**Water Society and Sustainability**
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**Lecture – 05**
**Hydrosocial ( HS )**

So, the 5th lecture is on Hydrosocial. As I had mentioned in the 4th lecture, that hydrosocial is particular theoretical framework and emerge in theoretical framework within political ecology of water. And it advances particular ecology of water, a by conceptualizing a kind of a cyclical relational dialectical relationship between water and society, that I would be explaining in the next couple of slides.

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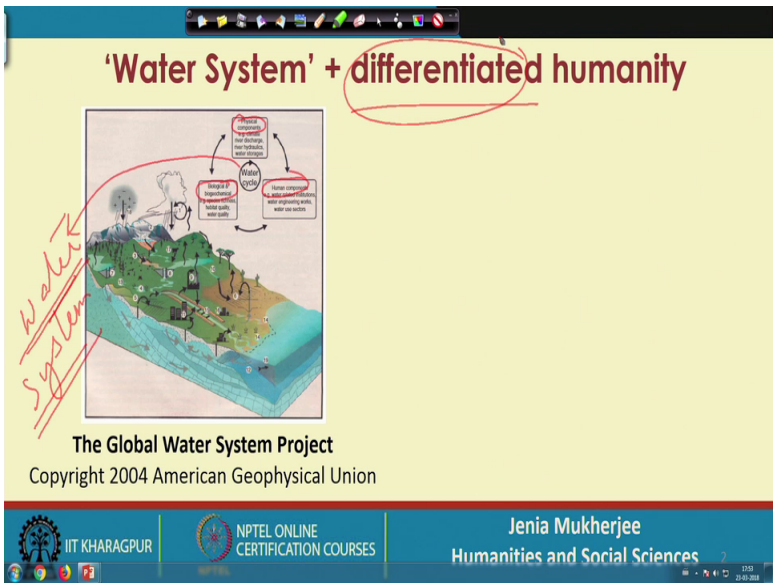


So, so yes. So, the global water system project, it recently mentioned that you know human beings, they are increasingly intervening with the basic you know pattern and the basic character of the water cycle. So, now, water cycle has to be understood as an integration, among, or across the physical, biological and biogeochemical, and human components ok.

So, the water cycle is no more a water cycle, but rather it has become what can be called as water system. Because you know as I mentioned that it is it is it is an integration, between or among biological biogeochemical, physical and human components. So, that makes the water cycle to extend transform into water cycle. So, what is this water system

sorry. So, what is this water system all about the water system, it presents and represents the very nature of water. And this nature we have to understand that this nature is highly complex and it is evidently social.

So, by the one important problem associated with water system is that, it presents humanity not as differentiated in or not is a differentiated entity, but rather and undifferentiated entity and disaggregated abstraction. So, what is the problem associated with this. So, it fails to understand that humanity actually represent differentiated, you know differentiated entity because, there are of course, whole lot of differences between the water reach water pool, rather there is the prevalence of water reach and water pool. So, this kind of an idea what is system has not been able to arrive at.

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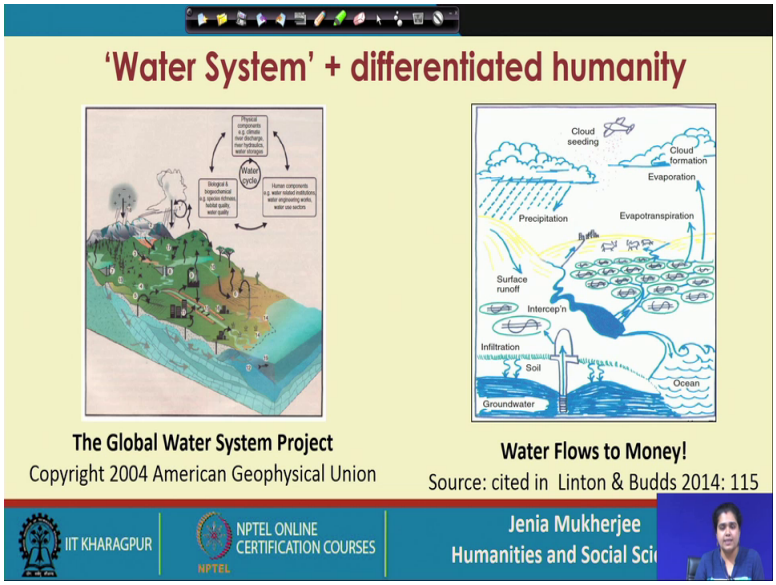


Now, with this if we come to the next picture this is a picture very interesting, you know figure drawn by Kate Elli, renowned you know hydrologist. So, he is working with the confederated tribes of the Umatilla Indian reservation on the banks of the Columbia river, across the state of Washington and Oregon. And she is extremely aware of the disposition of water rights by the Umatilla tribes and, a she also knows about the recruitment of the Columbia river in to global flows of capital.

So, this diagram is all about how water flows to money. So, she says and you know the particular ecology perspective of course, appreciate this kind of a statement that water does indeed flow uphill 2 month.

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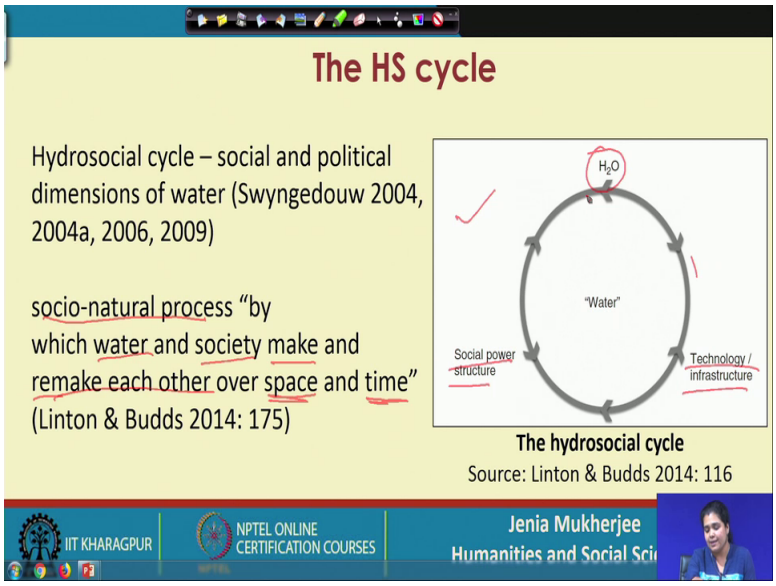


So, with this we come to the hydro social cycles. So, hydro social cycle as I have mentioned earlier that it is a it is a further step, you know from a ecological ecology of water framework, that actually discusses the dialectical relational, cyclical relationship between water and society. So, you know Jessica Budds and Jammy Linton they have come up with a very interesting and the comprehensive definition of the hydro social cycles.

So, they say that it is a it is a socio natural process by which all these words in this definition are extremely important. So, they say that it is a socio natural process by which water and society make and remake each other over space and time. So, the hydro social cycles is all about how water and society makes and remakes each other, make and remake each other over space and time.

So, we can understand that you know they are trying to so, this particular cycle. It is trying to come up with the argument, or it is trying to show and indicate portrait and illustrate that how water a shapes and intern it get shaped by social power structure, by technology infrastructure and by the materiality of water itself.

So, this is this cycle it really you know talk talks about, how water shapes all these things this entities is components in the whole process and, how water intern get shaped by all these processes yeah.

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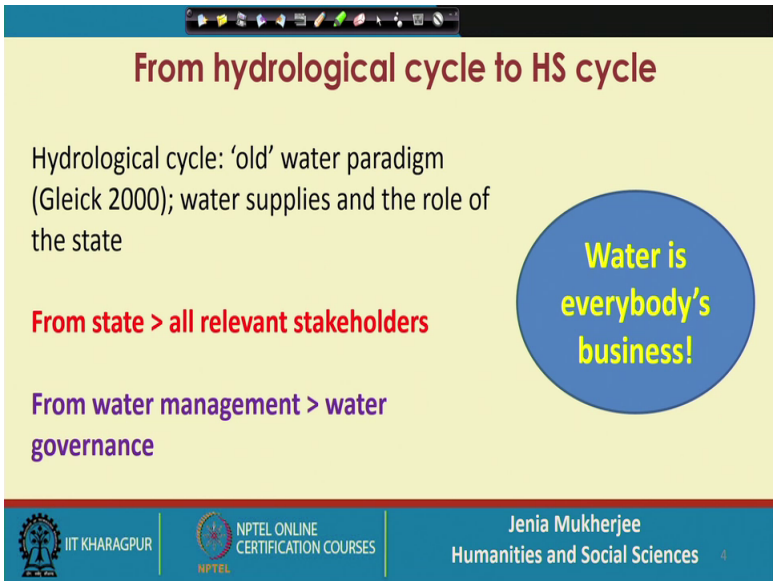


So, we have discussed about the hortonian hydrological cycle, in our second lecture on beyond hydrology as so, now we are discussing how the transformation today is taking place, in social science circle from hydrology to the hydro social.

So, Gleick a mentions that this hydrological a cycle is actually you know, it is an it is old water paradigm, which used to give whole lot of emphasis on the state on the role of the state because, hydrological cycle we are seen that how Karan (Refer Time: 06:30) associated they you know, I have said that this hydrological cycle also to great extent it talk it led to the formulation of what you call the state hydraulic paradigm.

So, in this hydrological cycle the role of the sate had been a emphasis like anything, but today we find a kind of a discursive shift from in a water management to water governance. So, which you know and this makes aware. So, we become more aware we come to realize about the entanglement of water with broad range of in a social the stakeholders within I mean and the broad spectrum, where a water has a water is deeply related, or water is deeply associated, with social a stakeholders across different sections of the society.

So, what happens is that you know so, the global water council has recently pointed out recently mentioned that, today you know water is everybody is business, we cant a deny that you know water is or we should not think that water is restricted only to the domain of the state, but today this discursive transformation had taken place, where we have to

understand that water has become business of everyone everybody within a wide spectrum, or within a wide range of you know social relationships.

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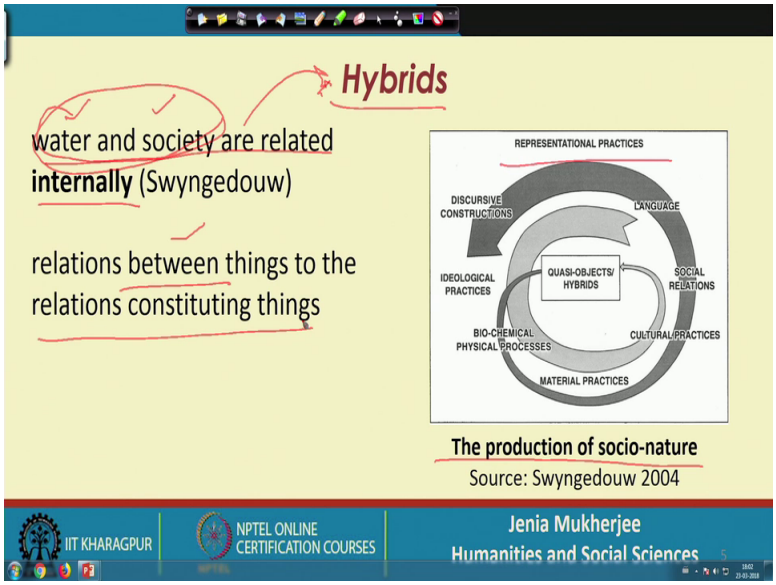


So, this is another interesting concept or conceptual formulation by Eric Swyngedouw. So, Eric Swyngedouw had done a his research on the on Guayaquil Ecuador and, we had written number of papers and books on a on socio nature and on hydro social on urban political ecology etcetera. And Swyngedouw had made exciting advances in this particular field because, a he talks about you know the hybrid nature of water. And hybrid nature of the relationship between water and society.

So, he says that the processes of the I mean he says of the processes, or the components in the process, that is water and social the systems, or water and social power these are related, but these relation is not external, this relation is rather internal. This is most important because by saying that you know water and society by saying that water and society are related internally Swyngedouw tries to emphasize on the hybrid relationship between water and society, which is which has also come out well in this particular illustration, where Swyngedouw has focus on the production of socio nature.

So, what happens here is that you know a he considers the components in this process not as separate entities, or pre given you know entities that a fall, within the realm of either water or society, but rather these two are you know the relationship are embedded.

So, the relationship is absolutely internal and the relationship is embedded a that and that we can a understand through the use of the concept of hybrids.

So, this is a hybrid relationship between there is a hybrid relationship between water and society. So, he explains that you know so, the relationship is not between things. So, we need to understand that water and society, there is no it is not an external relationship between water and society. So, it is not a relation between things, you know that for example, that might explain the impact of human society on quantity of water or for that matter quality of water.

But rather there has to be a transformation in a thinking, where we should think that this relation has evolved from relation between things to relation constituting things, such as the political, economic and cultural processes a that actually determine and define the particular nature of particular instances of water like, drinking water like desalinated water like, groundwater, like different other waters. So, water is not you know water is explained as different waters. So, this is also another a advancement in the understanding of water within the political ecology a framework, where the scholars they tried to focus on different instances, or different waters rather than conceptualizing water as a homogenous entity.

So, this can be explained by some examples that I will like to draw your attention on now.

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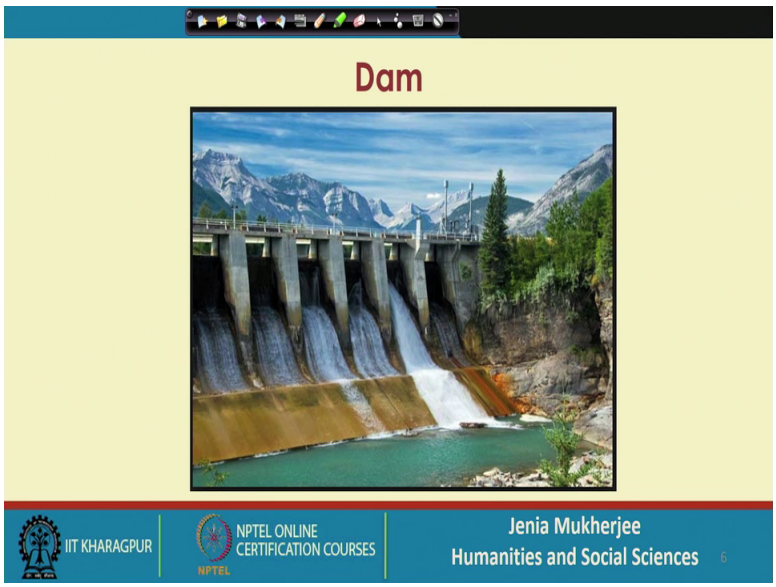

So, for example, I will try to give some examples on dam like, desalinated water, plant on groundwater etcetera. So, let us first focus on dam. Now, let us just think like the water that is a held in place behind the dam is it, simply H 2 O that can be measured by cubic meters and that falls through the penstocks and turbines to generate hydroelectricity.

So, is it simply H 2 O or there are very important other parameters other factors, other complex processes that are embedded that are in built, in this whole thing that actually determines the functioning of the dam, it is impact on society and visa versa.

So, this is a big question that we really need to ask, is water that that is being held behind the dam it is simply H 2 O or not the answer is of course, not why because like a the water that is held in place, it is being done by the state run utility. There are other things like for example, abstract hydrological calculations involved in the whole process, there is human labour that is that has been extracted you know for this for the construction of turbines of the pen, penstocks, and so many other components of this large and huge big infrastructure.

So, there are other thinks like for example, construction core consortiums there are water management protocols and, there are also strong discourses of national identity associated with the construction of or with the production of hydro electricity. So, we need to understand that all these important components, or all these important components within this process, they play very important role and they are internally related to each other that effect the functioning of the dam and that also consequently effect the functioning of the dam on society and vice versa.

So, hydro social cycle when if you apply the hydro social lens, if you apply the political ecology or the hydro social lens to understand the functioning of a dam, will be able to capture this complexities, which are otherwise you know which are otherwise remain ignored, or you mean missing in the mainstream narratives.

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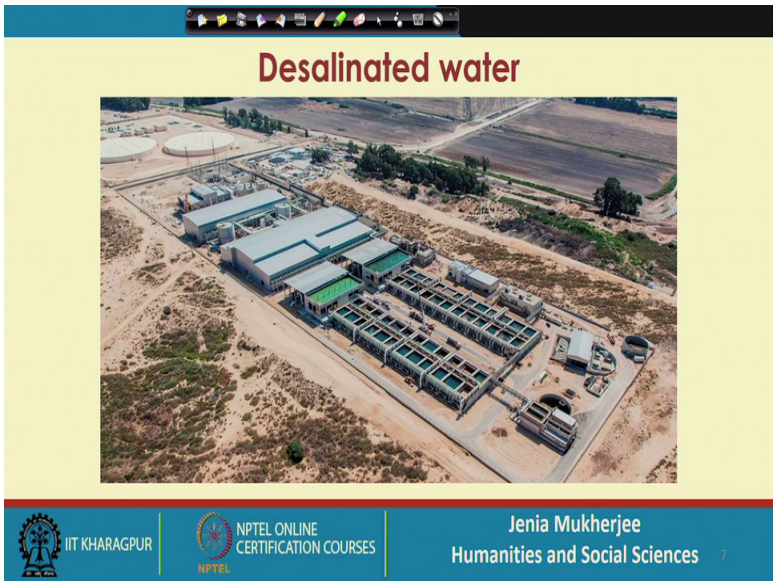


So, now I will I would like to give an example on a desalinated water. So, desalinated water also if we view you, if we perceive desalinated water if it try to understand desalinated water by looking into or looking through the hydro social lens, then will understand that it is a particular instance of water, which is produced in a set of relations involving sea water involving you know the technological configurations, involving international a trade and also involving a flow of capital and flow of energy.

So, all these things are involved in these process and it is not a linear simple process, but rather complicated one. So, now, if I given example for example, like what happened in Peru was that a particular mining company it came up with proposal for water swap, that is it wanted to extract water from the end is from the upstream end is and that water would be used by the by the mine for industrial output. On the other hand it suggested that as it would be drawing water from the endless. So, what it can do is that it can a provide desalinated water a in a downstream town.

Now, the question is whether the a people of people living Peru they actually accepted, they are proposal of the mining company, or not the answer is no they did not accept the proposal of the mining company. Because and there were also a savior protest by the savior society organization and very interestingly one particular civil activists, he said that this particular mining company is trying to replace now this is very important. They

are trying to say he said that, they are trying to replace our live waters, our live mountain waters with dead desalinated water.

So, the question is what is that stake here? Is it water that is a stake, or is it desalinated water that is so, so the whole an idea is that the politics of desalinated water is very different from other instances of water. So, hydro social cycle or hydro social lens gives us these particular understanding that how desalinated water. It is very different from other water like other you know drinking water, or groundwater, or different other water, how is it different and how it intern being different it also produces different sets of configuration.

So, and other thing also is that like I mean hydro social cycle also makes us aware of the fact that, a desalinated water it extracts rather it exhausts and endangers a new waterscapes, which new waterscapes and that actually a get is produced and you know created by transforming economic possibilities ecological conditions and also social identities.

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So, then you know coming to groundwater another example. So, again the whole question of like our social processes surrounding groundwater, similar to social processes surrounding other sources, or other states, or other forms of water. So, we hydro social cycle, again it studies the hybrid nature of the relationship internal relationship between water and society, making us aware that you know different waters, different instances of

water, they actually create different configurations, which cannot be fitted into a homogeneous and universal framework and understand.

So, for instance now if you focus on groundwater, will be able to understand that you know ground water is much more complex for that matter is much more complex than like a surface water. Now, why because groundwater it actually remains invisible. So, it is complex because it is invisible and it is very difficult a to measure and assess groundwater by both hydrologies and also the users.

So, same example I can give you know I mean relating to what happened again in Peru. So, what happened is that like so, one again one particular mining company, they wanted to extract groundwater from Peru, but you know the people again the civil organization they protested, they rejected the plan of the mining company. So, they accepted the plan of the mining, or the proposal of the mining company about using surface water for running their mines, but at the same time they rejected the plan of the company the mining company to extract ground water.

So, you can understand that is water should not be treated as an undifferentiated all homogenized hole, but a hydro social lens the hydro social angle make us realize make us aware about the heterogeneity in water and heterogeneity within the materiality of water. So, and again if you like focus little bit more on groundwater will be able to understand that groundwater it has characteristics that make it either you know that that either that provoke I mean the provoke uses to use it in a more frequent manner, or and that also at the same time provoke user not to use it.

So, I am saying I am tried to say that ground water has characteristics that play an important role increasing it is demand, at the at the same time ground water has characteristics that can also reduce it stream. So, if I give some concrete examples like when I mean a how I am saying that ground water is a characteristic that, can increases it demand, because like the supply is continuous. So, even dry periods in dry periods there would should not be ideally any problem with the supply of water.

So, that is the incentive at the same time the sediment load also remains low compared to you know surface water. So, these are the incentives that or these are rather characteristics that make that actually increase the demand of groundwater, at the same time you know the demand can also be reduced because, there are few characteristics

that again play an important role it reducing the demand of groundwater. For example, the there could be the issue of salinity right, the water could be saline in countries like south Asia for example, in Bangladesh more specifically India, there is the problem of arsenic contamination in groundwater.

So, I think that is a kind of a disincentive ok. So, that plays a vital role in reducing the a demand of groundwater, there might be other factors like for example, the drily and the pumping costs might be quite high. So, this could be expensive. So, that would again you know you know provoke the users not to use much ground water. So, that would again reduce the demand of groundwater.

So, what I am trying to say is that that groundwater has characteristics that at the same time might increase or decrease, or reduce you know demand and that would consequently have effect, or that would consequently effect the distribution of ground water among the users. So, and that will create configurations that will that will be very different from configurations created by surface water, drinking water, desalinated water, that we had discussed just before and also dams.

So, the hydro social cycle it is very important in the sense, it help us it help us you know get engross into and realize the this the history and the trajectories and, the complexities across different instance of water different states, different forms, different qualities, different quantities, of water that make water meaningful. And that make water you know different and distinct from other forms and other states of water.

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So, coming to the next component within you know hydro sociality, it is a very interesting advancement that is that had happened very recently and, I am happy to share that like, we are I mean we are involved in this project where, we are trying to transform you know the hydro social cycle to what we call hydro sediment social cycle.

So, what is happening today is that if you remember the second lecture on beyond hydrology, that I had mentioned that how mainstream water science, or more than what if you remember that hydrological cycle how I say that I you know later emergence of more than waters. And more than waters and during that time you know 1670 century Europe, how separations were affected between land and water.

So, all those places which were you know the marshes the friends the Buglance the Wetlands the Chorts that is given an Island set, when not taken into consideration at all because, it was thought by the state it was understood that these areas, or these you know these physical. So, call physical realities will not be very profitable for the state. Because like so, the state was interested in the durable landscape because, that would help the state to on an extract revenue from there, in terms of fertility in terms of agricultural productivity all that. On the other hand you know water, I mean the state was interested in water flows, or river flows because, a water was important of river was important in terms of trade in terms of a transaction ok.

So, in that way like a durable landscape and river flows, where consider as important because they would ideally contribute to the to the exchequer of the state, but all other all other the all different other forms, which are maybe the forms the physical forms which are neither water nor land, which are sometimes water sometimes (Refer Time: 25:43) which are partly water partly land.

And very interestingly in South Asia in the Global South in the coastal estuary deltyke regions these realities I mean so, frequent. And it also consists of or it thickly loaded with social realities as well. So, so hydro social cycle till now it has actually talked about the relationship between water and society, but unfortunately enough till now it has not been able to include you know sediments, that is also a very important component within water especially within costal estuary deltyke so, called and waterscape.

So, what we are trying to do or what we have done is that we are still continuing with the same set of research. So, we have a conceptualize particular term and interesting terminology which are call muddyscapes. So, which are neither water nor land, but combination of both. So, again if you not be quite appropriate to say that muddyscapes is a combination of both, again so, if we use the concept of hybrid. So, here land and water they are not separate entities, but rather you know land and water with entangle.

So, again a kind of embedded hybrid relationship between land and water so, what is focus what we have try to focus on is not only on the relationship and co production of water and society, but the co production of water mud and society. So, so this is the latest development within hydro sociality, or the hydra social cycle that how you know sediment which is again a very significant component in reverse, especially in it is in it is lower stretch mainly in the deltyke region. So, how it is also important to include sediments in the hydra social cycle and, how that could lead to a transformation in the hydra social cycle or rather expansion, or enrichment of the hydro social cycle from hydro social to hydro sediments social cycle.

And when you know hydro social cycle will actually be expanded to hydro so, hydro sediment social cycle, we have shown that how we will I mean quickly become aware about all this complexities and all this realities that you know muddyscapes actually consist of.

So, this is the latest development within the cycle itself. A hydro social a cycle, or you know political ecology of water, it has to move towards you know kind of an (Refer Time: 28:25) we rather all of us you know who are interested in studying water, in understanding water society relationships towards the larger goal of in a sustainable future, or should we should move towards agonistic transdisciplinary water research.

Now, what is agonistic transdisciplinary water resources. So, what is agonistic, agonistic is you know striving for an effect. So, there has to be some effect, there has to be you know the translation of ideas into practices that is what is required.

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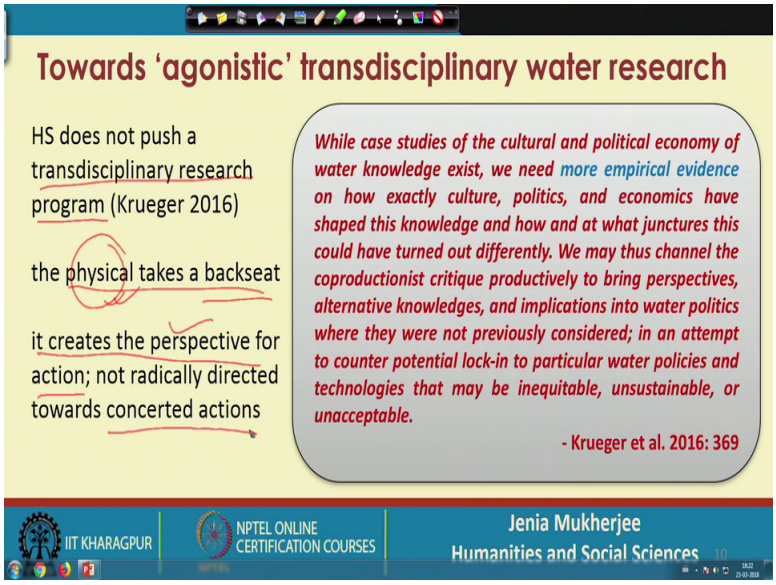


So, there is a strike criticism that you know hydro social cycle actually does not pusher transdisciplinary research why because, you know I mean it is it is still a does not pusher transdisciplinary research program, because in the physical actually takes a backseat.

So, in that sense a critical physical geography is again emerging as a feel, which is doing justice to both the physical and the social. So, will discussed critical physical geography at the end of the course, as one of the very viable approach is a frameworks, but for now concentrate or political ecology of water and hydro social, we will find that in a one of the criticism is that the physical is still taking a backseat.

So, it is so much loaded and embedded with the social dimensions that I mean there is not much discussion on the physical aspects of water. So, which is actually taking as

backseat and, how that is quitting some problems for you know getting a comprehensive picture, getting a larger comprehensive picture about the subtleties of what is actually happen of the occurrences of the evens.

So, finally, like another thing is that it is say that it creates the perspective for action. So, hydro sociality or political ecology of course, there is no doubt that it is creating, or it creates the perspective for action, but at the same time you know it is not the radicals directed towards concerted action. So, this is what is actually missing. So, briefly like it all about like the there argument is that you know critics of syncs they point out, that you know one of the shortcomings is that in particular ecology of water is that the intellectual commitment is still very much restricted within this you know intellectual, or the theoretical and academic domain.

So, now time is ripe enough that you know this intellectual commitment has to get translated into a political commitment and, when theory is really you know have to be followed and radicalize in the practice. So, we need to think about pathways we need to think about ways through we which we need to talk ways, come up with innovative strategies through which these intellectual commitment actually can get translated into the political commitments. So, Krueger n 2016 Krueger say. So, this is again a comprehensive quote that calls for a movement, that calls for the movement for radicalizing river research.

So, where he says that you know like there are. So, many case studies on the cultural political economy of water knowledge that exist today, but on one hand we need more empirical evidence. So, there should be more and more case studies focusing on how cultural politics and economics you know have shaped this knowledge and, how at what junctures this could have turned out differently. Again he says we may thus channel the coproductionist critique productivity to bring perspective, alternative knowledge and implication into water politics, where they were not previously consider.

So, what he says is that we need to bring this perspective, we need to make this perspective work. So, somewhere there has to be a translation of theory into practice. So, we need to really you know not only influence the policy circle, but really need to come up with waste through which you know things could be implemented into actions. So, that is what it is being suggested.

So, in an attempt to counter potential lock in to particular water policies and technologies that may be inequitable unsustainable or unacceptable. So, we have to really come out device strategies, through which you know inequitable and sustainable and unacceptable water use could be address. So, it is high time for us you know to address psychological and social justice by not only formulating theories, but also showing some ways through which this theories could be translated into actions.

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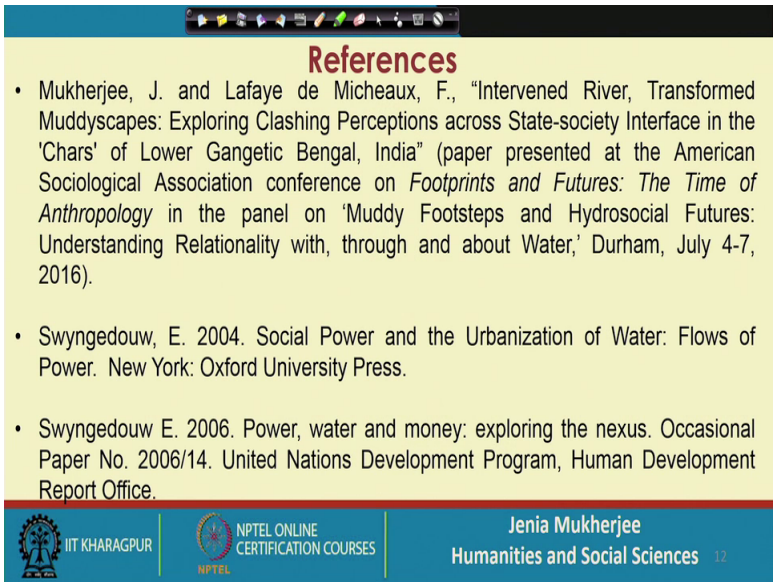


So, these are some of the references which would be shared.

Thank you.