Sustainable River Basin Management

Dr. Franziska Steinbruch

Department of Civil Engineering

Indian Institute of Technology, Madras

Module – 4 – 1

Lecture - 29

Part 4

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

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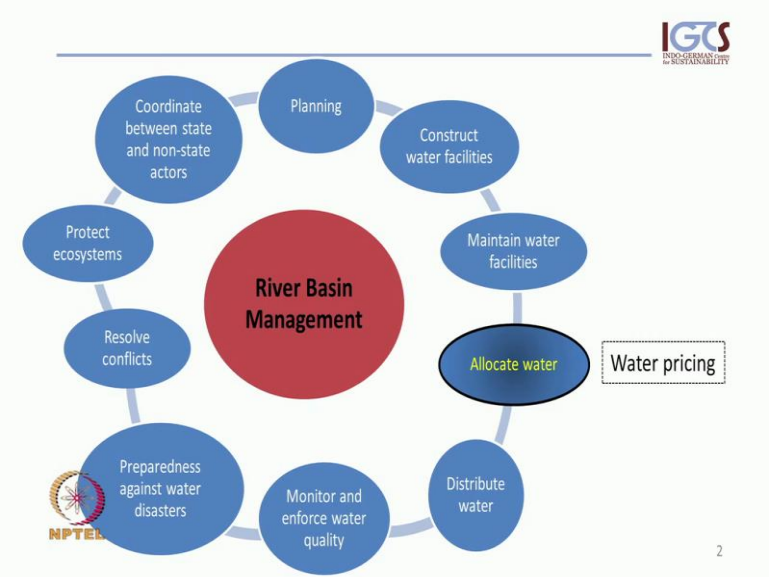

Today, we will be talking about river basin management functions, and we had started talking about water allocation; a topic that we will be continuing today, specifically, on water pricing.

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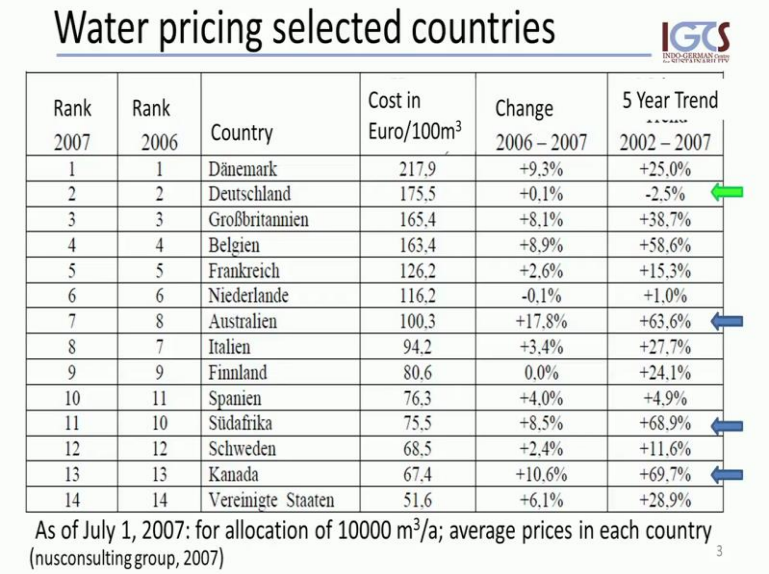

Now, let us have a look first at water pricing for, in selected countries. This is a table that was produced by a consulting company in the year 2007, and that shows us a comparison of prices between some countries. What we can see is on the first column, the ranking of, in terms of water prices in 2007, and the ranking in the second column of water prices in 2006 in these countries listed here. Then we have cost and use per 100 cubic meter or we could also say sensible cubic meters. Then we have a change from 2006 to 2007 and the five year trend in terms of price changes.

Now, what we can see here is that there are countries, ranking at the top with some European countries, in terms of water prices and that is for instance, US, united states here, ranking quite low in terms of water prices, but what is more interesting also, is to see the changes, which have occurred just as in one year 2006 to 2007. Then we have few countries, where we have steep increases in water prices and for the in the case of Canada, for instance, which in this example is at the bottom of the in terms of prices and the increase has been very steep, and the same for Australia here. When we look at the five year trend, we can see that in the case of Germany, prices have actually a negative trend. So, costs have gone reduced. About this five year period, there is only a minor positive change in just one year and then, we have a few countries, where we have major increases in this five year trend.

Quite interesting are countries like south Africa or the Australia again, where we know that those countries are struggling very much with water scarcity, but also with, in the

case of south Africa, with social security, which in parts can be explained by the situation around water pricing. We will come back to this phenomena later again, when we have been looking into the types of pricing applied in water.

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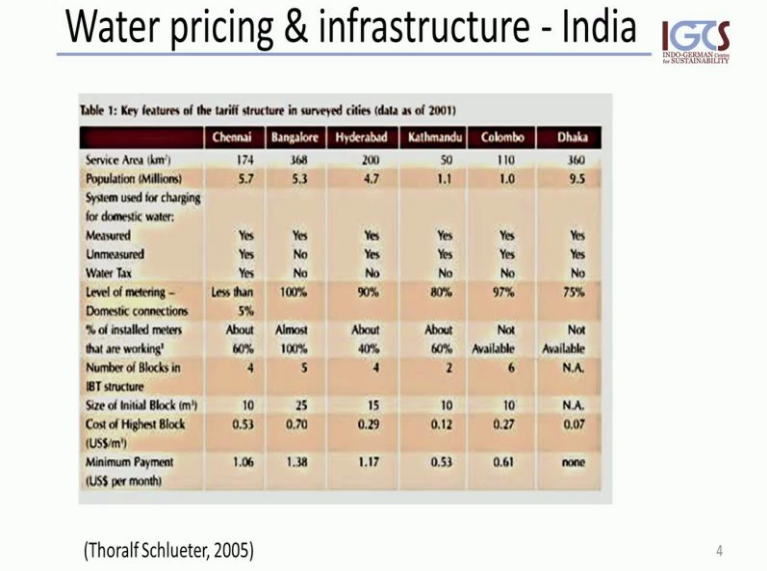

	Chennai	Bangalore	Hyderabad	Kathmandu	Colombo	Dhaka
Service Area (km²)	174	368	200	50	110	360
Population (Millions)	5.7	5.3	4.7	1.1	1.0	9.5
System used for charging for domestic water:						
Measured	Yes	Yes	Yes	Yes	Yes	Yes
Unmeasured	Yes	No	Yes	Yes	Yes	Yes
Water Tax	Yes	No	No	No	No	No
Level of metering – Domestic connections	Less than 5%	100%	90%	80%	97%	75%
% of installed meters that are working[1]	About 60%	Almost 100%	About 40%	About 60%	Not Available	Not Available
Number of Blocks in IBT structure	4	5	4	2	6	N.A.
Size of Initial Block (m³)	10	25	15	10	10	N.A.
Cost of Highest Block (US$/m³)	0.53	0.70	0.29	0.12	0.27	0.07
Minimum Payment (US$ per month)	1.06	1.38	1.17	0.53	0.61	none

Now, let us just look into the water pricing and infrastructure in the case of India, which may be more interesting to you. This comes from a study, conducted in 2005, and it essentially, shows us some of the larger cities in India and in Southeast Asia and we see the service area; it is (refer Time: 03:57) kilometers in the first bottom line here. Then we see population numbers; they are in for the case of India, the first three columns; Chennai, Bangalore and Hyderabad; fairly similar and where the differences start are at the level of systems available and water charging taking place at domestic level.

This happens in some of the cities and some are only partially, served in terms of metered water supply. Then we look into the level that is being served; then it becomes much more differentiated. In the case of Chennai, we have less than 5 percent served, with a metering system at domestic level whereas, in the case of Bangalore, at that time, they coverage was 100 percent and so on. So, we can see also here the different prices, pricing, attached to the initial block and the highest block. Interesting is the size of the block; initial block, which is the one, costing may be the lowest; it is an increasing block tariff. You see that there is differences are quite substantial. This is 10 cubic meter block, initial block and here, we have the other extreme of 25 cubic meter as the initial block. So, what this means you will be seeing in a short minute.

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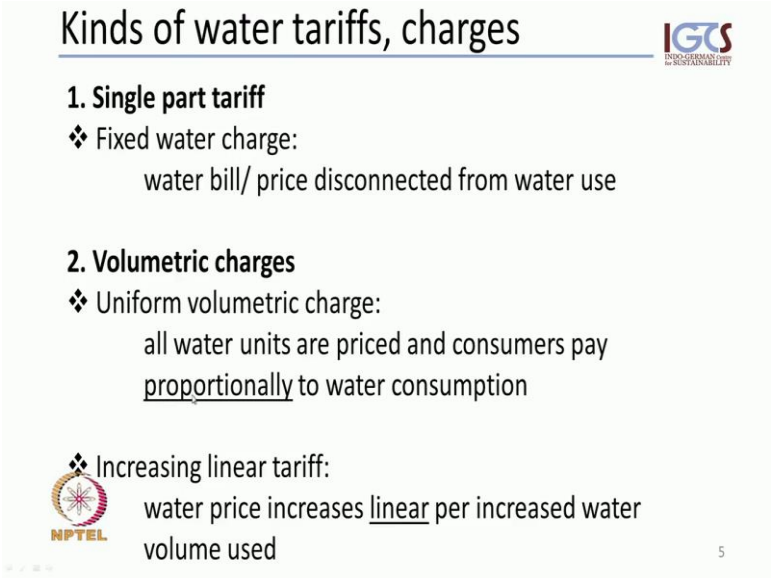

Let us look into the kinds of water tariffs and kinds of charges. First of all is what we call the single part tariff, which is meaning, it is a fixed water charge, which means also that the water bill or the price that we pay for water is completely, disconnected from water use. It does not matter how much and how often we use our water or whether we receive water at all. We must be paying a specific fixed water charge, which completely, disconnected from the water consumption and the water provision. The second type of water tariffs or charges is the so called volumetric charges, and one of those is the uniform volumetric charge; that means, all water units are priced and consumers pay proportionally, to water consumption. Then another example of the volumetric charges are increasing linear tariffs. These are water prices, which increase linear per increased water volume consumption. We will talk about this in more detail now.

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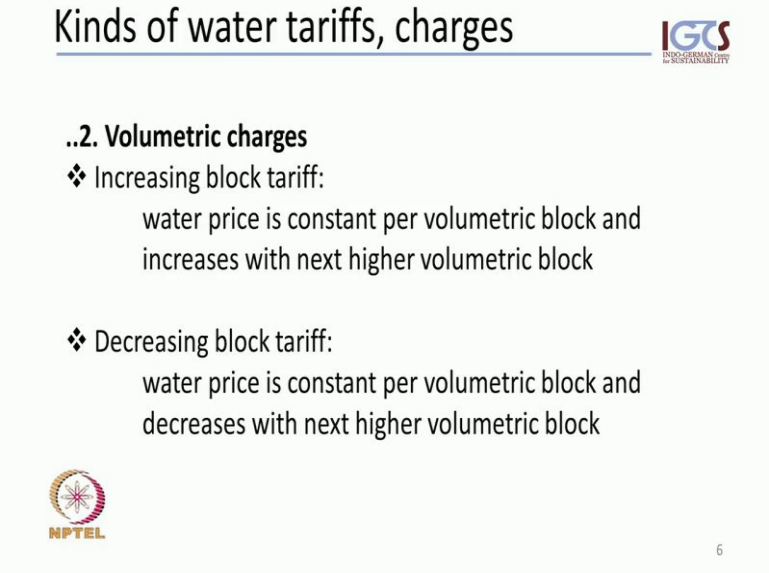

See in our example of a volumetric charge, the increasing block tariff, which means that water price is constant per specific volumetric block and increases with the next higher volumetric block. The opposite to this is the decreasing block tariff that is when a water price is constant for a specific volumetric block and which is high initially, and which decreases with the next higher volumetric block.

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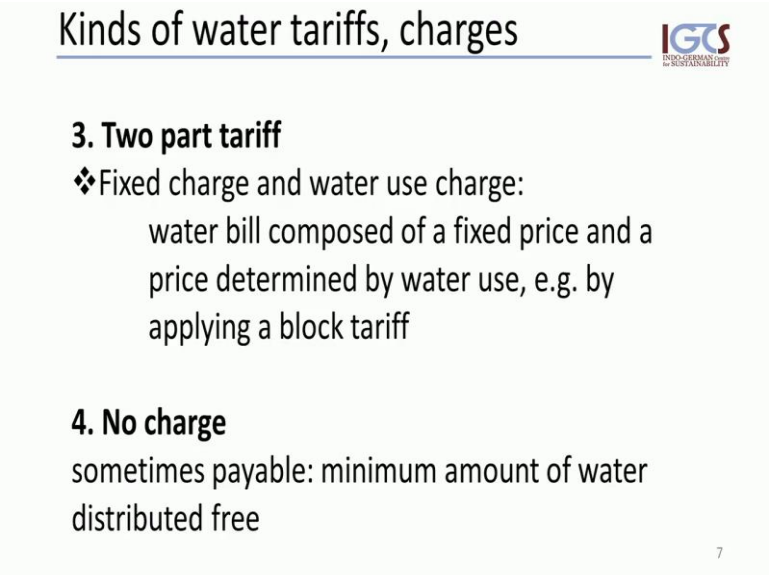

Now, the third category of water tariffs or water charges is the so called two part tariffs. This is a tariff consisting of a fixed charge and a water use charge. So, the water bill is

composed of a fixed price and a price that is determined by water use. What determine the water use could be again, by applying a block tariff or by applying any other of these volumetric charges. Then we have as the last option; there is no charge at all; only as minor symbolic minimum fee that is applied to the distribution of the water transportation functions of the water.

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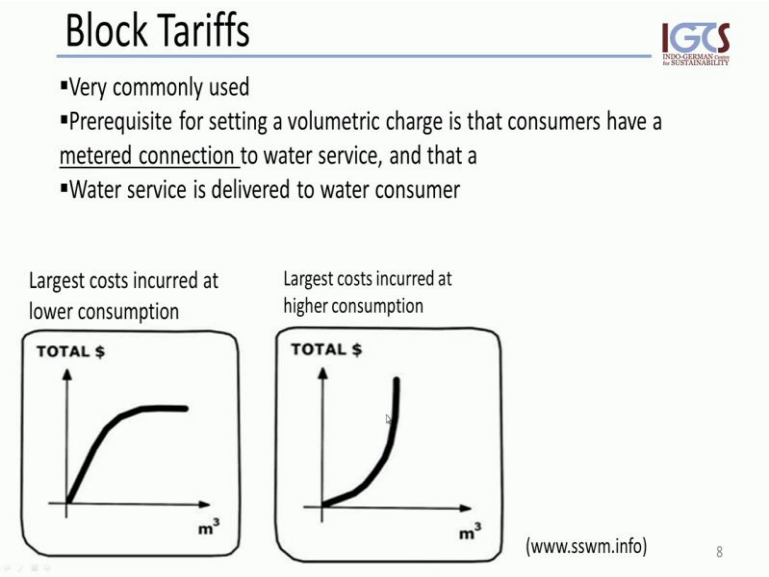

Now, let us look into the block tariffs in more detail. Those are very commonly used and the prerequisite for volumetric charge, such as the block tariff is that consumers have a metered connection to the water service, and that water service is also delivered to the water consumer. So, that there is water flowing in the pipe and water has been supplied to the consumer. Only those two actually make this works, installing as such. Then we have two options; one is the decreasing block tariff, where the largest cost occur the decreasing, where the largest occur cost occur at low consumption as we consume more water in terms of cubic meters. The cost will decrease and at some point, we can continue consuming and the cost will remain constant. The other form to this is that we have the lowest cost initially, and as we increase our consumption, that cost steeply increases as well; this would be our increasing block tariff.

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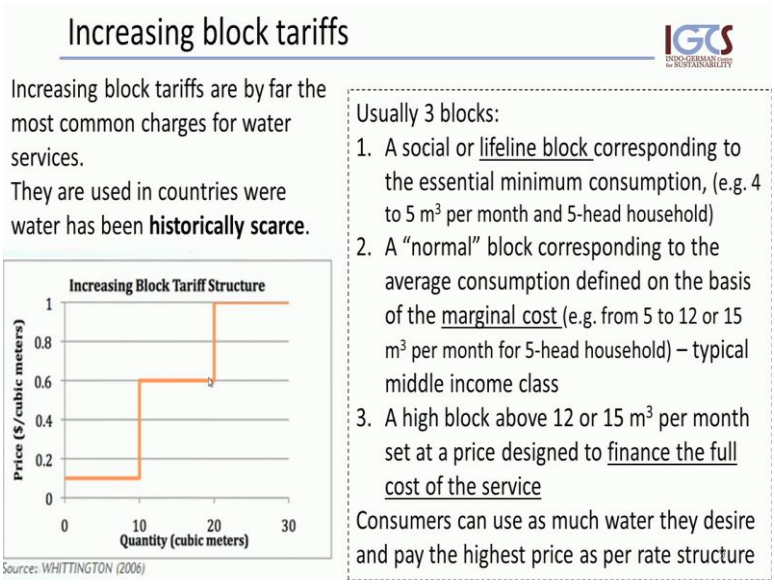

Now, let us look into the increasing block tariff in detail. Those are, by far, the most common charges for water services. They are used in countries, where water has been historically scarce. Now, how this looks like; it is, we have in this case, quantity in cubic meter here, and here, we have an example for prices per cubic meter. Then this shows us stepwise for the water consumption here. We will have a linear price to a certain amount of water that is being taken and used. Then at this point, we are moving into another cost category as we continue consuming additional units. Those will be charged under this price unit here. When you reach the limit for that volumetric block, we will again move up into higher price category and anything that we consume beyond this amount here, will be charged, under this price category here, for this whole volumetric block.

Now, usually we see something like in this graph that we have three blocks. How are those defined? The first block usually, is called social or lifeline block, which corresponding to the essential minimum consumption. What the essential consumption minimum is depends very much on the social structure of an area and how many cubic meters per months would be used or necessary to keep healthy living conditions in one household. This example here; we have 4 to 5 cubic meters per month for a five head household and then, we have a second block, which we would call the average or the normal block, which corresponds to the average consumption, defined on the basis of a marginal cost.

So, this covers already, some of the supply cost and the treatment, water treatment cost, but not all. That is calculated for a typical middle income class. Again, we need to know our consumer groups are and then, define what is affordable for a typical middle income class in the specific area. Now, the third block is the high block or the block above any of these, the 12 to 15 cubic meters per month. The price of this third block should be designated in such a way that it provides for a full cost recovery of the services. This means that we are, so the schemes cost subsidizing the social and the lifeline blocks and also partially, the normal block consumers to the high block consumption.

Now, the consumers can influence this. They can use this much for as they desire. So, water should be provided 24 hours a day, and they pay the highest price as per rate structure. So, they can influence how much they are going to consume and whether, they want to stay; make sure they stay within this range here or as they can afford to stay in this range, and they make sure they are not consuming above that block, because then it would fall under next category for the amount paid above those social and normal blocks.

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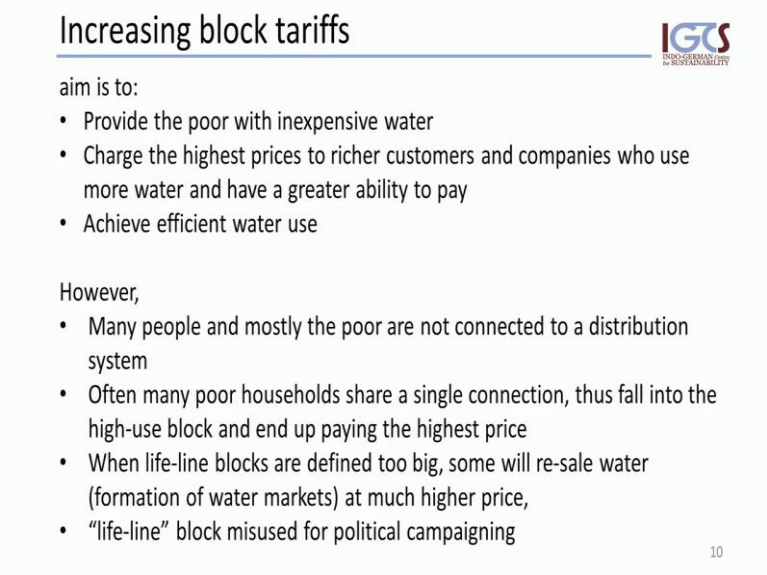

Now, the increasing block tariff has an aim to provide the poor, with inexpensive water. The charge is targeting the richer customers. So, the higher prices are usually, paid by those who can afford it; that is the theory behind it. Those who use more water, pay for that and it also, assumes that those who actually, use more also have the ability to pay for

that. So, that has a certain consumptive behavior pattern behind this that assume that the poor can be cost subsidized, and where still higher income layers of our societies can easily, afford paying the difference. Now so, this increase in block tariff, we can achieve efficient water use; however, there is a back side to this, because many people and those are mostly, the poor are not connected to a distribution system.

Often, several poor households share a single metered connection and then, they fall automatically, into these higher use blocks, and end up in the highest price; exactly, the opposite of what was wanted with this block tariff, and the lifeline blocks are, at times, defined very big; actually, too big, which will lead to the formation of water markets, because people will make use of these low cost amounts of water to resell the water to some other unserved areas and at much higher price. So, the lifeline block can often be misused for political campaigning as well.

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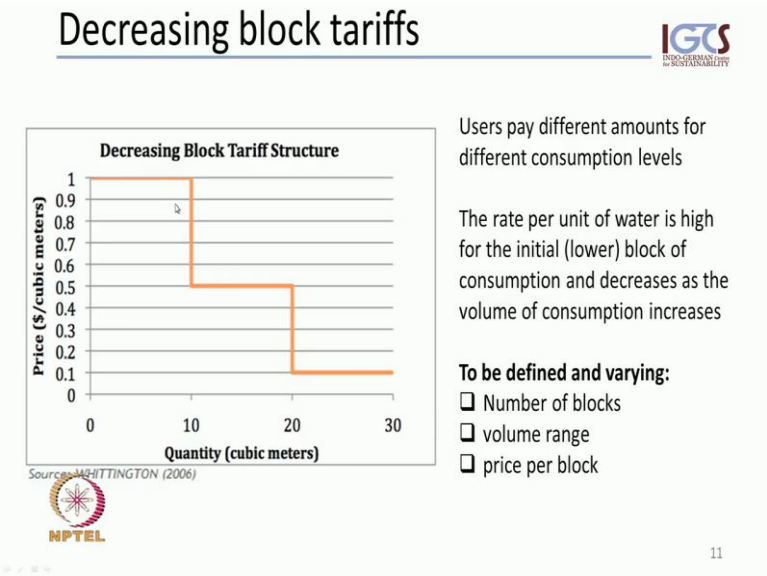

Let us look into the decreasing block tariff. The decreasing block tariff here is showing the quantities again in cubic meter. We have here prices; some stand also that we can compare the different charging structures. In this case, we start with a fairly high cost, the highest cost for the smallest amounts of water used and then, this decreases block in steps, as we increase our water usage, the amount of water that of money that we have to pay for the consumption decreases. This leads us up to a certain level, where we can end up the higher our consumption will be, the lowest our price will be. The users pay

different amounts for different consumption levels and the rate per unit of water is high for the initial block only, and decreases as the volume of consumption increases. So, what has to be defined and probably, ways is the number of blocks; there is no standard rule for this; the volume metric range and the prices per block

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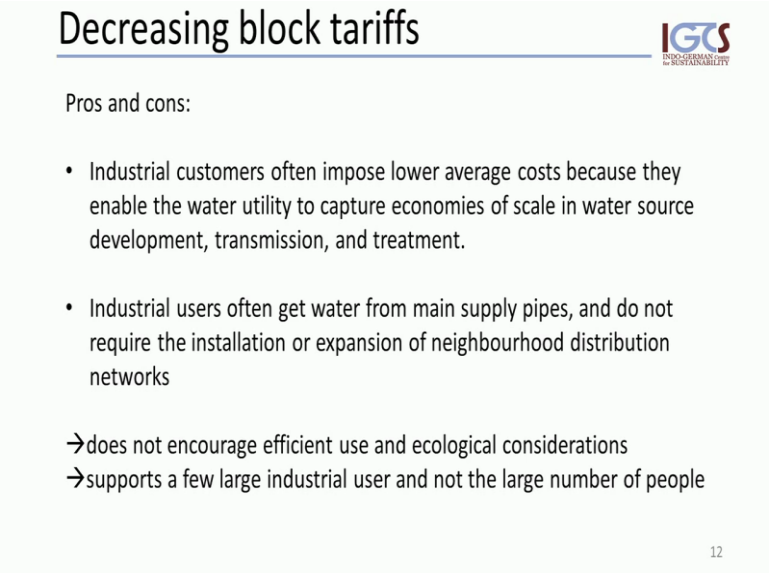

Now, there are advantages and disadvantages to this as well. The advantage is that industrial customers often, impose lower average costs, because they enable the water utility or the water service provider to capture economies of scale in water source development, transmission and treatment; which means that actually, the volumes of initial capital cost may be large, but the overall operational cost come to a certain optimum as we use the infrastructure properly, and consume higher amounts of water or amounts of water that were designed for that infrastructure. Now, industrial users often get water from the main supply pipes, which and they do not require the installation or expansion of neighborhood distribution system. So, it favors industrial users or large scale users. It obviously, does not favor the individual households. It also does not encourage efficient use and ecological considerations and really, only supports a few large industrial users and not the large number of people.

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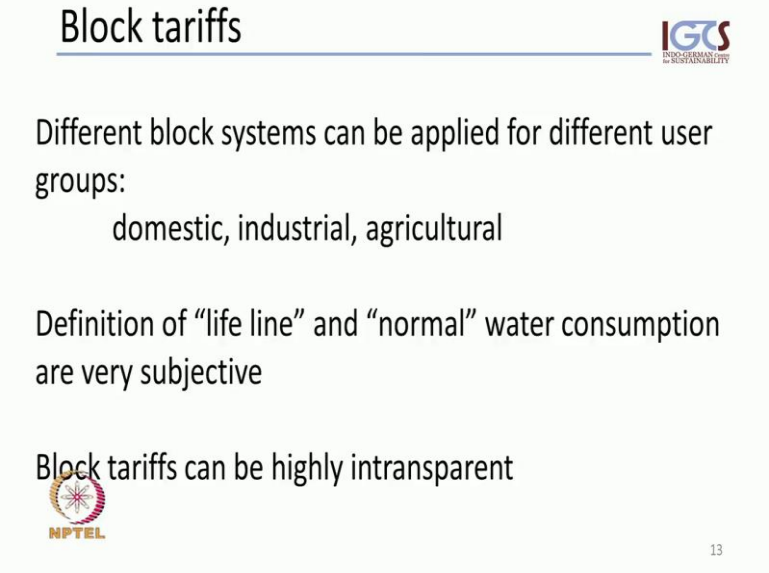

Now, the block tariffs can differ, and can be differentiated as per the different user groups. There could be different block tariffs for domestic, for industrial or agricultural users and this is not always, transparent to what is being applied; what the different user groups are actually, paying; the definition of the lifeline on normal water consumption. To define, those blocks are very subjective and this means that block tariffs can be highly transparent.

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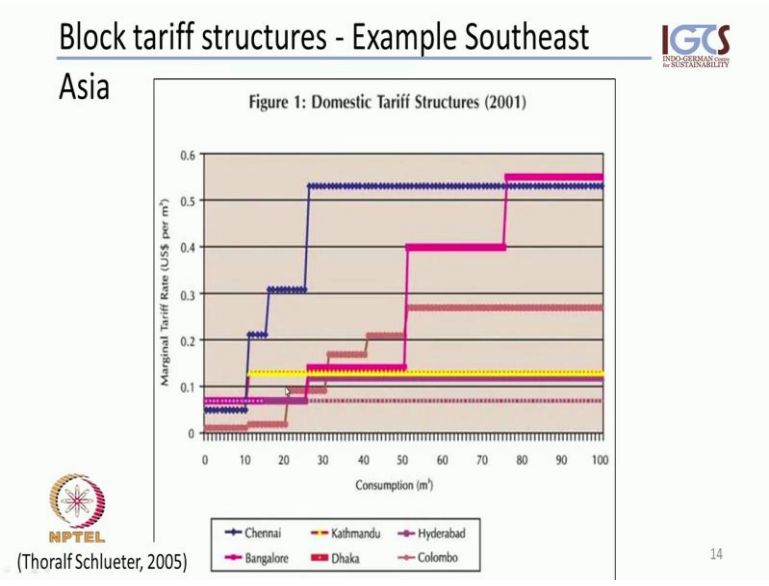

Now, let us look into an example again, from Southeast Asia; block tariff structures of some cities in India, but also some from Bangladesh and Sri Lanka. What we see is that example, blue line here, is the case of Chennai, where we have a quite complex, block increasing block tariff structure, where the initial block is at around 10 cubic meter per month at a very low rate. Then we have a steep increase here and a very comparably, small block, volumetric block, attached to that price which tends, steps up again, is again a little bit larger and steps up again, where it remains constant for. This is at about 25 cubic meters per month of water consumption.

Now, what the reasons are for these volumetric blocks, the design of these blocks and the prices is not always known or easily to understand and see. The other example seen here is in the case of Bangalore here, where we have a fairly, large user block and then, it steps away quickly, and very small price increases into new categories. Again, this is not very easily to understand, which consumer shall be supported in this case and which one should be the one cost subsidizing; the cost of these lower income water consumers. Now, this is just as an example to think about.

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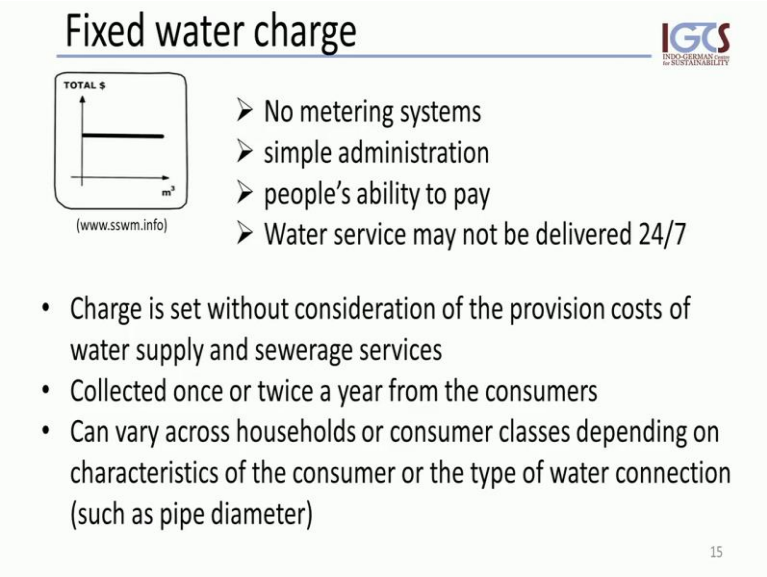

Let us now move into the understanding of the fixed water charges. This means that we have a consumption that is disconnected from the price. We have a linear fixed price here and that height of this price here can vary very much, depending on how it is being defined. So, the advantage here is that there is no metering system required. It is very

simple to manage, simple administration, which can be, it often responds to people's ability to pay and it does not require a 24 on 7 water service delivery in place.

Now, very often, it is linked to a (refer Time: 23:15) system, not just to have simple administration, but it is often the case when we have a (refer Time: 23:26) water service infrastructure in place, where we have very fast, rapidly changing land use is taking place. Then the first step would be a fixed water charge in many cases or when we have rapid administration, expansion of urban areas, taking place; often, this is the only response to keeping up is the extension of the water distribution system. So, the charge is that without consideration of the provision costs of water supply, and sewage services. It is collected once a year or sometimes, twice a year from the consumers. Very often, it is collected in conjunction with fees or some other public services, such as this sewage, garbage collection or electricity bills or so on.

So, it is not very obvious for the water consumers, very often, to how much actually, they pay for the water service alone. Those can vary across households or consumer classes, depending on the characteristics of the consumer, the type of water connection. This means the pipe diameter could be one; could be the distance to the next water tap, which may influence how much or what the water, the fixed water charges in those specific geographical areas.

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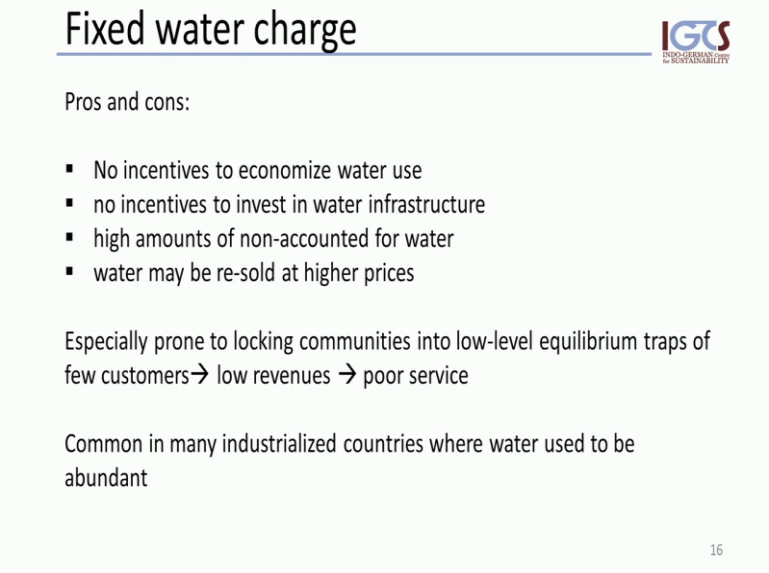

Now, the advantages and disadvantages of these fixed water charges are that well, they do not give, provide any incentives to economize water use. To be more efficient from a consumer end or to be more efficient from the water service provider side, there is no incentive to invest in water infrastructure. There are usually, very high amounts of non accounted for water and also, water may be resold at very higher prices, which again, is back filing on may be, water to a water services and the beginning first place, no reliable water supplies and those who are closer to a tap or a main line, may be better served and be in a position to make profit from the poor service in the first place.

So, especially, this keeps communities in a lock state of a low level equilibrium trap, which means there are very few customers, those who can afford; they will step out of the system and left behind of the poor portions of the society. There will be as a consequence to this, there will be low revenues and again, as a consequence to this, there will be poor services. So, it is a loop and it is a trap in itself, which is self reinforcing into a difficult to overcome, under such a system. They are however, common in many industry industrialized countries, where water used to be abundant. We know now that many countries are living or have to keep up with this water scarcity. So, such systems in such countries are also, not adequate anymore to responding to the issues of water scarcity and also, climate change.

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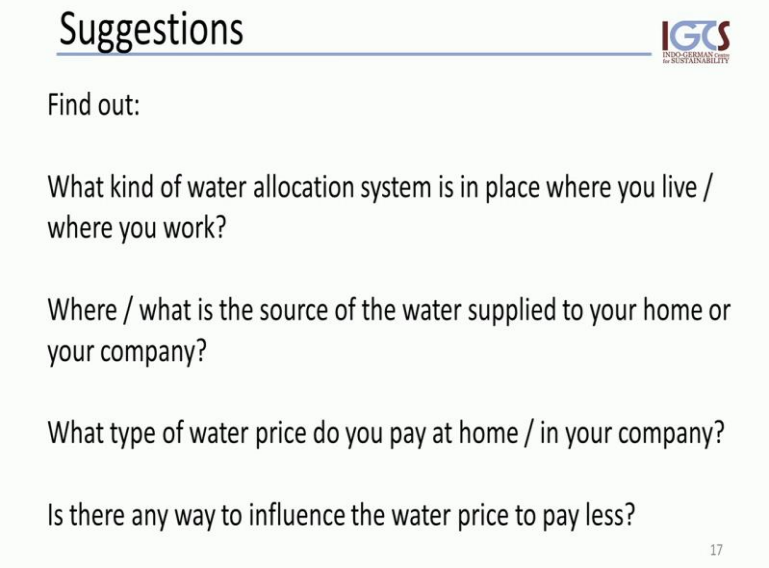

Now, before ending this part, my suggestions for you to take home; you should find out what kind of water allocation system is in place, where you live or where you work and see, where and what the source of the water, that is supplied to your home or our company and try to understand where the water comes from and what type of water price do you pay at your home or in your company or is there any way that you see, how you can influence the water price to pay less for instance. With this, we will continue next time and I will see you again.