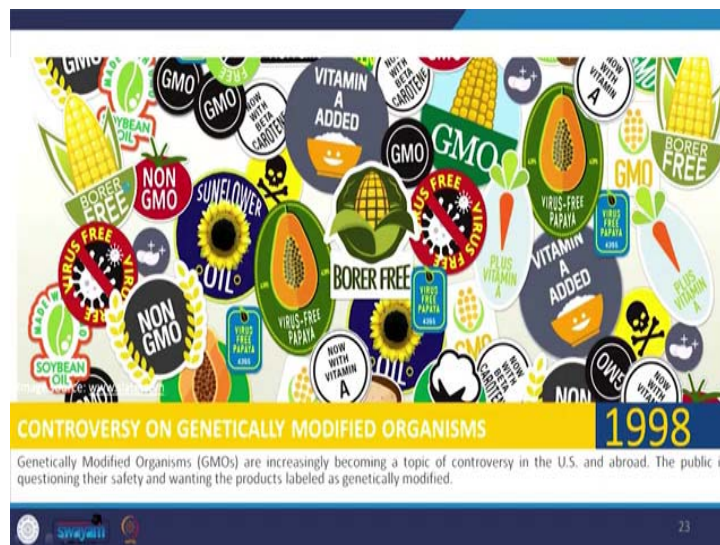
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In 1997, the Kyoto Protocol was proposed though it was not very successful in bringing the world parties the countries all the countries together till date. Yet, it was identified that global warming is occurring it is happening and the world needs to reduce its greenhouse gas emission.

Several countries have already signed Kyoto protocol; they have banned the use of certain compounds, certain processes in their countries and have committed to reduce the greenhouse gas emissions. The work on Kyoto Protocol is still going on, but it was a historic moment, it was a historic event where the world recognized that the greenhouse gas emissions they need to be curtailed cut down.

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In 1998, the controversy on genetically modified organisms was brought to the fore. It was an after effect, it was a result of the seed policy which we saw from 1988. So, in 1988 for food self sufficiency the world had moved from the conventional the traditional seeds and the methods of farming to more hybrid seeds.

And for the first time in 1998 the controversy on genetically modified organisms and crops GMOs came to the front and it was an uproar and especially it became a topic of controversy in the US. Gradually, this has happened across the world and people are talking about genetically modified organisms. We also saw a lot of revolts and controversies happening in our own country around the same time couple of years later.

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In 2000, United Nations Millennium Declaration was brought out and for the first time the Millennium Development Goals (MDG) were listed. So, for the first time here all the three dimensions were clearly listed tangibly listed in the form of these goals and the member states all the 189 member states of United Nations. They agreed to implement these Millennium Development Goals or to achieve these Millennium Development Goals and it was agreed that by the year 2015 the poorest of the countries will be able to achieve the better living standards.

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In 2002, the Earth Summit was held in Johannesburg exactly 10 years after the Rio de Janeiro, first Earth Summit and it was held to discuss what has been done in the last 10 years though the progress was dismal. There was not much that the world had done despite committing and there was lot more to be done and the world the environment had degraded largely, but yet it was a very fruitful meaningful summit where the accounting the measurement of how the world is going was done.

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In 2009, the Conference of Parties, (COP 15) was held in Copenhagen and United Nations framework convention on climate change and the 5th meeting of parties to the Kyoto Protocol was held. The world started agreeing on the climate change which is which was established by now and how each country would contribute towards mitigating climate change. So, this was again a stock taking.

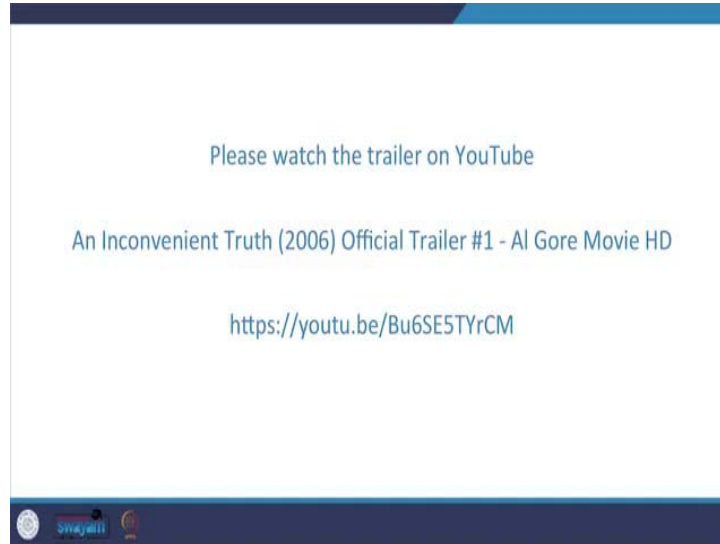
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In 2006, Al Gore the vice president of United States, he published brought out this movie An Inconvenient Truth where for the first time several very stressful phenomena happening in the environment towards the climate change were showed, and the world became aware and the world started discussing about the climate change as a phenomena more seriously.

You can watch this video, this trailer of An Inconvenient Truth and all the students who are taking this course are requested to watch the movie An Inconvenient Truth and familiarize themselves with how the world is changing the world environment is changing.

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In 2015 Conference of Parties 21 was held in Paris.

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And the expected key results result of the Paris protocol was the agreement to set a goal for limited global warming to “well below 2 degree Celsius” compared to pre-industrial levels. Majority of the world agreed to this agreement the Paris protocol and it was considered as a success and the movie An Inconvenient Truth. The parties to that they have trusted it they believed it to be a success because the world was coming together to

agree to contain global warming, limiting global warming to well below 2 degree Celsius to as compared to pre-industrial levels.

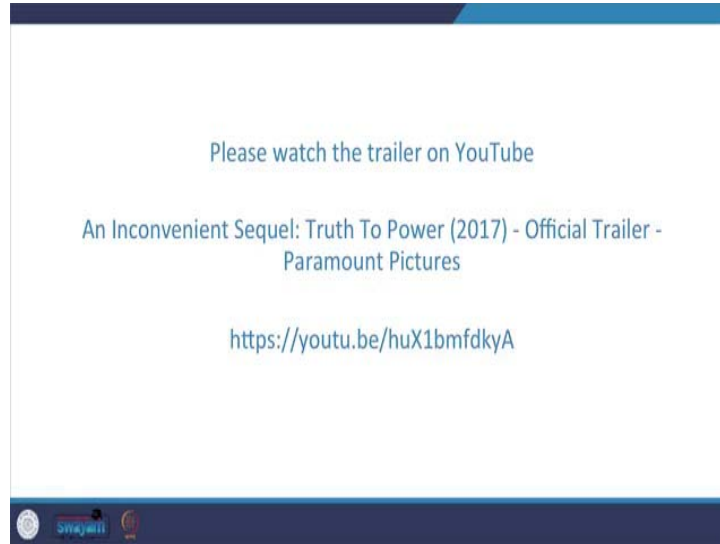
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However, the world has been going on as usual the business as usual and the tones in which we were discussing about climate change and sustainability have also been changing. From an increased focus on environment from 1962 to gradually incorporating the stakeholders, ~~peoples~~people's participation. In 2017 when the sequel to the inconvenient truth which is the movie called An Inconvenient Sequel was released it has a changed tone where it talks about capitalism, it in a way supports capitalism, but a more informed and sustainable consumerism.

So, the world has gradually changed ~~our~~ perspectives toward sustainability have changed, we have placed more focus on certain domains at certain different points of time. And that is why at the end of it we see that the focus from environmental perspective has been there in certain models, on economic perspective has been there in certain models and on social dimension has been there from a certain perspective. However, for any model on sustainability all these three models all these three domains are essentially present. You can watch the trailer to An Inconvenience Sequel here.

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So, in subsequent lectures when we start discussing about sustainable architecture. We would essentially know that there may be a greater emphasis on one of the domains, yet a discussion or an understanding about its impact on other domains will always be there. We may be talking more about environment because of our point of view or our perspective, but yet our understanding of how it impacts society, culture and economy has to be present that is all in lecture 4 today. See you in the next lecture.

Thank you.