

**Innovation, Business Models and Entrepreneurship**  
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**Lecture – 26**  
**Sustainability, Innovation and Entrepreneurship**

Hello again. Carrying forward with our discussion on social entrepreneurship and diverting your or let us say gaining your attention towards the context of society and entrepreneurship.

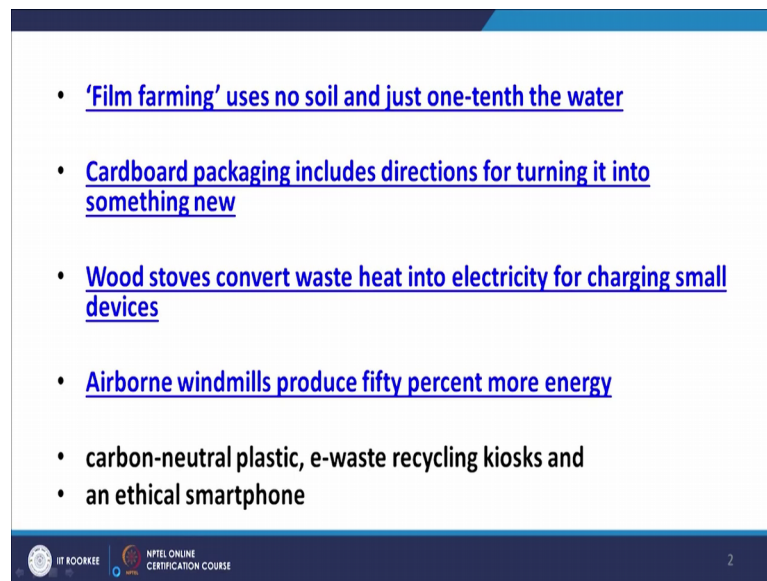
Now, I wish to draw your attention towards that how innovation entrepreneurship societal elements with the perspective of sustainability are connected together. Because when we talk of societal development or social entrepreneurial efforts and innovation with reference to the same or whatever we have discussed with reference to the definitions or the contexts we wish to build for our world today, sustainability is a very important aspect to be catered to. It is its much talked about subject and there are so many aspects of sustainability which are being developed and build upon nowadays.

But now we must try to look at all these elements together with reference to each other and in coherence to each other. There is sustainability innovation and entrepreneurship. So, briefly you know once you go through several websites or you surf around on the internet you would appreciate that people are doing a lot of things, whole of the world is actually thinking in terms of sustainability and innovation entrepreneurship together and specially sustainability per say.

And people are make in larger efforts, people are actually focusing on problems of climate change and there are so many scientific innovations, technological innovations which are going on in that kind of a direction that somehow if we can you know make our earth better place to live, we can reduce the pollution levels. People acknowledge that this process of development cannot be abruptly stopped and whole of the industrial revolution which has been brought in and so much which has been done up till now, in terms of development of industry sector or automotives or construction and so on cannot be stopped at all. So, this processes almost irreversible.

But how to contain this process how to bring in element of sustainability of environment and other elements of sustainability infused into this process, and how to partially curtail this process with reference to the urgent needs and requirements of today is a major concern. So, for example, you go through you know with which I also was I also do habitually you know go through the websites and a Google.

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- ['Film farming' uses no soil and just one-tenth the water](#)
- [Cardboard packaging includes directions for turning it into something new](#)
- [Wood stoves convert waste heat into electricity for charging small devices](#)
- [Airborne windmills produce fifty percent more energy](#)
- carbon-neutral plastic, e-waste recycling kiosks and an ethical smartphone

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So, interesting things which came up 4 or 5 which I wish to reiterate here for example, an effort in film farming wherein no use of soil is being going on and just one-tenth of the water.

And I remember one demonstration which exists in the city of Gwalior here in India the place is called Vivekanand Needam. Now, once I was attending a workshop wherein people from Vivekanand Needam were there and they were demonstrating that how they converted a barren piece of land into a beautiful livable area for specially for elders.

So, they got this quite suitable size of barren land, and then they brought in many people who required a place to live and stay and they started you know they were being supported by many you know funding agencies as well as they were entrepreneurily supporting them as well and which can be called as an example of social entrepreneurship also. But the most important thing at this point of time to be learn about them is that how they convert that piece of barren land into a beautiful green pasture laden with grass and thousands of trees.

So, and Gwalior does not have so much of water and rains that that is a dry area that that the and it is a hot area the part of India where a you know summers are very hot. So, and general temperature is high. So, now, they what they did was they started constructing huts or let us say partial huts or partial um you know living areas with the help of hollow bricks which have a space within two you know kind of or these bricks are hollow from inside and they captured the heat which does not grows inside. And then they utilized let us say in today's terms we can say green material for you know containing the temperature in summers as well as winters so that, so much so that they did not require coolers or air conditioners or these kind of things for as far as living comfortably grows.

Then, they utilized drip irrigation to support as far as their tree plantation drivers going on and for drip irrigation they collected waste plastic bottles of soft drinks and water that I will talk about also and then they cut those bottles from the bottom side and they hang those bottles in a reverse mode. So, that those bottles can drop water drop by drop at the root or wherever the water was just required by the plants and in the quantity it was required by the plants.

So, this is how the utilized water very very rationally to grow thousands and hundreds of trees and then they utilized the technology by scientific organizations to you know eliminate bacteria. And, or let us say sorry to utilize bacteria for eliminating the human waste and extracting water from whatever waste is being generated by people staying there and utilizing that water for several purposes other than drinking or bathing or diet use of humans by further processing that. And see they utilized several things to enhance or capacitate their efforts with lots of rationality, and lots of scientific and technological innovation and this thing remained me of we can need and wherein film farming is being utilized without soil and very less water.

Then there is an aspect of cardboard packaging which I was watching on the internet and you know that cardboard packaging they says it includes directions for turning it into something new. For example, once the this cardboard package comes in usually you have to through away it and or someone takes it away for further recycling of reprocessing that and then you know it is reprocessed in several terms. But this is a good use if someone can you know utilize that at home by changing the use of that package and turning it into something new let us say a partial table or let us say a corner table, let us say a chair or for something else. So, the that that website demonstrated that.

And then there are wood there was a reference to wood stones which convert waste heat into electricity for charging small devices, that was also very interesting. And then there are airborne windmills which produce 50 percent more energy. Now, this is quite interesting actually, wherein you see the you are actually have having flying windmills or you are taking wind mills were the you know air speed is high or you know you do not have to install windmills permanently at one single place. So, airborne windmills are now, being utilized and as they say that it produces more energies or, so much of advancement is now, being done as far as whole of this particular scenarios going on.

Then there is carbon neutral plastic. Now, plastic has become a meanest to this earth as we all understand as we all know people has started burying plastic beneath the roads to you know enhance the water containing capacity of the material which is being utilized. So, that roads have a longer life this is a quite a good solution which people are trying to bring in as far as the plastic mineral is grows.

But we are actually creating this people say that plastic the people are utilizing recyclable plastic nowadays, people are degradable plastic nowadays and so on, but to my understanding plastic has a very long life and it cannot be so easily converted into you know a perishable kind of a thing basically. So, people are working on carbon neutral plastic and I have personally sort of advocate wherein we should go for a plastic less world in due course of time because it has given us a huge advantage on one side, but it has created a huge level of waste which could not we would not be able to manage that kind of a waste which we have generated now.

So, and e-waste, e-waste recycling kiosks are being developed then they say that ethical smart-phones are coming and it has to be demonstrated well which is blond scope of this discussion and that can be fetched by a fetched to internet as such. So, these some of these you know kind of a examples they remained us of the context of sustainability innovation and entrepreneurship as such in coherence with each other.

So, further dwelling into this situation, now how to look at sustainability that is an important aspect; As I said there are several definitions and whole lot of discussions going around that and internet and text and books are full of the discussions on this. But, but we have to chose a way of looking at sustainability. So, you see a good way to look at sustainability is that for example, if you look at yourself and you look at particular

kind of a age bracket you stand in for example, if I look at myself a middle aged person wherein I have my elders whom I can see growing older and I have younger's who are actually growing elder.

So, if I stand here and look at this situation if I find that I would be live in a better world or better situation for the people who are coming behind me or growing elder. Now, and I would also satisfy my elder generation that the kind of world they looked for or they the they made their efforts for would exist. I would not be contributing in the depletion of this the world they were making efforts for, and if all the three generations I am referring to they are in coherence with whatever is being done and you know future secured for the generation which has yet to come.

The future security in terms of green terms of water, in terms of good fresh air and several other terms social security also. So, and avoidable disasters also so, if somehow this all the scenario is in coherence with the each other then we can say that we are talking of a sustainable world and we are referring to sustainability at large.

So, here I would referred to the example of Ganges and fortunately I have worked with an effort of government of India as I would have referred in few earlier discussions also. Now, you see one of its kind river which is associated with almost 500 million people and directly and indirectly as well and is responsible for food grains supplies and you know several other things water, irrigation and several other things for so many people and definitely in India. But, one of the rarest of its kinds of river which is connected with so many people for so many purposes at large.

Now, the situation is that there is pressing need for everyone to look into saving Ganges, because water quality is depleting sharp, there are so many aspects of the flow of river, there are so many aspects of keeping up or let us say saving the purity of as far as the water quality grows and otherwise also.

So once I was associated with this project and we went to the levels of origin of river Ganges not exactly the origin place, but to the levels of wherein it you know comes down gangothri is the place. So, I droop there along with my friend professor Rajat Agrawal. And we went there and from there we started coming downstream talking to so many people, looking at the situation for ourselves and we went along the tribute tributaries also. We met hundreds of people in due course of time understanding the

perspective of how do they look at this river, and how they wish to sustain the river water for future needs and future generations what should be done, what are they doing they were almost 110 people associated with this project across 8 of the Indian Institute of Technology's, you know IITs sorry.

So, they were working on different verticals we were working on, so cultural vertical during these effort. So, while we were talking to people the whole gamut of you know reasons via the situation has occurred that came in front of us, and what can be socially at least socially and culturally you know done that also came in front of us. And they were so many technological innovations which have been suggested in due course of time by the theme of IITs who was working on this project in terms of the flow of water, in terms of biodiversity and so on all these suggestions and recommendations and the processes which can be followed in due course of time in which government of India is trying to do. Or on the website called gangapedia dot n where one can fetch that what have been recommended.

So, when we were talking to these people the element of sustainability could well be understood, because at this juncture the most important point which has to be understood here is that if somehow this we lose Ganges or let us say it depletes to the levels wherein it becomes irreversible at that at this time. It is not advisable to imagine that kind of a situation and still we believe that that situation would not come because so many efforts are being religiously and you know emphasizingly made.

But again to imagine the worlds we tend to believe that then it will effect so many aspects of sustainability which are associated with those river. It will affect the food supply food growth, it will affect you know kind of water supply of course, which is primary in the belt where it flows. It will affect the green cover it will affect the climate and the weather of the places were through which it flows and so on and it will have a very large total affect hitting the sustainability from all the sides and which will have direct economic implications.

So, what I am trying to say here is the one river associated with so many people is having positive affect which were I do not know if economically noticed up till now, or definitely an account would have been maintained. But if we lose upon it then now, we

have an account of that what would we losing what we would be losing in terms of sustainability and you know larger economic efforts.

There were several public interest litigations we made with reference to climate change, with reference to pollution, with reference to you know irregular construction or illegal constructions or let us say Ganges as I said. And if you can surf about those cases which are being fought you would realize that how scientist and technology people, and then everyone academia and intelligentsia they are actually looking towards sustainability and environment and the perspective.

There are so many references to now, people say avoidable disasters for example, Chennai floods and Kedarnath floods which had because they are belong to this area I could see the after effects of those floods I had this opportunity obviously, in Kedarnath shine after it was reconstructed and I could realize that what kind of a devastation those floods brought in. And how many people's not only loss their lives, but loss their loss their livelihood and households and people who remain they have lost many things which have to be brought back to them and so on.

So, you know now, now, we reach to a situation wherein we say that let us chose the area or areas to be addressed for you know looking at sustainability innovation and entrepreneurship together. As I said in our last discussion also that definitely those areas primarily can be for water as this demonstration of few minutes suggest that if we can think in terms of innovation with reference to entrepreneurship and definitely sustainability with in context to Ganges there are so many things which can be done.

There are there are so many aspects which can be introduced in through so many verticals. One can think in terms of the bringing technological solution for generating electricity without hindering the flow of water for example. One can think in terms of usage of science and technology and culture and societal aspects also as you know the definition also said says and we had that in last discussion that how to contain or let us say how to manage the waste of the cities besides the river. So, that those that waste is not to be discharged in the river. And then it is again a very very big question which has to be addressed so one part is that.

And then there are several other aspects of you know less and rational utilization of water for agriculture because this belt is associated with agriculture. Then there is an

aspect of you know curtailing or containing the construction which is going on or which has gone through besides the river. Then there is an aspect of you know kind of improving not only the biodiversity of the river, but the river bed and let us say the area besides the river with the help of further plantation of trees and monitoring the growth of the trees.

And today we have we have so much which can be done we have we have drones to monitor the plantation and vegetation on one side, and then we have people who are deeply associated with the subject. And I remember one effort which was being done by big organization called Shantikunjh in Haridwar which actually went you know for a very large drive for cleaning Narmada. And that was a commendable effort which they did I have seen those films and videos and the demonstration given to us by those people who are involved there and I definitely you know plot those efforts which were being made by them.

So, and if those efforts can be associated with technological innovation which have been we have been referring to up till now, and then the those can be entrepreneurily associated with the beneficiaries and the people staying besides the river and so many other people who are interested in such kind of efforts. And the youth who is actually learning technology with the perspective of utilization of that technology for societal development if everything can be associated together then this picture would become more beautiful and more meaningful.

So, that is we have to ponder upon that you know how sustainability and innovation entrepreneurship would meet each other. And that the answer if you take a keyword from my side the answer to this is that let us think big, let us think for the long term, let us not think in terms of gaining immediate profits and benefits. Let us think of building everything bit by bit and piece by piece and you know associating everyone to a particular cause wherein everyone can live happily. So, let us think in terms of opulence, let us think in terms of prosperity and associate all the businesses, all the efforts and all the marketing acumen all the technological acumen for making this world a better place.

Thank you.