Sustainable River Basin Management

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Module – 4 – 1

Lecture - 28

Part 3

Welcome everybody to sustainable river basin management; module 4- 1, part 3.

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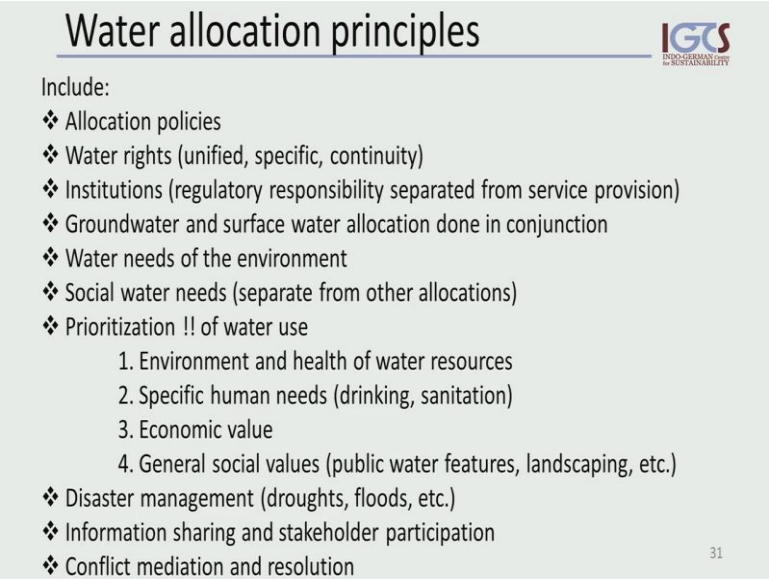

We were talking about water allocation last time, and this is what we will continue this time. Let us first of all now, move into water allocation principles. Those include allocation policies; it includes water rights; those could be unified water rights or specific or continuity water rights, different types. They also include institutions. There should be a regulatory responsibility, separated from for instance, service provision. This is in terms of accountability, important, some water allocation principle. There should be an aspect, included on ground water and surface water allocation in conjunction.

In most cases, those are separated by different authorities and in many cases, the river basin organizations that we talked about last time, are only dealing with surface water bulk allocation and ground water is already, singled out from the responsibilities. So, the

principle should be reposed or managed in conjunction. There should be water needs of the environment, should be incorporated and the social water needs should be specified and taking care of separate from the other allocations. There should be a privatization of water uses and that prioritization should be in that following order; this is an order here, from one to four. The first location, first priority should be always given to the environment and the health of our water resources.

The second priority should be given to the specific human needs, which means drinking water, sanitation. We talked about basic water needs earlier. This is in terms of priority at a second stage then, this is followed by economic value of the water use and the general social values come at the fourth; the public water features for landscaping and so on. Those would fall under social values. In many cases, the economic value is being taken up to the first level and only later, will be realized that there are human needs and there are ecological environmental functions, which are important to secure the water for the economic purposes, which or then at this point, may be degraded already substantially.

In terms of economic value, what we mean here is that we can balance water use, according to the value that we gain from that water use. There are more allocation principles; there should be one on disaster management; how to deal with droughts; how do deal with flood events and similar. There should be information sharing and stakeholder participation as a principle and there should be mechanisms for conflict mediation and conflict resolution.

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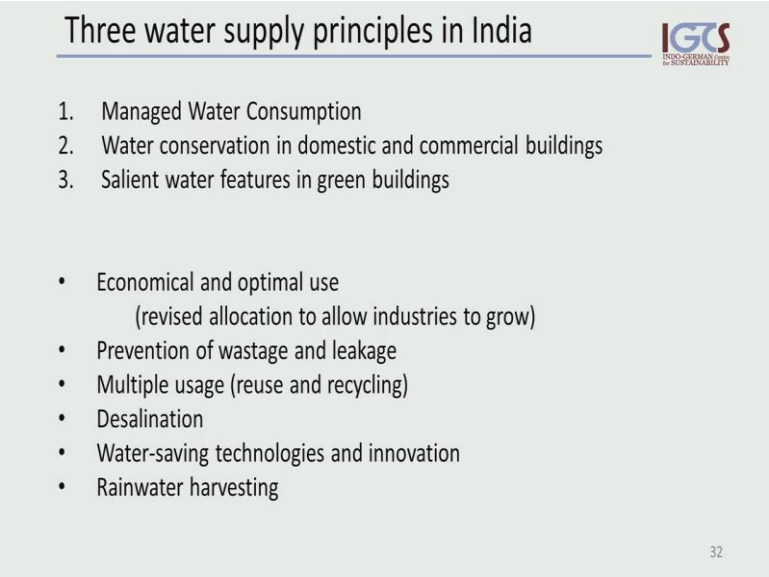

Let us look into the example of India, which has three water supply principles. The first is dealing with managed water consumption. Second is on water conservation in domestic and commercial buildings, and the third is on salient water features in green buildings. Now, the priorities are here, on the economical, on optimal use and in that respect, allocations were revised now, to allow industries to grow. For instance, this comes along with the reclassification of land use areas to provide, to convert a farming land into for instance, residential areas or into industrial development areas.

So, this is connected to water allocation and other one is the prevention of wastage and leakage. This is focusing on technologies and multiple usages, reuse and recycling are promoted our basic water supply principles and desalination is being built into the water supply principles. Important also, are water saving technologies and innovations and rain water harvesting. Now, remember looking at this list here, the chart that I showed you earlier on our adjustment strategies and also, think about the level of committed or commitment of river basins in India.

Then we can see that all these water supply principles are very helpful; however, they will not really, take us to finite positive solution, because many of the rivers are over committed so. Desalination may be one option to ease the situation right now, but it should not become a long term solution. So, a long term solution is on rain water harvesting, ground water enhancement, on the restoration of the functions of entire river basins; this may come along with the decommission also, of river infrastructure, basin

storages and so on, or the restoration of the connectivity of these river basin infrastructures. Let us just take another example, another angle of water supply principles and this is an example from Germany.

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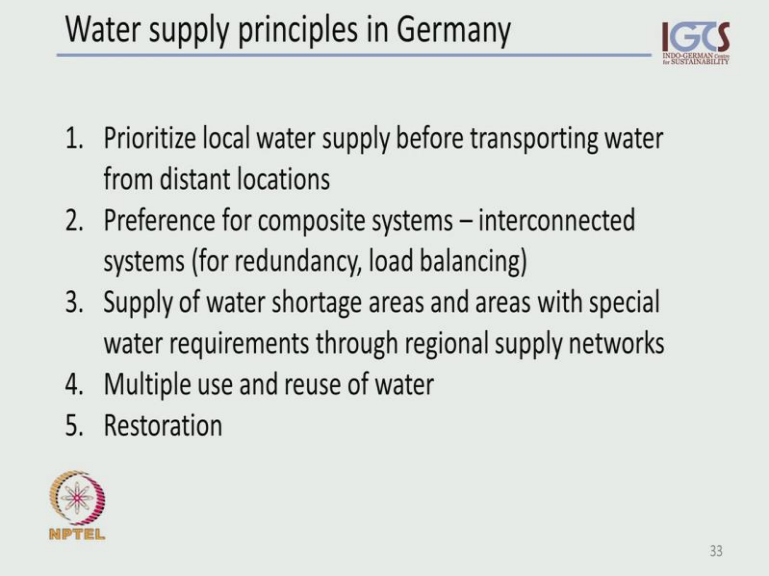

In this case, the first is prioritize local water supply, before transporting water from distant locations; this is very interesting. The preference for composite systems or interconnected systems; this is for to guarantee some level of redundancy and also, some level to balance load at certain times or certain parts of the year, when more water is required or less water is being consumed, during nights for instance, to guarantee that loads can be properly, balanced throughout the supply system. The supply of water shortage areas and areas with special water requirements should take place to regional supply networks. So, besides local solutions, there should be a network of supply systems at a regional scale and there should be multiple use and reuse of water and also, the restoration of water resources of water bodies or aquifer systems, is one of the principles.

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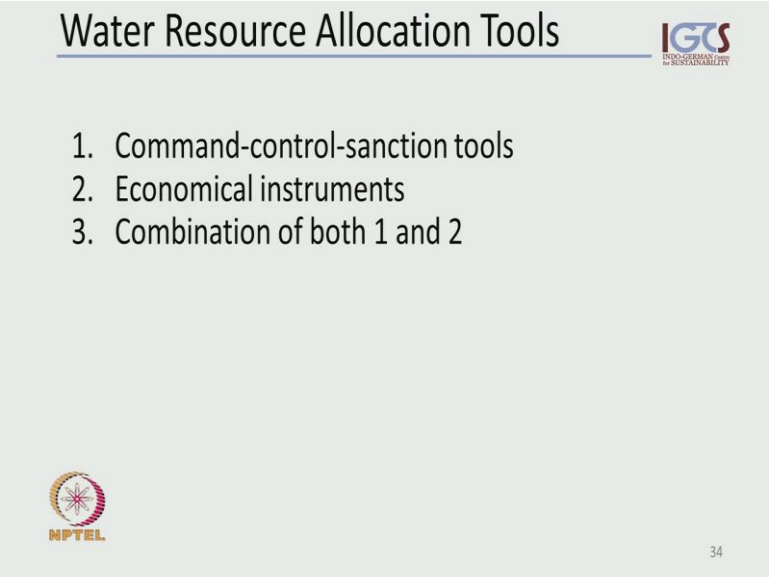

Now, having talked about these principles, let us now, move into the water resources allocation tools and there are essentially, two of them. The first is the so called command control or sanction tool and the second are economical instruments. In many cases, many countries, we can see a combination of both of these water resource allocation tools existing.

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Now, let us try to understand what is a command control tool. It includes the restrictions at three levels; restriction, prohibition and rationing of water. Specifically, it might be a legal prescription that can have a direct impact on the range of options, open to specific

social actor. It can constrain certain ways of acting or using water or having access to water or it could exclude someone from having access to water or conducting certain activities; some farming for instance, in certain areas. So, this is not providing incentives to conserve water or to be more efficient, this is being controlled by the way, the water is provided from its very beginning. If rationed, you only receive given amount and which will be available only for a given period of time and then, you have to expect another amount, quantity to be given and so on, and either you finished this amount or you will probably, not receive another portion next time, water is being provided.

So, it is not in that way, not giving the flexibility of an individual water user to influence its water use behavior in a positive manner. It requires monitoring and enforcement and that enforcement in many cases, can only work if there is also a comprehension that somebody understands, why this is going to happen and why this needs to be enforced. There must be mechanisms in place to enforce it for instance, the way of the license withdrawal or even prosecution. What we can say about this is that such a command control system should only be used in very rare situations as such; we will require resources to monitoring, enforcement of the system. It should, such rare situations could be a drought; it could be the outspread of diseases, but it should not be a lasting, a long term solution or the approach to water allocation over in a certain area, in a certain context of the river basin. It could for instance, this is applied in many countries, be for instance, that watering of lawns and washing of cars or swimming pool use at these stages would be restricted, during situations of drought for instance; that would be a comprehensive measure of a command control or sanction tool implementation.

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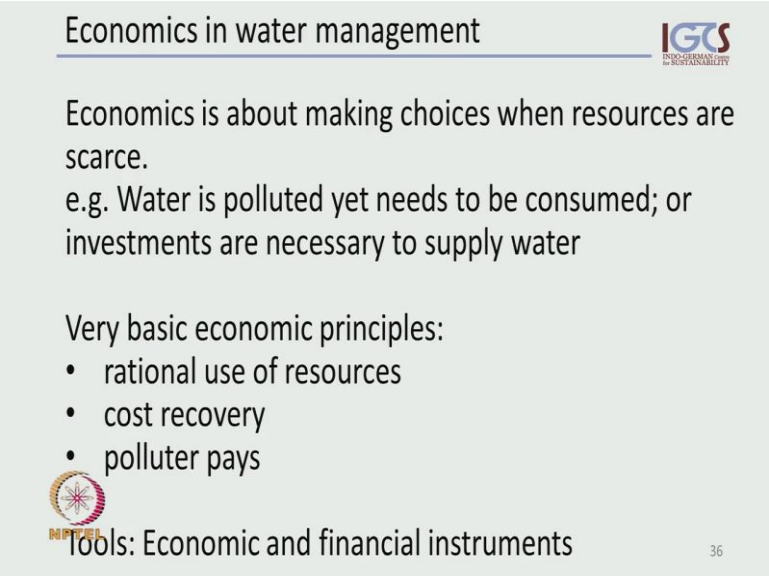

Now, the second tool, completely different approach to water allocation, is the use of economical instruments or economics in water management, and this is stepping out of this predefined frame by rationing and restricting policing. It is about making choices over scarce resources or when there is a huge resource competition. There may be for instance, polluted water only as the only resource and still, it has to be consumed or made available to be usable or there may be financial investments, necessary to take water to the users, to implement a water supply system, and all this requires economics behind the water management.

So, some of the very basic economic principles and remember; the white paper principles, proposed by the water supply industries, which I presented earlier to you. Those very basic economic principles are the rational use of resources, soon assuming that we are not wasting anything if there is no specific benefit coming from that, the cost recover y and the polluter pays principle. The tools I mentioned already are the so called economic and financial instruments to this.

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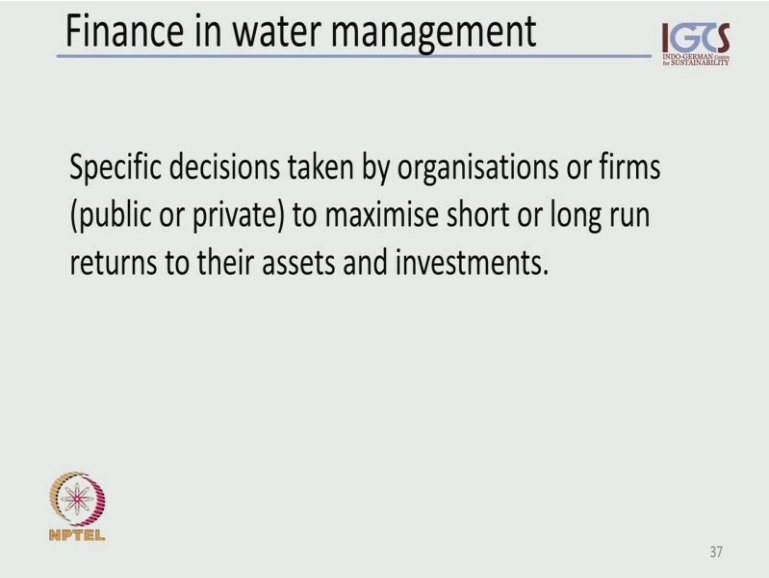

Let us quickly touch up on the financial instruments and finance in water management, without going very much deeper into this later. This is about specific decisions taken by organizations or firms and that could be public or private or both combinations to maximize short or long run returns to their assets and investments. This is general and very much applicable also, to water infrastructure.

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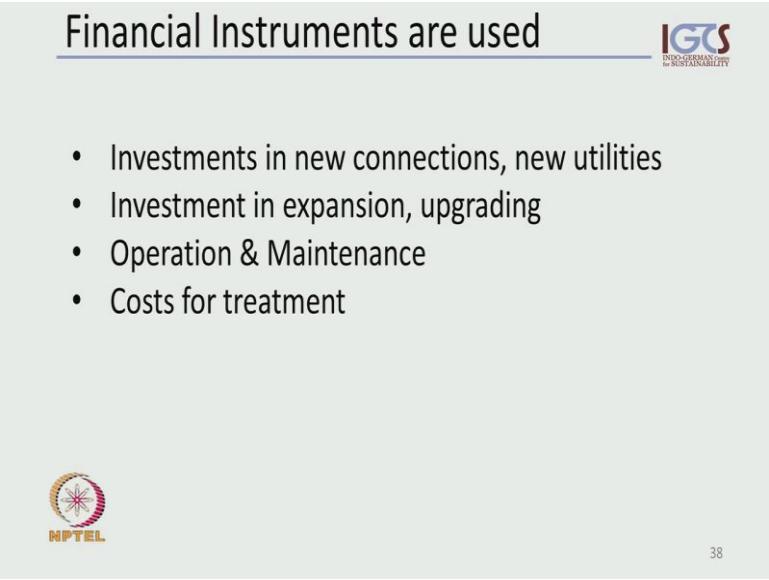

Now, those financial instruments are used in various ways. They are used in the investments into new connections; this is to expand the network, or to expand into new

utilities. It is used to invest in the expansion and upgrading in terms of area or in terms of water user, uses, user numbers. It also includes the finances on operation and maintenance and also, the cost for the water treatment.

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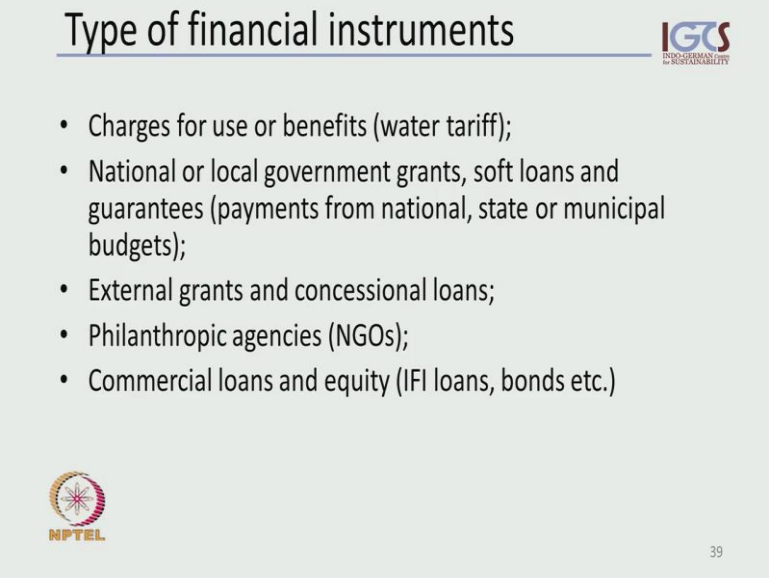

Now, there are various types of financial instruments, which some of them we will come back, are very important. We will talk about those when we come to economic instruments, because they come in combination with the financial instruments. One of them is the charges for use or benefits from water. So, one is water use, but also there might be charges for benefiting from available water in the form of water tariffs. There may be national or local government grants or soft loans and guarantees; those could be payments from national, state or municipal budgets. There may be external grants and concessional loans or there may be some philanthropic agencies, some NGOs, some foundations, some individuals or there may be commercial loans and equities.

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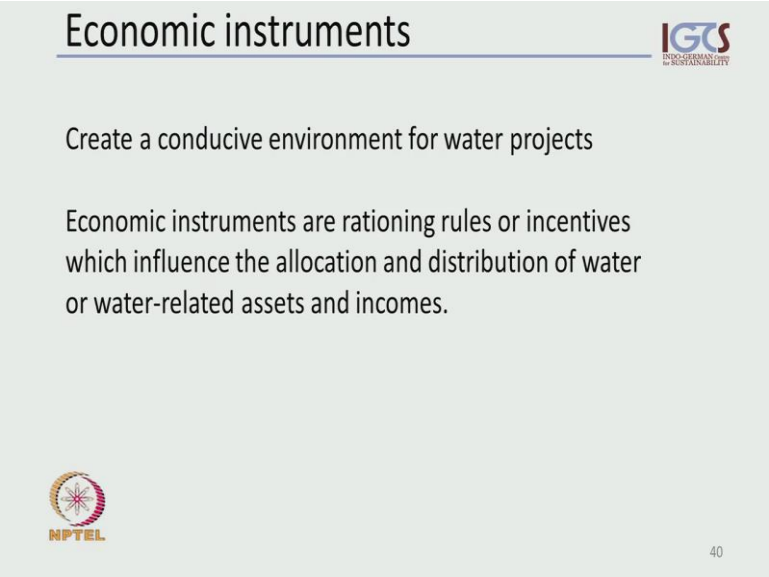

All of those are important, because water projects usually, are large scale in terms of financial requirements. Now, let us move into these economic instruments, and in those, we will be spending more time now. Those basically, create a conducive environment for water projects and economic instruments are rationing rules or rationing incentives, I am sorry, which influence the allocation and distribution of water or water related assets and income.

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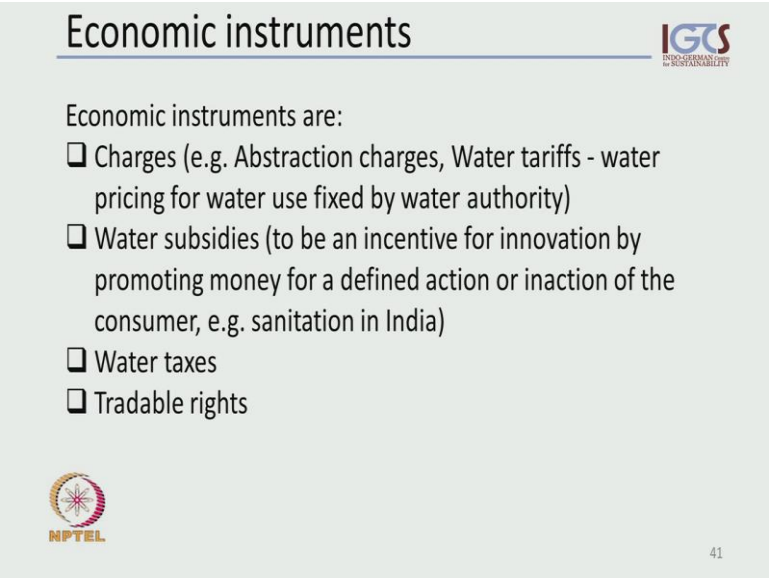

Those economic instruments include charges; for example, abstraction charges or they also include water tariffs, water pricing for water use, which could be fixed by or

regulated by a water authority; that is a water tariff; that is a regulated water price. There might be water subsidies, which might be applied to providing incentive for the uptake of innovations by promoting money for a defined action or inaction of the water consumer. We could take up the example of sanitation in India, where people are, the incentives were given to setup toilets and to use those toilets as well and then, there is another type of economic instruments, which are water taxes and tradable rights. We will talk about all of them, because all of them are extremely important.

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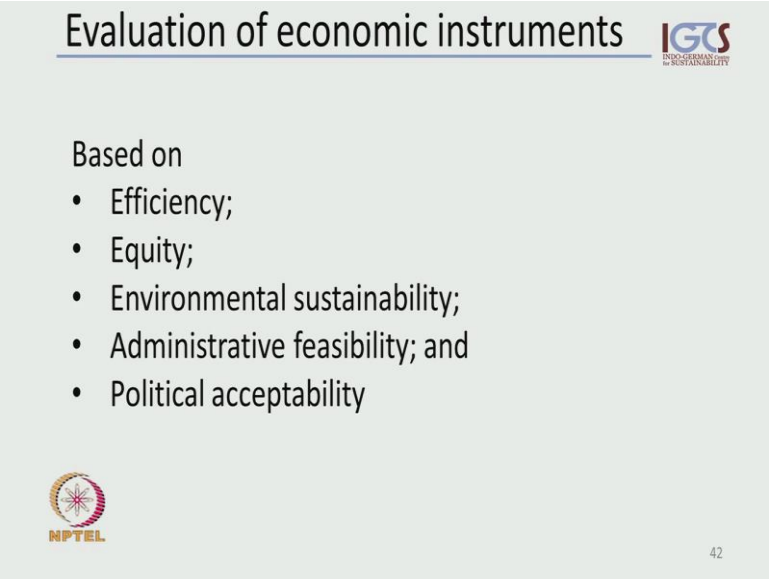

Now, let us first of all, think about the evaluation of these economic instruments. They are evaluated based on efficiency, based on equity and environmental sustainability, administrative feasibility and political acceptability, and those are quite interesting. Some of those are part of the sustainability framework, the efficiency, equity, environmental sustainability, but also interesting is the political acceptability. So, we see that some of the changes can only, take place in terms of how water is being used on what consumer demand from the respective industries, when there is a critical mess build up in political and social acceptance, be reached for the implementation of certain economic instruments at a large, at a social large scale.

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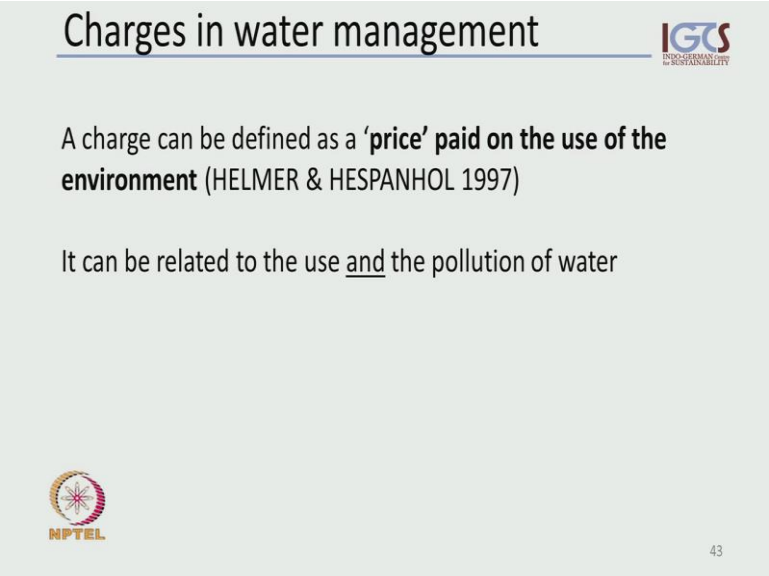

Now, let us look into the charges in water management in the next moment. What charge is in this context; it is a price that is paid on the use of the environment essentially. This is what a charge in water management is. This can be related to two things; one, the water use and second, the pollution of the water, because remember that any water use goes hand and hand with water pollution. No matter how well, we use our water or how careful, we are; any of the use will leave a footprint on our water quality.

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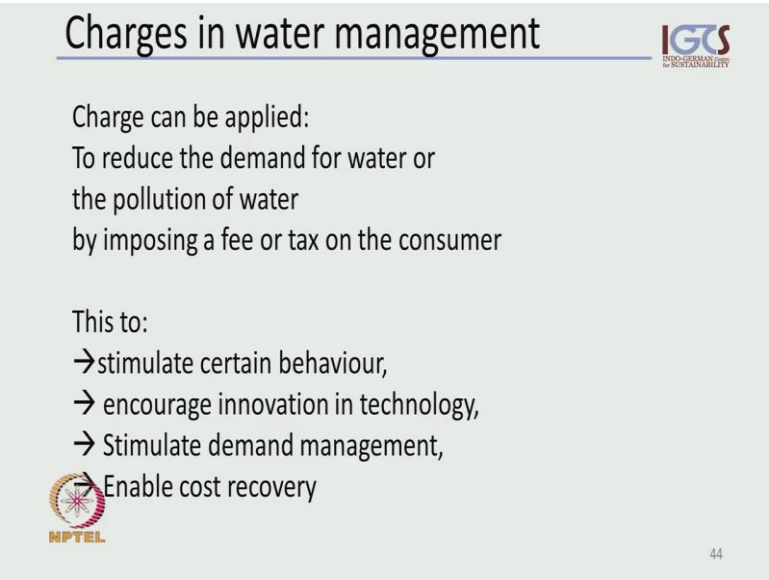

Now, continuing on these water charges, and those can be applied to reduce the demand for water or the pollution of water, both sides. We can influence both of these parts by imposing a fee or tax on the consumer and by doing so, we can achieve a number of

changes. We can stimulate certain behavior and this influences how people react; how as an individual or how people react in a group or how the entire societies may behave and change. It may also encourage innovation in technology. Very important, that there is a willingness and interest and motivation to put resources into research and development, in innovation in water technologies. It also achieves to stimulate demand management and it enables cost recovery.

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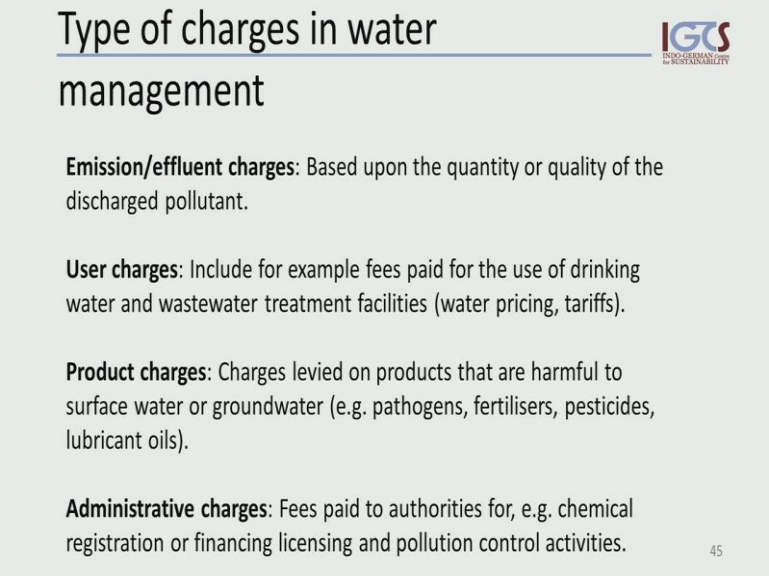

Now, what are the types of charges in water management? One that you probably, are familiar with is emission or effluent charges. Those are based upon the quantity or quality of the discharge pollutant. So, this means you paid; you are allowed to discharge a certain amount, quantity and certain type of pollutant into the river and for that by doing so, you are charged a certain amount that you pay, assuming that someone else uses this amount of water to clean up the water pollution. Then there are user charges and those include for example, fees that are paid for the use of drinking water and waste water treatment facilities. Those are water pricing tariffs and we will be talking about those in depth, next time. They are very important.

There may be product charges; there may be charges levied on products that are harmful to surface water or ground water, which may facilitate or introduce pathogens, fertilizers, pesticides, oils and sumps. These may be charged to certain industries for instance, which are more susceptible to such pollutants. Then there might be an administrative charge, which is a fee paid to an authority for example, a chemical registration or

financing licensing and pollution control activities. So, that is administrative to run the operations.

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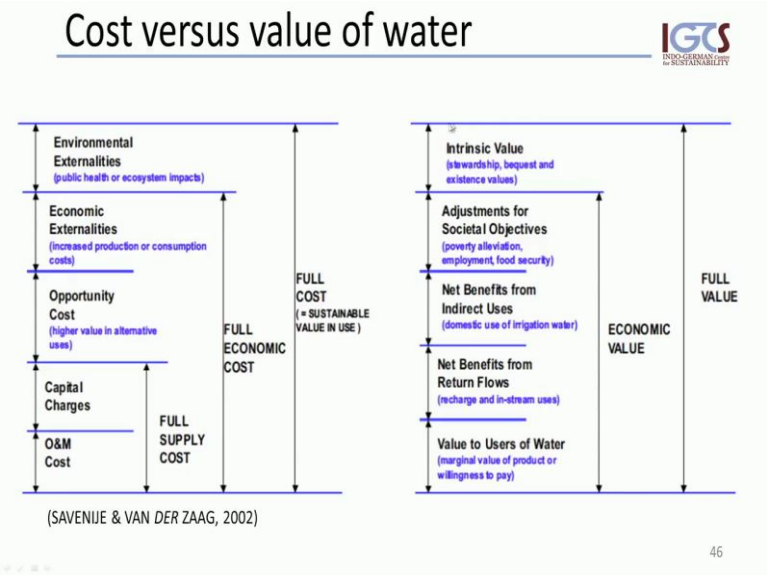

Now, I want to introduce an additional concept to how water pricing is made, which is to introduce the value of water to get over with the cost of producing and supplying water. This chart here, shows us both connected to each other here, from one side, all the relevant cost that occur with the finding of water, treating of water, distribution supply of water and on the other side, we have the value that we attach to the water at the various stages. So, in the least, we have operations and maintenance cost and we have capital charges investment costs and those are usually, added up to the full supply cost. In many cases, those are fully charged also.

Then we have additionally, opportunity cost and economic externalities, which together add up to the full economic cost, which very often, which has to be paid by somebody, but; however, it is usually not paid by the individual consumer, the receiver of the service, but paid by the society or some downstream person that is living downstream or far away from where, the water service was delivered. So, very often or this is a paid cost, but it is not taking care by the individual water user. Then we have environmental externalities which add up to the full cost if we analyze the cost of water from sustainability stand point and this cost usually, is not being calculated into any of these common usual economic cost benefit analysis.

So, this is a cost that is quietly, being taken up by our ecosystems services and also, have to have a response in public health. Now, on the same side, on the same scale, we have different values, which are worth being paid for; a value that is provided to the user of the water by receiving a certain amount at a certain time and certain quality and we are usually, well willing to pay for that cost. Then also, net benefit from return flows that is indirectly recognized and we also value that, but usually we are not accounting specifically, to it or and getting charged or pay for it.

Then we have net benefits from the indirect users and we have adjustments for social objectives. Those are for instance, poverty alleviation or additional employment or we may achieve food security through it; all of those give this economic value or socio-economic value that we recognize and we may monitor and we value the success of our social systems, social services against those. Then we have intrinsic values, which are not as obvious, like the stewardship (Refer Time: 28:27) and so on. Those add up to the full value of the water, which is very often as such, not being recognized by individual water users or by the society as a whole.

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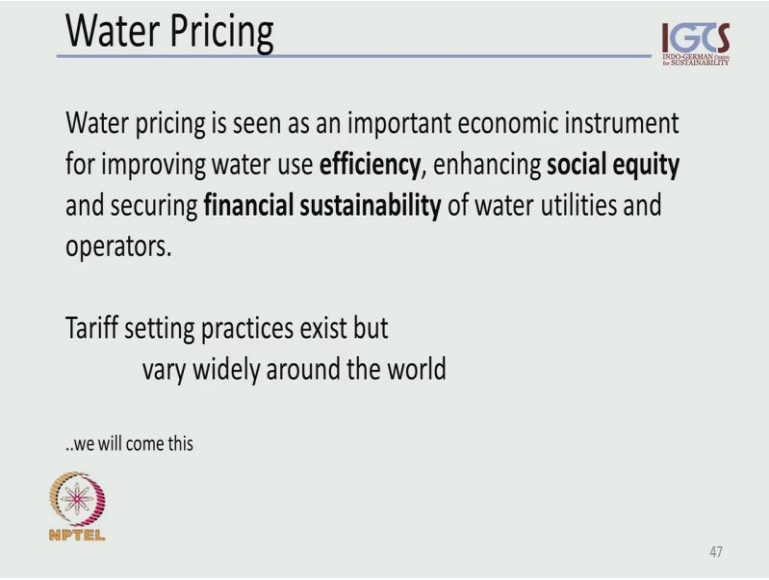

Now, this coming from economic instruments, keeping in mind the value of water and the benefits of water and the actual cost of providing the water, takes us to the water pricing concept, which I just want to introduce, before we close for today. So, water pricing is seen as an important economic instrument to improve water use efficiency, to enhance social equity and to secure financial sustainability of water utilities and operator.

So, this combines both of these parts, the value, the benefits from a social point of view from versus the cost aspect, from the financial sustainability, accreditation that I showed you just now. Both of those are combined in the water pricing and for that become acceptable to the water consumers and many times, those are set in tariffs and many countries also have tariff systems in place, which however, vary widely around the world. At this point, I want to stop and we will come in detail to this, next time.

Thank you.