Sustainable River Basin Management

Dr. Franziska Steinbruch

Department of Civil Engineering

Indian Institute of Technology, Madras

Module – 08

Lecture - 36

Part 1

Welcome everybody to sustainable river basin management; module 5, part 1. First, let us look at what we have been doing. We have finished module 1, 2, 3 and 4.

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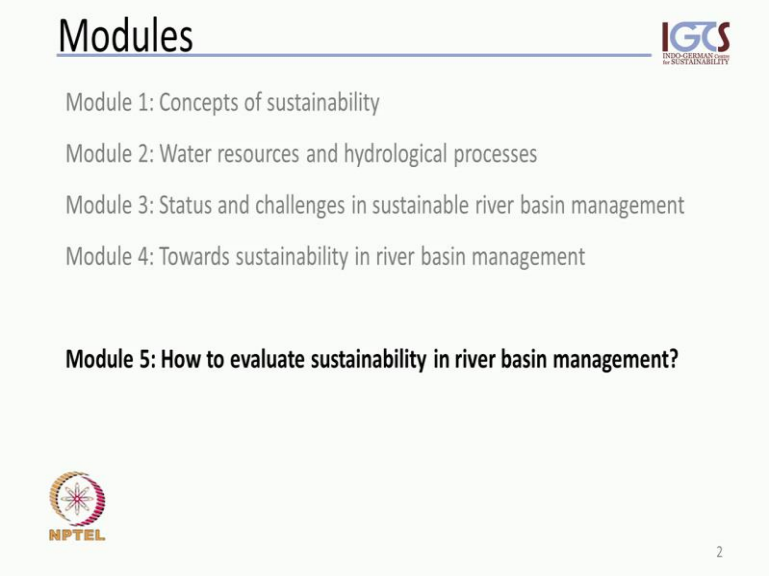

We now, move into the last module on how to evaluate sustainability in river basin management

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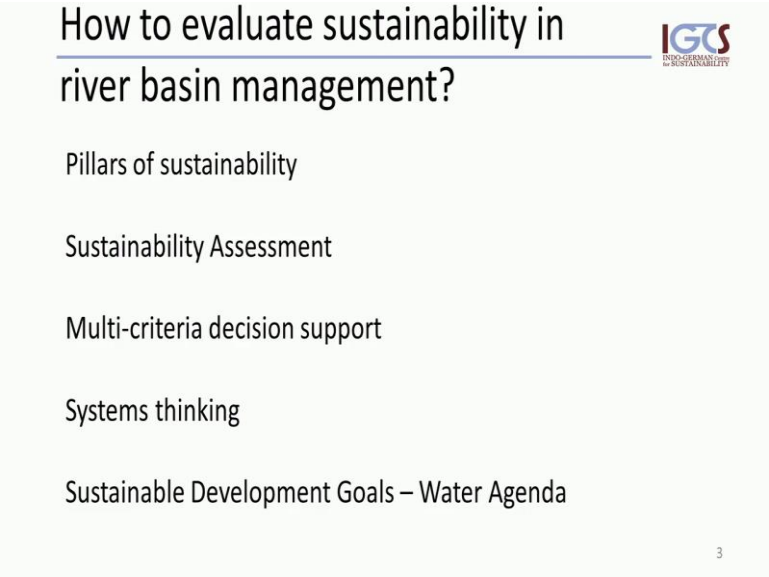

Now, I want to cover the following subjects. We will be talking about pillars of sustainability in this module; about sustainability assessments, about multi criteria decision support, about systems thinking and about sustainable development goals and water agenda.

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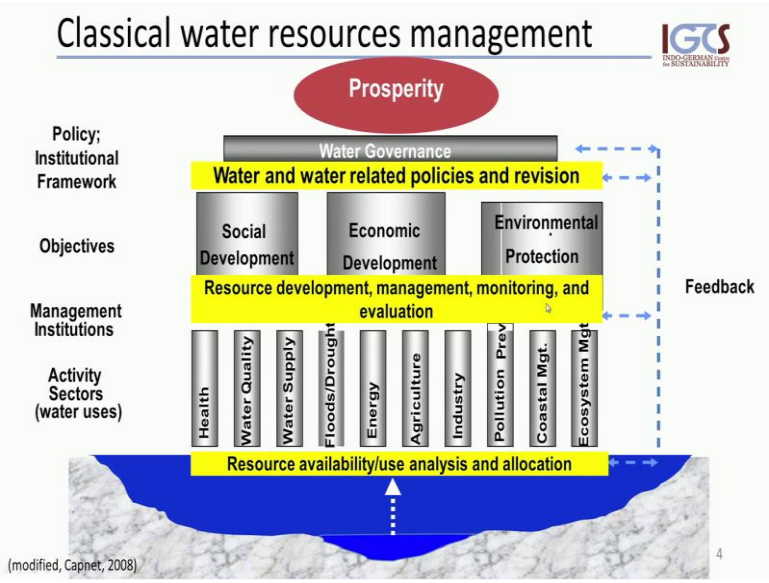

Let us first look into the classical water resources management. We usually departed from our water resource of some water body, a river or a lake, some ground water reservoir and conduct resources availability or resources use analysis and allocation and we deliver a service to the users. The overall goal of this is to achieve prosperity, to achieve well being and socioeconomic development. Now, in between, we have the

various sectors; we have the health; we have water quality; we have water supply; floods and drought; disasters; we have energy sector; we have agriculture; we have various industries; we have pollution prevention; we have coastal management; we have ecosystems management.

Those are dealing all or requiring resource development, the resources management, monitoring and evaluation. We have discussed some of these during the course. Then we are having various objectives to achieve. One of these is the social development. The other major objective is economic development and we have environmental protection, coming in as an end. This has been roofed by the so called water governance. This is our umbrella, which should bring into place, water related policies and revisions. Now, those different actors are linked to each other by the objectives that I just mentioned, and all of these require an institutional framework. It requires policies as a society to function. Then we have various management institutions that help us achieve those sectors, targeting specific water activities and specific water users; all of those may be coordinated or they may act individually, independent from each other.

All of them are using one and the same pool of resources. Then, we expect in many cases this is also happening; a feedback taking place between these various levels, sector levels, the local level from the resource location to the governance level. So, this is our classical model. The resource, the major objective, the prosperity is resting on these development oriented objectives.

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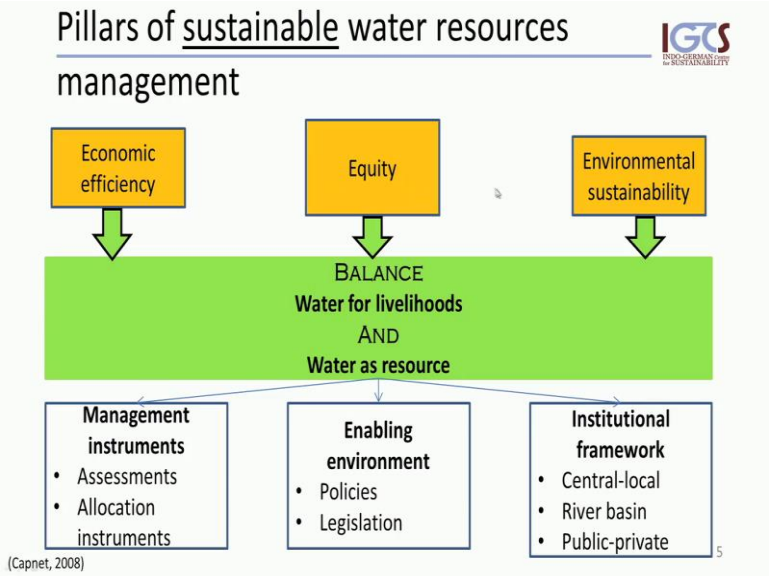

Now, there is a slight change, now that we bring into this picture when we actually, want to achieve sustainable water resource management, and I call those, the pillars of sustainable water resource management. First of all, we want to achieve a balance; a balance between two aspects; water for livelihoods and water as a resource as such. This is slightly different perspective to the prosperity approach. So, we want to make sure that we include and provide space for livelihoods in general, without the larger goal of becoming a better faster accelerating all of our dimensions, based on our current closed model. So, it is a balanced approach if you want to achieve here. Then we have those three pillars; the economic efficiency is one; equity as the second and environmental sustainability as the third.

All of them contributing and should contribute in a balanced, equally balanced manner to our major objective here now, a green box. Then we have various techniques, methods at hand. They have management instruments; we can conduct assessments; we have allocation instruments in place, applying to all of these three pillars, and we require an enabling environment for both, for all of these functions that should be created through policies, through legislations and we require an institutional framework. We need a link on this subject, a working link between the central government, the national level, the regional level and the local level and we need institutional frameworks for the entire river basin, and we need frameworks, which allow the exchange and collaboration of the public-private relationships. So, all of those three boxes that we have here, are equally relevant for each of these pillars, above here.

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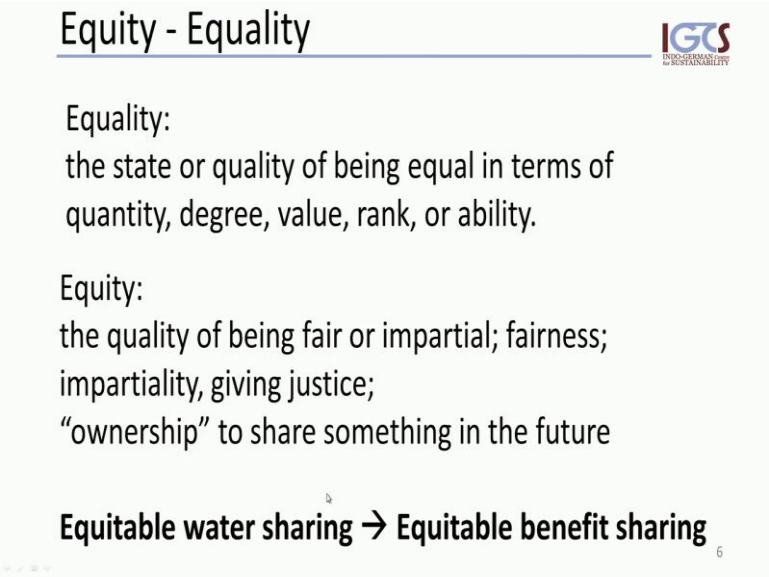

Now, let us briefly talk about the equity and equality issue. What we mean by equality is that we mean a state or quality of being equal, in terms of quantity or degree and value, rank or ability, and this means equal; as the term says equal in both sides. If we want to distribute water equally, means that all of us get the same share, same amount of water and the same quality at the same time, under the same financial conditions for instance. That would be equal and as we know that is not possible, because simply, we do not have the water resources available to do so, and on the other hand is also, no need to achieve equality in this, because individuals may not need the water equally, equal amounts, at equal times, under equal conditions and so on.

So, that introduces a new concept, which is equity and this is the quality of being fair or impartial; that also stands for fairness; over this perceived fairness, impartiality or providing justice, giving justice, but it also stands for a kind of ownership to share something in the future and this is what also, works in the water resources management to share benefits and to look for equity, look for fairness or justice in the sense, to providing access at the time in their quantities, amounts that are required or useful at a certain time.

For instance if a farmer requires water for irrigation, he requires that portion only, during a certain period of the year and he would perceive; it is fair. If someone else uses if that water will be available throughout the entire year, makes use of that amount of water to a better use during the times when he or she does not need that water for farming activities. So, also interesting is this ownership concept here, which allows somebody to take decision or so on; what he or she needs right now? What is fair or what is, do I need this in the future to be able to prepare, to plan, to focus economic investments or plan certain interventions for certain period of the year, and be sure that I have that resource or I can find; I am not able to make full use of it. I can share that in the future, once I shared that with somebody still, get my fair share back for my own applications. So, this takes us to the terms, equitable water sharing and also equitable benefit sharing, which are essential concepts to achieving a sustainable water management.

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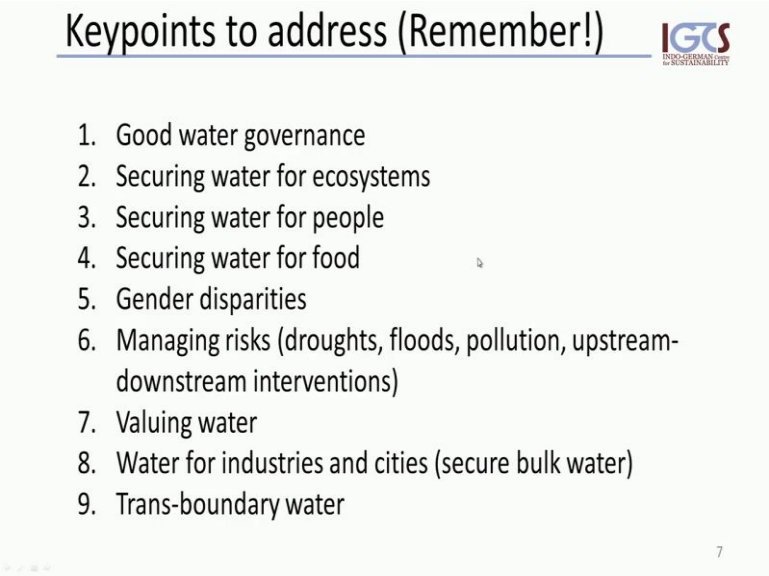

Now, remember the key points that you have to be addressed in sustainable river basin management. I just want to list them here again. We talked about them and we also talked about some of those in very detailed; the good water governance, the securing water for ecosystems, the securing of water for people, securing water for food, the gender disparities, risk management, the valuing of water, the issue of water for industries and cities in the form of bulk water and trans-boundary water. So, those have to be addressed adequately, to achieve sustainable river basin management.

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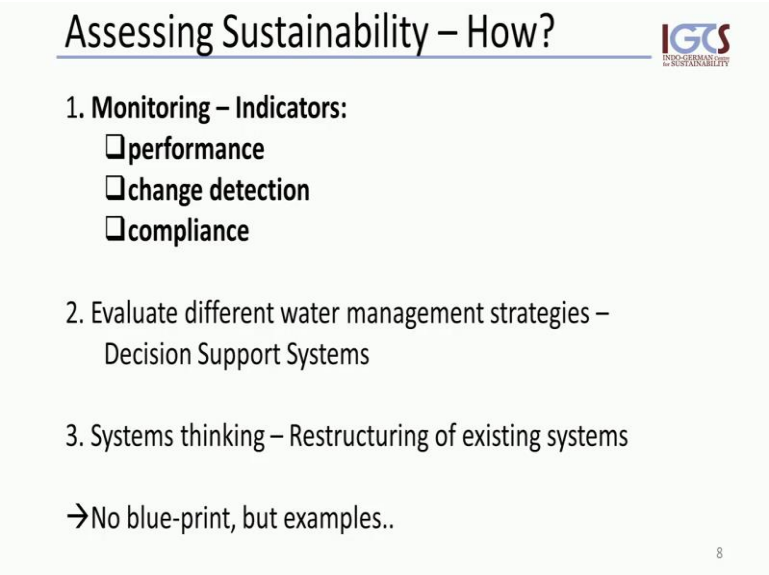

Now, how can you assess sustainability? Well, in the context of water management, there are around three different tools or concepts that I want to introduce to you. First is

monitoring, and for that we can use indicators. We (Refer Time: 12:09) us to analyze performance. We can also detect changes and we can use monitoring for compliance checks. This is what we have been talking about previously, and the second of these options of assessing sustainability, is to evaluate different water management strategies. This takes us to something that we call decision support systems, and the third is an approach called systems thinking, and this leads us to the restructuring of existing systems.

Now, let us keep in mind with, there is no blue print, no final recipient available to assess sustainability especially, in river basin management. I want to give you some examples. When we look into the monitoring indicators; essentially, looking into what is happening right now or what has been happening in the past; what has changed between today and the past? We use that for corrections, to administer our charges or our principles for instance, polluters pay principles, to redirect resources so on. This is what we use monitoring for. We are not substantially, changing and establish system to become, may be more sustainable. We can achieve resource efficiency and we can achieve compliance with the legal frameworks that were put into place. Now, the second here on the decision support system and this takes us already to a strategic level, where we can work on and reshape our overall goals. We can reestablish or revise our major frameworks, our strategies through this decision support system.

So, this already has such change and influenced our system as such; our established water resources management system. Then the third one here takes us to the profound changes within our established water resource management system, which profoundly can take us to sustainable water resource management scheme or system, where there is no such in place right now. So, this can take us to major changes in the entire frame that we have been looking into before.

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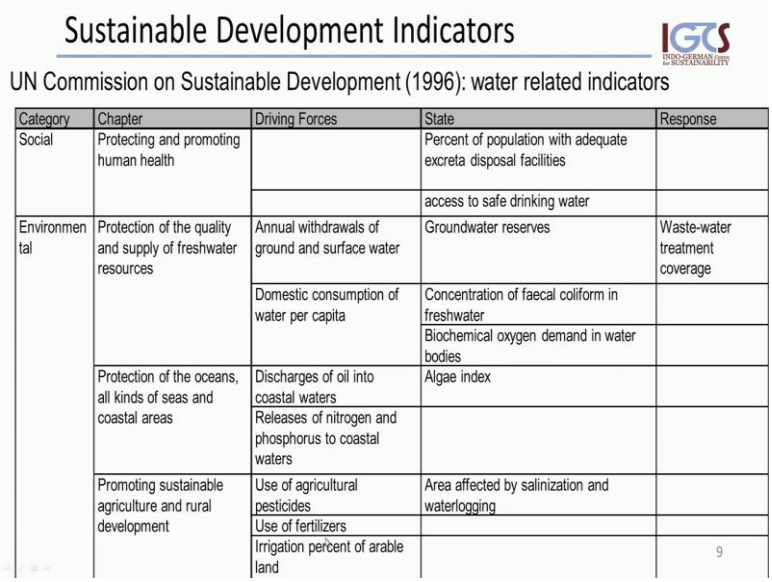

Now, let us start with the sustainable development indicators first. Here is an example taken from the UN commission on sustainable development, quite some time ago and only showing the water related indicators. So, we have here, categories and then, it is divided into chapters, into driving forces, the state and the suggested response here. Then we have here, categories, the social environmental and for each of those, we have different, what I call, chapter protecting and promoting human health, protecting water quality and supply of freshwater, protection of oceans and any kinds of seas and coastal areas, promoting sustainable agriculture and whole development. Then the driving forces looking into what the systems loops are, which could be enforced and influenced to achieve a certain state, represent of population with adequate excreta disposal facilities, allocation facilities, access to safe drinking water, amount of ground water reserves and so on. So, those could be the target goals, which should be achieved by addressing these driving forces systems loops in this.

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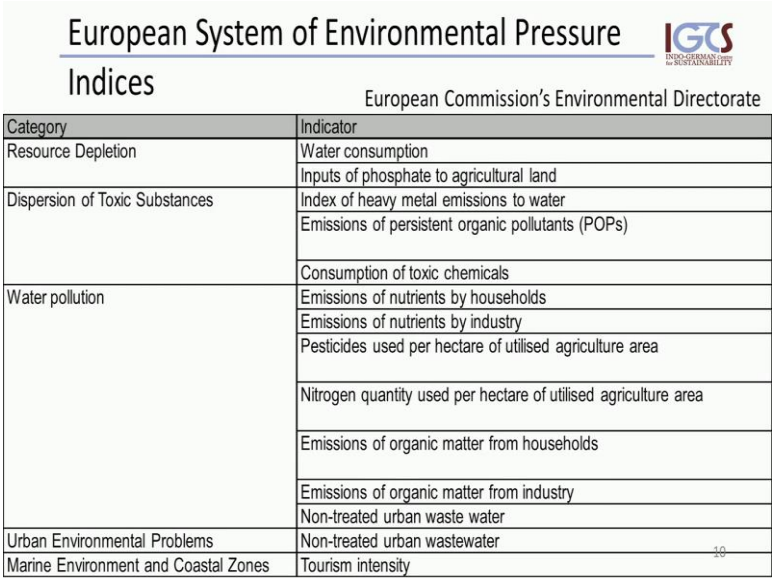

Now, another system we have here, from the European system of environmental pressure indices that was developed by the European commission's environmental directorate, and they formed different categories; the resource depletion, dispersion of toxic substances, water pollution, urban environmental problems, marine environment and coastal zones. Those are all issues when we look at this. Then we have indicators here and those are components that can be measured, that can be collected in the form of data. There could be interviews or there could be sensors, installed to measure these parameters here. So, we have sort of hard facts here on this side, non treated urban waste water, tourism intensity and quantity and so on, which indicate what the state here is. The question here is what do we want to achieve? We usually want to achieve a positive outcome, a positive impact whereas, here we are actually, monitoring towards negative impact and negative outcome. So, certainly as is one approach of dealing with that, but it sort of tracks us into another feedback loop of monitoring against a worst state, instead of monitoring against a wanted better outcome.

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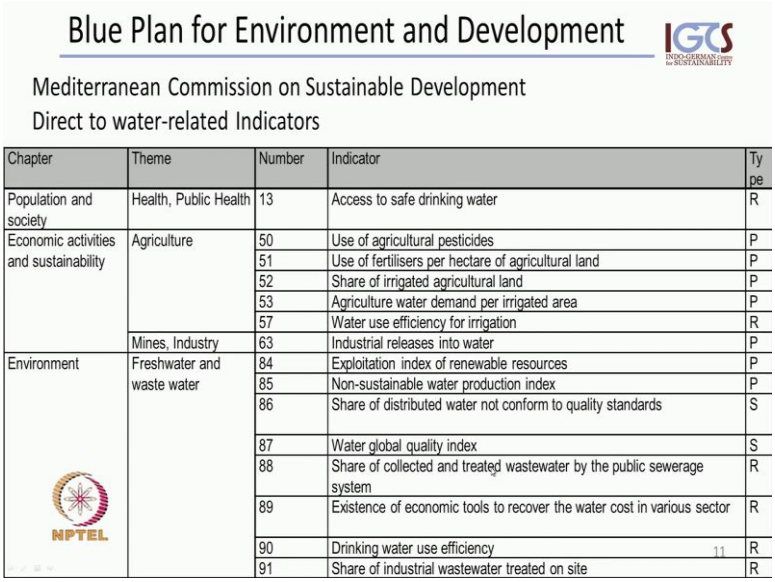

Chapter	Theme	Number	Indicator	Type
Population and society	Health, Public Health	13	Access to safe drinking water	R
Economic activities and sustainability	Agriculture	50	Use of agricultural pesticides	P
		51	Use of fertilisers per hectare of agricultural land	P
		52	Share of irrigated agricultural land	P
		53	Agriculture water demand per irrigated area	P
		57	Water use efficiency for irrigation	R
	Mines, Industry	63	Industrial releases into water	P
Environment	Freshwater and waste water	84	Exploitation index of renewable resources	P
		85	Non-sustainable water production index	P
		86	Share of distributed water not conform to quality standards	S
		87	Water global quality index	S
		88	Share of collected and treated wastewater by the public sewerage system	R
		89	Existence of economic tools to recover the water cost in various sector	R
		90	Drinking water use efficiency	R
		91	Share of industrial wastewater treated on site	R

Now, another example that we find is the so called blue plan for environment and development. This was developed by the Mediterranean commission on sustainable development. Those are countries that commission as composed of representatives of the Mediterranean countries. All of them sharing the Mediterranean sea and in that also, sharing the problems of water pollution occurring in that sea and along the coast lines. Here, we have again, a division to check that; the things and record number here or id and then, you have indicators here and then, a category, a class into which, this has been simplified to visualize it.

Then we have here, our three dimensions of sustainability; we have our population society with social component; we have our economic activities and sustainability, and we have our environment here. Then the different topics or themes, which appear to be very relevant for these Mediterranean countries; the health, public health, agriculture, mining industry perceive this very important or and freshwater entries, base water management. We have a whole lot of indicators of parameters, which can be measured and which can be recorded and shared between these various countries of this Mediterranean commission.

What you can see here already, is that in this specific case that you have many indicators; for example, for economic activities; if just one indicator for this social component and we have quite a number of indicators for the environmental dimensions, where then the question of how to represent those data in a common indicator for instance, in a common index for sustainability, might be not so straight forward.

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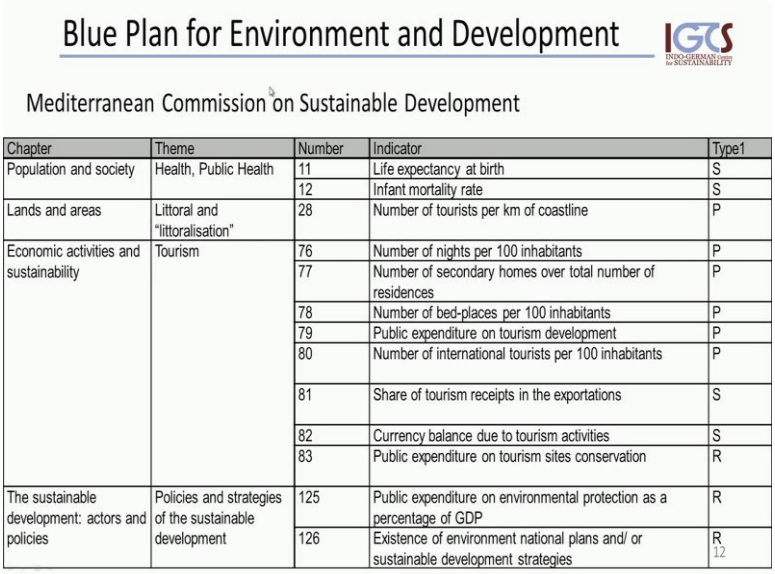

Chapter	Theme	Number	Indicator	Type1
Population and society	Health, Public Health	11	Life expectancy at birth	S
		12	Infant mortality rate	S
Lands and areas	Littoral and "littoralisation"	28	Number of tourists per km of coastline	P
Economic activities and sustainability	Tourism	76	Number of nights per 100 inhabitants	P
		77	Number of secondary homes over total number of residences	P
		78	Number of bed-places per 100 inhabitants	P
		79	Public expenditure on tourism development	P
		80	Number of international tourists per 100 inhabitants	P
		81	Share of tourism receipts in the exportations	S
		82	Currency balance due to tourism activities	S
		83	Public expenditure on tourism sites conservation	R
The sustainable development: actors and policies	Policies and strategies of the sustainable development	125	Public expenditure on environmental protection as a percentage of GDP	R
		126	Existence of environment national plans and/ or sustainable development strategies	R

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Now, additionally depending on the region, we have other chapters added to it. Again, the social component, the lands and the area as an additional issue that is relevant for some of the countries as far as the sustainable development actors and policies perceive this very important and then, depending on the area in sort of mining and agriculture is we have seen in the other case before. Tourism is one of the major topics in this specific case and for that, a larger list of indicators were developed as we have here, specific indicator on lakes and lakes systems, which are very important again, from a tourism perspective, and have a major impact on lands and areas. Then we have a component on policies and strategies towards sustainable developments. So, this is an example of how different countries with their very own economies, can come together and develop a joint assessments frame and plan for towards environmental protection development altogether.

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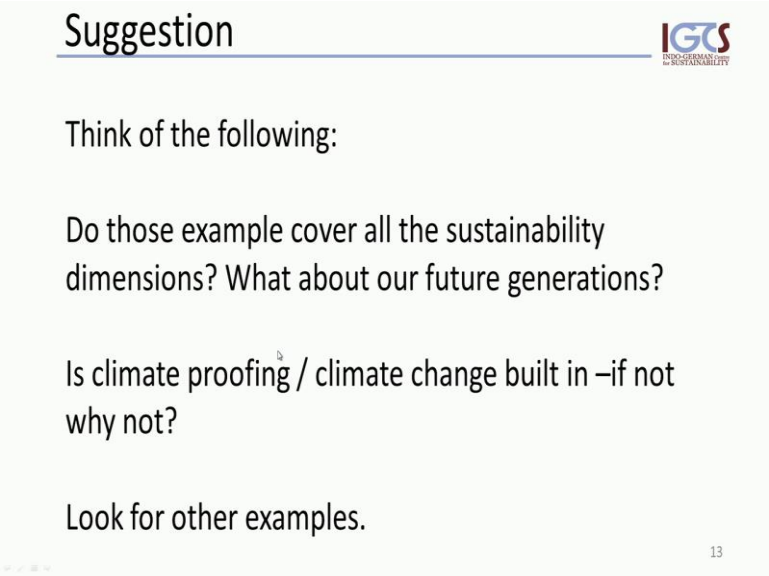

Now, before we stop here, I want you to think about the following. Do those examples which I showed you, cover all the sustainability dimensions? What about our future generations which is; obviously, part of this sustainability definition? What about the issue of climate proofing as climate change built in or not why not; what would you think? I suggest also you to look up other examples, which may provide you inputs to these questions that I leave with you now. With this, I want to close. See you next time for the next class.