Energy Resources, Economics, and Sustainability

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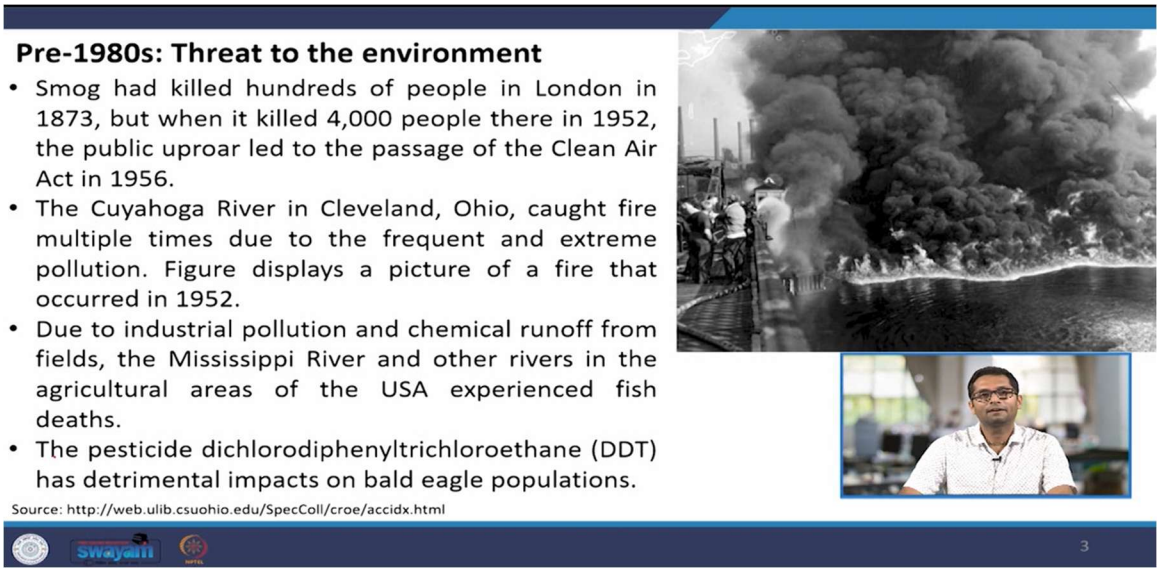
Week – 04

Lecture – 04

Lecture 20 - Business and the Environment

Hello everyone, welcome back to the course Energy Resources, Economics and Sustainability. In the last class we have been discussing some of the effects of the different strategies that the businesses take on the environment, how they have been going on and it's a truth for the 20th century or the 21st century that businesses have led to a lot of economic wealth creation in different parts of the world but this wealth creation has also been coupled with a lot of emissions either to the air or to the water or to the soil and it also had serious consequences which have to be like felt by the people who have been there around the people. As we have discussed in the earlier class that in most of the cases it has been that the profit has been privatized whereas the issues to the environment has been socialized. There are a select few in the businesses who are making a lot of profit whereas the common people were made to go through the emissions or the result of the emissions that result from the major industries. If you go through some of the examples before that let us also go through like one of the statement by the World Business Council that it made recently on sustainable development and it read as the days of measuring business success through financial matrices alone are over. Our vision is that by 2050 all companies will measure value and report their true value, true cost and true profit.

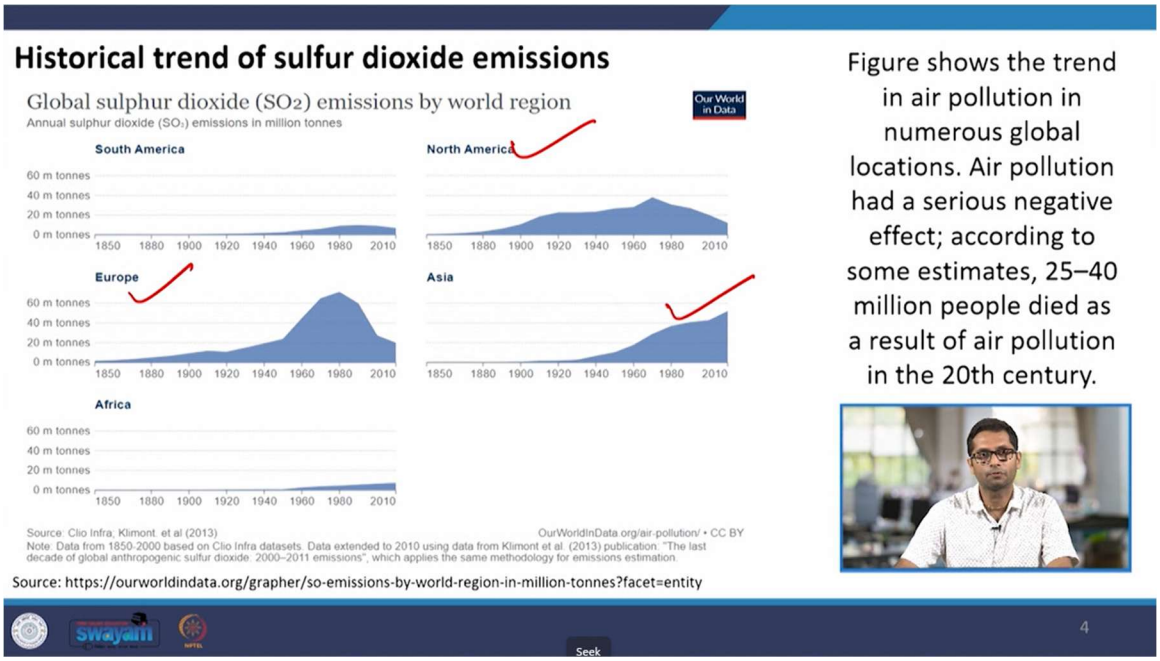
To do this companies need to go beyond just accounting for financial capital they need to take an integrated approach via better understanding on how to incorporate and account for the natural and social capital as well. So in short what it meant was it's the days in which the profit was only accounted in the financial terms are over. Now it's also important to value the natural or the environmental as well as the social capital in terms of relationship among the people. It is also known by the term ESG which stands for environment social and governance.Now a days companies are becoming more and more pertinent towards their ESG goals they would want to have their ESG policies they would want to have better outlook in the society in terms of their commitments towards the environment towards the social uplifting of the people toward the good governance. But let us try to see this how this things or how this perspective has been changing in the history. So if we go back in the history and we look at the scenario that existed pre 1980s from the onset of the Industrial Revolution we have had severe instances where a lot of emissions from energy production and the industries that were involved in energy production led to a great deal of emissions and had decremental effects on the life of people. We have heard about the smoke problem that persisted in the city of London which was mainly attributed to the use of coal in the nearby areas. It led to killing of a few hundred people since the 1800s but the social issue was such that people were a bit reluctant on raising their voice against the source of the pollution which was the combustion or the consumption of coal for the various industries and primarily it was for generation of energy.



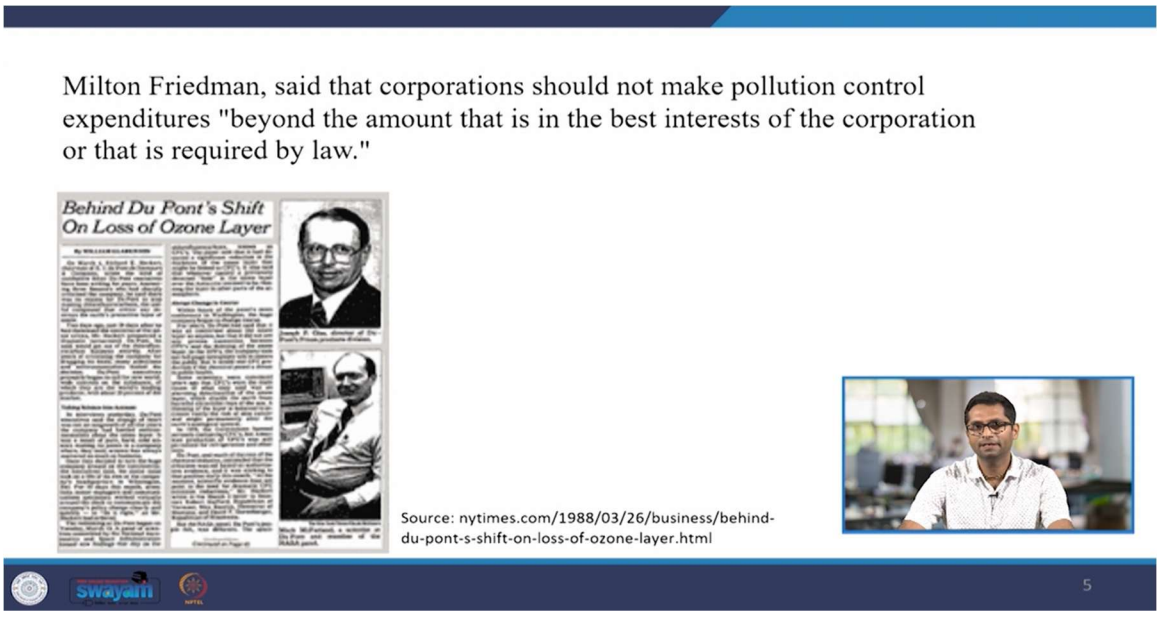
The thing was people were more interested in the economic well-being or the economic benefits that they were deriving from the combustion or the use of this fossil fuels that they didn't value much on the on the health aspects or the loss in terms of their health which was resulting from this from these kinds of emissions. It was only in the year 1952 that was beyond the Second World War that there was a severe smoke that killed almost 4,000 people and then there was a public uproar in UK and that led to the passing of the Clean Air Act where people felt it's enough they cannot live with these kinds of emissions anymore. Something similar was also observed in Japan where a lot of refining in the earlier few days led to contamination of soil and later on the contamination of food chain which led to severe problems. We also had the case of the Yehoga River in Cleveland, Ohio which was found to be burning like the picture you can see on the right hand side is of that very river where you can see fire being taking place and this has been reported since the year 1952 and one of the reasons was because of the percolation of the different kinds of harmful chemicals that were used in the industries around the river. We also have similar instances in the Indian cities where we would we have seen lakes catching on fire and one of the major reasons is the effluents that are used for various industrial processes end up in the water body, they contaminate the water body and also lead to disasters to something similar that you can see in the figure in front of you.

Further there has been a great use of insecticides, pesticides and fertilizers in the US and on 1950s what it led to was like a lot of these chemicals would enter into the water bodies

as the runoff or the agricultural runoff and it led to a lot of loss of life in terms of the marine life a lot of fishes became endangered because of this. If you hear about the perception of the people they have been trying to raise this issue so there comes a typical issue when there was the Shell Chemical Company who was blamed for the chemicals which led to a detrimental effect in the water bodies as well as killing of the marine life but all that Shell Company had to do was to say that like the effect between or the cause and effect chain between the use of different kinds of chemicals like the DDT's or the different pesticides and the effect in terms of the killing of the fish was not very clearly established using scientific principles. Further the issue was like these chemicals were also seen as being used for increasing the productivity of crops which was necessary for them for providing the food to the people in then and that was one of the reasons why all these industries have been growing on indiscriminately without paying much much heed to the environmental degradation that has been caused and this was much of the scenarios previous to 1980s the companies wanted to maximize their profit as much as possible and they would go by the environmental regulations as well as they they are not breaking the laws and further they were not very interested in doing anything good for the environment for them the only thing that mattered was economic success.



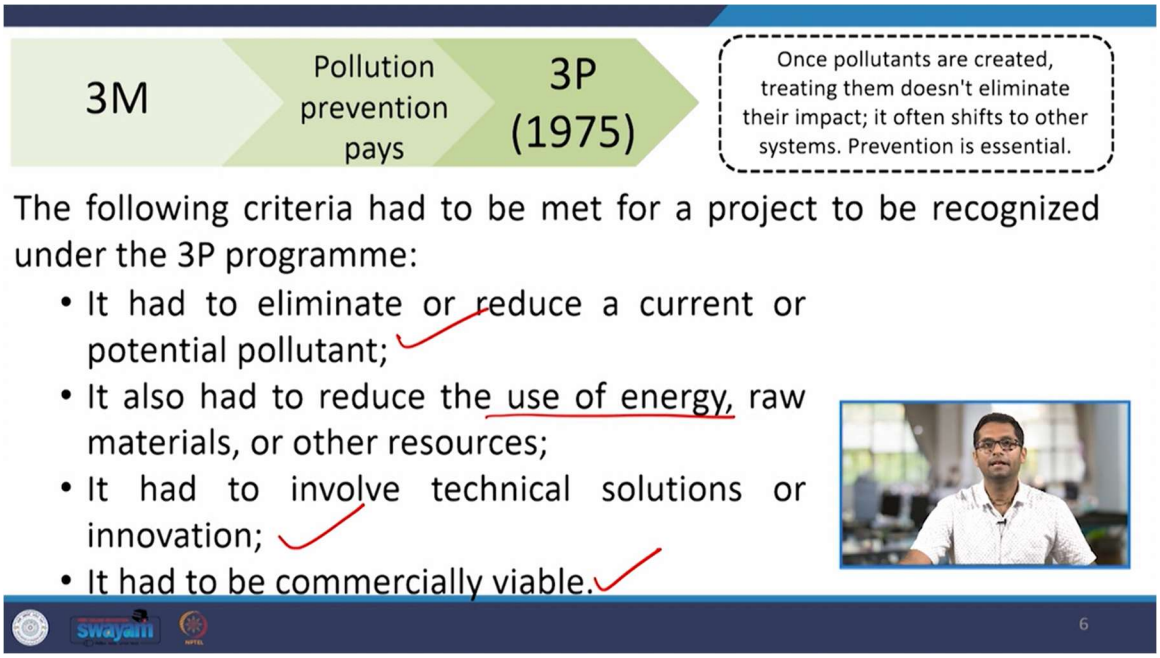
And this can also be seen like this was in the emission trends of the different parts of the world so here you see the sulfur dioxide emissions of the various parts of the world and if you particularly look towards the Americas as well as the Europe they have been increasing the SO2 or the sulfur dioxide emissions up till 1980s and it was only after that that people realized that they were losing a valuable human health and human life because of the indiscriminate emissions and in the aim for achieving economic prosperity they were harming their own life and that the policies came in and the levels have now turned to come down it is also estimated that during this rising the developed world has almost led to a death of around 25 to 40 million people's which would be more than the lives lost for if you combine the total number of casualties in World War one and World War two combined but as of now you can see the trends have been decreasing in the developed world particularly in and the Americas as well as the Europe whereas if you if you consider Asia we have a different trend the emissions are still rising people still value the economic well-being more than the well-being in terms of health so they the the emphasis on the emissions as well as the Asian economies are concerned has as very different from that for Europe and the North Americas.



And if you consider the history we had like like notable economists like Milton Friedman who is also a Nobel laureate come up with statements which said like that corporations should not make pollution control expenditures which means they should not want to like

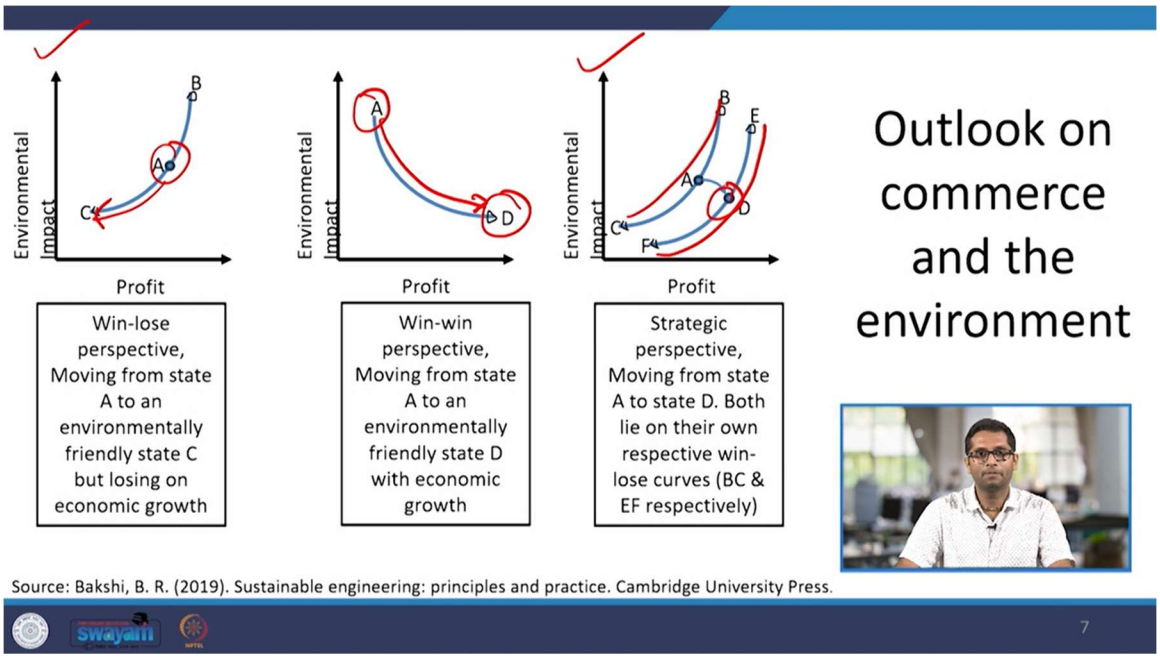
spend money in any ventures which would go beyond the amount that is in the best interest of the corporation or that required by law so at any place if there are there is a loss in the profit that the company is making or or if there is no law that governs the particular emissions the company should be not giving any emphasis for production or for the betterment of the environment around it it also meant that also he also said that any expenditure by the corporation for the betterment of the environment will be unadulterated socialism so this was his statement and he was of the view of the win-win theory of the neoclassical economics which says like it let the market decide what is the best for the markets so let the market come up with with the interaction of the supply curve and the marginal cost curve and come up at equilibrium which in decides the best cost and let the markets adjust but as we have seen in the last class these kinds of calculations or assumptions are often violated in the modern world and what it also leads to is the over consumption of the raw material which leads to even more emissions further there is no way the emissions or the raw material from the nature has been accounted for in the new economic a neoclassical economic theories a typical example that we can also study is a one that came up in the year around 1974 so there was a study that was published in the in the journal nature that said that certain kind of chemicals which are called the chlorofluorocarbons which are emitted from the aerosols like sprays and deodorants or other cosmetics was causing a harm to the ozone layer and might lead to ozone holes and they particularly pointed out to one company which was DuPont which was a major manufacturer of these kinds of chemical at that point so DuPont at that point thought it's an attack on their products and they funded studies several of studies which would negate this particular study that said that the effect of CFCs on the ozone layer they further came up with different kinds of different kinds of papers that's that negated these kinds of theories they said like CFCs are good and they also tried to like attack the scientific acumen of the people who came across with theories like this but it was ten years later when there were other pool of scientists who discovered the ozone hole to be in reality in the year 1985 and this ozone hole was found over Antarctica and later in the year 1987 we had the Montreal Protocol being signed which which was to basically do with the CFCs which were a major contributor to the ozone hole depletion and so later on we find that the same company DuPont would come up with a better

replacement for the so-called CFCs with the discoveries of the HFCs and the HCFCs which played a major role in like doing away with the CFCs and also like coming up with a better product so these are some of the case studies which we have seen in the pre 1980s era where the companies were very reluctant to admit that the processes that they were carrying out for the economic upliftment had severe effects on the environment but this kind of attitude has now been changing.



And this is what we experience in the present era and a typical example would be and the policy of three Ps which says pollution prevention pays and this was by a firm called 3M, 3M is again a major industrial firm with a lot of products and in the year 1975 they came up with a path breaking policy which says like pollution prevention pays it was one of the first industries that basically took a lead that we should be decreasing our pollution levels and it came up with a policy which says like pollution once it's created it's only being like going from one impact to other so why don't we eliminate the source of pollution at all so that the pollution is not changing those forms we are just reducing the pollution so the three Ps formula or the three Ps policy that it came up with had the basic underlying feature which said it has to eliminate or reduce the amount of current pollutant whichever it was releasing it has to reduce the use of energy because most of the pollutants were coming because of the energy that was used in the various raw material changes or the

manufacturing processes and then it also have paid a good heed to innovation the innovation that lead to coming up with new and new ideas which were environmentally sustainable and economically feasible and lastly it has to be commercially viable and because of this policy not only did 3M became a market leader in terms of sustainability it came up and down with the pollution levels at a very high level it also helped it increase this profit so the estimates were around like it could increase the profit the yearly profit by around 500 million dollars on the US products and almost 700 million dollars for the global market so this led to a change in theory that if a company is paying heed towards decreasing the pollution it might not always lead to a decrease in profit it can be profitable as well and this is one of the studies further if you also look at the previous case of DuPont where it was initially against the phasing out of CFCs because it thought that it might not lead to a decrease in the profit and the market cap but further with the further discovery of the HFCs and the HCFCs it could come up with a new product which was commercially viable and much more profitable to the DuPont so there has been a shift in which the companies have been thinking recently and that shift can be understood with the help of these three diagrams.



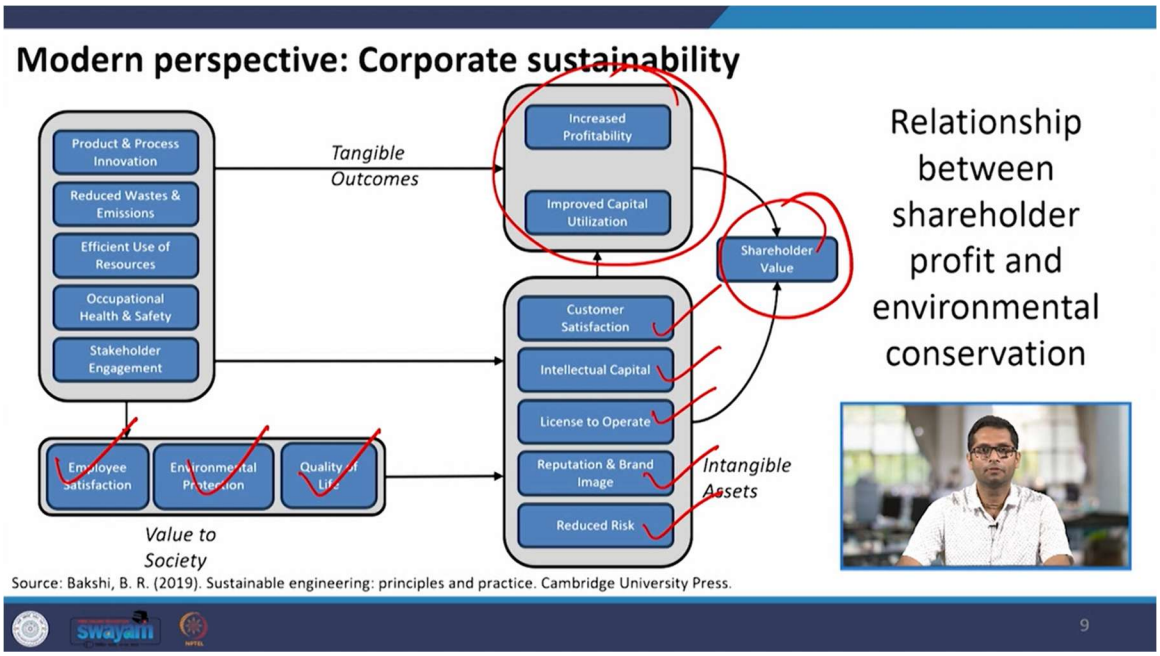
So the initial outlook for the different industries or the different companies initially or the pre 1980s era has been given on the extreme left where they thought that the profit and

the environmental impact were competing so if you have to increase the profit this would be linked to the increasing environmental impact there could not be a decrease in environmental impact with a decrease in profit and that is one of the reasons why the companies are reluctant if you move from a point A which was a current act to a more sustainable point C it always meant there would be a decrease in the economic growth or you would have to lose money whereas post 1980s with the help of a few companies taking lead in sustainability the trend has now changed the companies have made to realize that environmental impact and profit might not always be competing they can all they can also be complementary as we have seen in the case of the typical case of 3m the company realized that if they would have to go from a point A which was having an environmental burden and if you have to reduce that to a point D this can also be lead to an increase in profit what that called for that called for a lot of innovation in the process you cannot just carry on the same type of process but it has to be something innovative have to come out and in that case this kind of trajectory is also possible where the companies can maximize the profit as well as minimize the economic impact or the environmental impact but it might be a question that not every time you are going to come up with processes where the profit and whether environmental impact reduction are complementary so in reality one might come across strategies which are more closer to the strategy shown in the last graph on the right hand side that there might be a policy or there might be a product which would be following the curve from B to C which means if you have to decrease the environmental impact you would be losing the profit but with the help of innovations you might come up with a different type of product which shifts in the product on the right hand side which means the product which was following trajectory of BC where you would be losing profit if you reduce the environmental impact is now shifted to another curve on the right hand side which is ENF the result is that you would end up increasing the profit and decreasing the environmental footprint but the relationship remains the same a typical example of that could be the US automobile industry it was seen that if like and these smaller cars were always less emitting than the larger cars this was a case study but people always wanted a larger cars luxuries and it would not let go of their comforts in before the betterment of environment so the companies were a bit reluctant to manufacture small cars in the US and that is why

they were always going from one point A to B and not to C but with the help of innovation they could come up with cars which were gas or electric hybrid which could provide the same amount of comfort but that also helped in decreasing the environmental impact in terms it was using a cleaner fuel slightly killer fuel in terms of electricity and it also helped the corporates maximize their profit so this is a typical case and this is again a reason why the world is propagating towards electric vehicles or hydrogen fuel vehicles because there is an incremental increase or decrease in the environmental profit environmental impact as well as it could be much more profitable in the future as well.

So if you talk about the modern perspective the corporate sustainability plays a major role it's not that the companies are only valuing profit the market perception makes a lot of difference nowadays a recent survey that was done for the managers of the top corporate industries valued sustainability in the top three items or the top items that they would value and why would sustainability values be valued because the customers now prefer to have sustainable products and services they value it more then there is also a legislative and the political pressure the different countries have their own net zero targets and they would want to achieve it further the companies are also realizing the resource scarcity the resources which seem to be lasting perpetually 50 years back is the not the case anymore and if companies are feeling the heat and they know that they would have to have sustainable supply chain if they have to survive in the long run then it's also competition

among sustainability and the companies are competing in terms of like which company is more sustainable so if your competitor is arguing that and the product that they are making or they sell in the market is much more sustainable you might lose the market then there are stricter requirements by partners along the value chain even among and the different guides of stakeholders they would now want to invest in companies or they would want to partner with companies which have a much more sustainable value chain then the owners also demand a broader value creation it's not just the profit they would also want to be seen as a green sustainable a socially acceptable company further they're also competing for new talent people now would also want to associate or work with a company in which they can feel proud to be a part of people would want to work for a company they can proudly say is doing their part for the environment customers are also willing to pay a premium and and you also want to maintain a license to operate you would don't want to give up like like because of the emissions that you create an edge in terms of the business.



So if you look towards the perspective of corporate sustainability it's not just about see the tangible outcome in terms of increased profitability and improved capital utilization in one but there are many intangible assets which a companies have started to value which includes the customer satisfaction the intellectual capital the license to operate the reputation and the reduced risk reduced risk in the terms like the companies don't want

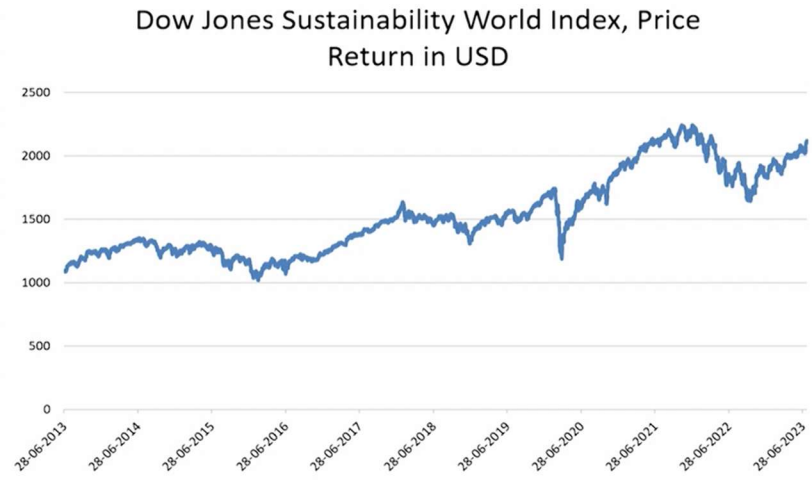
certain policies that come because of the net zero targets to to hinder their business anymore and this is this is what gives them the value to the shareholder and they would want to invest more and more into it further if you look towards the society it has giving the employee satisfaction the environmental production and the quality of life and this is this is in stark opposite to what economists have been saying almost 50 years back which say like any kind of consideration given to the environment is is pure socialism whereas the recent statements have been like if you think about the environment as a part of the business it should it would be pure capitalism because it leads to a value creation another example that could be seen on that in this front is would be that by Procter and Gamble which is a major FMCG firm and they came up and they have been one of the producers of the tide detergent which has been used for washing clothes so in the early 2000s they key and they they understood that in the washing of the clothes one of the major areas where energy was utilized was warming up the cold water because earlier these kinds of detergent required the water to be warm to a certain level before washing could be done and the thought like can we can they make something sustainable to the customers which would help decrease the energy input by the customers so they worked on developing a cold watertight which meant a cleaner or a cloth cleaner which would be working at at around room temperatures that didn't need the water to be heated and it led to the development of cold watertight and and this is one of the one of the products that is quite used throughout the world so one would argue like what was the benefit that the company derived out of it so the company as such had no benefit it was the benefit that was fully linked to the customer the customer was saving a lot of energy that the customer was spending in warming up of the water for for washing of the clothes and so the what the company got back was the that the customer became a loyal customer for the future it would want to stick towards a company that would value sustainability.

Dow Jones Sustainability Index (DJSI)

- The S&P Dow Jones indexes and RobecoSAM (Sustainable Asset Management) have partnered to administer the Dow Jones Sustainability Indices (DJSI), a series of indexes that evaluates the sustainability performance of thousands of publicly traded firms. The DJSI were first introduced in 1999.
- A study of a company's economic, environmental, and social performance forms the basis of the DJSI, which evaluates factors including supply chain standards, labor practices, risk management, branding, and corporate governance.

Source: Bakshi, B. R. (2019). Sustainable engineering: principles and practice. Cambridge University Press.

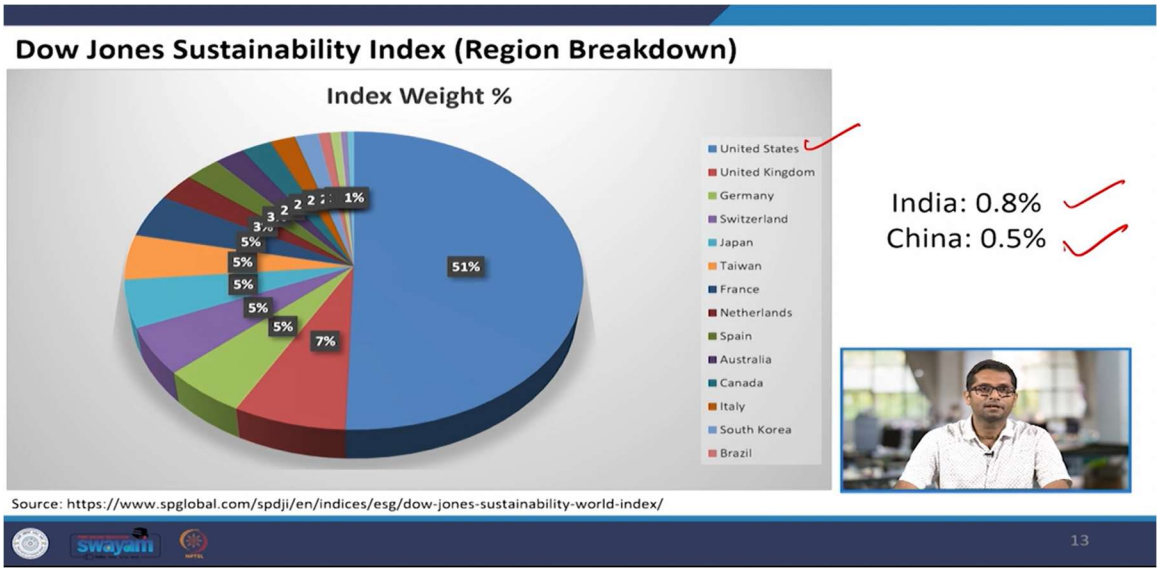
And so the company would want to be a part of a sustainability index like the sustainable Dow Jones sustainability index that lists the companies based upon the sustainability practices which encompass the sustainability practices that are associated with sustainability and so the company would want to be a part of a sustainability index like the sustainable Dow Jones sustainability index that lists the companies based upon the sustainability practices which encompass the environmental social and governance goal basically they evaluate factors like the supply chain standards labor practices risk management branding and corporate governance.



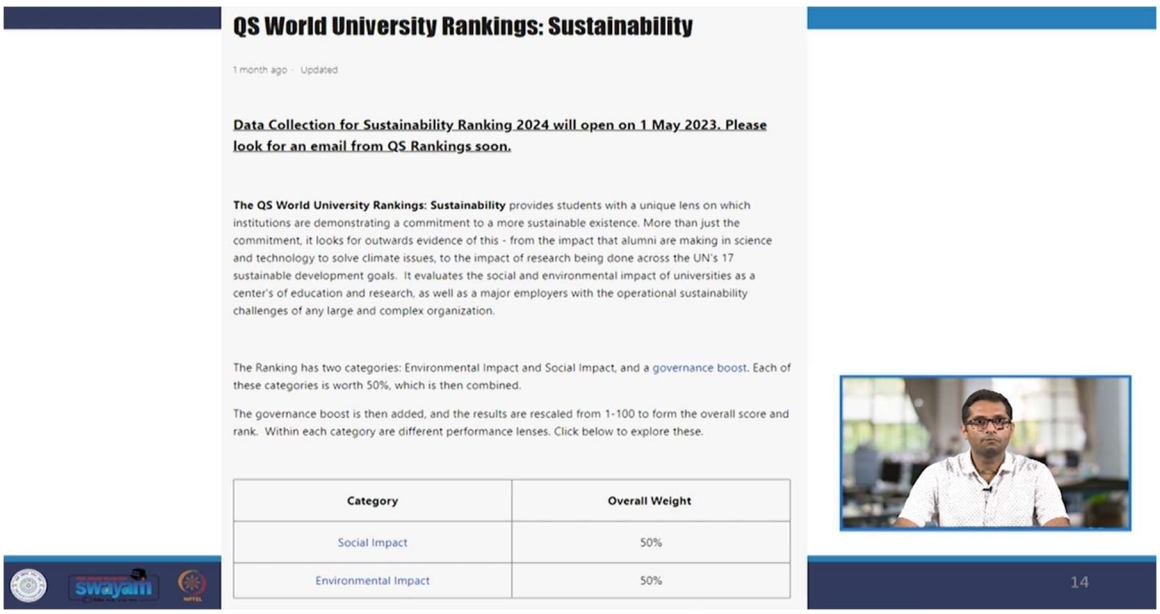
The top 10% of the largest 2,500 companies in the S&P Global BMI based on long-term economic, environmental and social criteria.

Source: https://www.spglobal.com/spdji/en/indices/esg/dow-jones-sustainability-world-index/

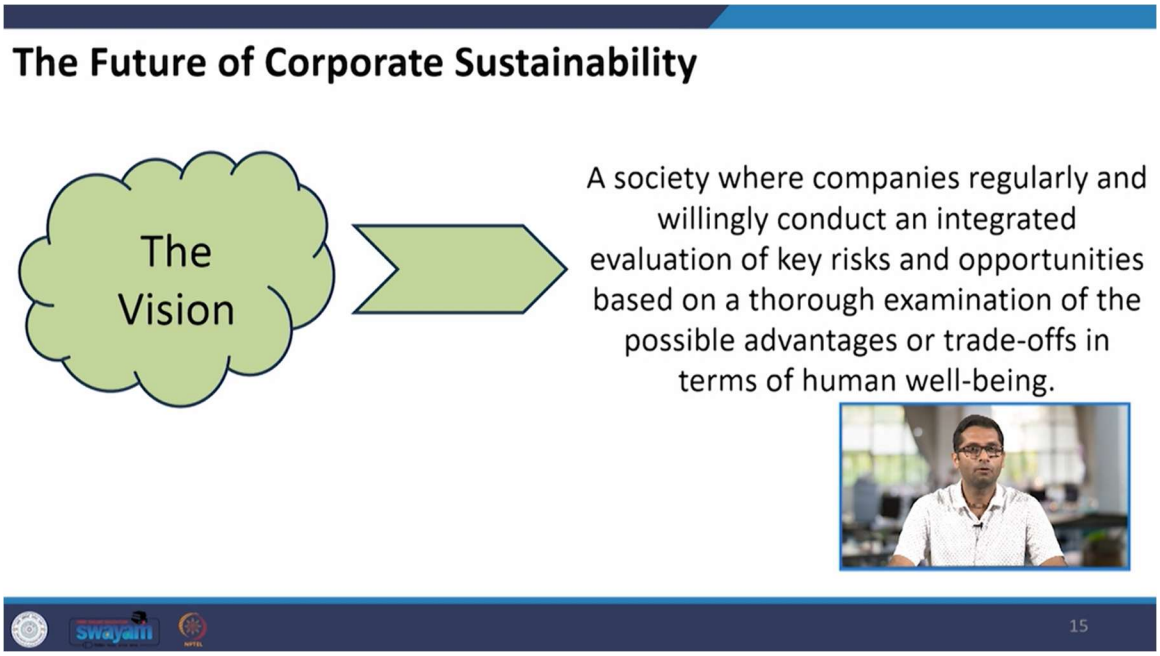
And if you see towards this particular index we could have like almost 10 percent of the largest 2500 companies are there and the index have been performing quite well for the last 10 years or so.



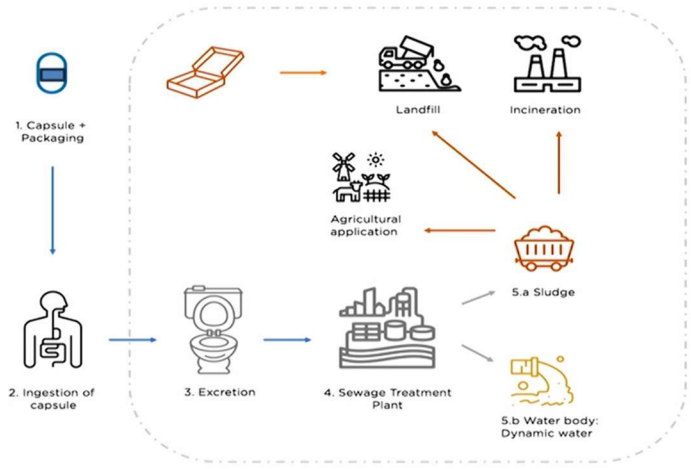
And also we can see the company have representation from all the major sectors it has been represented with IT sector the healthcare the financial industrial the materials the energy and also it has a decent like representation for different parts of the world although a major part of the companies are coming from the US but we can see a representation from India and China as well and and this is where like now people would also want to invest their money in terms of like the companies which are much more sustainable that would value future more than the present and the practices that is going to lead towards a much more healthy environment and not only like in the share market you can also see such kind of practices coming in the institute ranking as well.



So QS is one of the major rankings that is going to so QS is one of the major ranking in terms of the university ranking and even they have come up with the world university ranking even the different top universities of the world would want to compete in terms of sustainability as of now so this is one such ranking and where they pay a good amount of heat to the environmental footprint as well as social impact that the university is creating so the placements of the company were which were used to be the sole criteria in the past few years besides deciding like which is the best universities has now shifting towards which sustainable which university is the most sustainable in terms of which is which type of university would value give more value towards the environment as well as the social capital as well so the trend is moving more towards giving emphasis to the society as well.



So if you look at the future of the corporate sustainability it could be thought like they would they it is envisioned that there should be a society where companies would regularly and willingly conduct an integrated evaluation of the key risks and opportunities based on a thorough examination of the possible advantages or trade-offs in terms of human well-being so profit doesn't find or the capital profit doesn't find a mention in here people would want to look towards long-term human well-being which encompasses both the economic as well as the environmental effects and this has been a trend that has been seen quite lately.



Also like companies would now want to do exercises which sees the impact of the environment before a new product would come in so this is an exercise that we did for a major pharmaceutical firm which was coming up with a new type of capsule and and they would want to see the effect of the capsule before even the capsule was coming into the supply chain they would want to see if the capsule was ingested by a person and it would end up in the different kinds of water bodies or different kinds of treatment system what could be the effect in terms of the environment what could be the effect of or effect in terms of the packaging that would be used for that kind of capsule so this is how things have been changing lately even before the launch of a product the companies would want to analyze that what could be the possible impacts of the use of that products not only in terms of the formation but also a disposal.

The Future of Corporate Sustainability

To achieve this goal and unite policymakers and corporate sustainability executives behind a shared understanding of sustainability, several key advancements are required:

- Adopting systems thinking
- Measuring human well-being
- Extending ethical frameworks
- Earning stakeholder trust
- Embracing transformational change
- Data-driven decision making
- Collaborating at scale
- Enabling public policy solutions
- Influencing consumer behavior
- Extreme transparency
- Educating the next generation

So if i look towards and the future of corporate sustainability the companies would want now to adopt more of a system thinking which means they are no longer working in silos they would want to understand the whole system and and see that the whole system is not having a bad effect on the environment and there is a need for measuring the human well-being it should be given due emphasis the ethical framework should be extended where every stakeholder understands that the impact that they are creating on the environment they would value more of the stakeholder trust and the stakeholders would and want them to invest more and more into sustainable practices they would have to come up with transformational changes which means coming up with innovative products which can create a win-win situation in terms of products which have very less impact on the environment and at the same time can help them make a good amount of profit further with the advancement of the big data as well as other ai tools people would want to understand how the data the availability of data companies want to understand how their practices have been impacting the environment and this is the opportunity that they have further there is also a need for collaborating at scale with the different education institutes as well as the non-profit organizations so earlier what we have seen is that the NGOs or non-profit organizations have already always been at lower head with the different kinds of corporates where they have been basically coming up like how the corporate policies were against the environment and the public well-being but the strategy has changed now we are now these kind of companies would want to work hand in hand with the different NGOs or non-profit organization and even academia so as to bring up more and more sustainable solutions so the sectors which were early at loggerheads are now collaborating for the sustainable future as a whole further there is also a need for enabling public policy solutions influencing the consumer behavior there needs to be an extreme transparency in the way the emissions are noted down and as well as communicated and further there's also a need for educating the next generation where who would be the major stakeholders for the resources that we leave behind so with in this lecture we have tried to understand how how the perception of the industry has been changing in the last 50 years where the industry first didn't paid any emphasis to the environment they were seeing any emphasis to the environment was coming at the loss of capital to the present conditions where the environment is one of the major goals of any particular corporate

because that helps them build value and as well as a shared future for all of the humanity so with this we end today's lecture and from the next class we'll try to understand the environmental impacts of different kinds of energy use and how that links with the current policies or of the industries with this we end today's class. Thank you