Water Economics and Governance
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Lecture - 14
Water Sustainability: Viewpoints and Conflicts

Hello everyone, we have been discussing about the water sustainability this week, we did talk about the basic sustainability and then what in the last couple of lecture, we did talk about the Dublin statement its various key points and acts and agenda set in terms of Dublin statement. So, this is what we discussed we will continue our discussion on to water sustainability and in this particular class.

We will be talking about various viewpoints of sustainability, because if you follow the discussion on to sustainability you must have realized that sustainability just is a very broad term it is one of the most used term it encompasses, so many things that water has to be it in terms of water if you talk about. Water has to be safe for water has to be sufficient and safe for future generation, as well in addition it talks about the intra in and intra generation equities into the demand management or water provisions.

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So, when we talk about the sustainability there are various different viewpoints there are basically three particular pillars are considered for a sustainability, but before we go into that, there are 3 key elements to a sustainable water future. So, one of them is the

resiliency, then efficiency, and then quality. So, you are the efficiency of course, talks about how efficient the water systems are in grass.

So, it talks about the water supply system efficiency of water supply system efficiency of water treatment systems efficiency of sewerage collection systems, efficiency of revenue generation or revenue collection systems those things. The quality prospective talks about the quality of water which talks about sort of health prospective sanitation, prospective pollution, prospective environmental effects, or environmental impacts what kind of environmental impacts are being to be led in these prospectives, while resiliency talks about from the quantity prospective on to the resources particularly.

So, what are the water resources, what are the risk related to the like flood and draughts water related disasters risk, then vulnerability of the water resources in terms of quantity particularly. So, all these are covered under the resiliency, there are basically your it can be sub indexed as well, so resiliency will have your water stress or water scarcity what we call the green space, water related disaster raise, flood risk, water balance, water footprint, water reserves. So, all these will come in the sort of resiliency related this thing. Then in efficiency then there is leakage management leakage control water, charges tariffs service community wastewater, reuse efficiency metering water, drinking water, supply systems, pressure management systems, sanitation practices all this will fall under the efficiency. While the quality of drinking water the sanitary hygiene, and quality of the sanitation systems, treated wastewater quality, water related diseases water pollution, all this will fall under the quality prospective.

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Now, as we are saying that we will talk about the different viewpoints particularly.

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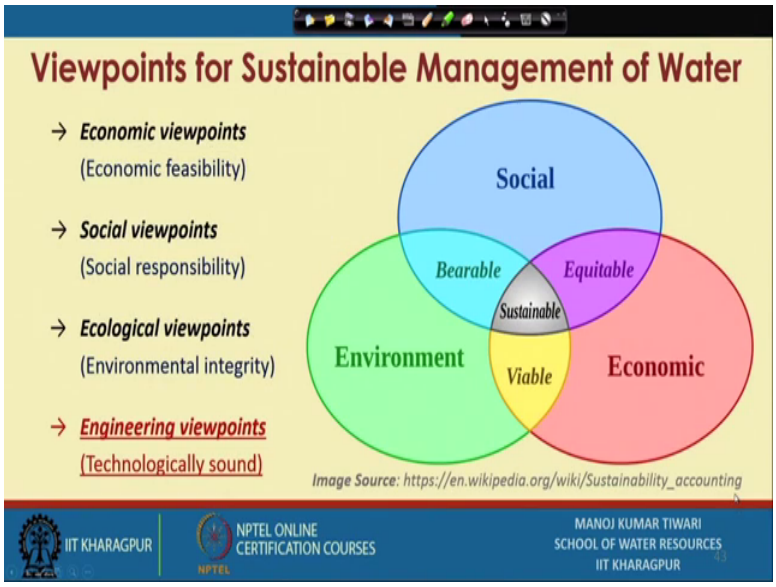

So, if you see the sustainable development has three basic pillars as basically is commonly said. So, there is a social viewpoint, there is a social pillar of the sustainability, then there is another pillar which is actually the environment. So, that needs to be taken care of or should be supportive in terms of environmental management that is what sustainable development is. And then it has to be economically sustainable as

well so, the economic or terms also is one of the very important pillar of the sustainability.

Now it is interesting that if you see these overlaps over here so, we have the social and environmental overlap is variable whereas, social and economic overlap is equitable, environment and economic equal lab overlap is viable while, if it is falling under all these three pillars, then only it is sustainable the central part of the sustainability which you can see from this point.

So, based on this there are certain viewpoints as we were saying initially. So, there is a economic viewpoints which talks about the economic feasibility. There is a different financial criteria as well which we will talk about in a few minutes, but as an overall there is economic feasibility has to be assessed. So, whether a system is economically viable or if you talk about in terms of the resource generation finished generation, so whether it is equitable or not so, those kind of things are seen here. Then there is a social viewpoint which talks about the social responsibility of the water management systems. Because eventually the water management systems has to benefit the society. So, what how much efficient or how much effective it is in serving those social responsibilities is decided it is social sustainability for example, let us say a water supply has to be equitably distribute the water another different section or subsection of the societies. Now if we have a water supply system which is being which is serving a particular group of people or particular type of particular income group of community, and ignoring the other it is not socially equitable and cannot be said to be socially sustainable system.

Then there is an ecological viewpoint which basically or environmental viewpoint you can say which talks about the environmental integrity. So, how much effective the system is in environmental maintenance this is more has to do with the quality. Of course, the quantity also will be a integrated part, but whether like we are degrading environment in terms of pollution or in terms of if you talk about the quantity.

So, if we are extracting too much of water from resources which is hampering the ecosystem demands. So, or ecological demands of water, then that is not environmentally sustainable system so, these are the three the environmental social and economic are the three sort of generally conceived generally considered pillars of sustainability; however, there is one more viewpoint which is often ignored particularly because when we talk

about the sustainable management or sustainable development it usually goes to the policy makers, bureaucrats and those kind of people. They do give deep due importance to society or in may be environmental prospective, financial prospective, economic prospective, but they often ignored the engineering viewpoint which is very important in sort of sustainable management of services in particular the water utilities.

So, that is another very important viewpoint which is your engineering viewpoint, or technological viewpoint you can say that whatever technology you are deploying in the field because the water utilities needs and incorporates various technological aspects at various stages. So, for example, there would be there would be with which technology you are abstracting the water from resource.

Whether you are pumping it making it in the canal form how you are doing if you are pumping what kind of pump you are using whether you are going for centrifugal pump or f b pump. So, there are different types of devices instruments or in general sense if we say there are various types of technologies available which one you are picking, there are when you talk about the treatment aspect again there is a variety of technologies available starting from the very basic chemical treatment procedures to the most advanced reverse osmosis or what typically we refer as row systems ok.

So, there is a variety of technology each have it is environmental aspects each may be having it is cost implication aspect, but so, when there are various technologies available what is the engineering viewpoint onto that particular technology in terms of sustainability. That also needs to be evaluated considered and should be given due importance. So, that is another essential component or essential pillar of a sustainable systems, that how efficient a technology or how sound the technology is that which you are using in terms of various aspects.

As the multiple technologies could be available for starting from the water abstraction to water treatment, to distribution, to supply, to resource generation. If you want to go for groundwater recharge or if you want to go for sort of put back into the system. So, how effective is your wastewater treatment technologically effective, or how technologically sound is your wastewater treatment system is all this thing will sort of contribute towards the overall sustainability of the system. And that is why the engineering viewpoint is also

one of the very important aspects of sustainable development or sustainable management of the infrastructure or of the systems.

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So, if you see the water policy is generally perceived for multiple objectives. And this then can be structured around four different dimensions. So, whenever water policies is developed it could have maybe one or in fact, more than one of these major objectives in for the sustainable dimension of course, the objective of water policy will be maybe putting water to maybe providing water the prime objective could be providing water to a community, but that will fall under a social objective if you see here.

So, there are four different frames of objective there is one is environmental objective. So, whatever water policy you are developing how helpful it is in fulfilling the environmental objective or the sustainable environment management for example. If you are abstracting water from groundwater, what is the allowable limit to abstract water, you can make a policy on to that seeing that it does not tend to deplete the groundwater level excessively. If you recall the basic concept of sustainable says that water withdrawal should more or less be equal to the amount of water recharged in terms of quantity in terms of quality both so, that way your environmental objectives should ensure that it is not hampering the environment.

Then there is a financial objective how much how much revenue you can generate out of a system, then there is economic objective then which would which is likely to be the

most rewarding program or most rewarding use or that kind of identification of those kind of opportunities from economic perspective would serve your economic objective. And then one has a social objective which sort of suggests, that which as I was saying in the very beginning itself that the social objective could primarily be the main focus of putting a water policy or putting a water utility or those kind of systems. For example, if you are trying to make a policy that, let us say you are having a Trans Boundary River, this much of water is to be taken up this was to be sent for irrigation this much of water is to be sent for the industrial applications this much of water would be for domestic application.

So, this is primarily the social objectives you are setting up you are allocating certain amount of water, for agriculture which is again for in turn will eventually generate the livelihood for so, many people there sort of income depends on to that. So, how it how the your water allocation can fulfill their expectation of irrigation water of that particular society, that particular community the agriculture the people involved in the agricultural business their community or small agricultural people there their community.

So, what social benefits are what social objective your policy is fulfilling for them, you are allocating certain amount of water for industrial growth, so there is certain objective aside to that that you are expecting this much this particular rate of growth for the industries or this particular industry to be set up at certain location. So, all those objective it will be there a requirement of this much water how much water you can allocate to them how it can be efficiently used.

So, all that will fall under the again sort of there could be a financial objective or economic objective involved in that as well as, we are saying that it is not that your objectives are independent of each other a certain activity may be leading to fulfilling more than one objective ok.

So, there will be societal development there will be financial recovery for allocating water to the industries. So, that is maybe setting up your economic objective as well as social objective, then there is a domestic water supply systems, or municipal water supply system, you can allocate for that certain amount. So, that is another fulfillment of your basic fulfillment of social objectives. Now these objective may at times support each other, but at times actually they may cause potential conflicts with each other. So,

we will talk about the conflicts how they can support each other we were just talking about let us say you are allocating water to industry. So, that is giving to your industrial growth which is one could be one of the social objectives, or may be sort of if industrial growth is promoted in a certain reason or certain town or certain area, it is going to be it is going to bring development into the community in many terms. In terms of productivity from that area, in terms of job opportunities, in terms of maybe higher per capita income so, all these things eventually may land up increasing or working in favor towards the development of the overall society, which could serve as a social objective at the same time it could serve sort of economic objective that water sent to industries will be charged at a probably higher tariff as compared to the 1 that comes from the domestic circles.

So, that is going to probably serve your economic viewpoints as well; however, at times there would be conflicts as well, because if you are setting up certain amount of water taking the same example, if you are setting up certain amount of water for industry what if you are sacrificing on the environmental demand or ecological demand of water. In case of limited water availability. So, if let us say the your resource does not have significant or does not have sufficient amount of water available, what eventually will happen to the ecological demand, if you are putting water to the industry or other purpose.

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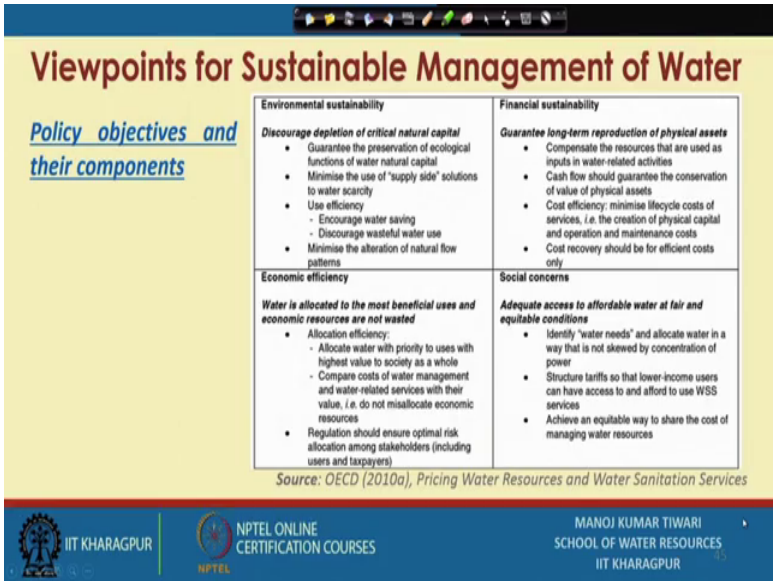

So, there could be conflicts as well along with the along with your supportive object, support towards the one of support from one objective towards the achieving the other objective as well.

So, if you see the different components of these policy objectives major policy objectives. So, the your environmental sustainability objective sort of discourages depletion of critical natural capital, water is you are a critical natural capital now your this aspect, this environmental sustainability aspects just a minute yeah. So, environmental sustainability aspects says that water should be judiciously used so, that the ecological or environmental sustainability is ensured now.

Environmental sustainability means your water that you are taking out from the resource is not that much. So, that it can actually affect the ecology in gross terms so, for example, if you are taking a if you are abstracting water from river. So, that if you are abstracting too much of water from a river, and the water left in the river is not sufficient to maintain the e flow requirement minimum environmental flow requirement for survival of aquatic ecosystems or for other environmental purposes.

So; that means, that resource is under severe threat, and it is a non-sustainable practice. So, that has to be ensured then there is another aspect of the quality aspect. If you are putting pollution polluted discharge into a water body in a quantity that it cannot sustain or it cannot deal with then the quality of the quality of the water at your resource is going to be depleting day by day that is another non sustainable practice. So, the environmental system sustainability aspect says that there has to be in terms of policy it guarantees the preservation of ecological functions of the natural water resources or natural water system.

So, it encourage eventually the water saving from the community uses. So, because if your water demand is less you will abstract less water so, more is available for ecosystem uses or ecosystem purpose. So, it encouraged basically the water saving from that perspective and discourage the wasteful water uses so, wasting of too much of water uses or sort of unjudicial water uses.

So, that needs to be discouraged water should be saved as much as possible, and this way it sort of minimized the alteration of natural flow pattern. So, your natural flow pattern should not be altered too much the river is best in it is pristine stages. So, kind of

attempts should be made towards the maintenance of that stage, then there is a financial sustainability which talks about the guaranteed long term reproduction of physical assets. So, this kind of compensates the resources that are used in put the water related activities. So, it ensures the cash low cost efficiency, and the cost recovery in financial terms, then there is a economic efficiency, which says or which suggests that water is to be allocated to the most beneficial use and economic resources are not to be wasted.

So, water considered if you consider water as an economic resource, and if you take the perspective from any economist you will say that resource should be allocated or should be given to the section or to the society or to the community from where you get maximum return ok.

That is it is most beneficial use. So, the allocation wise if you talk about the economic efficiency allocation wise that water should be allocated based on the priority to use with the highest value for the water. Now this highest value for the water is very dicey term if you see, what is the highest value for the water, maybe if you are giving water to the industries they will pay the highest array, because they are using that water for profit making their business is depending on the water let us say.

If for example, our company let us take example of nestle if nestle is making a food product, it is requiring certain amount of water in the processing. Now that water if you supply that water to nestle;, nestle, will be able to pay much higher tariff for that water, then if you provide that water to a middle income aged family group or even if you your middle income group family can also pay some amount to the water services; however, if you provide the same water to another's, to another family or low income group family. So, you are not expecting any return from them.

So, that is not going to be the value or higher paying value in terms of water if you see independently, but the value to water is a different thing in value to society is a different thing. So, water allocation to industry maybe highest like highest return on to the water in terms of finance or in terms of capital, but water supply to the needy society people for their domestic uses is the highest value to the society.

So, in economic efficiency and that is sort of a debate that what should be the priority allocation of the water. So, if you take the wholly economist prospective or economist view, it is said to have that water should go to the place from where you get the

maximum return, but a societal perspective suggests that water should actually go to the most beneficial societal, uses and for societal uses, or for the use of a society the most beneficial or the most basic use of the water is to the fulfillment of the domestic demands.

Fulfillment of the water demand for the purpose our drinking, for the purpose of cooking for the purpose of maintenance of our body or which is bathing and all this stuff. So, that is probably the most valuable or highest value use in terms of society. So, the cost of water management and water related services has to be compared, and then water considered as an economic resource should be allocated, with proper regulations, and proper tariffs that is the economic efficiency objectives.

And then under these social concerns. So, adequate access to the affordable water at fair and equitable conditions is to be ensured. So, from society point of view one needs to identify the different water needs of the society, and allocate water in a way which is not skewed by the concentration of power so; that means, it talks about the equitable distribution that water should be equitably distributed it is not that if certain section is from the well to do family or have the more capacity to pay or that kind of thing so, they are entitled to get the more water.

That concept is not like socially sustainable. So, for societal concerns it has to be equitable distribution. So, the water needs to be accessed maybe based there you can see that based on the standard of living certain people needs this much of water certain people needs this much of water. Now a person living in a living in a sort of large bungalow would; obviously, need more water even for cleaning and household activities as compared to the person which is living in a small slum, per person water if you see you can the drinking demands would be similar, it can fairly be assumed that drinking demands are similar.

Maybe cooking demands more or less you can consider similar though, but then there as cleaning demand, gardening demands maintenance demands, all that will again depend on the area occupied and this kind of stuff as well coming to the picture. So, the water needs societal water needs is to be accessed carefully, and then distribution has to be accordingly it is not based on the sort of power politics and all those things.

The tariff structure should be so, that the lower income users can also have access to the minimum quantity or the expected quantity or the quantity which is being given to which should be provided to them under their rights to water and sanitation acts. So, that much amount of water should be available at lower tariff or based on their income and all these aspects to the people or to the lower income groups of the society as well.

And then cost sort of again try will we try to put into the prospective that when how much cost recovery is to be done from which sector, and how equitable way of cost management can also be ensured in a society. So, those kind of policy objectives are to be set for the sustainable management of water, and based on these objectives one has to frame the policy and implement those into the field from different perspective. As I was saying that these policies at times brings too many conflicts and that is what we will be discussing in the next lecture on to the conflicts.

Thank you.