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INTERNATIONAL  
CONFERENCE  
ON  
NATURAL RESOURCES

# THE DEPLETION OF GROUND WATER TABLE, A CHALLENGE TO FUTURE WATER SUPPLY

WORLD WATER FORUM  
FOR DRINKING WATER SUPPLY AND SANITATION



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**REPORT  
ON  
NATIONAL SEMINAR  
"RAPID DECLINING OF GROUND WATER TABLE:  
A CHALLENGE TO RURAL WATER SUPPLY"**

**NGO FORUM  
FOR DRINKING WATER SUPPLY AND SANITATION  
4/6, Block-E, Lalmatia, Dhaka-1207**

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## EXECUTIVE SUMMARY

At the forty-seventh session in November 1992, the United Nations General Assembly adopted a resolution designating March 22 of each year as the "World Day for Water". To mark the Day for the second time at the national level NGO Forum, the apex networking body of NGOs engaged in WATSAN sector, organized a National Seminar "Rapid Declining of Ground Water Table: A Challenge to Rural Water Supply" in Dhaka.

The primary objectives of the Seminar was:

- \* to critically analyze the trend of ground water table declining and its adverse effect on rural water supply;
- \* to consolidate recommendations for combating the ground water declining issue with particular emphasis on rural water supply;
- \* to highlight the issues relating to women and water.

The seminar was inaugurated by the Chief guest of the Seminar, Minister for Health and Family Welfare, Government of the People's Republic of Bangladesh. State Minister for Social Welfare, Government of the People's Republic of Bangladesh; Director General, NGO Affairs Bureau; Deputy Representative, UNICEF; Counsellor, Royal Danish Embassy; and Chief Engineer, DPHE were present as special guests. The Seminar was chaired by Dr. Fazle Hasan Abed, Executive Director, BRAC and Chairperson, NGO Forum for Drinking Water Supply and Sanitation.

The Seminar was attended by about 100 representatives from different Government Organizations, Diplomatic Missions, Donor Agencies, UN Bodies, NGO Community and from Mass Media.

Director, NGO Forum for DWSS delivered the welcome address. Welcoming the resource persons and participants he hoped that through their thoughtful discussions the objectives of the Seminar will be achieved.

Mr. Qazi Mahbubul Hasan, Information Officer, NGO Forum presented the vote of thanks to the participants.

In working session of the Seminar two papers were presented. The presentations were followed by open discussion.

The Seminar was facilitated by the Information Officer of NGO Forum.



Guests of Seminar are seen in the Picture

**WELCOME ADDRESS BY MR. S.M.A RASHID**  
**DIRECTOR, NGO FORUM FOR DWSS**



The United Nations declared this day with a view to ensuring safe water for all the people of the world. It had been conceptualized in the Human Settlement Conference in June 1976 at Vancouver, Canada that safe water would be ensured for all by the year 1990; "International Drinking Water Supply and Sanitation Decade" was declared in this regard since 1981 to 1990. In the review of the 'Decade' achievement it was noted that

only 73 crores people were ensured with safe water out of the global total of 540 crores people. Consequently a second Decade was launched for the period 1991 to 2000.

A total of 92% rural people presently are covered with safe water and hygienic sanitation facilities while it was only 40% at the beginning of 1980s. Only 1% of the earth surface water is safe and the rest 99% is polluted by any means, and more than 80 water-borne diseases are caused by polluted water. So, ground water is the only option for our health and living. But it is a dreadful fear for our nation as the ground water table is declining so rapidly. It is being feared that the tubewells of 35% area of our country are about to be inoperative. The irrigation system along with drinking water scarcity are facing a devastating problem as about 165,000 irrigation pumps have already become inoperative due to unavailability of spare parts and a massive declining of water table. A total of 15,000 deep tubewells also have gone out of operation while 4,000 of those are in the North Bengal belt.

The Water Development Board has recently made an observation on 1,250 tubewells all over the country according to the last 4 years statistics which reflects that the ground water table has been declined 1½ feet to 4 feet on an average within one year. The water

table declining rate this year increased 12 feet in Rajshahi, 5 feet in Khulna, 5 feet in Dhaka and 4 feet in Comilla than the last year. The hydrologists are anticipating that the water table of 2% of the country including Dhaka and the Borendra Region will decline about 46 feet to 80 feet. Consequently the low water table is increasing and the shallow water table is decreasing rapidly due to declining of water.

The theme of this year's World Day for Water is "Women and Water". The United Nations established an Inter-Organizational Task-Force to empowering women and recognizing their social importance, focussing mainly on their involvement in water related programmes. So, this creates a strong demand to ensure women's participation in the WATSAN sectors in order to ensure the positive impact of this programme.

NGO Forum is the apex coordinating body of about 496 local, national and international NGOs, engaged in water and sanitation sector. This organization has been working since 1982 with a view to preventing diarrhoeal diseases and reducing child mortality rate by ensuring safe water and hygienic sanitation facilities at the grassroots level. NGO Forum has already installed about 23,525 No. 6 tubewells and 592 Village Sanitation Centres through which about 8.5 million rural people are getting benefit directly and indirectly.

Let us promise on this Day to work for ensuring safe water supply and hygienic sanitation facilities including environmental conservation. And it needs are integration of mutual understanding and cooperation of all of us.

I welcome you all in this Seminar on behalf of NGO Forum.

## SPEECH OF THE CHIEF GUEST

MR. CHOWDHURY KAMAL IBNE YUSUF

THE HONOURABLE MINISTER, MINISTRY OF HEALTH AND FAMILY WELFARE  
GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH



The water issue is presently related to our existence as the total life cycle on earth is being regulated keeping water in the centre. But it is a matter of great regret that water, which was the most available component on earth is now becoming scarce due to improper management and policy. The water problem is now very much acute in Bangladesh.

Our life and total atmosphere even now is being victimized due to use of polluted water which cause various diarrhoeal diseases. A countless people are suffering from diarrhoeal diseases while a major portion of them are children. About 3 lacs of children are facing death every year due to diarrhoea. The mal-nutrition rate of our people has already exceeded than the people of Ethiopia due to our improper use of safe water and sanitation.

Since the last few years the ground water table is declining very rapidly at different parts of Bangladesh. The river flow plays an important role in keeping the ground water table in a natural position. But presently the water flow over Bangladesh is less than 2500 million cubic meters per-day instead of the natural flow of 3400 cubic meters. It is happening due to lack of natural flow of the international rivers and this is why our rivers are getting dry; the water table is declining; the no. 6 tubewell are getting inoperative. Presently we are facing the reality to manage and use improved technology to lift water from the deeper layers, because it is too expensive to afford.

Considering the prevailing reality research and development activities have been taken by the govt. for the coastal belt.



Initiative has been taken on the redistribution system of deep tubewells, stone covered shallow tubewells, development of pond-sand filter and catchment of rain water. A programme is going on to develop the 'Tara Pump' in the deep water table areas which are under research and development activities. Moreover, the govt. has the programme to examine the possibility of inventing a Super Tara Pump, alternative mechanism for the hilly areas i.e. mechanical drilling, development of fountains, infiltration gallery and catchment of rain water.

The slogan of this year's World Day for Water is Women and Water. It complements the objectives of the Beijing World Conference on Women to be held this year. The World Summit for Social Development held in Copenhagen very recently made a 10 - point declaration where it has been stated very clearly and directly to create equal provision for the women making gender equality regarding their right in every step. The matters demand more importance in the context of our country. About 70% women of the world are living under the poverty line. Let our expectation of this Day be the economic freedom of the women and their integration with the development activities. The half of the global population are women while it is not possible to set any absolute development keeping women aside. Women and water are very much integrated and for this the women are specially emphasized on the World Day for Water.

On the other hand, NGO Forum for Drinking Water Supply and Sanitation has been engaged for the last 12 years in developing and ensuring safe water and hygienic latrine facilities for the rural people emphasizing on women's active involvement in the sector, and this truth reflects through the selection of maximum of their caretakers from among the women.

## SPEECH OF THE SPECIAL GUEST

MR. FAZLUR RAHMAN

THE HONOURABLE STATE MINISTER, MINISTRY OF SOCIAL WELFARE  
GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH



Bangladesh has achieved a remarkable success regarding safe water supply and sanitation coverage through the continuous initiatives and activities taken by the present democratic government and various service delivery non-government organizations. But the success, achieved so far, is not enough for improving public health. Because the present statistics reflect that only 16% of the rural population is using tubewell

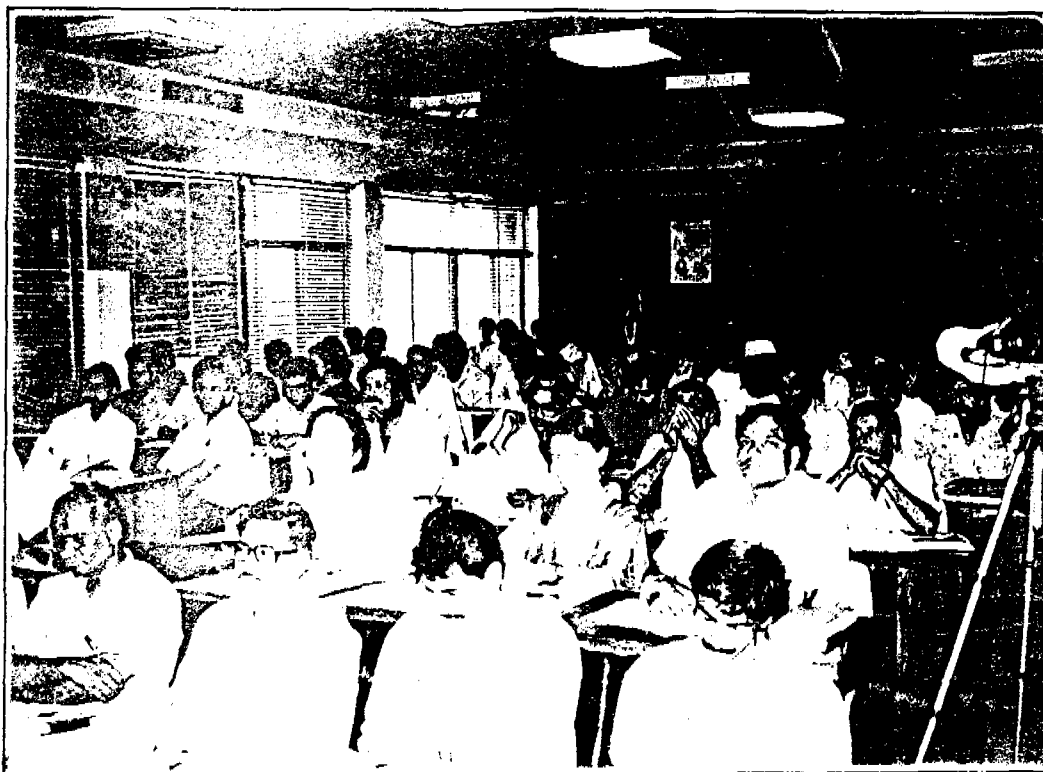
water for all household activities and the sanitation coverage has been achieved so far is only 35%. Our experience discloses the truth that use of safe water for drinking purpose only would not be enough to reduce diarrhoeal diseases. The responsibility leads us for making the people aware of using safe water for all purposes vis-a-vis the 100% of our population must be provided with hygienic sanitation facilities.

A living being must be regulated depending on water and this leads to define water as life. Water is the maximum and mostly used component in human life among all other resources. Apparently there are two sources for usable water - earth surface water and ground water. But it is a matter of great regret that the ground water table is declining dreadfully as because the rivers of the country are about to getting dry gradually and consequently the northern and southern parts of Bangladesh are about to turn into a desert. We are about to lose our fish resource; a big portion of the crop field has turned into barren land. The shallow tubewells of 32% areas of the country are feared to go out of operation due to declining of ground water beyond the suction level. Meanwhile, 50%

shallow tubewells of the Borendra Region has already gone out of order.

A healthy nation is the pre-requisite of a country's development. The slogan 'health for all by the year 2,000 has been declared to set more emphasis for ensuring public health first. This is to be mentioned here that people of 86,000 villages of the country are at the central point of the target and ensuring of safe water supply and hygienic sanitation facilities to the rural people is being considered as the key measure to reach the goal.

The water-related activities are executed mostly by the women. So, the women must be integrated with water and sanitation activities. Their involvement in the economic development process should be ensured recognizing their importance in the economic sector as because economy is the key for developing a society. The women who presently are engaged in different NGOs, leaders of different women organizations along with the activists from all stages of the society should play an important role in this regard.



*The participants of the Seminar are seen*

## SPEECH OF THE SPECIAL GUEST

MR. ABDUL MANNAN

DIRECTOR GENERAL, NGO AFFAIRS BUREAU



The World Day for Water is being observed at a time when the whole country is facing an alarming problem for safe water. But the present government by realizing the need, has given high priority in water resource management. To reduce the pressure on ground water, efforts are being made to use surface water for irrigation by reforming canals and rivers. The Honourable Prime Minister herself is trying the best to solve the

water problem by maintaining bilateral and regional initiatives and also voicing in the different international forums. But the pressure on ground water still increasing day by day. By realizing the problem and fact, the subject of this seminar is very timely which, I believe, would be helpful to emerge a solution to the prevailing water crisis.

Not only the Government, but the NGOs are also playing a vital role in water sector. At present there are about 500 NGOs, those are engaged in water supply and sanitation programme. In Bangladesh 23,525 handpump tubewells out of 1,600,000 were installed by the NGO Forum's initiative. In sanitation side it also demands praise. So far NGO Forum has established 592 Village Sanitation Centres.

He also said that recently the water table has been declining from 2 to 10 feet of 32% areas of our country and if proper policy guideline and coordination in management could not be implemented then the safe water supply management could fall apart. To face this situation joint venture of Government and NGOs is essential. We all know that the government has began to work with the NGOs in developing of sanitation situation. And NGO Forum would act as coordinating agency in this regard. I hope that from this seminar

specific policies regarding short and long time duties would come out and this would help as guideline in future planning. I wish this seminar a success.



*A part of the participants is seen*

## SPEECH OF THE SPECIAL GUEST

**MR. ERIK JENSEN**  
**COUNSELLOR, ROYAL DANISH EMBASSY**



Today is 22nd March, the "World Day for Water". The United Nations declared the International Drinking Water Supply and Sanitation Decade since 1981 to 1990 to facilitate safe water and environmental sanitation to each and every of the people of the globe. The 2nd Decade has been following the 1st one since 1991 to 2000 reviewing the success and failure of the past decade. And in the beginning of this decade the

United Nations, at the 47th Meeting of its General Assembly declared this Day. In fact, this historical declaration by the United Nations is for ensuring safe water supply for all the people on this earth. To mark the Day NGO Forum for Drinking Water Supply and Sanitation has organized this Seminar "Rapid Declining of Ground Water Table: A Challenge to Rural Water Supply". The theme of the "World Day for Water" for this year is "Women and Water". I personally feel very much honoured for being present in the Seminar.

Water is the basic demand of human life. It is one of the fundamental rights of human being. Human being can no longer survive without safe water vis a vis no development can reach to its sustainable stage without safe water. Because safe water is the pre-requisite to sound health, and sound health, itself, is the basic condition to any development initiative, social unity and human values. But it is a matter of great regret that presently safe water crisis appears to us as the dreadful enemy. Water table is declining gradually, but not slowly. The surface water is salty, polluted and totally unworthy for drinking. On the other hand ground water lifting is going out of our capacity as it is getting declined day by day. The tubewells are getting dried and we are

being pushed to drink unhygienic water. Consequently, we are very easily being affected with the water-borne diseases. Now is the time to set more emphasis on the issue with a view to finding out an appropriate and effective solution.

We are presently engaged in two important sector along with the Govt. of Bangladesh, various donor agencies and NGO community. We are working, helping different organizations engaged in water and sanitation sectors in supplying safe water and hygienic sanitation, the basic condition to people's sound health. The Govt. and the NGO sector have been working in WATSAN sector since the last 20 years which has resulted to some achievements. But we are yet to run more miles which we must have to cross. This is our responsibilities to ensure safe water to the rural marginalized people. The safe water supply to the rural people would be ensured if the four major indicators can be maintained. The indicators are: (a) coverage, (b) continuity, (c) quantity, and (d) quality. We must work together for finding out an absolute solution for safe water overcoming the present challenge - declining of ground water table.



*Dr. Fazle Hasan Abed, Chairperson, Mr. M.A. Mannan, Special Guest, and Mr. Sk. Abu Jafar Shamsuddin, the key note paper presenter are seen*

## SPEECH OF THE SPECIAL GUEST

**MS. GRETCHEN GOODALE**  
**DEPUTY REPRESENTATIVE, UNICEF**



The issues of improving water supplies, sanitation and hygiene practices and improving the lives of women and children are intricately intertwined. In Bangladesh, women and girls are the main collectors of all drinking and household water. In areas where safe water is not easily available, collection is a time and energy consuming task. It prevents women and girls from engaging in other activities, such as child care, education, income

generation, household maintenance, and food production. At the same time. There are health risks. It can also cause a steady depletion of energy which leads to malnutrition and hence, lowers resistance to disease. In addition many communicable diseases are related to polluted water and unsanitary environment. Many women, particularly in rural areas, are regularly exposed to polluted water in the course of their daily activities. Looking more broadly, women, in their capacity as domestic managers, decide how much water and from which sources it will be collected for the family; how it will be stored and used; and how and where the waste water will be disposed. A family's sanitation and hygiene, or the lack thereof, lies in the hands of women. In their role as change agents as well as providers, women pass this health legacy on to their children and family members. Therefore, it is critical that women are not regarded as passive, but as active participants in the use and management of domestic water, and sanitation, as well as personal, home and food hygiene.

However, women's managerial capacity stretches beyond their own homes to their neighbourhoods and communities. Here women's roles include basic maintenance and repair of tubewells, and the promotion of good sanitation and hygiene practices. The ways in



which women pass on knowledge about hygiene and sanitation affects not just their own children and family members, but also the entire community.

When it comes to the actual construction, maintenance and use of new facilities, women should, again, have a central role. With the support of the DPHE and non-governmental organizations, there are now about 30,000 trained women caretakers in Bangladesh and 75 women tubewell mechanics. In the construction of sanitary facilities, women have contributed by providing labour, by raising community contributions, and by providing services.

Considering rural women's low status in their communities, low literacy rates, their poverty, and the milieu in which they live, if they are to participate actively in these developmental schemes, they need the support of their husbands and male family members, their communities and their government.

Improved sanitation is not just a technical issue. It is a way of living and thinking. In Bangladesh even with about 85% of the population having access to safe water and 96% people drinking tubewell water, we have not been able to prevent about 700 children under the age of five from dying of diarrhoeal diseases every day as a result of polluted environment and poor hygiene practices. The main challenges facing us now are how to bring about sustained behavioural changes through the proper usage of safe water and sanitary facilities. The full participation of women is clearly crucial. Only when women are actively involved in planning, and implementing water supply, environmental sanitation and hygiene programmes will sustained behavioural changes become a reality and the long term public health impact will be achieved.

## SPEECH OF THE SPECIAL GUEST

**MR. AMINUDDIN AHMED  
CHIEF ENGINEER, DPHE**



"Rapid Declining of Ground Water Table: A Challenge to Rural Water Supply" is a very perfect and timely utterings as because the country is facing a dreadful water scarcity and we must have to identify the solving measure of the water problem. A burning question is living with us how to reach safe water to every head of the nation while, on the other hand, the safe water source - the ground water table is getting declined day by day.

So, presently lack of sufficient water is being considered as the vital challenge to face. The present reality is that we are failing every year to control excessive water in the rainy season, and in the dry season a wide part of the country is turning into like waste land due to lack of sufficient water. Our nation is standing on this vital rack of excessive and insufficient water situation which we are yet to ensure a balancing point of this abnormal position.

A total of 2000 million tubewells have been installed so far in the country. 1000 million of the total have been installed by the Department of Public Health Engineering (DPHE) and the rest by the different NGOs and other organizations. But it is a matter of great regret our achievement is still far behind to ensure safe water for the nation, specially the rural people. A remarkable number of No. 6 handpumps have already gone out of operation due to declining of water table beyond the suction limit. In 1986 the ground water table declined beyond suction limit of about 12% of the country and it reached to 20% in 1990. In 1995, about 43% of the country has gone beyond the suction limit and it is being feared that this declining rate would reach to about 55% in the year 2000. So, the reality pushes us to identify an alternative way and a massive

installation of "Tara Pump" can be suggested in this regard. Though Tara Pump is a cost effective and time consuming mechanism.

Irrigation in the agricultural sector is being suspected as the vital cause for reducing the reservation of ground water. But it can never be a solving measure to stop up-lifting of ground water for irrigation purposes. The ground water reservation within the suction limit can be enriched through increasing the flows of the rivers and all other natural sources. Initiative can be taken to rain water catchment mechanism and ensuring an economic use of that water. The safe water problem is acute and we must have an alternative measure, which we are yet to find out, to ensuring safe water for the rural people.



*The Guests in informal gathering*

## SPEECH OF THE CHAIRPERSON

DR. FAZLE HASAN ABED  
EXECUTIVE DIRECTOR, BRAC  
AND  
CHAIRPERSON, NGO FORUM



Safe Water is the absolute pre-requisite for sound health and environment conservation. The life cycle of the living beings are regulated with the direct touch of water. But the present alarming scenario is that the uneven distribution, unavailability and pollution of water is making human life distressful while the environment is deteriorating every day. Our ground water table is declining very rapidly due to some man-made disasters

like Farakka Barrage and other devastating causes. Consequently the flow of the rivers are gradually decreasing as a result of that the salinity is gradually making its rapid entry at the upstream region which is altering the soil structure. This might have irreversible negative impact on our agribased economics. The salinity is now swallowing the sweet water areas crossing the saline belt of the country. The salinity is causing the change of water quality of the sweet area, besides, soil fertility is being destroyed, forestry and plants are being devastated.

The Dailies are regularly publishing news on their cover pages "Dreadful Scarcity of drinking Water - Our Ground Water Table is Declining very Rapidly, etc. but the truth is that this ground water table is the only source for drinking water. In this circumstances, it is too difficult to ensure supply of safe drinking water to the rural people. And the problem is not only for drinking water rather irrigation is also being hampered very badly. The ground water is presently used for irrigation due to lack of enough surface water resulting in less crop production.

The United Nations has declared "Women and Water" as the theme of this Day. The cross cutting theme of cultures and sub-cultures in the third world nations makes women an integral part as procurers, providers, facilitators and recently managers in WATSAN sector in its entirety. The statistics reflect that about 92% women live in the village areas in Bangladesh and every one of them works 11 to 14 hours per day on an average while the half of this time is spent for water related activities. So women's participation is most important to ensure safe drinking water and hygienic sanitation as well as public health status. In this connection the importance of women in different sectors must be identified instead of considering them only for actors of social welfare activities rather they should be empowered in terms of policy making for establishing a developed society.

We express our utmost hope for distributing water of the international rivers as per the demand of humanity and equality; to ensure the proper use of the ground water identifying the causes of its declining and taking necessary measures against the declining. Initiative has been taken for empowering the women since the last two decades but it needs to be ensured. So the time has come for declaring the necessary programmes considering the question of gender equality.



*Mr. Qazi Mahbubul Hasan, Information Officer, NGO Forum, is delivering the vote of thanks*

## WORKING SESSION

**CHAIRPERSON: DR. KAZI FARUQUE AHMED**  
**EXECUTIVE DIRECTOR, PROSHIKA-MUK**

The Working Session was scheduled for presentation of two papers. The keynote paper "Declining of Ground Water Table: A Challenge to Rural Water Supply" was presented by Mr. Sk. Abu Jafar Shamsuddin, Executive Director, Community Development Council, and Dr. Bilqis Amin Hoque from ICDDR,B presented the paper on "Women in Water Management". To picture out the reality and to make the presentation lively the presenters showed a lot of slides.

The presentations were followed by open discussion:

**Paper**

**Presented by**

**Women in Water Management**

**Dr. Bilqis Amin Hoque**  
**Head**  
**Environmental Health Programme**  
**ICDDR,B**

Women's roles as manager of water have worldwide recognition. Depending on the existing availability of water their efforts to this responsibility will vary. This will be complexed by socioeconomic and cultural factors. However, this is obvious that their responsibilities as water manager at household level remains. Since a women in Bangladesh also play key roles in sanitation, family health and child care, it is important that the decision makers at programme and policy levels do appreciate their involvement and attempt to make it more effective.

In today's brief speech I would like to mention a specific observation made during our evaluation and research activity. The Government of Bangladesh made efforts to facilitate women's role in management by advocating their involvement in handpump site selection and handpump caretaker systems. Overall, this programme has failed to show their effective participation.

In our research projects as well as in selected NGO programmes, women have shown performances in handpump maintenance as good as male mechanics. Why is it a problem at wider scale? Because they

are not effectively encouraged, involved and/or trained to undertake the roles. This involvement is important in order to make them more effective user and manager of the water sources. This has also implications for appropriate use of their time for various domestic purposes and development. We would like to recommend that the women's role in site selection and handpump maintenance be planned and implemented keeping in mind sustainable support for their real involvement.

**Paper**

**Declining of Ground Water  
Table: A Challenge to Rural  
Water Supply**

**Presented by**

**Mr. Sk. Abu Jafar Shamsuddin  
Executive Director  
Community Development Council**

**SYNOPSIS**

Endowed with enormous potable groundwater resource base the Rural Water Supply (RWS) sector of Bangladesh attained commendable achievements during recent plan periods. However, the declining water table phenomenon and its various implications pushed RWS into a disastrous situation and raised a series of challenges before the sector. Concerted efforts, reoriented strategies and innovative measures may help overcome the constrained situation RWS is facing. The paper attempts to weigh the consequences of declining water table and identify appropriate strategies & innovative measures to counteract the phenomenon and promote RWS.

**Sources of Water for RWS**

Groundwater has been considered as the dependable potable water source for rural water supply for a number of reasons. In terms of bacteriological contamination, groundwater is safe. In some places groundwater contains iron in excess to permissible limit and in coastal region water in shallow aquifers is saline. Otherwise, groundwater of the country, by and large, is of good quality.

**Water Table & RWS programme**

Prior to 1980, water tables in the country excepting Hill Tracts Region and Barind Areas were not a significant problem and were within suction limit (7.5 meters).

In many parts of the country tapping of groundwater is gradually becoming a problem for unique simple reason. Water table is declining and going beyond the reach of suction mode handpumps (primarily No. 6), the backbone of rural water supply system of the country. This has been noticed since late seventies and more prominently from early eighties and since then gradual declining was continuing. Situation took a serious course and the water table was falling alarmingly during eighties. The reasons attributed to this phenomenon were, rapid growth of shallow & deep tubewells for irrigation and reduced surface water flow because of Farakka Barrage in India.

### CHANGE IN CONFIGURATION OF RWS PROGRAMME

#### **Declining of Water Table**

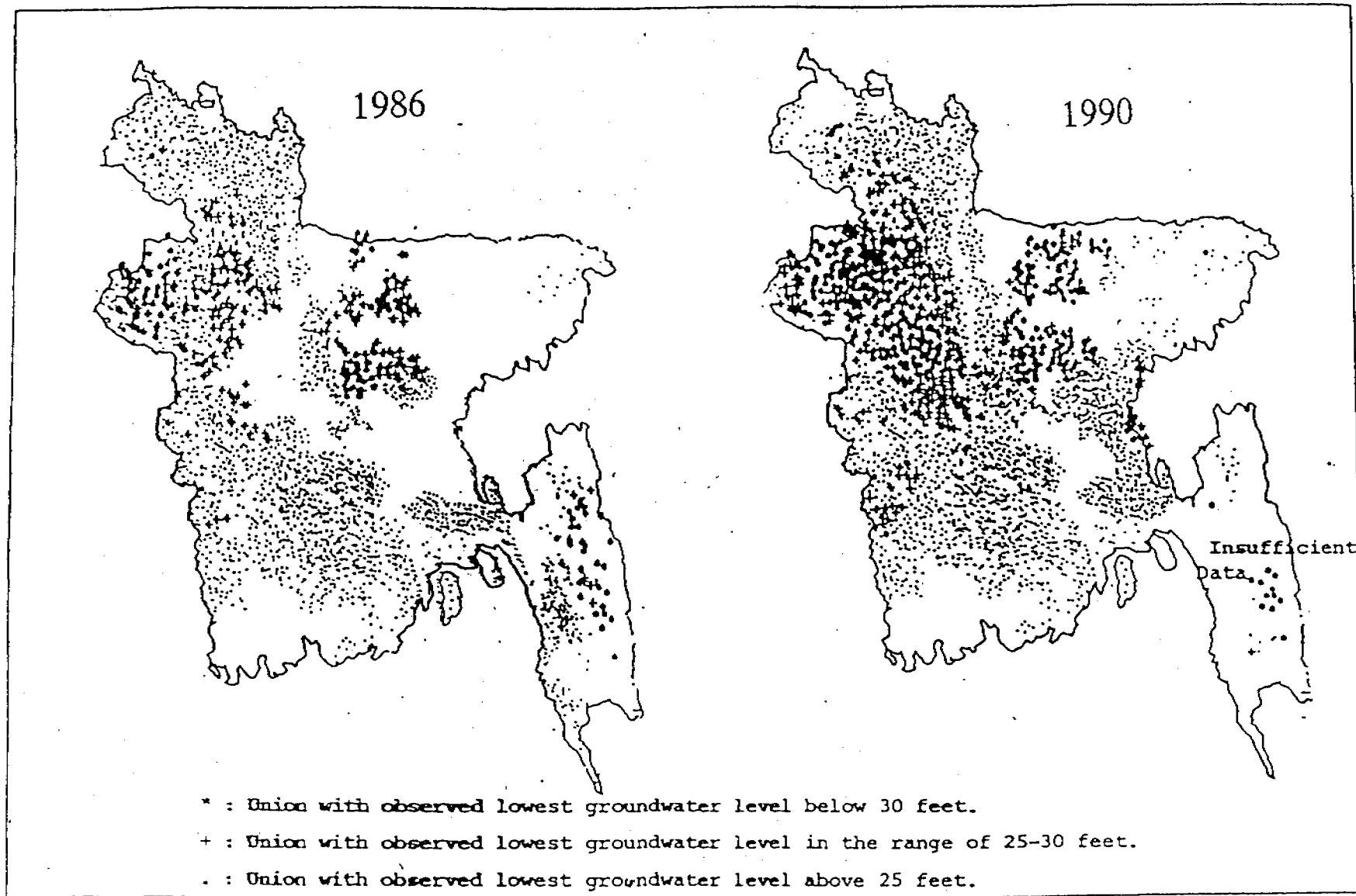
Even though the water tables started depleting from mid seventies the monitoring activities to record the water tables started quit late. It was only mid eighties when mapping on water tables was first done. The Department of Public Health Engineering started its monitoring activities from 1986 and began to develop its data base on groundwater tables. The monitoring includes about 4500 handpumps through out the country. Water tables are measured in each of these observation wells in between last week of april and first week of May every year.

A study was conducted by a DPHE engaged Danish consultant, attached to MPO in 1985 to forecast water tables declining in each plan period. He observed that, back in 1980 it was only eight percent of the country's geographical area that falls under low water table area. The area increases to 15% in 1988 and is forecasted to increase to a level of 20% in 1990, 40% in 1995 and over 50% in year 2000. The DPHE groundwater data base so far gives results consistent to the one predicted in 1985.

Another Data Base can also be referred, to have a comprehensive picture of the overall scenario. The Bangladesh Water Development Board (BWDB) monitors water level of 1200 wells in the country. As an example, the hydrography as depicted in Figure-1, based on data from continuous monitoring of groundwater table shows evidence of gradual declining of water table.



Low Water Table Areas: Situation in 1986 and 1990



## Hydrogeological Scenarios & Impact on RWS

Interms of water table, geographical area can be divided into two categories. The shallow water table area (SWTA) and the low water table area (LWTA). From hydrogeological consideration coastal saline area (CSA) and Chittagong Hill Tracts Area (CHTA) can be dwelt with separately. Depletion of water table means increase in the LWTA and consequently an equal amount of decrease in SWTA and these two always maintain a dynamic equilibrium. Declining water table will gradually decrease the SWTA meaning, a number of NO. 6 tubewells becoming non-functioning. To keep the coverage figure in position relatively expensive technology, i.e., Tara handpumps are to be deployed for each affected No. 6 handpump. Further interpretation means, by the year 20000, about 400000 No. 6 public handpumps alone will be redundant and in place equal number of Tara handpumps will be required, to keep the number of operational tubewells in position let alone the population growth and increase in future demand.

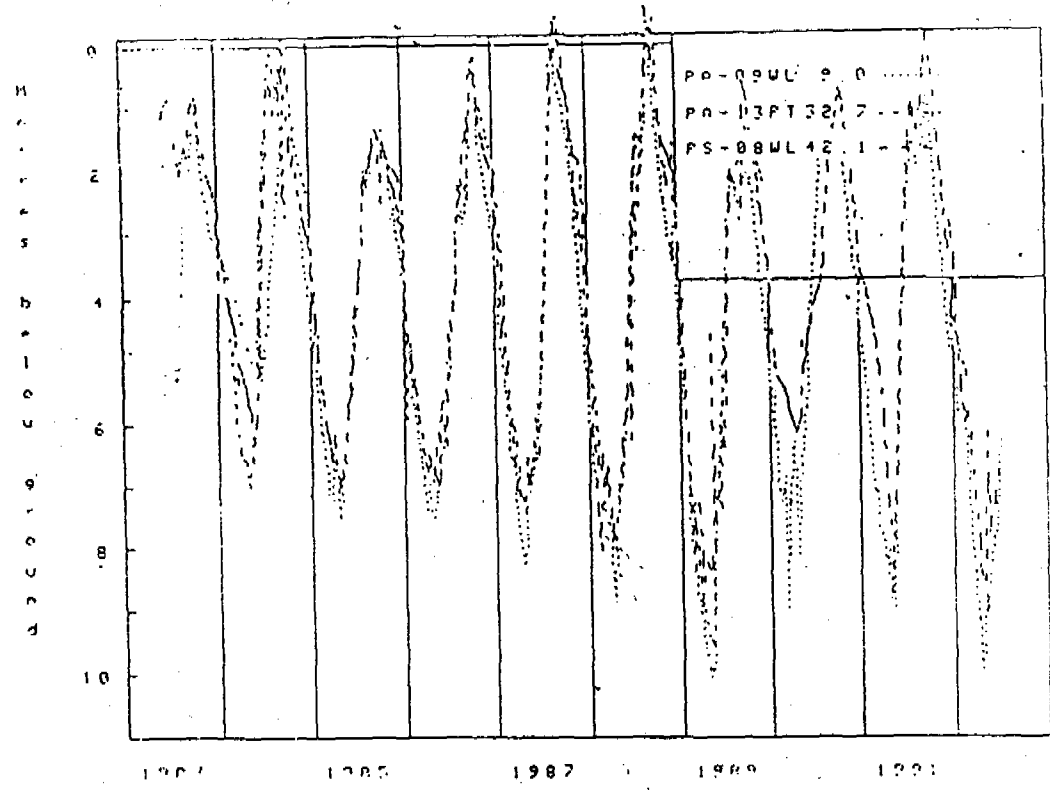
The hydrogeological scenarios in the country, particularly, the interaction between SWTA and LWTA can be visualized from Figure-3 developed from the findings of the studies conducted in 1986.



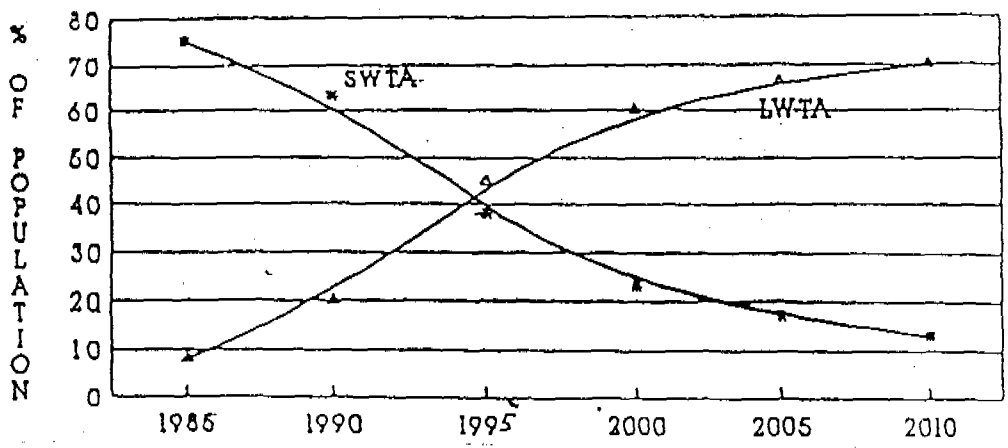
*The participants are taking part in open discussion*

# WATER TABLE DECLINING

## CHATMOHAR - PABNA



Declining of Groundwater Table : A Challenge to Rural Water Supply



### Recent Studies

A recent study (1994) sponsored by DPHE-UNICEF to forecast the declining groundwater tables seems to be consistent with the findings of the study carried out in 1985-'86 though numerical figures are slightly different. The expansion of LWTA in different planning cycles seems alarming. The following table shows number of thana (out of 348) that will come under LWTA and SWTA in future plan periods.

**Declining of Ground water Table:  
A Challenge to Rural Water Supply**

**Number of Thanas Under SWTA & LWTA**

	1995	2000	2010	F.Dev.
SWTA	196	159	131	113
LWTA	152	189	217	235
Sub-Total	348	348	348	348
Out-Side Study	138	138	138	138
Total Thana	486	486	486	486

### **RESEARCH & DEVELOPMENT**

#### R&D Activities

In order to overcome the adverse situation of declining water table a rigorous R&D activities was undertaken in early eighties. The concerned organizations are DPHE, UNICEF, UNDP-World Bank Water and Sanitation Programme. The joint effort culminated in the development of Tara, a direct action force mode handpump of VLOM characteristics. Tara is capable of abstracting water where water table is within 15 meters below the ground level. The pump was conceptualized in 1983 and was lab. tested in a simulated condition at MAWTS, Mirpur Dhaka. Following lab. test about 150 Tara handpumps were installed in a village in Mirzapur for field testing. In 1986-'87 nearly 2000 Tara handpumps were installed in

field as pilot testing in the country in affected low water table areas.

To face the consequences of declining water table, a number of R&D activities are being undertaken.

### **New Technology in the Programme**

During 1987 Tara handpumps were accepted as a viable technology for rural water supply in low water table area (LWTA). Since then these pumps are being installed in the country on large scale through Annual Development Programme. The project, "water supply in the low water table area", keeps provision of installing 60,000 Tara handpumps over a period of seven years. Today, there are over 50,000 Tara handpumps in the country.

### **Effect on Existing RWS**

The new technology will have a series of effects on the RWS programme. It will have direct impact on financial resource and indirect bearings on operation and maintenance, on training, on physical qualities of the civil works & products, spare parts distribution and management, stores management and existing manpower. More importantly, the social response on the issue needs to be assessed carefully to address them effectively.

The new technology will demand more efforts to ensure proper operation & maintenance. The current training programmes will no longer remain effective with the changed scenario. The relatively complex technology and the required development rate will bring in additional problems and the issues of sustainability will be more and more challenging.

## **IMPLICATIONS OF DECLINING WATER TABLE**

### **Financial Consequences**

The financial consequences of declining groundwater table is rather complex. It is very difficult to assess its impact in financial terms. However, the direct implication can be drawn from the cost of Tara pumps to be needed in different plan periods to replace affected No. 6 pumps. By the year 2000, to replace about 4,00000 affected No. 6 public handpumps only, would require about 5000

million Taka at current price with out overhead expenses at various levels.

### **Operation & Maintenance**

From development experience it is seen that system fails in O&M phase. So, an innovative O&M mechanism over conventional sort of approach is required to be developed. This is surely a big challenge to meet. There are there are three aspects, one is financial, sufficient revenue should generate to meet operational cost, the second is technical, system should be sufficiently technically sound to remain operational and the third is social, there should be a social base established to take care of the first two.

### **Spare Parts Distribution and Management**

The Number of elements in Tara pump are more and they are more sensitive. In the coming year, as the number of Tara pumps will increase dramatically, smooth flow of quality spares at the community level will pose a great challenge to sustainable RWS system. It is obvious that, the market will respond according to the demand generated. In order to prevent such situation to happen an innovative mechanism is to be developed.

### **Quality Control**

It is envisaged that in the coming years high demand of Tara and its spares will encourage the growth of private manufactures on an increased rate and the rate of large scale production of Tara and its spares will also be increasing. This will naturally raise concern over the quality and standard of the products. An innovative mechanism is to be evolved to ensure production and marketing of standard materials to support sustainable RWS systems.

### **Store Management**

One of the important issues that will emerge as a consequence of declining water table is extra burden on logistics management. Numerous elements of Tara and the enormous shape and size of RWS future programmes will demand enhanced management capability of the stores and other logistics network. This in turn, will require additional resources to upgrade the logistics structure. An

advanced sophisticated stores management system is required to be introduced.

### **Skilled Manpower**

The future RWS programme which will be of enormous size and shape will need increased numbers of skilled manpower at various levels. The relatively sophisticated technology of RWS will demand appropriate training programme to be arranged for different categories of personnel involved in RWS programme.

### **CHALLENGES AND FUTURE STRATEGIES OF RWS**

Under such constrained situation as mentioned in the aforesaid sections the strategies to be followed to promote RWS in the country are rather challenging. The choice of technology is the first hurdle to cross. However, in no case, technology will remain a problem. There are solutions. May be expensive and need to be modified for local situations. The real hurdle lies else where. These are primarily the soft issues and may be identified as: capacity building within community; women's involvement; participatory approaches; strategic monitoring; NGOs' participation; sectoral and inter-sectoral coordination.

### **Capacity building within Community**

Sustainability of RWS depends on a number of factors of which capacity building within community is most important. Capacity building depends on a number of determinants. This is an area where only limited thoughts were given. Concerted efforts are required to be paid in order to reach a consensus in identifying the determinants, their relative sensitivity and then establishing the empirical relation. Then through effective interventions capacity building can be enhanced which will promote sustainability.

### **Women's Involvement**

In water supply, in fact, it is the women in the community that is the central element that matters the fate of RWS. At primary level

they are the water manager, they have the strongest influence on water for domestic needs. 90% of the domestic water are collected, stored, and managed by the women. But it is fact that, in planning, implementation and development of water sources, choices of technologies, site selection etc., women virtually have no role to play in the present context. If their capacity to handle domestic water issues is enhanced the overall community capacity building will be increased dramatically which will lead to a sustainable system.

### **Participatory approaches**

There are a number of stakeholder in RWS. Unless participation of each stakeholder is ensured, the overall RWS development will be hindered. As the systems will be used and maintained by the end users, i.e., the community, they are the target groups and their participation is vital for the sustainability of RWS systems. Identification of issues, prioritizing the problems, planning, implementation, O&M, and successive evaluation, that means, in all phases, in one way or another the target groups are to be involved. Their participation should be there.

### **Strategic Monitoring**

To neutralize the effect of declining water table the growth of Tara should keep pace with the expansion of the low water table area. The expansion of low water table area will require the growth of Tara at a very high rate. This high rate of installation will be critical from various angles, particularly, installation quality of the tubewells. Physical implementation quality, performance standard, operation & maintenance level, user satisfaction, down time etc. are the key parameters to be mentioned to ensure that the RWS activities are on the track and leading towards envisaged objectives.

### **NGOs' Participation**

The current activities in the low water table area is virtually limited to DPHE-UNICEF programme. It is expected that the Government will give due importance to protect future RWS in the country. DPHE-UNICEF programme has less flexibility to comfortably accommodate software activities of RWS. The latent potentials of NGOs which enjoy flexibility in their systems can be tapped to



augment the capacity of DPHE-UNICEF programme. Without concerted efforts it will be almost impossible to counteract the adverse effects of declining water table phenomenon.

### CONCLUSION

It is apparent that the declining water table phenomenon will continue as predicted in various studies. The implications of the declining water table and the consequences that the RWS is to face are inevitable.

Only concerted efforts, involving all stakeholder in the sector can facilitate meeting the challenges. Action plans are to be formulated in line with the strategies identified to proceed with the future RWS development activities, particularly in the low water table area.

A Task Force may be constituted to chalk-out micro level action plans and their implementation programmes at an early date. The existing National Advisory Committee for Water Supply and Sanitation may play the role of the steering committee and overview the performance of the Task Force and the whole affair.



*Dr. Qazi Faruque Ahmed,  
Chairperson of the  
Working Session is  
delivering his speech*

## FROM THE FLOOR

Questions were raised from the floor on the two papers, presented by the two resource persons. One participant asked for more explanation on how our womenfolk can be made more dynamic and key role player in water sector. Dr. Bilqis Amin Hoque articulated in answering to him that there was a very strong and deep relationship between water and women. They are the key role player in collection and distribution of water. The women can perform their role in handpump maintenance as good as male mechanics. But they are suffering from lack of social recognition and encouragement. She opined that the women should be encouraged and recognized effectively and they should be trained very regularly and thus our women would become an efficient partner in water sector. The women's role in site selection and maintenance of hand pump should be planned and implemented keeping in mind sustainable support for their real involvement she added.

Dr. Bilqis was asked to point the cause of the variation she showed in her presentation that about 15% women of the community generally attended in the caretakers' training for handpump maintenance; but 10% of them participated in site selection of hand pump. In reply to this question she answered that her study did not cover the whole country. The study was limited to some selected community. So, there lies a confusion whether it is the actual scenario of the country or, not. She said that it was a very complicated matter to find out the cause why the other 5% of the community women were not participating in site selection activities. It was suggested that the women were some how dependent on one another in site selection and this is why all the women did not participate together.

A comment was raised to Mr. Shamsuddin that only two causes had been highlighted in his paper as the major factors to water declining- water flow was getting decreased and massive lifting of ground water for irrigation purposes. It was demanded from the floor that there might be some other causes out of those two and Mr. Shamsuddin had to pay heed all other causes. In response to this comment Mr. Shamsuddin opined that obviously there were some other causes behind the withdrawal of ground water table and those had also been emphasized in the paper. He disclosed that all the causes were not considered as the major phenomena in the safe water crisis and the already identified and recognized causes had been

stressed with due importance, and he suggested everyone to go through his paper carefully which could help to reach nearer to the proper causes behind declination of water table.

Another comment emerged to Dr. Shamsuddin that water got reserved in the underground tables taking a long period but the people lift it up within a very short span of time using different mechanism. But there is a doubt that this lifting is not always hygienic and it can spread diseases to the community. Mr. Shamsuddin accepted the comment positively and articulated that possibility remained to some extent as there was no "Water Policy" in the country and water was being pumped up very indiscriminately. So, the govt. should take initiative immediately to have a water policy for drawing and conserving water. The NGO community should be integrated with the govt. sector for formulating a policy for the better management of water resource.

Answering to a supplementary question to the above mentioned point Mr. Shamsuddin opined that people should realize the prevailing situation and should be careful to the economic aspect of water. He stressed on to learn even from the indigenous people for the better management of water while they can suggest from their traditional knowledge and experience.

"Is it possible to solve the safe water problem by addressing of the socio-ecological problems only?" Having acquainted with this question Mr. Shamsuddin placed his opinion that "Socio- Ecology" is the complete sense which covers everything to our safe living on the earth; it is no way a separate part of the people's living atmosphere. So, the matter of safe water is also integrated within the socio-ecological boundary. But the responsibility goes to every person of the nation. Only the financial involvement can not be enough rather the involvement and commitment of the social and political sector must be ensured with all other sectors, and all these can confirm an absolute solution of the prevailing problems, which water resource is facing presently.

## WINDING-UP SPEECH

In the winding-up speech the Director of NGO Forum Mr. S.M.A. Rashid expressed his belief that the observation of the Seminar had reached to its goal through a very spontaneous and fruitful discussion on the prevailing dreadful crisis of safe water. He articulated that the participants tried so earnestly from different angles to express their views focussing the preliminary objectives of the Seminar. Discussion on women and their relation with water, their role in supply and management of safe water received due importance in the Seminar. It had been emerged from the Seminar that women's participation should be increased as the integrated part of water resource management, although the NGO sector has involved women for taking care of the 70% pumps installed by them.

Mr. Rashid opined that it needed an integrated initiative, commitment from every sector and supplement of every one's professionalism towards a water resource management policy. The suspected dreadful water crisis should be tackled through an integrated approach with participation of all sectors.

He said that the observance of the World Day for Water, highlighting 'Women' and 'Declination of Water Table' in the country would set a positive impact on people's conception and it would help in facilitating general awareness not only among the rural people rather among professional and policy makers. Thus a concerted effort will bring a positive improvement in the sector.

He said, "I would like to conclude by requesting our colleagues in the government, donor agencies, NGOs and UN bodies to work together to take necessary measures to combat this disastrous situation".

Finally, Mr. Rashid expressed his utmost thanks and gratitude to all for participating in the Seminar and also to the SPARRSO authorities for their whole hearted cooperation for making the Seminar successful.

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