Water Economics and Governance
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Lecture – 61
Course Summery

Hi everyone. So, we have completed the discussions over the content that was proposed to be covered in this course and in this particular session what I am going to cover is the summary of whatever has whatever we have covered over the previous weeks.

So, this summary will be divided in two sessions. The first session we will cover the summary of the content covered from week 1 to 6 while the second session we will cover from the summary of the remaining discussions that took from week 7 to week 12.

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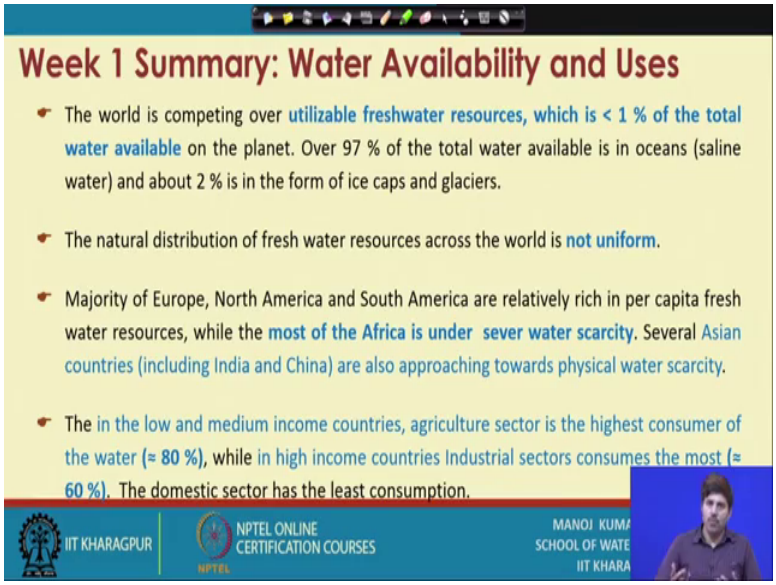

To start within week 1, we discussed the water availability and uses conditions in the entire world and specifically focusing the conditions in the India. So, quickly discussing the whatever we discussed as the word is actually competing our utilizable fresh water resources which is less than 1 percent of the total water available on the planet because over 97 if we go by the US Geological Survey estimates its actually 97.2 close 2 percent of the total water is available in the ocean which is saline and cannot be used and about 2 percent is in the form of ice caps and glaciers again impractical to use it. So, we are

basically competing for fresh water which is less than 1 percent of the total water available.

Now, the natural distribution of fresh water is not uniform some portions like some continents or some sectors have more allocation of the water or more reach in terms of water resources majority of Europe North America and South Africa are relatively reach in per capita fresh water resources while if we look the additions in the Africa that is the most poor. So, Africa is under severe water scarcity and several Asian countries including India and China are also either water stressed or approaching towards physical water stress or scarcity.

The low and medium income countries the agriculture sector is the highest consumer of the water which consumes around 80 percent and for high income countries the industrial sector is the highest consumer which consumes around 60 percent. The domestic sector has the least consumption in over the world actually, and the consumptions typically ranged from up to 10 to 11 percent at max.

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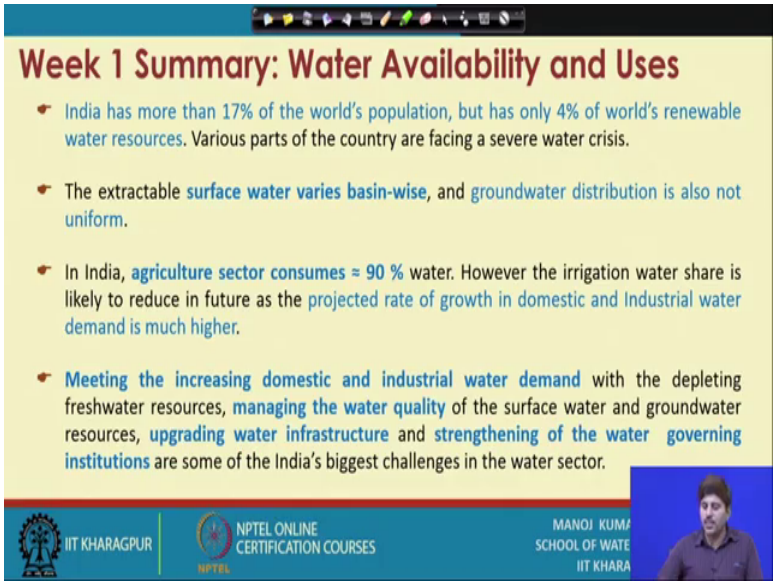

So, talking about the Indian scenario, we discussed that India has more than 17 percent of the world's population, but only 4 percent of the worlds renewable resources and that is why the various part of the country are facing severe water crisis. The extractable surface water varies river basin wise. We discussed the detail of different river basins during the lectures and the groundwater distribution is also not uniform, various state has

various quantities of extractable groundwater up tops the list, but there are various other states and the conditions actually for some states its almost negligible while some states are pretty rich in the groundwater allocation.

The agricultural sector consumes around 90 percent water in India the different agencies estimated differently some say 91, some say 89, some that order, but approximately it is 90 percent water which actually consumed in agricultural sector ok; however, the irrigation water share is likely to reduce in future not in terms of quantity, but in terms of percentage. So, it is likely to reduce in future as the projected rate of growth in domestic and industrial sector is much higher as opposed to industrial sector. So, domestic and industrial sector which consumes around 5 6 percent of the total water at present are expected to go double by 20 30 while the consumption in the agricultural sector will increase marginally.

Then meeting the increased increasing domestic and industrial water demand where depleting fresh water resources managing the water quality of surface water and groundwater resources upgrading the infrastructure and strengthening the water governing institutions are some of the India's biggest challenge in the water sector as we discussed during the week 1.

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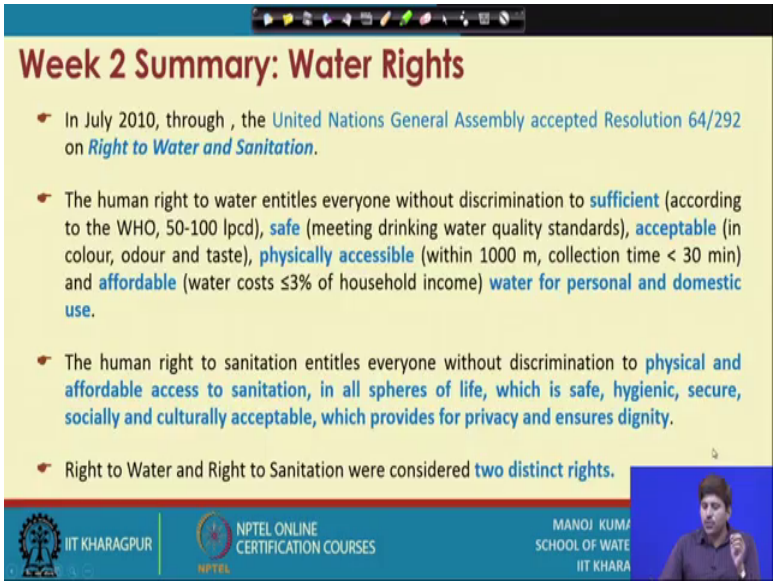

Coming over to the week 2; week 2 was dedicated towards the discussion on water right when we discussed that how in July 2010, United Nations General Assembly accepted

the Resolution on to Right of Water and Sanitation. The right to water entitles everyone without discrimination a sufficient safe acceptable physically accessible affordable water for personal and domestic uses. So, the sufficient water as per WHO standard is 50 to 100 lpcd, safe water means it should meet the drinking water quality criteria's acceptable means it should be acceptable means it should not be object objectionable visually like in terms of color order and taste. It should not be objectionable it should be of the acceptable category and then physically accessible means within the 1 kilometer distance or the two way collection time should not increase, should not be more than 30 minutes for water.

The affordability criteria suggested that water cost should be less than 3 percent less than equal to 3 percent of the household income. So, that was the right to water while under right to sanitation everyone is entitled without discrimination to physical and affordable access to sanitation which is safe hygienic secure socially and culturally acceptable and provides privacy and ensures dignity. So, that was the some of the criteria under right to sanitation, which were discussed back then.

The right to water and right to sanitation are considered as 2 distinct right.

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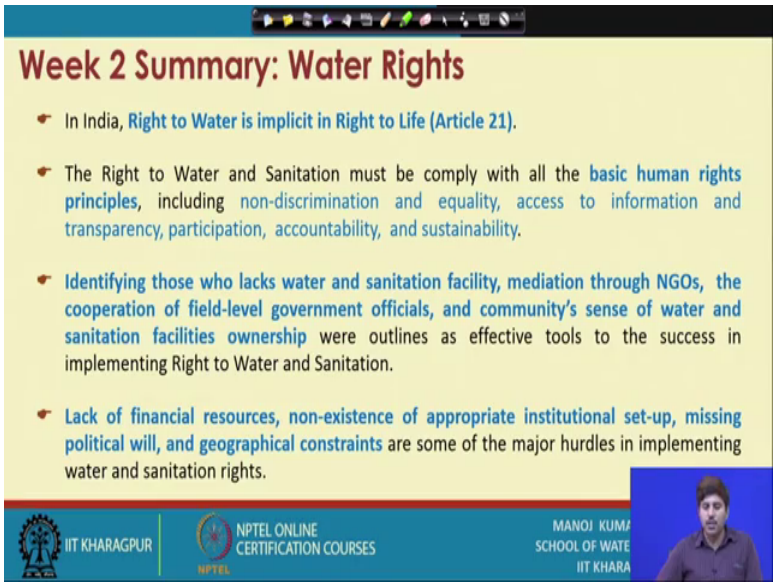

So, that is also important that it is not linked because when it was linked together the much focus much attention was given to the Right to Water or to the water services and sanitation was largely ignored.

Now, in India Right to Water is implicit in right to life Article 21, we do not have a separate constitutional provision that sort of interest Right to Water, but it is implicit as has been examined and elaborated in several supreme court or high court's decisions. So, that is Right to Water is considered as an implicit part in the right to life which is under Article 21 of the constitution .

The Right to Water and sanitation should comply with all basic human right principles, which is non discrimination and equity access to information and transparency then participation of the various stakeholders accountability and sustainability. So, these were the various principles for any human right and Right to Water and Sanitation should sort of follow these as well.

Now the identifying those who lacks the water and sanitation facility then involving NGOs and various other stakeholders in the process. The cooperation of the field level government officials and the community sense of ownership of the water and sanitation facilities were outlined as an effective tool to ensure the implementation of the Right to Water and Sanitation in the United Nations mean.

The challenges were challenges or hurdles were also discussed, which includes the lack of financial resources then non existence of appropriate institutional setup because without appropriate institutional setup implementation of such thing becomes very difficult. So, that was another important point which was discussed then missing of the political will and the geographical constraints because that sort of deals with the availability of resources itself. So, these were the major hurdles that in the process of implementing Right to Water and Sanitation.

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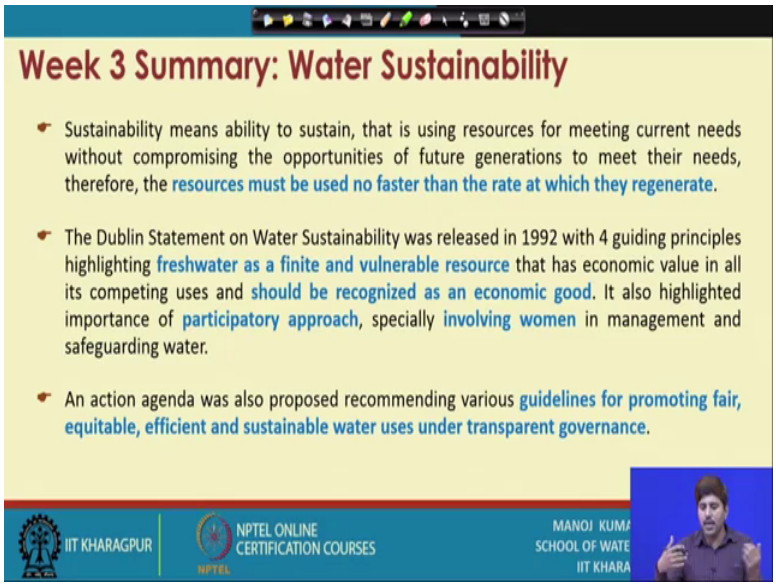

So, this was all covered in week 2 while week 3. the discussions were targeted towards the water sustainability now sustainability means ability to sustain, which means 1 utilizes resources in such a way that it leaves it does not make the future generation suffer. So, utilizes resources for meeting the current need, but also ensures that the future generations get insufficient resources to meet their needs or almost equal resources to meet their needs.

So, therefore, the resources or replenishable resources like water must be used no faster than the rate at which they regenerate. So, groundwater should not be abstracted at a rate higher than it recharged, rivers would be in short to maintain a flow and all those aspects were discussed.

The Dublin Statement on Water Sustainability, which is a landmark in this sector, which was released in 1992 with 4 guiding principles was also discussed in the detail. The guiding principles basically highlight freshwater as a finite and vulnerable resource and say that it has an economic value in all its competing use and therefore, should be recognized as a economic good the guiding principles also highlighted the importance of participatory approach where all the stakeholders should be involved in water decisions especially involving women in management and safeguarding of the water which was 1 separate principle under The Dublin Statement.

The action agenda was also proposed which recommended various guidelines for promoting fair equitable efficient and sustainable water uses under the transparent governance.

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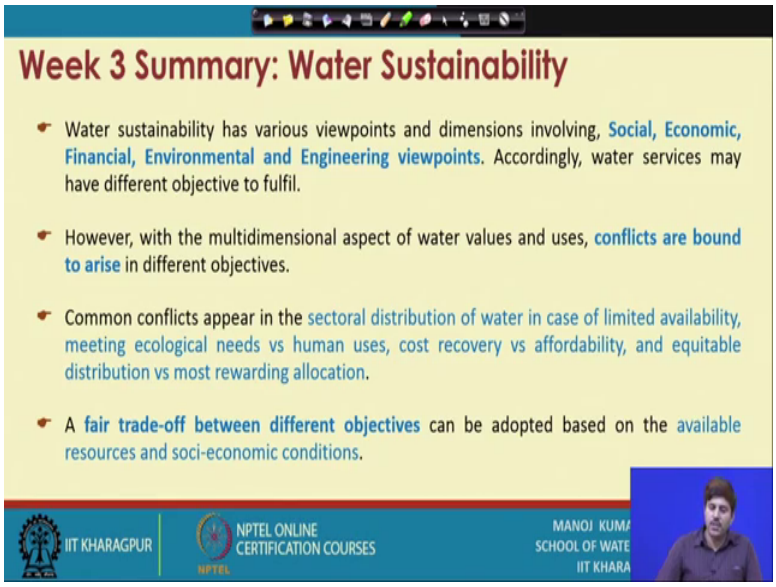

The sustainability has various viewpoint and dimensions, which includes Social viewpoints, Economic viewpoints, Financial viewpoints, Environmental viewpoints as well as Engineering viewpoints. So, all this was discussed and elaborated during the lectures. So, water services accordingly because of these different viewpoints could have different objectives to fulfill and when there are different objectives to fulfill and the water which has multi dimensional aspect of values as well as uses. So, there are conflicts that are bound to arise.

So, among common conflicts that typically appear involves sectoral distribution of water in case of limited availability. So, when water is limited with sector 1 should allocate whether it should go for environmental sector or e flow maintenance that is targeting environmental sustainability or it should go for domestic consumption that target social sustainability or should go for the most financially rewarding uses, which targets financial sustainability. So, those kind of conflicts were discussed there could be conflicts in meeting ecological needs and human uses there could be conflicts in the cost recovery or affordability whether it should price for a cost recovery or affordability

purpose and equitable distribution versus most rewarding a location could be another point of conflict.

Now in order to manage these conflicts when we have different objective a fair trade off between different objectives becomes essential and should be adopted based on the available resources and socio economic conditions of the society.

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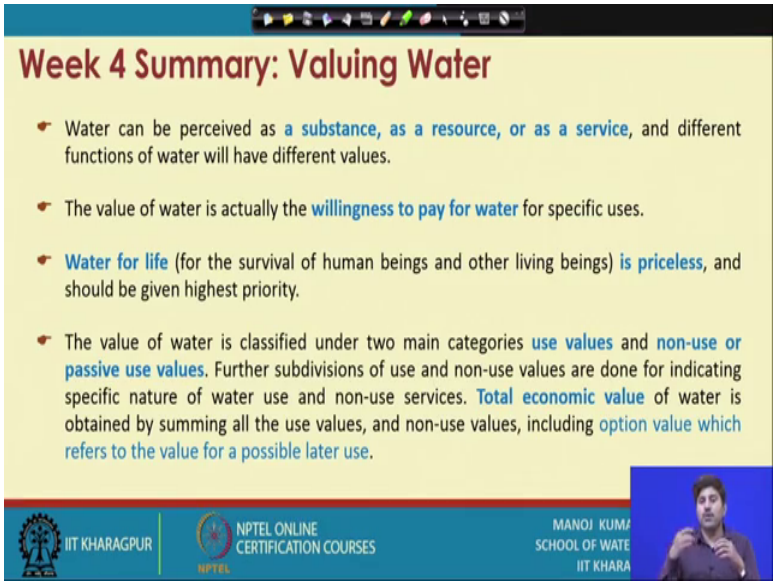

So, that was discussed in week 3 relating to the sustainability of water. The week 4 we discussed about valuing water how the water should be valued. So, we discussed that water can be perceived as a substance as a resource or as a service and then its value could be different according to the different function it serves.

So, the value of water actually depends on its uses and also the value of water will actually be the willingness to pay for water for that specific use. So, for whatever purpose water is being used the value of water will accordingly be how much people are willing to pay for domestic uses of water how much people are willing to pay for irrigation water or how much people are willing to pay for industrial application of water. So, that way the water same water could have different value when it is targeted towards the different uses.

The water for life which is which is kind of essential for the survival of human being and other living beings is priceless there is absolutely no price or no value tag can be

allotted to that water and that should be given the highest priority the second priority should go for value for water for other activities and the third one is the 1 where basically profit making industrial uses on those kind of uses come water for development.

The value of water is classified under 2 main categories the use value and nonuse values. Use values or is also known as active use values and nonuse values or passive use values. So, there are further subdivision of use and nonuse values, which were discussed in that in detail and the total economic value of water is obtained by summing all these different sub components under use values and nonuse values and this includes option value as well, which refers to the value for a possible future use.

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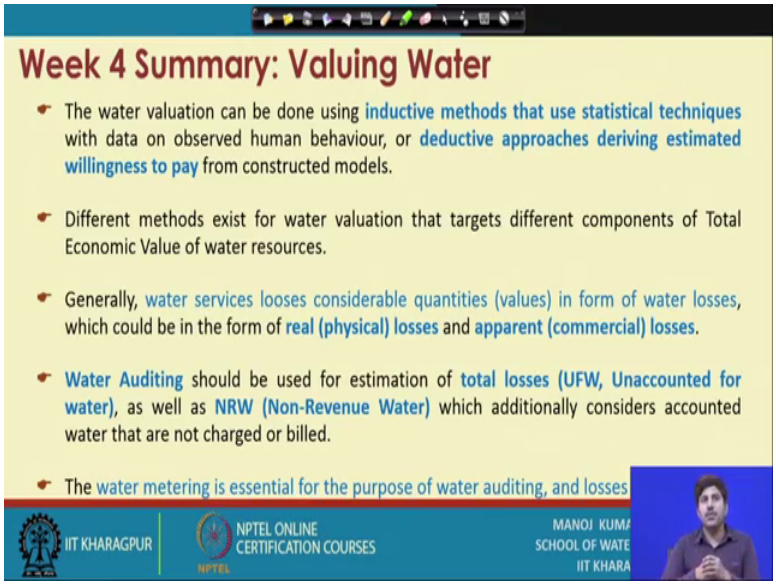

Then the discussion tends towards the different methods for water valuation which could be done based on inductive methods that use statistical techniques or data or deductive approaches which derive estimates of willingness to pay for the specific constructed models based on the desired level of services.

There are different method exists for water valuation and they target different component of total economic value of water resources, which were discussed during the lectures, generally water services loses considerable quantities or when water is losing quantity one can say the water is losing value in form of water losses.

So, which could be in the form of real or physical losses, which are primarily due to the leakage in the connection service pipeline or leakage from meters join those kind of thing and could be apparent or commercial losses, which are because of the water theft or lets say inaccuracies in water metering. Those kind of things can lead to the commercial losses.

So, when we sum up the real losses and commercial losses we get the total water losses which is also known as the unaccounted for water or UFW now the estimation of this total losses can be done through water auditing. So, where one can estimate the UFW or unaccounted for water as well as NRW, which is non revenue water which in addition to UFW also incorporates the sort of water which is accounted, but not billed or charged. So, water which is not being charged will although it is accounted is its not a loss. So, it will not go to the total losses, but it since it is not generating any revenue. So, it is added to the NRW.

So, this details IWA water audit sheets were discussed where how we can basically do a water auditing of a system and identify or figure out what are the different losses or what are the different use and losses component of the water. The auditing needs water metering, which is essential for the purpose of water auditing and determining its losses or its use values. So, the different type of metering regimes are also discussed during the week 4.

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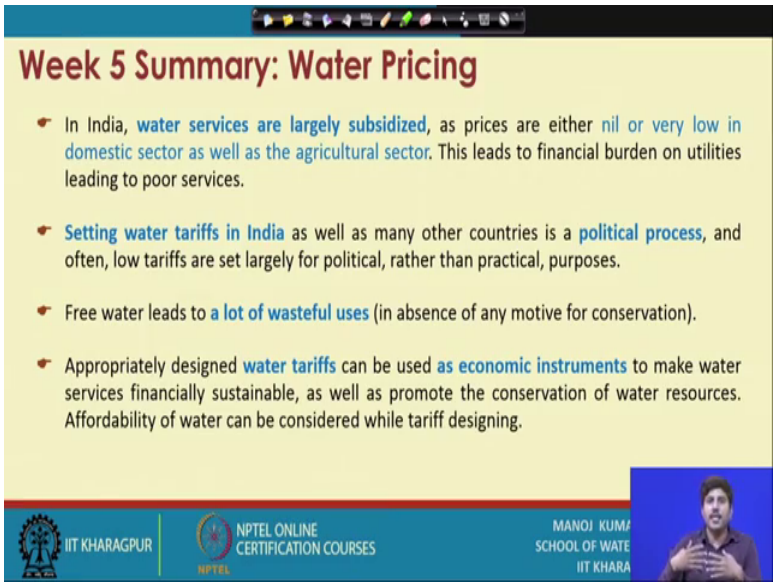

Then week 5 the targets for discussion was the water pricing, where we discussed the status and some of these structures for setting water tariffs. So, it was discussed that in India water services are largely subsidized prices are either nil or very low in domestic sector as well as agriculture sector and this leads to lot of financial burden on utilities that eventually leads to the poor services because if utilities are not getting enough sufficient funds. These services are; obviously, going to be poor .

So, setting water tariffs in India as well as many other countries is a political process and often the prices or the tariffs are set for the purpose of gaining political advantages rather than the practical purpose or looking for the purpose of sustainability or improving the services ok. So, that is one of the major hurdles in setting up of a sustainable water price that way.

Now if water prices are very low or the water is free, it do not leads to any motivation for conservation until unless somebody is very pro environmentalist it we will not think about water conservation, the major motivation of the water behind water conservation could be if water is priced highly. So, people will start value water as a resource for which they have to pay and then; obviously, the wasteful uses will reduce.

So, the free water leads to a lot of wasteful uses which is one of the major concern and reasons why water should be appropriately priced. So, appropriate design water tariffs should be used as an economic instruments to make water services financially sustainable as well as promote the conservation of water resources now there will be a there will be a problem with the affordability or there could be a problem with the affordability, which can taken care while setting the tariffs different tariffs.

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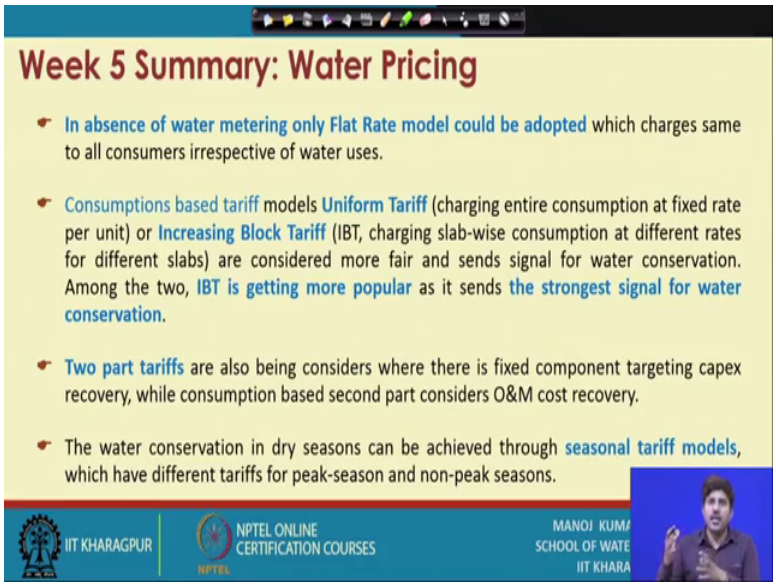

We also discussed the different models of the water tariffs setting water tariffs. So, if there is no metering available only flat rate model could be adopted which charges same to all consumer irrespective of water uses and in Indian cities Indian towns most of the Indian towns because meters are not there or meter connection are not there if any prices are being charged it is being charged on a flat rate model for most of the places of course, few cities have the different tariff structures consumption base tariffs structure.

So, among the consumption based tariff models the Uniform Tariff, which charges the entire consumption at a fixed rate per unit and increasing block tariffs, which is also known as IBT which charges slab wise consumption at different rates for different slab .

They are considered more fair and send signal for water conservation because they are more fair, because they charge based on the consumption wise otherwise in flat rate model whatsoever quantity one household is using irrespective of whatsoever quantity of water is being used, everybody has to pay the same prices. Whereas, the consumption based tariffs said the different prices for the different consumption.

So, among these two also the IBT or increasing block tariffs is getting more and more popular because it sends the strongest signal for water conservation and ensures probably the low block is our lifeline block can be kept at a low tariff where it also ensures the affordability. So, that is how it is getting more and more popular then there are two part tariffs which are also being considered where there is fixed component that targets the

capex recovery or the capital recovery which is being made while the consumption based second part typically considers onm cost recovery ok.

The water conservation in dry seasons can be promoted through seasonal water tariff models as well although it is at very few places, but in such case one can actually have different tariff structures in different seasons. So, peak season and nonpeak season water consumptions will be charged at different rates. So, that were the discussions in week 5 over water pricing while the various conflicts arising in water pricing were basically discussed in week 6.

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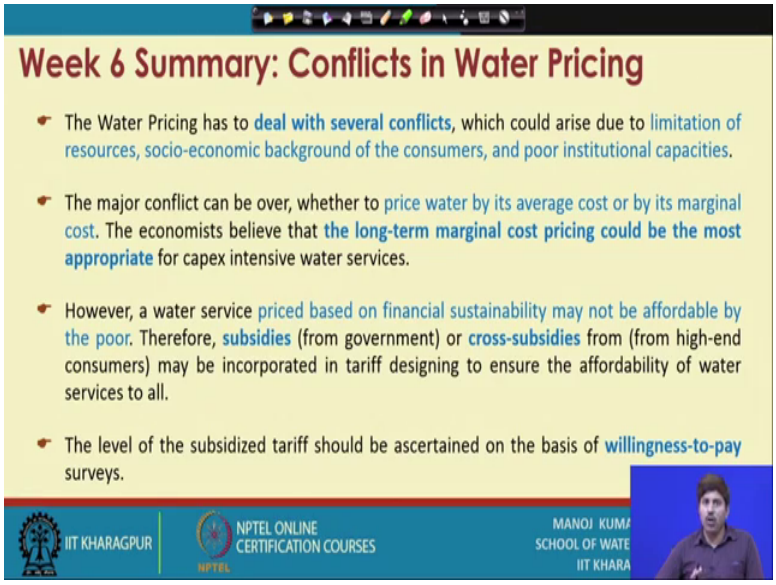

So, there we saw that the water pricing has to deal with variety of conflicts which could arise due to the limitation of resources socio economic background of the consumers and poor institutional capacities. So, major conflicts can be over whether to price water by its average cost or by its marginal cost the average cost which is total investment divided by the total water produced. So, per unit what are what would be the cost while marginal cost is the cost of production of additional 1 unit.

Now the economists believe that long term marginal cost pricing could be the most appropriate for capex intensive water services; however, again there are lot of concerns associated with this and which were already discussed in detail during the lectures that how at times even the marginal cost pricing can have issues there could be a possibility of getting profits or generating too much of profit in the marginal cost pricing. So, water

cannot be used water services cannot be used for generating too much of profit. So, that criteria should be seen.

Accordingly, but in a fair way it can be priced at a marginal cost shorter and marginal cost does not consider the capacity expansion. So, it basically works on the same capacity. So, may not be suitable for capex intensive sectors. So, that is why the long run marginal pricing would be better in such cases; however, the water services price based on the financial sustainability may not be affordable particularly affordable to the low income users or the poor.

So, therefore, these subsidies concept of subsidies can be used, now these subsidies could be subsidies from the government or could be subsidies from the high end consumers. So, the subsidies from the high end consumers which are terms as cross subsidies can also be an approach ah, but it should be although it should be considered for incorporating in the tariff design to ensure the affordability of the water services to all; however, it should also consider that the prices to the high end consumer should not should not be too much. So, that they start looking for the alternate sources because in cross subsidy model that could be a problem.

The level of subsidized tariffs should be ascertained based on the willingness to pay survey. So, how much people are willing to pay for the water they are consuming from different income groups. So, we can have that way and particularly the increasing block tariffs kind of model gives us this flexibility as we can look for the slab wise tariffs. So, the low cost low slab tariffs can be kept in there,.

There are lot of issues related to this which were discussed in detail during the lectures that particularly when the people living in or the low income group large families if lets say a family of 10 people is residing in a area their consumption rate is; obviously, likely to go in higher slabs in IBT model.

So, they will not get advantage of do subsidies which are given in the base price while high end consumers can get because there are in a big bungalow maybe just a couple of people living or 2 3 people living. So, there their consumption will not cross the higher end slabs even after they are financially strong .

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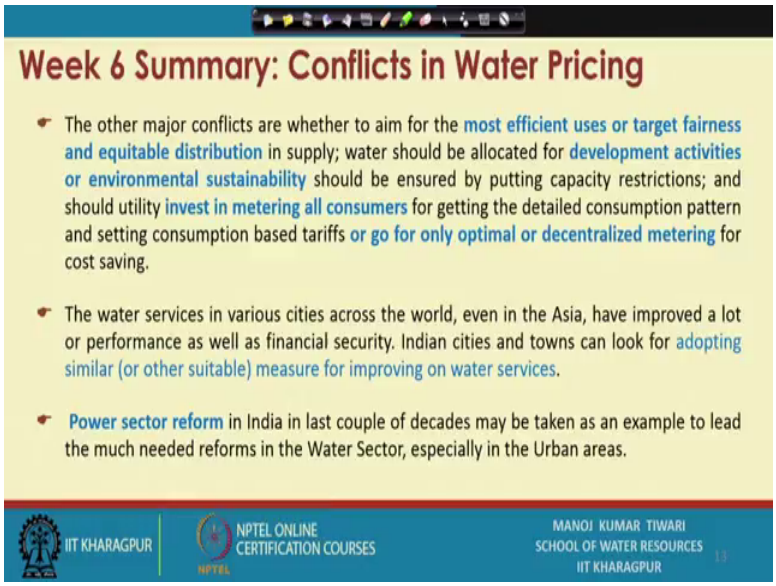

So, the other major conflicts that were discussed in week 6 were basically conflicts that arises over issues like whether to aim for the most efficient uses or targets fairness and equitable distribution in supply. So, what happens that one can actually target the efficient uses or the economic efficient uses where water has the potential to generate maximum gains or target fairness and equitable distribution during the supply or sectoral allocation of the water.

The other point of conflict could be whether water should be allocated for the development activities or should be reserved or should be restrained for the environmental sustainable purpose. Then another point of conflict, which was discussed whether utilities should invest in metering all consumers for getting the detailed consumption pattern and setting out the consumption based tariffs because one can set consumption based tariffs only when the all the consumers are metered then only the consumption can be recorded and a consumption based tariff system can be set.

So, whether to invest in metering and putting up a system where consumption based tariff setting can be done and detailed consumption pattern can be obtained or go for only optimal or decentralized metering for cost saving because metering all consumers will require huge amount of cost and whether that cost is going to give that much of advantage in terms of water conservation or in terms of financial recovery then only it is

justifiable otherwise optimal or decentralized metering can be adopted for specific purposes.

The water services in the various cities across the world even many cities of the Asia have improved a lot on performance as well as financial security and Indian cities are towns can look such examples or can adopt some of the similar practices or other suitable practices because always similar practices may not be workable in India our socio economic conditions are different than the socio economic condition in other countries or the practices in other countries.

So, the exact same solution may not work in India, but a similar customized solution can be set out for our cases and that way we can look to improve our water services. So, various case studies from the different cities across the Asia and were discussed during the week 6.

Then the power sector reforms in India which took in the last couple of decades may also be taken as example to lead much needed reform in the water sector specially in the urban areas. So, that were the discussions that were held in week 6 and the discussions from rest of the weeks or the content from week 7 to week 12 will be summarized in the next and the last session.

Thank you.