

# Efficiency in Water Use Management—Need of the Hour

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The farmer if he is growing rice. Once it goes beyond the bottom of the straw, you then have to switch technologies to one that pushes the water up from within the water table. That technology, the deep tubewell technology, is very much more expensive. And without subsidies it is not worth investing in to grow rice.

What we would see over the next five to ten years is the opportunity for expansion of this cheap irrigation technology most probably coming to an end. And I would not wish to be any more specific than that at this stage.

**Lakhi Narayan Sheel** : In the irrigation sector minor irrigation system played a vital role and will continue to do so. Even at present more than 90 per cent irrigation is done by minor irrigation system. Minor irrigation system means pumping of water through low-lift pump from canals, streams, small rivers, etc. That is the cheapest mode of irrigation. At one time it was a very highly subsidised scheme. And it was the single best irrigation system contributing to the food production. Subsequently deep tubewell was introduced. During the green revolution in the 60s the first IDA deep tubewell project was introduced.

After completion of the first IDA deep tubewell project one could understand that deep tubewell is not necessary in all places as water table was quite near enough to introduce shallow tubewells, centrifugal pumps. The World Bank gave a funding for installation of shallow tubewells through BADC. About 9800 shallow tubewells were installed. In the meantime, BADC also with other donors started shallow tubewell project. Even Krishi Bank began financing shallow tubewell projects.

At present shallow tubewells are fully privatised. In the last boro season over seven lakh shallow tubewells were working. Low lift pumps (LLP) is also now under private sector and about 66,000 LLPs are in operation. These LLPs are comparatively smaller ones. BADC installed over 30,000 deep tubewells but at present 25,000 deep tubewells are working.



Lakhi Narayan Sheel

This year 4.1 lakh cusecs of groundwater has been withdrawn. Out of that 3.5 lakh cusec of water has been withdrawn through shallow tubewells. And this trend will continue so long the farmers get this water. He will continue to draw from the groundwater whether you like it or not.

So my point is whether in the National Water Management Plan you allocate water for agriculture or not, the farmers will continue to draw water so long he gets it. Nobody can stop it.

**Mahfuz Anam** : That is survival logic. We don't have to argue about it. The point I was making is what is the level of our ground water? Is it going to become dry after 10 years in 2010? Is that the scenario? Or the water table gets replenished?

**Lakhi Narayan Sheel** : It is something like that. What I mean is that after the rainy season the water table will come again to its original level. It is being replenished.

**Mahfuz Anam** : So water table goes down beyond a point only in the dry season and then in the wet season it is back to original.

**Tauhidul Anwar Khan** : First of all I think you have got your answer. You were asking whether we will totally dry out the ground water?

No. As a matter of fact, what happens is that it gets the acquifer down below the ground. Just replenished with 55 days of normal rainfall. Usually 80 per cent of the total rainfall in this country occurs within only four months. Seven months of the year it remains high and dry when there is no rainfall. So at that time we depend on the ground water.

Now up to the year 2005 or 2010 ground water will be there but it will not be able to cope with the increased demand of water. That's the issue.

I would now recall what Dr. Faruque mentioned about the quality of water. Here we are talking only, you are asking how much is the recharge potential, how much is the total ground water availability? There had been umpteen number of estimates starting from 10 billion cubic meters to 15 to 17 to 22 to 34, even 40. Everybody comes in this country as a consultant and he comes up with a fantastic figure. There are controversies about the figures.

While we are talking about the quantum lets not forget about the quality. Because there may be so many billion cubic feet of ground water but in reality, in the field, what are we facing? We are facing the problem of arsenic. We are facing the problem of heavy salinity, contamination of the ground water. These are the facts. So even if there is an amount of water available whether that's usable, or hygienic? Right now arsenic is killing people, but we don't know whether this arsenic gets into the food chain. If it does it will be a disaster.

**Dr. Faruque** : We need to put some facts and understandings on the table. If we want to make progress in terms of how we manage our resources we should try to be as factual as possible. If the facts are not known we should get the facts. And once we get the facts then we know how to move.

The question about how much groundwater is there to extract or to use? It is a very complex question. First thing to be understood that as Mr. Khan and others said that every year water gets replenished. Every rainy season, whatever amount of water have been used in the dry season, will be refilled or replenished.

Now about the different estimates. Let me put the facts on the table. There was an attempt by the 1991 Masterplan, they had made some estimates and their approach was by defining recharge, potential recharge, available recharge, reachable recharge, they used some techniques. By those estimates they say that there will be enough groundwater even by 2010. In fact that it would be even more than what will be used by 2010. Some projections were made. By that time there would be no problem and there will be even surplus to be extracted. However, their calculation of use was underestimated.

Later when NMIDP did the calculation of the actual use and actual extraction was much more. They estimated by some other means and said that availability of groundwater or ability to go to groundwater is even much more. They had shown that the actual use is already about 2.2 million hectares but they could go up to another five million hectares.

These are the estimates available. Now we have to resolve this issue of how much groundwater is there and will be available even in the dry season. How far and how extensively can it be used?

The other question that should be kept in mind is the cost of doing this operation. In the report there is an item called economics of irrigation in Bangladesh. It is clear that the cheapest method is the low-lift pumps. However, the low-lift pumps cannot be used everywhere because wherever the surface water is near you can use it. Second is the shallow tubewell. In the report it is shown again from available evidence that the return to shallow tubewells is second to low-lift pumps. Low-lift pumps is 64 per cent and shallow tubewells about 61 per cent.

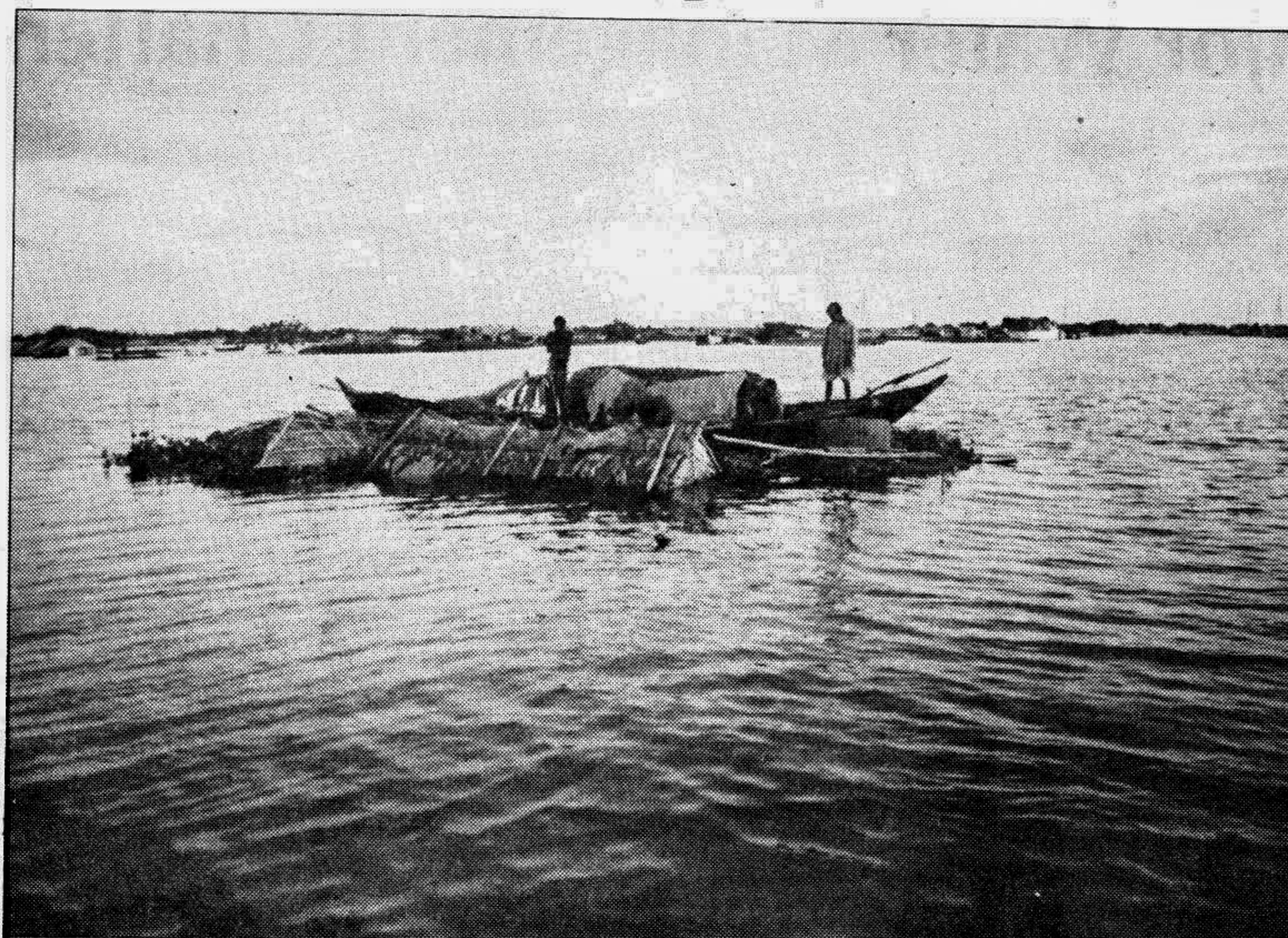
Now after that if we go for deep tubewell methods there is tremendous increase in cost. Naturally the question of affordability comes in. So if we are talking of going beyond shallow tubewells to deep tubewells or surface water projects, the important thing is to consider the cost.

Many discussions promote the need for surface water development, nobody would argue about that. But one has to take into account the economics of that. How much money can we spend to get this water to do agriculture or something else. The economic cost is an important factor. In fact, in the report it is argued that availability of groundwater is not a physical question, it is also an economic question. Can you afford to spend that money? Logically the answer is 'no'.

So that's why the groundwater availability or usability question is fundamentally linked with economics of it.

**Mahfuz Anam** : Add to that, what Dr. Khan said the issue of arsenic.

**Dr. Faruque** : This I must also clarify. I don't know where from



Water: Its abundance causes flood in monsoon but it's scarce in dry season.

Dr. Touhidul Anwar Khan got this idea. All the studies, so far, have clearly shown that arsenic is not due to drawing of water.

**Mahfuz Anam** : Dr. Khan did not say that. What he was saying was when you are talking about supply of ground water you have also to think about the quality of groundwater. And now whether due to whatever, extraction or something, we have found arsenic in the groundwater. It is a problem. And therefore even if we have abundant supply of groundwater at an economic price, we may find it dangerous to use it if it is arsenic contaminated. And second point which he mentioned is that if it goes into the food chain then you have a totally whole range of different problems.

**M.H. Chowdhury** : Managing the flood and living with the flood, this should be our thinking today. Sometimes small floods can be beneficial



M.H. Chowdhury

for crops also. From that point of view I think controlling flood or flood proofing, this type of measures should be taken up in future.

About the dry season irrigation programme, as has been mentioned that 80 to 85 per cent surface water is available from the Ganges and the Brahmaputra. It is true but it is also true that the cost of using it in other areas is an expensive affair. From the agro-ecological point of view whether it can spread to other areas has to be looked into. From that point of view the ground water use in future is going to continue. Up to 2010, use of shallow tubewells will continue to be one of the best option. After 2010 it will be difficult to continue the use of shallow tubewells not that water will not be available but because there will be increase in demand.

As 91 per cent of the watershed area or catchment area is outside Bangladesh, whatever plan we do, we have to depend on the cooperation of the neighbouring countries.

As has been mentioned that after 1996 Ganges Water Treaty the salinity has been reduced in the Southern areas. But I think much will depend on implementation of Ganges barrage project or Ganges river project. Dr. Faruque's paper mentions that there is less or little cooperation between the Water Development Board and other authorities. I think it is a matter of the past. This has been resolved and we have good cooperation with Water Development Board and other authorities and hope that there would be more cooperation in future.

We have one project assisted by the Asian Development Bank which is called Small Scale Water Resources Sector Project of 60 million US dollar financed jointly by ADB, IFAD and Dutch government. This is in the

western part of Bangladesh covering about 37 districts. We are hoping for another similar project under the assistance of ADB on the eastern part of Bangladesh. And we will have similar projects with the World Bank also.

It has been mentioned in this report that there is less control in the water management by LGED. But now we have formed Water Management Cooperative Association that is functioning well and we also have good recovery of O&M cost. We have introduced rubber dam projects in Bangladesh for the first time. We have already completed three rubber dams, two in Cox's Bazar district and one in Sherpur district. And we are having more rubber dam projects with the Ministry of Agriculture and we have also collaboration with the Water Development Board in this regard.

**Emaduddin Ahmad** : I shall be dealing with the topic of managing our water. So it will be partly on the flooding and partly on the dry season.

We have the floods and also the dry season shortage of water supply. We also have problems of salinity intrusion. We also have the problem of river bank erosion. In the coastal zone we have a different problem. We have problems even on the flood plains. When we are going for the infrastructure that has a serious impact on the distribution of the water.

With increase in population on the flood plain and urbanisation the water quality will become a serious problem. In this backdrop when in the dry season we are heavily using the groundwater then lot of our regional rivers will be dried up. The water quality will be threatened if we do not find scope for augmenting our resources in the surface water during that time.

From the National Water Management Plan we are proposing for an integrated water resources management programme.

Now question is, how are we looking into it? Are we looking into it in our country alone? Yes, but the upstream developments also affects a lot. We should know how in the next 10 years or 25 years the upstream regions are developing these resources or withdrawing these resources. These information should be made available to our researchers and the planners so that they can make best use of it. This ought not for the dry season alone but it is equally important for the wet season.

Under these integrated water resource development programme, the WARPO will be the clearing house for all these projects. And therefore the Water Resource Plan Organisation is to be properly manned. It can be done by them, by the supervisory officers. But lot of work has to be outsourced.

**Mahfuz Anam** : I followed the presentation very carefully but I still don't have the answer to my question. You are saying that you have taken up integrated projects, you will do this and you will do that, but all these are in a way theoretical.

**Emaduddin Ahmad** : In fact by integrated way of looking into it we need to know that when a project is considered by an agency it has an impact on the other sector agencies. So you will have to quantify, you will have to look into in the near future and also in the far future. This

sort of planning we have not done. The National Water Management Plan has been given very crucial responsibilities. For this they need lot of data and information.

**Mahfuz Anam** : What is the present scenario? Do we have enough water? Will the agricultural growth be like this? Will we have drinking water in the future? If not, what are the possible sources? What are the possible scenarios? Here what I am hearing are only good words but they are not really satisfying me.

**Emaduddin Ahmad** : In the scenario of 2018 we find that agriculture, navigation, environment, fisheries and domestic use -- they will be requiring about 24,370 million meter cubic water. And at that time there will be near about similar amount of water reserve available. So the scenario is that if we are in a position to manage the water properly, then your



Emaduddin Ahmad

demand and supply somehow matches. It is not a very crisis situation.

**Mahfuz Anam** : Position number one. Do you agree with that?

**Emaduddin Ahmad** : If we look into the main rivers it is supplement in the maximum. That is about half of the water. Now you cannot draw water from the main rivers during the seven months of the year unless you go for conserving the water. And in the conservation process you need to carry out some of the major structures which are also very much debatable. Question comes about the cost economics and all that. But the figures say that unless you go for the ground water you do not have that amount of water that you can extract. But these figures are also debatable. But we can start from somewhere.

So that means this scenario is acceptable if you go for augmenting the water into the river systems, if you go for the conservation, if you can carry out the exercises right from now otherwise you find a very bleak prospect in 2018.

**Dr. M.K. Farooq** : Actually by mentioning water resource management, we from the perspective of the Department of Environment mean sustainable water resource management. And in respect of sustainability of this management we believe and our National Environment Policy formulated in 1992 clearly states about the environment-friendly development of all water resource management projects.

The Environment Policy 1992 clearly states to preserve and develop natural balance through conservation and development, protect the country through natural calamities, identify and control all kinds of pollution activities, ensure and

Photo: Courtesy — Philip Gain

sustain long-term environment-friendly use of national resources and finally associate with all international initiatives relating to environment and development.

It has been made mandatory for all development projects including the water resources development projects to carry out environmental impact assessment and make the development



Dr. M.K. Farooq

environment-friendly. But to mention a very interesting situation, earlier these environmental impact assessment (EIA) were not duly considered in this part of the world. This is a very new idea and in fact our nation faces a lot of problems. For example the construction of the Kaptai Dam could be taken into consideration. So it is very nice that by now the Water Resources Ministry, the Department of Forest and the Department of Environment in association with the Flood Plan Coordination Organisation under the Ministry of Water Resources developed some guidelines under FAP-16, environmental guidelines. And these guidelines are being followed now.

From our Department of Environment it would be recommended that if there could have been some possibility of carrying out some environmental audits of the past developments, it is possible to take some exercise on some post EIA. Say for example the case of Kaptai Dam. I will be requesting our honourable Secretary and through him the National Water Resources Management and WARPO whether it would be a possibility.

**Mahfuz Anam** : It may be a bit provocative, you have all these policies from 1992, very good policies.

Do you have the capacity to monitor and if they are being followed?

If they are not being followed, do you have the capacity to punishment or to force them to implement?

**Dr. M.K. Farooq** : I say yes and no. We have the limitations.

**Mahfuz Anam** : Don't be diplomatic. This is our country. We have to develop it. We have and we have not. It does not solve any problem. Give me one instance, because this policy came in 1992. Give me one instance where the Ministry discovered that a particular department has violated this rule and you have been able to do something. Can you give me one instance?

**Dr. M.K. Farooq** : It is difficult but we are trying.

**Mahfuz Anam** : So you see, we have good policies and we have good policies in so many ways. You are government servants and you have to follow your instructions but what have you done in Dhaka city about the

lead pollution. I don't know as a newspaper editor that you have punished one car owner for emitting black smoke, not one single car owner, which is a very simple thing. You have the law in your hand. You have everybody supporting you, the people are with you, you have not done it. So how can I have faith in the Ministry of Environment to protect the environment?

**Dr. M.K. Farooq** : The Department is very small. Nevertheless we cannot carry out our environment policy because it is a huge task with a very small number of people.

We have the proposition that in every development ministry, the ministry will have some environmental cell. It is clearly stated in the Environment Policy also. And in fact there are very few responding to that.

**S.A.M. Rafiqul Zaman** : I will seek some sort of clarification, elaboration on: number one is policy issue. Dr. Huda very rightly highlighted the three pictures of the policy. And if we look at the policy which was approved in November 1998. And it has some implication on the institutional aspects of different water using organisations like say WASA, Public Health Engineering, who are handling this drinking water issue which is number one in the list of priority. Then there is Ministry of Fisheries, Ministry of Inland Navigation. Are they operationalise this policy? There is an implication on the institutional mode of working. And following the approval of this Water Policy, Water Board and WARPO are being restructured and they are reviving their mandate. So in the same way, are they aware of their new role under this changed scenario?

And then next is this allocation issue. The point just raised by Mr. Mahfuz Anam on the DOE's role of enforcement of environment laws. I think similarly to have a policy, to have a legal frame and enforcing it is something different as the DOE has failed and others also failed.

So we have a policy where we have some good legal framework. Who is going to implement it? Is it WARPO which is having a skeleton staff at the national level with no regional setup or anything? As we know from the institutional arrangement, there is a National Water Council headed by the Prime Minister and then in the second tier is the executive committee of the National Water Council headed by the Minister of Water Resources where other departments have their representations. But at the WARPO, is there any representation from other development agencies like say WASA, Public Health Engineering, IWTA, then Department of Fisheries, Department of Agricultural Extension, who are the major users of water. If they don't have a representation there and given the location of WARPO under the



S.A.M. Rafiqul Zaman

Ministry of Water Resource, they have a feeling its an organisation, they are dealing for the Water Development Board or the Ministry of Water Resources. In the structure of the WARPO they need some sort of representation. That's the point. How to protect their interest? How to give them the comfort that their interest would be taken care off, will not be overruled or overtaken by somebody else.

Then the role of the clearing house has been raised by others. I have the same question. They are going to clear all water related projects. It does not mean that it is not only the water sector projects of the Water Board, IWTA project, BADC projects, Fishery project, anything. And even the Roads and Highways who are interfering with the flow of river water. How they are going to achieve that?

And are they going to send everything to the WARPO? And how they are going to deal with the small projects? Do they have the capacity?

I think in the first presentation one point was missed. The coping strategy and also the conservation issue. As raised by Dr. Z. Karim that conservation issue in the dry season man-

agement. And the LGED has shown some rubber dam and other things. But the farmers, they are doing it traditionally -- conserving water during the post-monsoon and rain-water harvest in the ponds.

**Mahfuz Anam** : I would like to get your views on the future direction. What are the priorities? And how do we go about it? So we start looking into our future while inviting our Secretary to share his ideas with us.

**Dr. ATM Shamsul Huda** : I will respond to that vision. I think I needed to clarify one or two issues.

One was that this controversy over ground water versus surface water. The thing is that ground water can be used for only agriculture and drinking purpose. But there are other uses of water like navigation. You cannot do fisheries with ground water. You cannot navigate with ground water. So I think this point was subuded or was not raised in the discussion. So it is very important for a riverine country like Bangladesh to highlight the significance of surface water. It is important for navigation. It is important for salinity control. It is important for fisheries.

So that is why the National Water Policy has rightly focused that there has to be simultaneous development of both surface and ground water. We should not unnecessarily quarrel with this.

About the future vision, I think, the most important thing for us is a broad consensus. I had found that there is lot of dispute among the agencies as to what we ought to pursue. There has been disagreement between BADC and BWDB, between BADC and probably Local Government Engineering Department. They were not always agreeing. I think we should leave behind that chapter and should agree on a formulation that is now being attempted by the National Water Management Plan.

There has to be consensus between the government agencies and the experts that this is the goal. Unless that is achieved, donors and other people who want to help us they also get confused.

And one reason I tell you frankly and I don't mind if I am quoted, the National Water Policy that we formulated in the past was not accepted because lot of back door manipulation was going on. The BWDB was supporting one formulation, the other people were meeting the ministers and donors and saying 'no, no, no, they have not done it right'. When it was placed before General Ershad in the National Water Council, the ministers were not in agreement with the output. And for that reason no decision was taken.

Now for the future we do not want to face such a situation. We want this time that the National Water Management Plan, that will be ready by the year 2001, should be a document which is shared and accepted by all parties.

It will be acceptable for couple of reasons. One is the process through which it is being developed. It is highly participatory. I have myself been associated with a number of exercises that will be done. Secondly, as was raised by Mr. Rafiqul Zaman, as to this clearing house concept.

Now I think what the National Water Management Plan is doing, asking for project portfolios from all water sector users. These will be coming now. All the sector, fisheries, navigation, everybody will be placing and these will be discussed in a broad forum with all the experts, all the agency heads and finally at the executive committee of the National Water Council where the secretaries will be present. So there will be a broad consensus on the major projects. About the small projects, the Planning Commission has issued an executive order that at the district level there will be an inter-agency appraisal committee.

Now if the LGED is going to do a small project, LGED cannot do it by itself. This proposal has to be jointly conceptualised, formulated and appraised with other water related agencies. Similarly if the Water Board wants to do a small project it cannot do it alone. The Planning Commission will not approve it. So, at the grassroots level, the district level, there is an inter-agency committee. If there is any dispute in that committee, then it comes to WARPO. Then if WARPO cannot resolve it then it comes to the executive committee. So the institutional framework is there. This is new as a consequence of the National Water Policy.

So to answer to your ques-

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