NPTEL ONLINE CERTIFICATION COURSE

ECOLOGY AND ENVIRONMENT

Chasing Sustainability – The Challenge – Part 2

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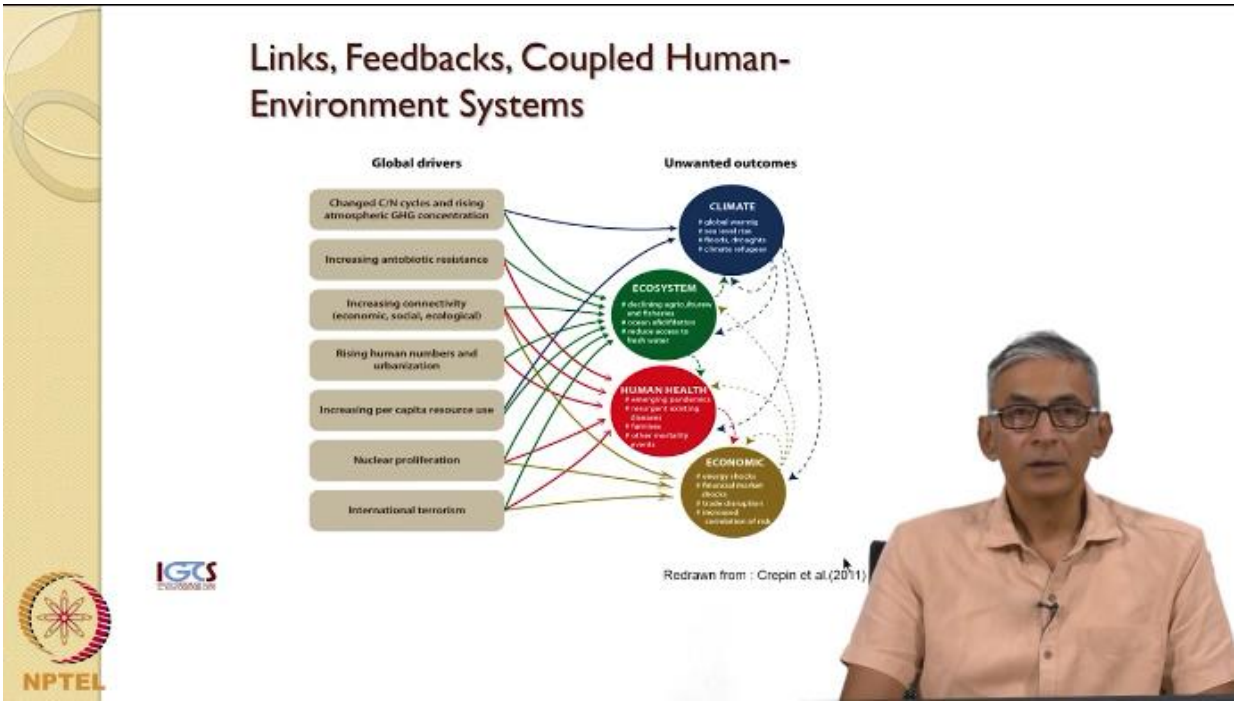
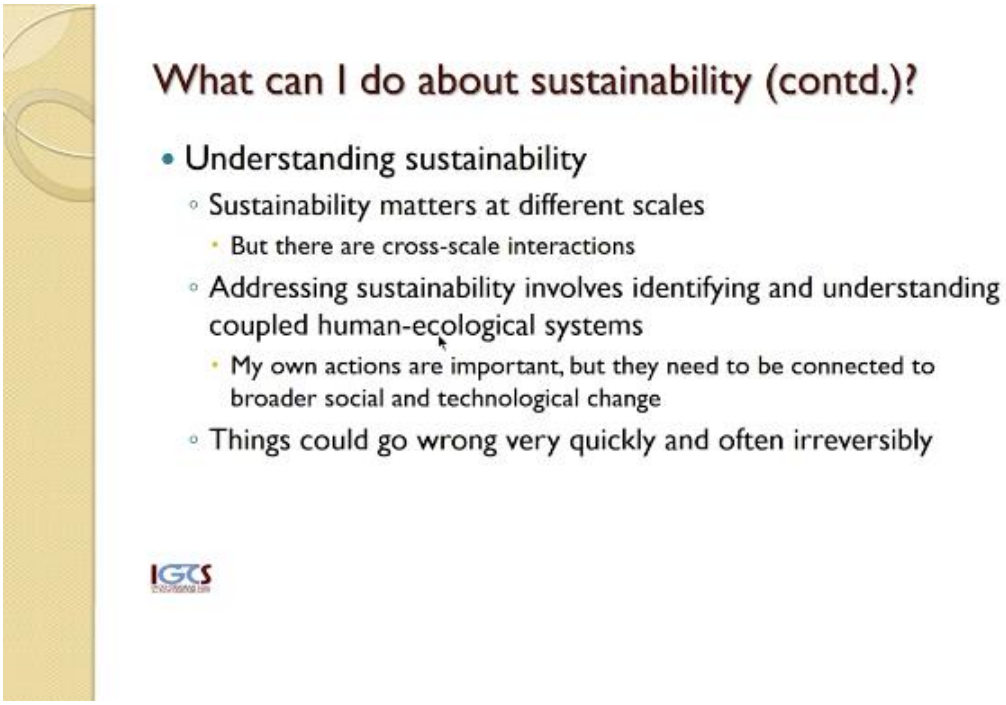


So, one of the things to pay attention to when one thinks about the human environment systems is that they are complex, they are deeply coupled in all sort of ways, they are multi-scale, and there are many links and feedbacks among these systems. So just to give you an idea that the climate system is linked to carbon and nitrogen cycles and rising atmospheric GHG concentrations, but of course, there are ecosystem effects, there are impacts on some of these cycles because of ecosystems effects, and then you have other sorts of challenges relating to health and economic impacts.

And likewise, if you think about all the other human activities like increasing antibiotic resistance because of the loading of antibiotics in the atmosphere and the oceans, and the water bodies, and the soils of the geosphere, you start to see increasing impacts on the ecosystem,

impacts in turn on human health, etcetera, etcetera. So, you see again for instance increasing economic, ecological and social connectivity through globalization leading to a whole series of other impacts, rising numbers of human numbers, rising numbers of humans in the population and urbanization again causing various types of impacts, increasing per-capita resource use, the use of nuclear energy in particular because of the waste generation and so on, and activities like international terrorism, of course, these global drivers are hardly a comprehensive, exhaustive list but you can anticipate the kinds of complexity and the inter-linkages among these types of activities.

So, all this goes to show that the human environment systems are difficult to entangle the lots of linkages among them and trying to understand those linkages is part of the large enterprise of environmental science.



So, we are asking again, what individuals can do about sustainability? And just to recap sustainability is about trying to make sure that future generations do not lose out on the options that present generation have, most people in the present generation appear to have, and to also make sure that acuity is preserved between inter-generations, across generation as well as within the same generation and to make sure that social, environmental and economic access to resources and so on are maintained.

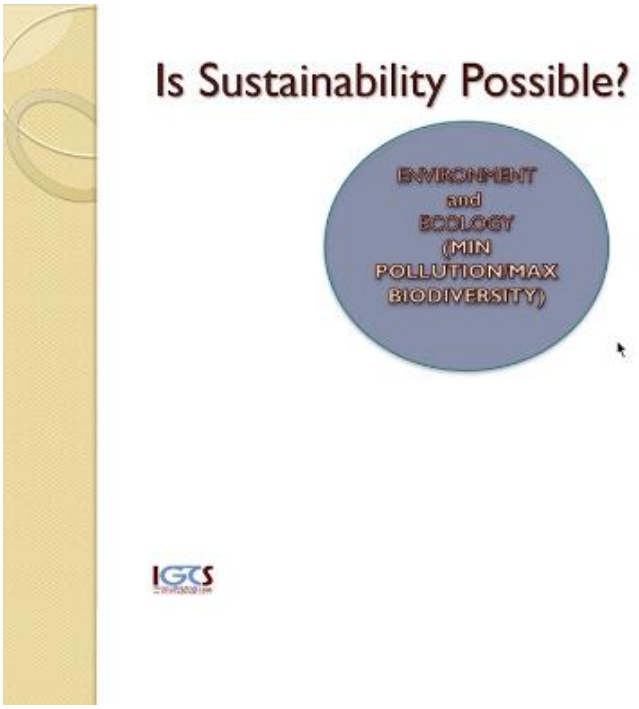
So understanding sustainability means understanding at different scales, at the local scale, at the regional scale, at the global scale, the linkages across scales, the multi-scale problem of sustainability, also trying to ensure that these coupled human-ecological systems are in fact not

going to lead, the fact that there is coupling should also warn us that there may be both positive and negative feedbacks but also runaway effects that we need to be aware of.

Certainly my own actions, individual actions are important, but my actions are always within a context of you know social practices and the availability of technological resources, so I need to make sure that I am not leading wasteful overly consumptive life, but at the same time I need to make sure that my impacts are in a sense not going to be unrelated to the impacts of my peers, in another words I need to have perhaps play a positive role influencing them, but also make sure that I build systems with them to lead sustainable lives.

And of course, there is always a chance that things can go wrong very quickly, and often irreversibly and this happens partly because of these positive feedbacks, and so I have mentioned the word runaway, warming runaway effects, ecosystem effects and these are some things that need careful analysis and consideration.

Final question is, Is sustainability possible at all? What do we need to make sure that we actually understand, what do we do to understand sustainability and what do we do to ensure that we produce sustainable outcomes? Certainly, we need to pay attention to environment and ecology, and a large part of the effort of trying to build sustainability at least from a research and academic prospective is to try and understand the world's environment systems,

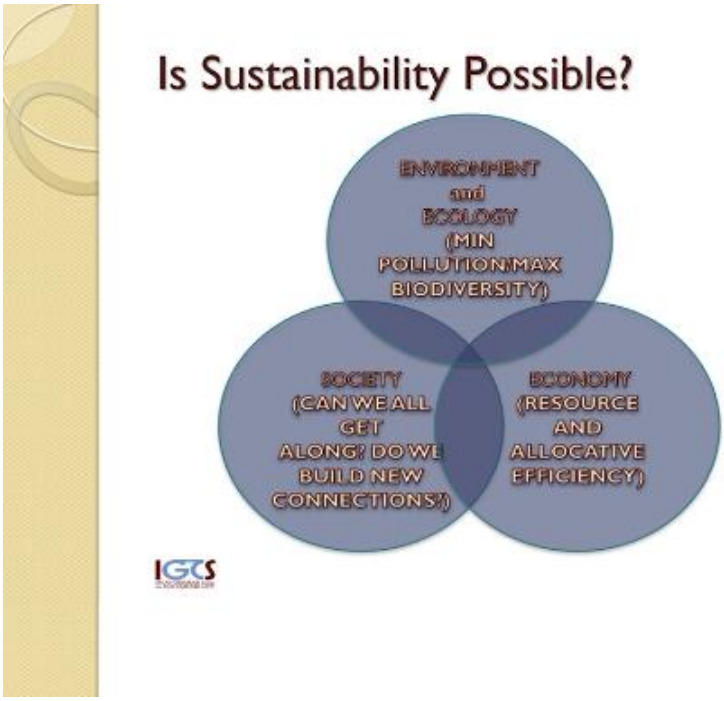


ecological systems and to make sure that human impact on these systems is minimal and where there is undue impact in the Anthropocene to try and ensure that some of those effects can be

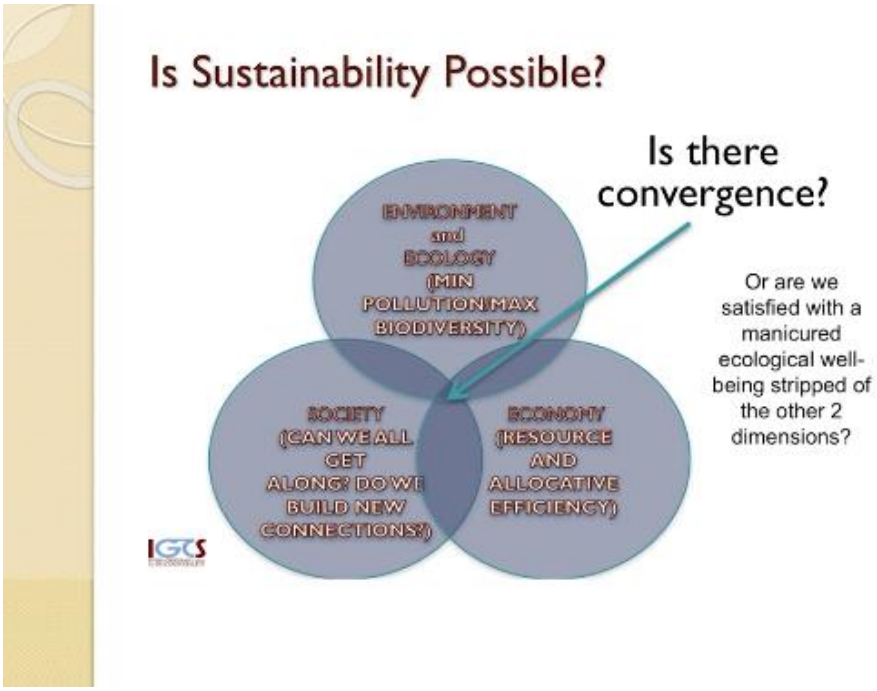
mitigated through other actions, so understanding environment and ecology is, of course, a very, very significant part of trying to understand if we can achieve a sustainable outcome.

But just as important, our questions around the availability of resources, their allocation how efficiently they used, so resource efficiency and allocative efficiency are two separate issues.

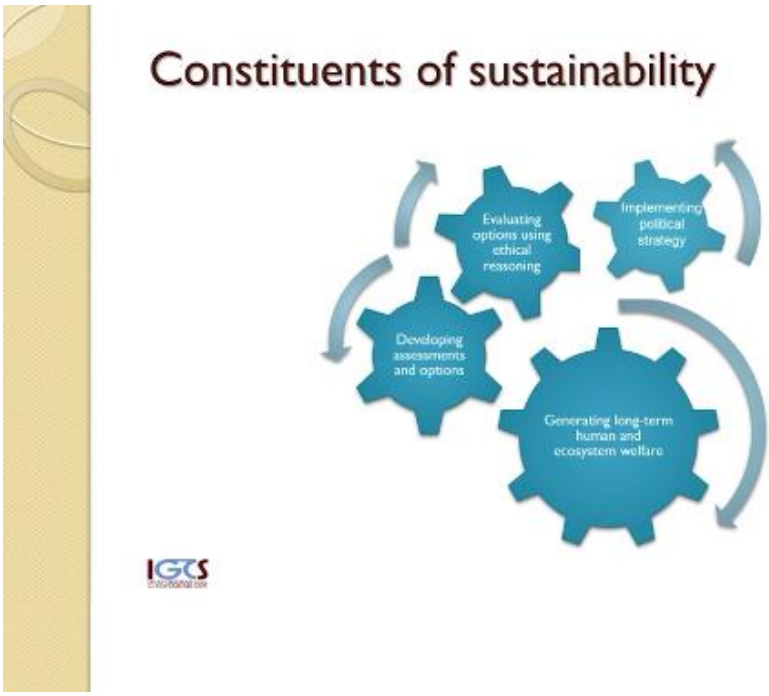
Resource efficiency really means, are we using resources in a manner that leads to maximum outputs, allocative efficiency is about while we are producing these outputs, are we making sure that we are not, they are no unintended consequences that we are not actually distributing them in some unfair manner. So, economic questions often also require some kind of ethical understanding of allocation, and usually this is done within the framework of what is known as utilitarianism, and this is the topic that I will cover in a future lecture, but it is important to know that the allocative efficiency is at least as important, if not more important as using resources efficiently in themselves.



And last but not least is a question of, can we all get along, can do we actually form new connections with each other, do we build solidarity, do we find ways to interact effectively together and that is, of course, the social dimension, the social dimension has often being ignored or underplayed in studies of sustainability. Most people seem to think that the environment and economy are the only two questions that need to be addressed, meaning people are often trying to understand what is this interface, and how do we make sure that we use environmental resources efficiently, and perhaps also use them with some degree of fairness. But the social question of actually ensuring that we get along and that we produce some modes of solidarity, getting along well, living well as a result of getting along well, all of those kinds of questions have been rarely studied, in fact sociologist themselves are partly to blame, because they have not paid much attention to sustainability for very long time until quite recently with the increase in threats from the Anthropocene. But it is also due to the fact that the sustainability domain has been largely dominated by people from the natural sciences, engineering, and economist, and so there need to be some kind of balance across these three pillars of sustainability.



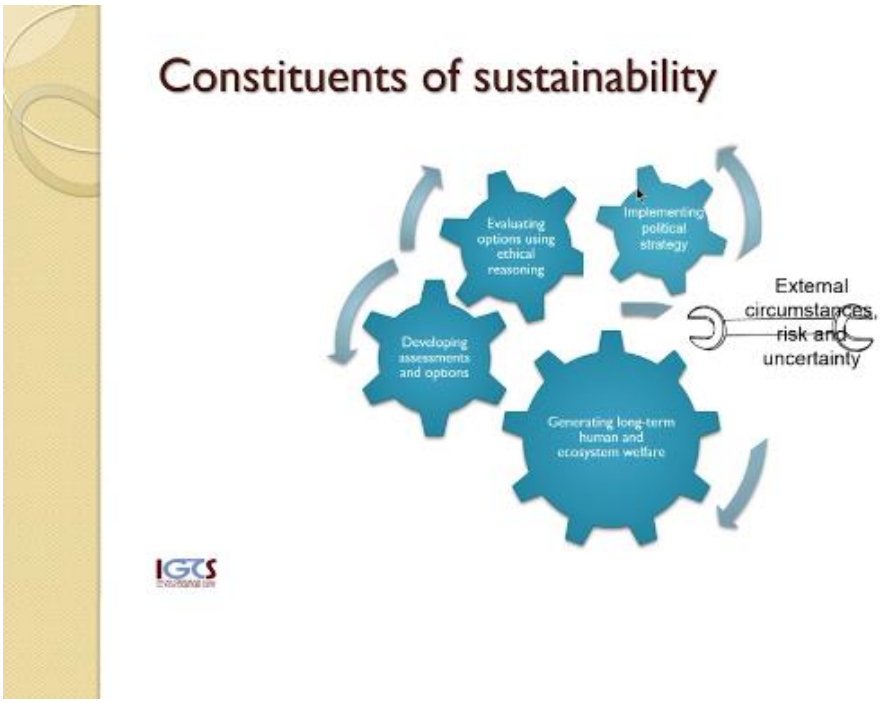
Is there convergence is a question that is extremely important, is something that people are asking all the time, and if not, if there is no convergence are we usually satisfied with some kind of manicured ecological well-being, some idea of ecological well-being that is stripped of the other two dimensions. So, what tends to happen is the undue focus on environment and ecological questions might lead us away from questions around resource efficiency, allocative efficiency in particular but just as importantly you know questions of how do social formations actually work well, what kinds of institutions are required to keep them working well, what kind of emergent effects are likely when people work well together, and what emergent effects are likely when people do not work well together. When communities enter into conflict and strife what are the effects especially in the context of depleting resources and eco-systems being destroyed or degraded.



Doing sustainability well is obviously involves many, many things and here what we are trying to represent is the series of gears to show that lots of things need to work well together, right. So, if the ultimate goal is to generate long-term human and ecosystem welfare, then all of these other components are quite important, right, first of all we need to develop good assessments and clear options about what needs to be done, we need to evaluate those options using some form of ethical reasoning and I use the word ethics quite carefully because ethics is about what must be done, what should be done, it is not a scientific question, it is a question of values, it is a question of values that I shared, so it is a societal values to be sure, they are not neutral values I mean that is an oxymoron to talk about values in a sort of an objective, neutral sense, they are values to which we as human beings are committed to, one way or the other, so we need to articulate those values well and we need to make sure that we understand why we are doing, what we are doing, what our goals are. So, ultimately it is very important to bear in mind that this ethical reasoning is really why we are actually even talking about sustainability, sustainability is not some you know it is not just anything, it is a value, we care about the future, we care about the present, we care about not destroying the earth, we care about not destroying the fragile inter-linkages between human beings, across human beings and between human beings and the rest of nature.

And so trying to ensure that we understand what needs to be done in sort of a broad, more or less generic sense is extremely important and just as it is in specific circumstances, should this option be pursued rather than the other option, what are the ethical criteria we will use to decide on that, these are extremely important questions and doing ethical analysis or doing the evaluation of options correctly, properly is a very important part of the exercise of trying to achieve sustainability.

Certainly there is another dimension or another gear as it were, that of implementing a political strategy. And of course politics is about trying to get groups who may not agree with each other groups, who maybe in conflict with each other to end up engaging in action that is mutually beneficial, and sustainability or to be as to the extent that the ethical values of sustainability are well-articulated then effecting a sound political strategy is more likely, but these are not given by any chance, there are all sorts of ways in which things can go wrong, there are all sorts of interest groups that may need to be appeased, there may be short term and long term types of comprises that need to be thought about, and of course huge questions of power, questions about elite groups and elite interests, questions about who is going to be left in and left out of these kinds of negotiations, all of that constitutes politics, something that certainly needs to be taken seriously, not to be sort of left as an add-on at the end of a serious thought process about implementing sustainability.



Now, certainly all of this is also subject to external circumstances, risk and certainty, uncertainty rather and these are, these can be appear in multiple forms. For instance there might be a terrorist attacks somewhere that completely destroys the plans that a country has made to implement some kind of sustainable policy, there could be a war or some other external natural disaster that destroys; natural disaster unrelated to you know the kinds of environmental challenges we have been talking about and earthquake perhaps, another geological event, not due to climate change, not due to any of this other factors, now the other planetary boundaries being affected, and yet these could play havoc, on all of these elements. So, chasing sustainability to begin where we started is a worth-while cause, it is a tough cause, and it requires multiple disciplines to be working well together, certainly environmentalists,

ecologists, engineers, social scientist of various types, including economists, right. And the ethical components of sustainability must not be forgotten, and neither must the political components.

Thank you.