CHAPTER-VII

SUGGESTIONS AND RECOMMENDATIONS

The management and regulation of ground water resource in the area and for that matter anywhere in the country is achievable alone though well framed legal basis of control that finds public opinion and acceptability. Left alone, "the common access" to resource shall continuously damage the ground water resource & environment. As seen in earlier chapters, the net annual withdrawal in Gurgaon is far more than the net annual recharge. During the last 20 years the ground water level has declined in whole of the area of the district and the decline is in the range of 0.77 to 1.2 m/yr. So there is a need to take measures to arrest the decline of ground water level for which there are various ways to deal with. A major few are listed below:

Artificial recharge

Artificial recharge to ground water is one of such measures. As can be seen from the comments of the experts, whole of the district is suitable for artificial recharge to ground water. Excess rain water in agricultural field, surplus canal water and rooftop rain water can be injected to ground water system. Recharging shafts and injection wells are recharging structures suitable for the district.

There are many depression areas where water gets accumulated during rainy season. These areas should be intensively studied by technical experts' team which may include international specialists from the countries which are listed in international best practices. This, if implemented properly, can turn the bane into boon. This will help in enhancing the recharge to ground water reservoir. This can

lead to permanent solution of water logging. The ways and means may be explored to store the flood water for peak demand months for irrigation purposes without any treatment. Plan may be formulated to treat such water quality as per usage. The rooftop rainwater harvesting technology should be adopted and recharge structures may also be constructed.

Treatment of Waste Water

For planned new urban areas in Gurgaon, it should be made mandatory to have different distribution networks for treated water, rain water and treated waste water (of different BOD level). For example, New Delhi Municipal Council (NDMC), Delhi, there is separate network of pipelines for the recycled water for horticultural purposes. In Gurgaon, such networks of pipelines may be planned for supplying water for horticulture, irrigation and drinking purposes separately. There is also need for more treatment plants in Gurgaon to re-use waste water.

Adapt Crops

The crops consuming less quantity of water may be grown in place of crops requiring more water in the over exploited block. For this, there is already an institutional framework, which can be utilized efficiently to impart training to farmers as well as supply of seeds and technical know how. ICAR, Seeds Corporation of India and many other central government and state agencies have mandate in this area. In Israel, for example, there are areas where water is saline, the government there has encouraged use of such crops, which are saline-friendly. In Gurgaon also, there are places, where water is saline. So, there is need to have more applications of such national and international researches in the fields.

Bye Laws

The construction of roof top rainwater harvesting structures should be made mandatory in building bye-laws in all the blocks, which will help in checking the falling water level trend in the district especially in the urban areas.

The water level monitoring network needs to be increased in the block. For this, the states may be provided with a model bill by Ministry of Water Resources as done in **the Model Ground water Bill.**

The contribution of surface water to irrigation in the district is very less. There should be a long term, sustainable plan to deal with both ground water and surface water supply. Measures should be taken to increase the canal water supply for irrigation.

Use of Information Technology

Information Technology is very useful in Geological and geophysical areas. GPS, GIS tools can be deployed for getting better ground water assessment in terms of quality, quantity, depth etc. For example, Delhi Government has set up a company Geo-Spatial Delhi Ltd, which will exclusively do these surveys and data collection which will immensely help the State to take effective measures based on such information to deal with all related issues.

Steps should be taken to make rainwater harvesting mandatory both at individual as well as community level. The policy formulated should include measures to encourage and motivate people in this regard. The abandoned dug wells

may be cleaned and should be used for the purposes of recharging the ground water by utilising the surface monsoon runoff.

Development of surface water bodies like ponds, tanks etc is need of the hour. Old data /historical records may be consulted to locate dried up water bodies and the revival of such bodies may be ensured. For this the schemes of Ministry of Water Resources like RRR (Repair, Renovation and Restoration) of water bodies need to be streamlined to make them more practical to the situation.

The development of check dams, open well and injection wells as suggested by Central Ground Water Board to recharge the Ground water resources should be paid serious attention. There should be some centrally sponsored schemes to assist the states. But most missing part in such schemes is effective monitoring. There should be a high level committee to look after all such concerns. These committees should include the representatives of the implementing authorities of the States. Construction of more monitoring wells for monitoring the Ground water levels on regular basis is very important so that these data can be analysed for better planning.

Mass Awareness Programme & Water Management Training

Programme on conservation, protection and management of water need to be organized to highlight importance of water conservation and described method of Ground water management of the district. Intensive, integrated coordination amongst the persons from the field of Agriculture, Public Health Engineering, and Irrigation and Town & Country Planning departments is required. Exhibitions, Melas, Fairs etc

should be used for mass awareness Programme displaying maps, figures, data and posters on ground water conservations.

Water Policy

Some important provisions are currently missing from the Model Ground Water Bill. These include the need to prioritize among uses and to put drinking and domestic water as the first priority. Further, the model bill does not differentiate between small and big users of Ground water, commercial and non-commercial uses and does not take into account the fact that non-land owners/occupiers are by and large excluded from the existing and proposed system, which focuses on the rights of use of landowners.

Two sets of issues are not addressed in current versions of the model legislation. The first relates to the regulatory structure, whether the centralized regulatory approach is likely to be effective. The second concerns content, i.e. the numerous Ground water management needs that the proposed regulatory structure may not address water logging, pollution, quality, and conjunctive management. Both sets of issues could be addressed in the revision proposed by the CGWB.

The government should have a degree of real power to shape management approaches. Approaches to developing Ground water management institutions need to strike a balance between the roles and powers of centralized government organizations and the decentralized roles and powers of local stakeholders. The regulatory authorities such as CGWA, other State Level authorities and Planning

Boards should assume greater responsibilities and coordinate to prevent degradation of water resources.

Holistic and Integrated Approach

An integrated approach need to be explored for implementing sustained development & management of resource which means that Ground water & surface water resources should be developed & managed as a whole with due regard to quality & quantity of resource. Water management policies & frame-work should be an integrated policy frame-work that deals with agriculture, industry, energy and environment.

Ground water management deals with a complex interaction between human society and physical environment and presents a difficult problem of policy design. Management of Ground water resources, projecting the future development possibilities and socio-economic as well as environment impact assessment, can be achieved through effective implementation of water harvesting and artificial recharge measures. For sustainable Ground water resource planning in the district, surrounding areas, and the whole of National Capital Region of Delhi, the major objective is to not only match the long-term withdrawals of Ground water to recharge but to restore the lost levels of aquifers. Aquifers are exploited by human decisions and over exploitation cannot be always defined in technical terms, but as a failure to design and implement adequate institutional arrangements to manage people who exploit the ground water resources.

Integrated Water Management Plans should be prepared by the constituent States including recycling of waste water for their respective district and sub-regions. Steps should be taken to conserve water, reduce losses and promote use of water saving flushing cisterns, etc. suitable public education campaigns as felt necessary should be launched.

The need of the hour therefore is a long term planning for effective and efficient management of this precious resource as well as to bring in additionality to depleting water resources by adopting a holistic approach.