

Chicu Lokgariwar: I am interested in understanding what the efforts are (towards restoring the Ganga) and how each effort interlinks with the other. I wanted to gain some clarity about that. The IIT consortium is developing a plan. What is the approach you have taken? What is the process that you have followed?

Chicu: What I am trying to find out is, who have you identified as your stakeholders; who have you included in the process and in the structure?

Dr. Vinod Tare: See, we have essentially almost looked at all kinds of factors and stakeholders. But our approach was very non-traditional, in terms of actually consulting them or involving them. For example, you are an actor in the whole process. But you would not even know how we have taken your input. We have tried to make an attempt to capture the feelings of everyone, but not necessarily involve everyone. That we thought is difficult. For example, spiritual aspect is one thing. We may not have talked to all spiritual leaders, right? Or not even one or two. But we have tried to capture their views. For example, Avimukteshwaranand was on our project management board. Informally I have discussed with him, 'n' number of times. And tried to get exactly what is his view on the Ganga, what he expects. Similarly, Dr. G. D. Agarwal may not be involved but he was invited a number of times and we have tried to discuss with him, capture his views. Similarly the central government officials are also stakeholders, right? We may not have had a meeting with them one-to-one, or with the state government for that matter. We may not have had a meeting or a formal workshop or whatever. But because I have been working in this or the last 15 years, 20 years I know exactly how the secretary thinks, how the chief minister in a state government thinks, how the leader of the opposition party thinks. The Central Pollution Control Board is there – they are also stakeholders and the state pollution control boards are also stakeholders. If a formal consultation is held, some engineer comes, he tends to present his personal views. You cannot say it is the view of the State Pollution Control Board. Or when we talk to the Secretary, or anybody for that matter, it is hard to say that we are getting government's view. Isn't it? Actually, he is giving his view. He presents his state of mind at that time. So that's not actually what we can say the government wants. It is very difficult to say that. This is what happens when you organise a workshop. That is why we have not followed that. But we speak to them, we have tried to understand the processes, how the government processes are, what are the linkages of the secretary, what is his tenure, what are his constraints. His first mandate is to satisfy his minister, isn't it? So when he speaks to us, his first thought is, 'what can I obtain from them that will make my minister happy?'. After that, he also does not have a long term perspective. Because he is only looking at his duration and anything which can come in that. So he is not interested in talking about this or that, isn't it? For capturing views, we have had n number of meetings, hundreds of meetings. I myself have delivered lectures on various fora, interacted with various fora, so we have used that. For example, WWF organised something on e-flow. They invited all the CSOs, what is their thinking about the river. I was a spectator there. The deliberations at that meeting, it has come to us. So they will think, the IIT consortium never consulted us! But actually we have tried to capture. So we may not have formally involved anybody. Where it was necessary, there we have. The same thing for the industry. We have had several roundtable discussions with industries- whether textile industry, pulp and paper industry, sugar and distillery industry. We have done it within the Ganga Basin, outside the Ganga basin. We may have done it under different names, instead of calling it Ganga basin, we might have spoken about implementing ZLD as they do in the South. So IIT Chennai organised a workshop. All the industries based in the south, we asked them, 'what is your problem? Is ZLD working here? Should it be there or not? ' Then they said, 'yes it should be there, but you should also do it in Kanpur. Then it will be economical for us.' So in this manner we have done the process of consultation. Then of course we also organised formal

meetings. As part of our project, at the highest level we had the project management board. The constitution of this board was that all the directors of the seven IITs were there. Okay?

Chicu: So it was a high-level board?

Dr. Tare: A high-level board. And then we had three expert members in that. One is Avimukteshwaranand, who I mentioned. Dr. Bharat Jhunjhunwala was there. The third was the former secretary of water resources, Chitale. I don't know his first name. He is a hard-core water resources engineer, pro-hydropower. Bharat Jhunjhunwala is anti-hydropower, right? So we had that and that was a good kind of discussion. There were people there who balanced each other, isn't it? Then there were representatives of three ministries of the Joint Secretary level. They were from MOEF, Water resources and human resources. So this was the board. Then we had what we call the PICC- the project implementation and coordination committee. We had created various thematic groups. Though we always had the complete picture in mind, we cannot work in total. So we divided it into groups. We had one group on water resources management, one group on ecology and biodiversity, one group on socio-cultural, socio-economic aspects, another group on environmental quality and pollution, one group on fluvial geomorphology, one group was on policy, law and governance. That group mapped all the legislations, from British times to the legislations of the Central government, of the state government, local bodies, what are the overlaps, where are the conflicts, where are the contradictions. Similarly policies, what are the issues with EIA clearance and public consultation. And for each of these, we have come out with reports also. There is one report we have come out with for public consultation for hydropower. We also have done a SWOT analysis of the Ganga Action Plan itself, where we saw what was good in that, what was bad in that, that kind of analysis. Each thematic group had about 15-20 people from the IIT system. Then wherever we thought we had weaknesses, where we did not have strength, like ecology and biodiversity, we do not have so much strength in the IIT system. So we co-opted Central Inland Fisheries Institute- Mr. K.D. Joshi is there. Prof. R.P.Mathur was a retired professor from Roorkee, he is a person from life sciences. He was leading that. So many times we went to Barackpore, had discussions with him. Of course WWF was continuously part of it. For socio-cultural, a person from IIT Roorkee was leading the whole thing. We discussed all the agricultural issues in that- we have collected all the agricultural data, how landholdings have changed, how fertilisers are used, how the yields have changed, what is the status of the districts adjoining the Ganga, what is the trend in the non-bank districts, the policies of every state government, how electricity tariff influences water, all those things in a very different way. We have done a complete hydrological modelling of water resources. There was a different group for environmental quality and pollution. In that we've looked at industrial waste, at solid waste, at all aspects that are responsible for unpolluted flow or 'nirmal dhara'. Starting from cremation to sanitation. Within that we looked at what we need in the villages and what we need in the cities. Within cities, we looked at what is necessary for newly established colonies and for the main part of the city, which tends to be very congested. After that we looked at the sewage treatment plants constructed earlier. In 1974, the Water Act had been passed. We are 38 years down the line, why we have not been able to implement. Why have we not been able to stop industrial pollution? We have looked at what is the structure of our state pollution board. They are autonomous, but they are actually not autonomous. It is a politically governed process. Corruption comes from that only. But the whole structure is like that. If the CPCB chairman has to report to the joint secretary, how can he be independent of the government? Even if they shut down some industry, they get a call from the Ministry, 'how did you shut it down? Open it again!' How can it work like that? Or sometimes there is pressure to shut down all the industries. Even if there is no rationale. Then there is some money involved..So this whole process, it is not only technical. So we have done a

complete consultation of this type. We did not have all this, we got the information through discussion, with the common people about their aspirations, with everyone. So common people may not have realised that we have consulted them. But we tried to capture their aspirations. And all the suggestions that we receive..for example everyone gives suggestions to the Prime Minister through his website, his email. He forwards all those to me. And when I go through it, by and large we feel that 'yes, we have considered everyone.' It is a different issue that we are not able to satisfy their egos. They think, 'I've given a suggestion and noone listened to me.' But we have taken care of it. We have no vested interests. Neither in the technology, nor in anything else. We have tried to fight on both sides. On one side there is hydropower- we've told them that no project should be without environmental flows or river continuity. On the other hand, someone like Jhunjhunwala, a spiritual leader, say that the river has a right over 51% of its flows. We have told them that this is not possible, you tell us the real requirements. We recognise that cultural and spiritual requirements are important for e-flows, right? But we also say that if we have ecological requirement, then what is the need for a special cultural requirement? Those things are more anecdotal and more observations, you can say. 'water used to go upto here', I would say this is a hydrological measurement. That water goes upto here, if it goes there every year, water is adequate. You cannot say this is socio-cultural requirement. But it is an observation, that is there. This does not mean that people expect that there should be so much water. Then people say that the Ganga has arrived because it is spiritually important. Somebody also gave us some literature that 'musalsnan' is very important.

Chicu: What is that?

Dr.Tare: Musal Snan means that you stand in the river and water flows above your head. So people were saying that we need to consider this in socio-cultural requirement, that there should be enough water that people should be able to do that. Then I asked the counter argument to them, ' Tell me how is this done in Gangotri? There even in the natural conditions, it is not possible. That means that this is not something that you can do everytime in every place. So this is an illogical requirement.'

Chicu: Even in the Gangetic plains, the water spreads.

Dr. Tare: Exactly. Even there we said that when we provide environmental flows, you get that situation in the centre. If you ask for it at the ghats, that you want the water there to flow over your head, even if you remove all the dams and do everything, you will still not get that much water there. So that's very unreasonable. So we have tried to rationalise. I asked the same thing to Avimuktेश्वaranand, how can this be? So he gave me a very logical answer, that musal does not need to be standing, it can also be lying down. Whoever wants to take a musal snan, can lie down in the river. You cannot expect anything more than natural. We have tried to sort this out and give some sort of logic to that. Whether it is this, or industrial pollution. After that we did a technological assessment. Of course, we are strong in that so we have no issues there. But we have more looked at implementation issues, at why things have failed. Our assessment is that all the actors have different 'residence times'. For example, the secretary has a post duration of not more than three years. So he is not interested in anything that spins for greater than three years. This is the same for politicians. If there is a clear-cut mandate, then they have patience for four or five years. Otherwise, everyone asks for something which will show results tomorrow. Noone has any magic like that. What happens in that process- that things need to be done in the next four to six months- there is a lot of unnecessary expenditure. And we do not move in a right manner. We are being told, you took so much time. We were told in the beginning to tell them what can be

done immediately. With great integrity, we presented them with four-five reports within six months. This was in 2010. Now it is 2014, there has been no action on those. Now they are saying there is no time. If they had begun 4 years ago, we would have been ready by now! We had said that each town needs an urban river management plan. That is, we should know in each town how much water is coming and from where. How many tubewells, how many drains, how much of the river space has been encroached upon. All this mapping we asked them to do for each town. We had said that this should be done very professionally. They had money too, we had estimated that each town will need one-to-two crores for this. They had the World Bank money, and this could have been done for 200-250 towns. If they had done this, we would have all the data required to say where things need to be built. They never did that, and now they are saying that it will take time. But four years have been wasted without any decision. What happens is that they are just in the expenditure model because the efficiency of a government official is judged by the amount spent. He is in the process for only 3 to 5 years. He is given a budget and thinks that if I do not spend it this year, I will not get any money next year. His efficiency is evaluated based on how much money entered his ministry that year, and how much was spent. So he is in a hurry to distribute money. As soon as the State government comes to know that the Central government has a scheme, the State government tries to find out how much money will come to the State, and they make a project based on that. No one worries if the project is actually needed or not. After that, suppose they are making a STP. Money comes in for construction of the STP, but not for operating it. So they amended it to including the operation and maintenance costs for ten years. That is also not a good idea. What happens is that the builder increases the capital expenditure and leaves only a small amount for operation and expenditure. So he gets the full money for commissioning. Formally, he has taken the contract for 10 years. But his major payment has already been paid, what interest does he have in maintenance? For the first two-four years he satisfies the official by some means or the other. After that all the officials have also left and no one is accountable any more, no one is responsible. This is what is happening on STPs. No one is accountable or responsible for anything. That's why this should be done more professionally. We are saying, just as you consider other things to be an industry, also consider sewage treatment as an industry. Say that this is the sewage we have. We don't even need to worry about other infrastructure now. Because sewerage treatment will take a lot of time. Measure the discharge of each drain that outfalls into the river or tributary, and tender for the treatment of that sewage. Get it measured by those who will be treating the sewage. Then you say, 'this is the raw material I can give you. And from that sewage, you produce water and give it to me. I will buy that treated water for the next 15 years.' Now what I do with that, whether I reuse is, is up to me. So my worry is not to make STP. Let that investment come from the private sector. I will only purchase the water. In this, the government does not need to invest, private parties will come forward for that. The local body will also get money from the reuse of this treated water. The STP operator will also get revenue. The support of the local body is essential for pricing of water. This is how we will learn to price water for various uses. We are not telling you to give the natural resource to a private party, only the sewage part of it. So the responsibility we are giving to someone else. And what we are saying, why do we need to give fresh water to industry? For example tanneries. What we say is they should recycle their water completely. But suppose a 100 units of effluent is produced, only 70-80 units of recycled water can be reused. The remaining balance should be made up by treated sewage. Thus their entire fresh water consumption will be covered. It is difficult to implement this by regulation and policing. So for that, you need to do pricing. We need to decide to price fresh water at 1.5 to 2 times that of treated water. We are not even saying that industry cannot take fresh water. If you want to drink bisleri water, then pay the price for it! And the Ganga water is of such good quality; if you want to use it to wash leather then pay the price for it. And the ETP which is there, the industry will be dependent on that ETP, because they will get water from it.

After this is done, you don't have to apply any ceiling to the industry, or worry about a license, because their water is getting recycled. Water extraction is now less. People that if you do not put even treated water into the river, then what flows will remain in the river? But we don't want to have waste water flowing into the river. And if we are recycling water, then obviously I will not extract that water. So the fresh water will come, and it is fresh water which should flow in the river not the waste water. And then policing becomes so difficult, whether they have treated waste water. If we implement this policy, even the common man can observe whether the drain is flowing into the river or not. That is easy. But it's BOD content, COD, coliform content, that is a matter of controversy. If we prevent the waste water from entering the river itself, the option is that the drain should be dry. If it is not dry, then people can take photographs, make a complaint. It will be monitored instantly. Then CPCB and SPCB also cannot do that. So we are trying to simplify. The actual idea is to realise the value of water. We are not saying you price it for everybody. Price it for those who can afford, and industry can certainly afford. Slowly, when we do this for industry, for commercial uses, when people come to know of its value, it is possible that ten years down the line the public will also realise that if I use so much water, I need to pay for it. It will then not be so difficult to price water and tax the local people too. This is how it will bring in the reform. Instead of policing, we are insisting on good governance.

Chicu: So if I understand, a big component of your plan is the treatment of sewage and its reuse on a market pricing model. What are the other components of your plan?

Dr. Tare: One is Nirmal Dhara, basically what I spoke about. River cleaning means what? You stop dirtying it. The investment that is being done for this is not for the Ganga, it is for urban infrastructure. To say that this is done for Ganga cleanup is wrong. What we are doing is, we are not allowing urban centres to dirty the river. Then the river will automatically become clean. What we believe now is that even if 70-80 percent is rural population and urban population is only 20%, direct pollution is only done by this 20%. So it is not necessary to insist so much on the villages. Some other things we are insisting upon are those that even if it is very small in quantity has a very high importance. Like religious pollution, whether it is flowers or puja material. We are saying that our religion also does not say that we should throw it here. We have tried to convince the spiritual leaders that it is your responsibility to tell society that this is a sin. Throwing puja material into the river is a sin. Now you say it is a punya; you need to change that. If you call a pundit into the house, he says 'son, take all this, put it into a plastic bag and throw it into the river.' Isn't it? He himself is committing a sin. Our religion does not say this, has never said this.

Chicu: how will you institutionalise this?

Dr. Tare: It is possible to create a law or regulation for this, but it is more convincing to the spiritual leaders. They need to tell people. When we went to the Kumbh and told them, they agree on that. Atleast they say so. That's why everyone is angry with us. We tell both industry and religious leaders. One thing I have tried to do, to the extent possible, whenever there is a discussion is to not allow mixing of the issues. Mixing of the issue in the sense that if we are talking of puja material, I will not allow them to talk of sewage or industrial effluents. Focus only on this. I say 'yes, it is important. We are handling it in our fashion. You are not knowledgeable about it. So don't poke your nose in it. Tell me how you will handle this issue. And this you alone need to handle.' They say 'no, no, this is only 2%, 4%'. Then I say 'even if it is only 2-4%, but you are the leaders of society. If the teacher in a school commits only one mistake, the others are justified in committing a hundred mistakes. Even if it is a small quantity, you will be morally on high ground to ask industry and sewage to stop provided you stop. Even if it is quantity-wise less. Yes, I agree with you that

cremation or even immersing corpses causes less changes to COD and BOD than industrial pollution. But this is a very high impact kind of thing. Even if quantity-wise it is less, if you can show, we will have a moral ground to ask that.' Now if we go to industry, they say 'you only tell us, what are the spiritual leaders doing?' They have a chance to speak, don't they? Even they know how it is. All actors are looking from their perspective and trying to confuse the issue. As a result we are not able to move. So one of the approach has been to stop mixing up the issue. If you don't have a ticket, you are caught, you answer first, you need to go to jail. Don't ask me if I have a ticket or not.

Chicu: What about 'aviral dhara'?

Dr. Tare: For aviral dhara we have categorically said that river's continuity, longitudinal connectivity and environmental flows needs to be seen. So no structure should come up on the river or its tributaries which violates this. There is no question of giving environmental clearance to such projects. Don't even ask MOEF to clear this. If at all this has to be done, it has to be a political decision at the highest level, in the larger national interest. If at all that has to be done. Normally this should not happen at all. If it has to be done, don't take the environmental excuse. If you give the clearance, accept that this is going to cause environmental disaster. It has no environmental sanction yet we are doing this in the larger critical interest of the nation. But environmentally it cannot be cleared. Anything that obstructs the longitudinal connectivity and environmental flow is irreversible damage to the river and is environmentally not acceptable. No environmental clearance can be given to such kind of projects. This is the basic category and the government has accepted this recommendation in general.

Chicu: Does this apply only to the main stream of the Ganga or also its tributaries?

Dr.Tare: All, all, all. All rivers. Now the issue of connectivity raises the question, connectivity for what? Connectivity for biota movement, isn't it? Now where there is no biota movement at all, or there are many such rivers which are not perennial. There you cannot talk of biota movement, migration or connectivity. Like Chambal or Shipra, there if you create stop dams, or small check dams, it actually improves the situation.

Chicu: No sir. The ecosystem is changed, is it not?

Dr. Tare: But then what has happened is at some point of time they were actually perennial rivers. And then if you want to restore the conditions there, then you have to allow groundwater to get recharged. Now you can do it upstream and so restore groundwater. This is what has been the concept of watershed management. They have created these small check dams and stop dams. If you apply the same principle of river connectivity to that, then that is not valid. So river connectivity also we have defined. For what? Biota movement, sediment movement, isn't it? For all rivers which are perennial, any obstruction is not possible at all. But the rivers which are not perennial, if there you want to restore ground water, bring base flows back into the river, then you will have to do this. For that yes, it will bring a change. But anything that you do, it is a continuous process. All ecosystems, naturally also continuously keep changing. You cannot say I will do nothing. Even if you do nothing, there will still be some change. So that kind of thing we will have to take.

Chicu: What is the vision of Ganga that you think will be achieved by the implementation of this plan?

Dr. Tare: Vision is obviously that we want aviral and nirmal Ganga. It has to be considered as an ecological entity and it has to be realised that it is a geological entity as well. These are the four basic principles that we are based on. And we have also said, 'why Ganga only?' We are taking Ganga now, because it has been given so much importance. But we hope whatever we do for Ganga, if we are successful, will be replicated elsewhere. So we again do not want to confuse this issue. Many people ask us, 'why the Ganga?'. We reply 'our mandate is the Ganga. We have been told to look at the Ganga basin and that is what we are doing. This does not mean that the Narmada is not important, the Kaveri is not important. They are, but now we are working on the Ganga. We are trying to take advantage of it, that this is one of the most important rivers, it has been declared as the national river, and we have even quoted from Gita'. In the tenth chapter of the Gita when Lord Krishna describes his various forms, he says, 'I am the Janhavi'. This shloka is also quoted in the Prime Minister's bulletin. That is the importance, 'why Ganga?' And then later on we can say that the Ganga is our country's culture, and so all rivers are the Ganga. That's a different thing, because all rivers we consider as the Ganga.

Chicu: I forgot to ask you one thing. When it comes to Aviral Dhara, what about the existing blockages?

Dr. Tare: Right now, as for the existing, it is like this. You have already spoiled the river in an irreversible way by constructing Tehri Dam, by constructing Koteshwar, This is an irreversible damage that you have done. Now how to change that, that's a different thing. This government is very serious about it, it is not that they are not serious about it. In a very serious way we are working on these options. How can the Ganga be Aviral with Tehri there? So we are looking at all possible options. Business as usual to the very extreme step of dismantling Tehri.

Chicu: And the other dams upstream of Tehri?

Dr. Tare: As for the new projects, the government has given an affidavit in the Supreme Court that we will follow IIT's recommendation. This is what I have circulated, it is based on that only. That we will not give any clearance unless this ecological entity, longitudinal connectivity and environmental connectivity. So all projects have to be redesigned. Even if they have been given clearances earlier. They have to come afresh. Second thing that they are sharing is, it is not the capacity of the project. Earlier it was (no clearance for) less than 25 MW. That also they have removed. Now it is any project has to come for this. So I think that's a big change that they have been able to do based on our recommendation. For aviral dhara that is the policy you need. Then people will come up with new designs and alternatives. We are even thinking of at the base of Tehri..suppose I have to have tehri as well as have the connectivity. I can even think of a technical solution; I can provide a river pass through the reservoir. Like by using a tunnel, we take a road or a railway below the sea. So I can think of having a river flowing through the Tehri reservoir. So complete connectivity is maintained above and below the reservoir. The fish won't even realise that they are travelling under a reservoir. They can swim from the top to the bottom. So that's a possible solution. Tehri is an extreme with its 40 km long reservoir. The others, like Maneri Bhali I and II are only a half kilometer long. So making a river pass half a kilometer long is not a big thing. There will be complete connectivity of the river. Excess water can still go into the reservoir. The first right of the water is for the river. The structure will be such that there will be no manual control over it. If the water is below a certain level, it will always flow through the river. It is only when it is above that level that it will go to the reservoir. So that way I hope we will be able to keep a balance between things. We also need energy after all. Whatever other impacts the projects have, are more or less reversible, some of them are temporary, and many of them are due to indiscipline in

our construction process. If we take care of that, I don't really think we have to hide for that. And we can generate much more energy than what we are generating now, if we keep this discipline. So both sectors can be planned. And it is in the larger interest. So we need to improve. We can't do tunnelling in a very haphazard way. There are techniques available which can be done. You don't dispose of muck in a haphazard way, just putting it into the river channel. That is indiscipline.

Chicu: and the sad part is that the guidelines for that already exist.

Dr. Tare: Yes, they just need to be implemented.

Chicu: What stage is the plan at?

Dr. Tare: We are almost near completion of the first phase.

Chicu: What was the first phase?

Dr. Tare: First phase is the first version. Our belief is that this is a dynamic activity. We have done whatever work we have done based on whatever information was available. But we still believe that much of it is not scientific. Because we just don't have that data. Like we were talking of hydrology. Without proper topography, which hydrological model will work properly? And we do not have that topography data. We need the longitudinal profile of the river and do not have that. So we are saying that slowly you need to build up that data. Now the techniques are available. As more and more data comes in, we will be able to tell more precisely that this is needed here or that is needed there. Whether water can be retained here or not, whether this is a recharge zone or not. That micro-level input we currently do not have. And this information has to be gathered. So even for data collection, there has to be a systematic drive. And what we are saying is, we should move away from a centralised government-controlled data collection to decentralised community-based data collection. Involve the community. For example gauging discharge. To gauge discharge, all that needs to be done is measurement of a single level, isn't it? Why can't we select two youths in villages along the length of the Ganga, every 50-100 kilometers, give them a mobile phone each, and tell them to take a daily photograph and send it to the server. With this their ownership will increase, their involvement will increase, they will get a job. So this is what. We need information about ecology. We don't use any hi-fi technique for that. We just bring and analyse samples. This can also be done in schools. This can be decentralised and coordinated by a regional institute. They can teach the students of 10th to 12th standards to take samples. Now every school has internet connectivity. This way when we go to data collection, then at least after 15 years we will not have to say that we do not have data. Slowly this will keep coming. Ownership will come, jobs will be created, capacity will get built up. For that we have said that we need to move from NGRBA, we need a separate entity which is above all the ministries. We have proposed a commission- The national river Ganga basin management commission. That should get strength from the parliament. That is why we have proposed an Act, the national river Ganga basin management Bill. The commission will be created through this bill. Then the commission will not be controlled by the government. We have specified different views of the commission. The main purpose of the commission is to be a custodian of the Ganga basin. So their only job is to ensure that the Ganga basin is protected. They will not look for the industries or any of this. They can take action on their own, or based on anybody's complaint related to any harm that is happening to Ganga basin. So they are custodians of the Ganga basin. They will have the research and development wing, information, investigation wing, etc. And whatever knowledge that we have built up, we will give that as a seed to this commission. And from that seed, this commission

should grow into a big tree of information. The data that we have now, all will be made open data. This should be the commission's responsibility. And commission will not be reporting to any ministry or minister. We will be doing more of a coordinating role. But we will have the authority to sanction, we will have the authority to shame people. They will say that this municipal corporator did not do anything. They won't have a rod (authority to penalise), but they will say that this municipal corporation did not do anything. And then they (the municipal corporation) will not be entitled to any of the Government schemes.

Chicu: But if the Commission does not have the power to impose fines..

Dr. Tare: no, that is there. Commission will have the authority to fine if they damage the basin.

Chicu: And what about slapping a legal action? Starting a legal case against people?

Dr. Tare: That they will do. But they will not sort out individual cases. For example, fight between you and me regarding pollution they will not mind. No dispute resolution. They will only handle cases which are against the basin.

Chicu: So do you see them doing the second phase of the plan? Or will that remain with IIT consortium?

Dr. Tare: It is upto the commission. IITs can continue to work in the matter. We will continue to do this, they can also have their own, but we can continue. Our this engagement is going to continue. MOEF is thinking of signing a perpetual MoU with us. They also realise what we have been saying, that this is going to take a long time. Developing the entire plan will take 15-20 years. 4 years have already passed without doing anything. So we have to have patience. World over, whatever river you take, even the small Murray-Darling in Australia, needed 25-30 years to make a plan. But it is not that we cannot take any action while the plan is being made. What we call no-regret actions. For example sewage needs to be stopped. For that what is the need of a plan? Industrial effluents need to be stopped. We can definitely stipulate conditions for hydropower plants- why do you need a plan for that? That kind of thing we can do. And this, slowly we are taking it up. Like agriculture, it is also a sector which we are handling. Ganga Basin is the poorest in terms of efficiency..in productivity per unit of water. There are many reasons for that. The landholdings are very small. Those farmers cannot go for any technological intervention. They don't have the money for that. Our agricultural GDP is only 7 to 8%. And 50% workforce is working in this. So that farmer has no option but suicide. So one challenge is how can we increase the productivity per unit of water. For that we have to have technological intervention, we have to go for crop radiation (?), more..isn't it? That small farmers cannot do. So how do we do that? How do we move out people who are in the farming sector? Our agriculture needs to increase, but people working on the farm have to be moved out of that, okay? Either we do that, or we develop a system of coordination, form a society, do contract farming, facilitate them with technology so that they can continue to have their small farms, but support them by creating a sort of corporation.

Chicu: So what you are talking of is a consolidation of family farms.

Dr. Tare: Yes, yes.

Chicu: But historically, when it has been tried in the US, also in the USSR, agriculture has actually diminished. It has..besides the ecological costs, the small farmers have become impoverished as a

result of consolidation. How can you avoid that?

Dr. Tare: There are two things. Either we say, 'okay, these are small farmers. Let them be there'. But then I create a system wherein he is supported in terms of technology or whatever. Call it a cooperative society or contract farming, whatever you want to call it. That is one model. Second model is, you buy the land from them all. And give it to some big entity, he will manage the whole thing.

Chicu: I feel frightened when I hear that..

Dr. Tare: I am not suggesting that that should be the model, but that is one of the models. Extreme cases I am talking about. If you want to improve the efficiency, these are the only two things. Another thing is there, these people, can we not move them into the service sector? Agriculture related production, instead of just farming. And nowadays, you will see, even if you go to the villages, even in Uttarakhand, people are not interested in working in agriculture. They are more happy working in a hotel, someone will put up a stall and work in that, they don't really want to go there (to the fields) and work. So if we can increase agricultural products or the service sector, like for example sanitation is itself a big sector. Rough estimates I will give you. If you assume that to fill his stomach, a person needs 60-70 rupees for a day then to empty that stomach properly, you need 10 rupees per person per day. Take any technology whether in the villages or in cities you need that much money. Install any type of toilet. I am not talking of technology. Irrespective of technology. What they are talking of now, the Swaccha Bharat Abhiyaan, it is not sweeping the streets. That is just shifting it to one side. We cannot put anything under the carpet. So what issues from the stomach when it is emptied, if you want to minimise its ecological impacts, keep the rivers clean, then I have to spend 10 rupees per day. 10 rupees per day includes about 1-1.5 rupees on the solid waste that you see around, whether polythene or whatever. Whether in cities or villages, we have to get rid of it. 4 to 5 rupees are required to empty the stomach. After you build a toilet, if you want to compost or recycle what comes out of the toilet, you will need to spend 4-5 rupees, whether you install sewers or do on-site sanitation. The expenditure remains the same. People do not realise that the cost is the same. Septic tank people think is a very cheap solution. If you work out the costs, it is more expensive than even a centralised system. You need to empty a septic tank once a year. It costs 3000 rupees to empty it once. 3000 rupees for one family of five people, so how much is that? Per day, 2 rupees is just to empty the septic tank. And we are not considering the other things, like the overflow from that, initial installation costs. So 5-6 rupees you definitely have to spend. So 5-6 rupees for this, 1-2 rupees for solid waste, and 2-3 rupees for water. So ten rupees you need to spend for this. 50% of those ten rupees is for labour, for manpower. So if you consider 43% population in the Ganga basin, that is about 50-52 crore people. Consider 10 Rs per person per day, you are talking of 520 crores per day. Take 50-60% of that, I can create jobs worth some 250-300 crores per day, through sanitation, solid waste and water. Only thing is, we have to make this very dignified. Like in aircrafts, people wear nice ties and nice sarees, and do the same work, don't they? How does waste get emptied from an aircraft? The airhostess. We can develop simple machines which can be hand operated, which will maximise employment. This is what I was saying, we can create more service sector. Production efficiency cannot be increased by employing 10 people where you need one. And that is the problem with the agricultural sector. The number of people are more than the work. And so obviously efficiency goes down, and also per person income is very less. So it is not sustainable. They get frustrated, they commit suicide. They are more vulnerable. The small farmers- sometimes the water comes early, sometimes late, there is a drought, the impact of these on them is quite severe. But if this is a large farmer, he will be able to deal. He will have good prediction tools, he will know when the

rains will come, when to sow, when not to sow. So this trade-off we have to do. Whether we do in an organised way and let everybody be there, but with some kind of cooperative society or we do contract farming or whatever. So these two are models which can come up with this. But we have to necessarily do this. 80% water consumption is in agriculture. If we have to save water for the river, even if we increase efficiency by 20-25% our rivers will not be dry. Crop rotation, combining agriculture and horticulture, the slow introduction of organic farming- all this will come. So it is a big activity. The most important challenge is, we have many actors. All actors say that Ganga is very important. There is no one who will say Ganga is not important. Everyone wants to be connected with the Ganga. But everybody is sitting in different directions, and they see from their perception. Each one's perception is different. He thinks what I am doing is the only correct way, and he wants to pull others to his side, that the Ganga will only be restored by my solution. The other person thinks his solution is correct. As a result, when the pull is more either the string breaks or the net result is zero. This is what, including international actors- Germany, Australia and the others. The main challenge is how to bring all the players to one side. So that everybody pushes it. All actors we have defined- state government and central government. Within the government, politicians, bureaucrats, technocrats all have a different residence time. This is what we need to align. We hope that there has to be somebody who looks at it in the long term basis. Now everyone looks at it in the project mode. And a big visionary project is of 15-20 years. No one is interested in it. This is what we hope, if the parliament gives the authority, it will be the mandate of the Commission to look at nothing but the basin and the process, so they will go through it long term. The international players just give us half knowledge. They will give us a gate worth 10\$ and take a 100\$. This has to go. My expectation is that this confusion will go on for the next 2-3 years. But hopefully they will realise. This is our effort. We have recently made this IIT C+ group. So far we were only the IIT consortium, we have added more institutions like CIFRI, CLRI. Plus we are now adding all people who do businesses. Those who build sewage treatment plants, do investment, financing, advocates, people working in policy and law. The bill we have created, if we want to push that..the idea is that instead of everyone acting from different directions, if they come through this, and I ask them 'tell me what is wrong with our research? If it is right, support us.' We are also ready to give the credit to them. So no more is this the plan of IIT consortium, but it is IITC+. And we not have the intention to present that to the Prime Minister.

Chicu: My next question was going to be what are the challenges and opportunities. One challenge you have already told. So in the current political and social context, what are the other challenges and the opportunities that you see for your vision to actually be born.

Dr. Tare: See the opportunity is that if you actually maintain Ganga and Ganga basin, our economic growth rate will actually go up. And that's the sustainability issue. What Modi is saying that if you really implement the spirit of zero effect and zero defect..isn't it? So I think we have the biggest opportunity. We have talent, we have manpower, and we have good climatic conditions. Such climatic conditions are not to be found anywhere else for work like this.

Chicu: Climate..politically or actual climate?

Dr. Tare: Actual. So much water, such rivers – are nowhere else. So if we manage them properly, we have a much better opportunity. So this basin development, I had said how much expenditure this will entail. The next day, Dainik Jagran printed an article 'Ganga Ma is asking for one lakh crores'. Now Ganga is not asking for this one lakh crores. This is what you need to repair your cities and villages. If you do this, the Ganga will be all right, and you are the one who will benefit by it. Your health will benefit. I told you about the 10 rs expenditure; on an average, every human falls ill

at least once a month due to water-borne diseases. With each illness, even a poor person has to spend 300 rupees. If he can't work for one day, he loses 300 rupees. That is excluding medicine, the suffering that he has. And as a result everyone is forced to drink this water (indicating bottled water). A poor person is also obliged to drink bottled water. He is doing it. And that comes for 20 rupees a litre. And if we treat sewage, its price is one paisa per litre. That's the order of magnitude. So if we invest at the proper place. The 10 rupees I told you about also includes complete sewage treatment- to make it drinking water, to tertiary level. But somehow people feel, we are a poor country, we cannot afford this, we should not pay, this is not done outside either. But I think we have to go beyond that. Even if we are poor, in some things our standards should be better than other countries. Our spiritual and cultural standards are much higher than any other country, right? So with river-related, water-related, our standards have to be much higher because we are very susceptible.

Chicu: there you are right, our vulnerability is high.

Dr. Tare: Very high. So we need to spend more on that than even advanced countries. Need to emphasise more.

Chicu: I just need to confirm, the plan includes all the tributaries , does it not?

Dr. Tare: All.

Chicu: But not the Brahmaputra-Meghna.

Dr. Tare: no, Ganga. From Madhyapradesh, Shipra, Shipra to Chambal, Chambal to Yamuna, upto diamond harbour. Till Calcutta. Hooghly and its tributaries.

Chicu: And the reports that you mentioned earlier, the budget, and the proceedings. Are these in the public domain?

Dr. Tare: Yes, we have the Gangapedia site.

Chicu: I go there, sir. But whenever I click on the reports..

Dr. Tare: For some days we have been having a problem there. See even we don't have professional manpower to maintain the site. We developed it well, but maintaining it on a continuous basis..but still we have entrusted someone with that responsibility. But if you want any report, he (Rakesh) can share it with you. Whatever you want. One thing I can tell you, whatever work we have done, nothing is confidential. Nothing is secret. Nothing is such that we cannot give it in the public domain. If you can't find it, it is our inefficiency, and nothing else. Except the classified flow data. Other than that, nothing is confidential.

Chicu: More than sending me the reports, if you can send me the link once it is uploaded, I'd like to link to them on the India Water Portal.

Dr. Tare: That is our purpose. We won't be able to push this program ourselves, the public will do it. See the idea is, if the government will do anything, the public will have a report of it. They will be able to say that the IITs had recommended this, why did you do otherwise? So this will help it in getting implemented. And if the government acts contrary to the plan, it will have to explain why.

This is the only way we can drive this process. And if we have said something wrong, if our understanding is faulty, if comments come in, we will also be scrutinised. We do not have a vested interest. If our understanding is one thing..there are many questions.

Chicu: Actually it is not just the question of corrections, if feedback comes in, if the public feels that you have shared everything, automatically the trust increases.

Dr.Tare: exactly.