CHAPTER SEVEN

Conclusions & Recommendations
Outline:

1. Conclusions.
2. Recommendations.
   2.1. Drinking water supply area.
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Conclusions:

Water supports life in all its facets on this earth. All plants, animals and human life essentially thrive on water. The development of civilization of mankind has been found to progress around locations endowed by nature with plenty of God given water. Water has thus been reckoned as a powerful force for integrating habitation of all mankind, plant and animal kingdom as well.

The total amount of water on the earth is fixed and has a volume of some 32.6 crore cubic miles. It is estimated that 97.2 percent of water occurs in oceans, 2.2 percent in ice caps and glaciers and 0.6 percent is liquids fresh water. Surface and ground water are used for community water supplies. There is a strong tendency for large municipalities to seek surface-water sources, but ground water leads itself more readily to smaller community water-supply development.

In India the importance of providing safe drinking water was fully recognised in the fifth Five Year Plan, which included provision of safe drinking water for villages in its Minimum Needs Programme. The municipal corporations are responsible to supply potable water in urban areas at the rate of 150 lpcd. For the rural areas various schemes are working. The demand rate of water supply is 40 lpcd. or one handpump for 250-300 people in the rural areas.
In Uttar Pradesh for providing the facilities of water supply, the Public Health Engineering Department was established in 1927. However, in 1949 it was replaced by Autonomously Administered Engineering Department which is now U.P. Jal Nigam. Jal Nigam is entrusted with full responsibility to provide drinking water in the rural areas of U.P.

The district Aligarh comprises the northern most portion of the Agra division and lies in the upper Ganga-Yamuna doab. It extends from 27° 29' N Lat to 28° 11' N. Lat and 77° 29' E. Long to 78° 38' E. Long. The north boundary is purely conventional and touches the district Bulandshahr; on the north-east the Ganga separates it from the district Badaun; on the east and south-east lies the district Mathura and on the west it is separated from Haryana by the river Yamuna. The greatest length of the district is about 120 k.m. from the Yamuna to the Ganga near the northern border and maximum breadth from north to south is some 72 km.

According to the Central Statistical Organisation (CSO) the district covered 5030 sq. km. and 27th in the state in respect of area and according to the census of 1991 the district has a population of 32.96 lakhs, rural population being 24.67 lakhs and urban 8.29 lakhs. It stands 12th in the state in respect of population.

The district is divided into six sub-divisions namely Koil, Khair, Iglas, Hathras, Atrauli and Sikandra Rao, each
comprising a single tehsil bearing the same name. Koal has an area of 917.9 sq.km. and a population of 4.8 lakhs. There are 340 inhabited and 17 uninhabited villages and the town Aligarh in the tehsil. Tehsil Khair has an area of 1040.4 sq.km. and a population of 4.5 lakhs and has 278 inhabited and 5 uninhabited villages. Iglas has an area of 552.2 sq.km. and a population of 2.7 lakhs and possesses 189 inhabited villages. Hathras has an area of 755.2 sq.km. and the population 4.2 lakhs. There are 365 inhabited and 13 uninhabited villages and town Hathras, Sasni and Mursan in the tehsil. Atrauli has an area of 819.5 sq.km. and a population of 4.9 lakhs. There are 278 inhabited and 11 uninhabited villages and the town of Atrauli in the tehsil and Sikandra Rao has an area of 872.2 sq.km. and a population 3.6 lakhs. There are 247 inhabited, 6 uninhabited and the town of Sikandra Rao in the tehsil.

The district lying in the upper Ganga-Yamuna doab is a plain gifted with remarkable fertility. It slopes gently from north to south and south-east. The surface is varied by several depressions, formed by there river valleys and natural drainage lines, while the elevation consists merely of slight ridges of sand. The general level of the district is extremely regular. The greatest height of the ground surface is about 195 m. above sea-level at Chandaus and Tappal in the north-west, dropping to 189.58 m. at Soma in the central depression. The district is not reversed by any river, the Ganga merely finches it in the north-east, while
the Yamuna flows along its boundary for a short distance. The other streams running through the district are; the Kali and Isan, the tributaries of the Ganga and the Nim, the tributary and Kali and the Rind, the Sengar, the Karwan and the Patwa, the tributaries of the Yamuna.

The climate of the district is characterised by a hot summer, pleasant winter and general dryness except in the monsoon season. The south-west monsoon season starts from the middle of June and lasts till the third week of September. The average annual or normal rainfall in the district is 647.3 mm. and it varies from 604.5 mm. to 724.9 mm.

The driest part of the year is the summer season with relative humidities less than 25 percent in the afternoon. In the monsoon season skies are generally heavily clouded and overcast on same days and rest of the year skies are mostly clear and lightly clouded. During this season the depression originating in the Bay of Bengal which move in a westerly or north-westerly direction across the central parts of the country affects the weather over the district causing widespread heavy rains.

The district enjoys exceptionally good irrigation facilities. Canal, wells and tubewells are the most important sources of irrigation in the district. In spite of the great extension of the canal system, wells and tubewells still form the chief sources of irrigation.
There are 19 running schemes in the district, which are providing potable water to the rural masses through piped water supply. These schemes have been launched time to time, when and where it has been found necessary. The total 2.25 lakhs people have been benefited by the schemes through piped water supply and 9079 litres of water have been supplied daily till 1993 according to the fixed norm of 40 lpcd. Total 1647 domestic connections have been given and 232 standposts have been installed in the rural areas of the district.

The total 6569 handpumps have been installed in the rural areas of the district till 1993 and according to the fixed norm of the government one handpump is meant for 250-300 persons. So we can say that about 17 lakhs people have been benefited through handpump and 2.25 lakhs have been benefited by piped water supply till the end of 1993. According to the 1991 census the total rural population of the district is 24.67 lakhs but the benefited population by the drinking water is 19.25 lakhs measuring approximately 78% of the total population. The achievement is far behind the objective stated by the government to provide drinking water to complete population by 1990. The reasons of non-fulfillment of the target are the lack of finance, lack of proper management, poor designing of the schemes, ineffective planning and lack of people's participation etc. Moreover, the expected rural population at the present growth rate in 2001 A.D. will be 34 lakhs. The demand rate of the water is
expected to be 70 lpcd due to the rapid urbanization process and increasing standard of living. The expected demand will be 2380 litres per day. Presently the schemes are not sufficiently supply the water when the demand rate has been envisaged at 40 lpcd. If the condition of water supply remains the same, the population increased and the demand also changes over time, the situation is expected to be alarming in near and forceable future.

The average annual irrigated area of the district through canals is 114 thousand hectares of land and 27 thousand hectares of land through tubewells during the period of last six years. Thus the total 141 thousand hectares of land are being irrigated annually although the total cultivated area is 389051 hectares. Measuring approximately 38% of the total cultivated area. The reasons for the poor result are electrical and mechanical defects, lack of funds, short power supply, law and order problem, civil defects and personnel management problems, etc.

Ineffective planning is one of the most serious problems of drinking water supply services. It is fact that for better running for the scheme a better planning is needed. There are so many schemes or agencies with no inter-agency co-ordination indeed. In this regard the water supply services of Aligarh is no exception. In the planning of the scheme at no stage, these agencies meet together and chalkout the strategy of the programme in an integrated manner.
Poor designing of the scheme is also an important problem. At the time of designing the scheme and search for perennial sources are not made and factors like minimum water requirements of the people and population growth etc. are not taken care of.

It is also being experienced that poor maintenance of the scheme is equally responsible for the ineffectiveness of the scheme. The water supply services of Aligarh are also facing such a problem. As a matter of fact government had neither a comprehensive policy nor sufficient budget for maintenance of the schemes till very recently.

The most important problem of drinking water supply services of Aligarh is lack of finance. Without adequate finance smooth functioning of the schemes is not possible. In this regard government has not formulated any clear cut policy. There is no plan budget for the maintenance of the schemes. The government provides plan budget for water supply but that is also insufficient for the said purpose.

The importance of infrastructure in case of water supply services of Aligarh cannot be exaggerated. It is also one of the factors responsible for the unsatisfactory performance of the schemes.

The willing participation of the people is necessary for the success of any scheme. Without people's cooperation no scheme howsoever planned and designed nicely, can be
implemented successfully. This is equally valid in the case of Aligarh Water Supply Services.

Besides the power supply is uncertain, replete with frequent interruptions, frequency changes, reverse current and erratic voltage. This is a great contributory factor in the poor performance of the tubewells irrigation.

As power supply is available only for about 6 hours and that too not at predetermined hours and generally during night hours, there is delay in rectifying electrical defects and consequent testing, which leads to additional closure.

Mechanical defects generally leads to long periods of break-down. The state irrigation department has laid down maximum time schedule for carrying out the repairs of equipment as below. Burnt motors - 3 days, pump defects - 7 days and starter defects - 1 day. But this time schedule is not adhered to and often there are abnormal delays. The reason for delay are attributed to laxity in taking the equipment to workshop for repairs, delay in communication and transport and non-availability of spare parts/materials to be used in repairs in the workshop. Unsuccessful boring of tubewells which could not be developed to give the desired discharge could be found mainly due to lack of proper technical investigation of underground hydrogeology. Also in some cases the tubewell has been located in depression instead on the watershed due to unsatisfactory topographical surveys on due to local influence resulting in the
construction of field channels in high embankments and consequent poor performance.

The maintenance and timely release of grant is the backbone for the efficient functioning of the whole tubewell scheme. Timely maintenance not only keeps all components serviceable but also cuts increased expenditure that may be required due to faster deterioration. The irrigation scheme are suffering on account of lack of funds, which also leads to their closure.

The transfer of Mechanics is not allowed from one district to another or even from one division to another because of government policy to avoid displacement of low paid employees to long distance. Thus a man is always imposed and in the context of prevalent of indiscipline and weaning of authority, there is growing inefficiency.

There is an increase in the cases of thefts of transformers, motors, starters and other accessories on state tubewells. The problem is connected with law and order in general and the collaboration of staff with anti-social elements in the above cannot be ruled out. The thefts not only lead to long closures, but also creates difficulties in the replacement because of lack of maintenance funds and timely availability of parts/spares.

Recommendations:

On the basis of the above discussion the clear picture that emerges is that the rural water supply services in
Aligarh district is not up to the mark. The causes for the prevailing situation have already been discussed. The following recommendations are made which, if implemented properly will go a long way in improving the functioning and status of water supply systems in Aligarh district:

**Drinking water supply area:**

While discussing the problems we have come across with the fact that ineffective planning is a big problem and a constraint in the smooth running of the scheme. For the better running of the scheme a better planning is needed. Generally high level committees set the target and then hand over to their subordinates the responsibility for implementation and maintenance of the targets. Most of the time the members of planning committee are unaware about the prevailing situation and existing condition of the region to whom target is going to be planned. So district level planning should be there. A team of Executive Engineer, Assistant Engineer and Junior Engineer should be responsible for the planning of such schemes and they should ensure the involvement of local people.

While designing the drinking water schemes, search for a perennial resources should be made and selection should be on the basis of last two or three years minimum recorded discharge or such sources. Further, while designing the schemes factors like minimum water requirements of the people and the population growth etc. should also be taken care of.
Ecological factors like afforestation, soil conservation and other preventive measures should be considered.

For the better implementation of the programme, the planning and the target should be in accordance with the existing regional conditions and available infrastructures. Only the rational targets and plans are able to achieved. So while setting the targets or goals, care must be taken that the goals and plans of the programme are rational and realistic.

Poor maintenance of the scheme is equally responsible for the unsatisfactory performance of the scheme. For making scheme more effective and functional, proper stress for timely maintenance should be given. Modern technology and new equipments should be used for the maintenance of the scheme. Scientific equipment should be used to detect and repair leaking pipes etc.

For the success of any programme or schemes, the willing participation of the people is a must. Without people's cooperation and participation no scheme howsoever nicely planned and designed can be a success. This is equally valid in the case of Aligarh rural water supply services. Thus, people's participation in terms of identifying the perennial source of water (for piped water schemes/handpumps), installation of piped water lines/handpumps and their maintenance would not only reduce unnecessary waste but also help making schemes functional.
It is, therefore, necessary that the government should enthuse the people by providing various incentives, so that the people may participate in the scheme willingly and extend their cooperation.

Importance of infrastructure in the case of rural water supply services of Aligarh cannot be overemphasised. The lack of adequate infrastructure in case of rural water supply of Aligarh is also one of the factors responsible for the unsatisfactory performance of the schemes. Therefore, government should endeavor to provide the infrastructure particularly indigenous infrastructure which may suit to the prevailing socio-economic conditions of the district and it may help making the scheme more effective. In sufficient budget of lack of finance is the biggest hurdle in the way of effective and smooth running of the scheme. As a matter of fact, budget allocation for maintenance was being funded from non-plan budget but recently the government has agreed to provide 10% of the plan budget of rural water supply for the maintenance works which again not sufficient. Therefore, it is the need of the hour that the government should provide more plan budget and reduce the financial problem of the rural water supply schemes. Today the drinking water schemes have become 100% official schemes because of that no local efforts to maintain them are found, as people have come to depend on government for their upkeep. Previously the Gram Sabhas used to contribute a part of the outlay of the drinking water supply schemes and actively involved in...
the execution and maintenance of the schemes. Therefore, the government should endeavor to involve the people and Gram Sabhas so that they may contribute in part towards the outlay of the scheme, which atleast be helpful in reducing the financial burden of the programme. It can be achieved with a little bit of motivation and cultivation of the community ethos among the people and making them integral part of the programme right from its conception to its maintenance and in this way it would not be difficult to create fund for such an important scheme of drinking water supply.

Irrigation:

The quality and quantity of power requires radical improvement. 18-20 hours power supply per day to tubewells should be ensured especially during seasons of agricultural operations. Tubewells should be provided with independent direct feeder lines so that steady power supply at proper voltage and frequency is available. All future planning of tubewells should be compatible with availability of power. In the context of high agricultural production, government should make policy decision in regard to giving higher share of electric power for tubewells. For providing independent electric feeders and generating sets for tubewells located in isolation, a project like modernisation of tubewells should be conceived. The major consumer like Irrigation Department should have member representative on the State Electricity Board for better coordination.
The power supply should preferably be during day time and its timings be notified and known to beneficiaries and the schedule of power supply should be adhered to and properly monitored. Material required for energisation of new tubewell and for rectification of electrical defects on tubewells should be set aside by State Electricity Board to avoid delays in its not being readily available in stores. The stolen/damage transformers should be replaced with least possible delay. The State Electricity Board should be made answerable for delays. Monitoring of defects like low voltage, single phase or highly unbalanced current, transformers and cable defects should be done. The energisation of tubewells should be done simultaneously with the installation of tubewell machinery.

Every tubewell division should have repair workshops provided with modern machines facilities, to cope with peak load requirements and manned with properly trained personnel and no repair should normally be allowed to be undertaken from outside. The workshops should have independent power generators to be used as captive power. All precision and non-precision spares/parts needed for tubewells should be manufactured at irrigation workshops, which should be fully equipped to meet the requirement, of all the tubewell divisions.

The sitting of tubewells and alignment of water courses should be technically checked and approved by suitably
trained engineers. The gul culverts or syphons should be constructed on all crossings of tubewell water courses with village and chak roads. Likewise drainage crossings or crossings with existing private water courses should also be constructed.

The pumping sets, motors and other components which have completed their useful life should be replaced from Replacements and Renewals (R & R) funds. At present government is not releasing this amount fully which should be done. About 300 tubewells fail every year after spending their useful life. There should be given highest priority for construction through renewal and replacement funds.

A maintenance grant of Rs. 5000\- annually for tubewell of 100 hac. command area, excluding regular establishment depreciation, interest and energy charges should be made available and it should be linked with price escalation and made available accordingly.

The mechanics should be provided housing accommodation near the tubewells which they have to look after. Also housing accommodation for Junior Engineers should be provided at their headquarters. The mechanics and junior engineers should be given vocational training in the use of modern machines and advance technology as applied to their jobs. The Irrigation Department should established modern workshops for imparting such training. Hour-meters should be installed on all tubewells to check pilferage of irrigation revenue.
The inadequacy of financial powers of various officers for local purchase should be reviewed urgently to meet emergent purchases in case the situation so arises. The disbursing power of Assistant Engineers should be restored so that they may command better respect and exercise control more effectively. The responsibility must go hand in hand with authority. The efficiency and availability of drilling rigs and allied equipment should receive attention of the senior officers and all out efforts should be made to reduce the sickness factor.

The extension services to educate farmers on the economical use of water for optimum benefits should be strengthened. Linking of long term canal projects gradually to the system updated may bring benefits to the suffering public.

If the above recommendations are implemented, it is hoped that they will go a long way in streamlining the functioning of water supply services of Aligarh and will also improve the operational efficiency of water supply systems.