

14. Bore wells scheme (1993-94)

1. Background :

The bore wells scheme is implemented as emergency water supply scheme in the villages in remote areas of the State where the ground water table is low. Electric pumps are installed on bore wells with high capacity, while hand pumps are installed on the bore wells with low capacity.

2. Implementing Programme :

1. The bore wells which have capacity of more than 2,250 litres per hour are meant to be high capacity bore wells and electric pumps are installed thereon, while hand pumps are installed on the bore wells with capacity lower than that.
2. The norms prescribed for installing electric pump on a bore well are as follows.
 - a) In the village in which there is dearth of water, electric pump should be installed on the bore well having available maximum quantity of water within that village.
 - b) In the village having population of at least 500 and having facility of electricity, electric pump should be installed on only one bore well even if water is available to more number of bore wells.
 - c) In the village in which there is piped water supply scheme of provisional or permanent nature, electric pump should not be installed on a bore well even if it is having sufficient quantity of water.
3. The amenities of pump house, water storage tank with a capacity of 600 gallons, a tank with capacity of 200 gallons for the use of cattle and two stand posts are made available for a bore well on which electric pump is installed.
4. The total estimated cost of bore well with installation of electric pump is expected to be Rs.57,000.
5. Initially this scheme was implemented through Ground Water Survey and Development Agency and since 1985, it is being implemented through Zilla Parishads. The administrative approval to the installation of electric pump on bore well is given by the Chief Executive Officer, Zilla Parishad.
6. This evaluation study was undertaken at the instance of the State Planning Board to assess whether the programme of installation of electric pumps on bore wells with high capacity and that of hand pumps on the bore wells with low capacity was implemented in accordance with the procedures prescribed therefor by the Government and how far it was useful in overcoming the shortage of drinking water.

3. Objectives of the evaluation study:

The objectives of this evaluation study were as follows :

- 1) To assess the extent of bore wells taken under the programme and those out of them which were successful and also the extent of bore wells on which pumps were installed.
- 2) To study as to whether water supply is made regularly and in expected quantity from the bore wells and also to study how far the problem of shortage of drinking water in the village has been solved.
- 3) To study the extent of bore wells with pumps thereon in good condition, the period of pumps remaining under repair and the reasons for the occurrence of defects therein.
- 4) To check whether amenities on the bore wells are created as per the design.
- 5) To study whether proper arrangements are made for maintenance and repairs of the bore wells.
- 6) To study the duration of time required for completing the work and the reasons for delay.
- 7) To study the procedure of implementation of the programme and to make suitable recommendations.
- 8) To assess the reactions of the local people and others concerned, about the programme.

4. Sample selection :

1. For this survey, 17 districts were selected in the State and two tehsils were selected from each such selected district. From each of the selected tehsils, pumps in operation and those having been defunct were selected for the survey.
2. Out of the beneficiaries of the selected pumps, five beneficiaries each were selected for the survey.

5. Period of Field work :

The field work of the survey was conducted during the period February-March, 1993.

6. Findings :

1. During the seven years' period of 1985-86 to 1991-92, the number of high capacity bore wells undertaken in the districts excluding the districts of Raigad, Ratnagiri, Kolhapur and Bhandara in the State was 11,852. As regards the four districts viz. Raigad, Ratnagiri, Kolhapur and Bhandara, the programme was implemented therein but the information as to how many bore wells were undertaken in the districts could not be available.
2. The number of successful bore wells in the State including those in the above four districts was 12,436 during the same period. The percentage of successful bore wells, excluding the above four districts works out to 97.5.
3. Out of the 12,436 successful high capacity bore wells, electric pumps were installed on as low as 57.6 per cent bore wells and hand pumps were installed on 34.8 per cent bore wells. The information as to whether electric pump or hand pump was installed on the remaining 7.6 per cent bore wells or otherwise was not available.
4. During the seven years' period of 1985-86 to 1991-92, programme of 41,774 low capacity bore wells, on which hand pumps were installed, was undertaken in 25 districts in the State excluding the above four districts. The number of bore wells undertaken under the programme in the four districts was not available.
5. During the above mentioned period, 81.6 per cent bore wells were successful in the State excluding the four districts.
6. Out of the 38,737 successful bore wells, hand pumps were installed on 97.6 per cent wells.
7. During the seven years' period from 1985-86 to 1991-92, the number of successful high capacity bore wells taken was 11,412, out of which electric pumps were installed on 7,163 bore wells and hand pumps were installed on 4,249 bore wells. Out of these 11,412 bore wells, according to the official records, the water supply was in continuous flow at the time of survey in 88.9 per cent of the bore wells situated in the 27 districts wherein the information was available.
8. As in the case of 37,813 low capacity bore wells in the same period, water supply was in continuous flow, according to official records, in 88.8 per cent of the bore wells situated in the 27 districts wherein the information was available.
9. During the two years 1991 and 1992 respectively, 5.0 per cent and 4.7 per cent of the high capacity bore wells were permanently defunct according to the records.
10. During 1990-91, 5.8 per cent of the total low capacity bore wells were permanently defunct. This proportion was 5.7 per cent during 1991-92.

11. The equipments like starter, main switch, motor, submersible pump, jet pipe etc. which were installed on the permanently defunct high capacity bore wells were in a good condition and could have been utilised elsewhere. As in the case of hand pumps, equipments like handle pump, barrel, pump head, nozzle pipe were in a good condition.

12. In all the districts in the State excepting Jalna, agency has been created for conducting repairs to the bore wells.

13. As regards the transferring of the bore wells to the concerned village panchayats after completion of the scheme, there were no difficulties in the districts of Ratnagiri, Dhule, Ahmednagar, Pune, Satara, Sangli, Kolhapur, Solapur, Parbhani, Beed, Latur, Buldhana, Akola, Amravati, Wardha, Nagpur, Bhandara, Chandrapur and Gadchiroli, as reported by the concerned officers.

14. In the remaining districts in the State, financial incapability and inefficiency of the village panchayats were the hurdles in the transfer of the bore wells.

15. Proper care by the local people, sufficient storage of water, well-functioning repairing system, proper use of the pump, proper maintenance by trained person, checking electricity voltage before starting electric pump etc. help the scheme to remain in good condition.

16. As informed by the concerned officers, the main reasons for being the bore wells defunct were displacement of submersible pump, absence of any arrangements for maintenance and protection, chemical quality of water, short circuit in electric motor/pump, rusting of equipments due to stagnant water nearby bore well, non-availability of funds with the village panchayats, internal disputes among the local people, etc.

17. The hurdles in implementing the scheme as reported by the concerned officers were non-co-operation from the local people, lack of facility of conducting chemical analysis of water, delay in getting electricity connection from the Electricity Board, non-availability of open land for the scheme, insufficiency of machinery and equipments with the Government, negligence of the local people towards the scheme, financial incapability of the village panchayats, undue insistence from the local people for taking the bore well in the scheme at a particular location merely convenient to them but without considering the source of water etc.

The schemes selected for the survey (conclusions):

18. For the survey 110 schemes which were in operation were selected and 25 schemes which were not in operation were selected. Thus in all 135 high capacity bore well schemes were selected. Similarly, in all 68 low capacity bore wells were selected out of which 60 were selected from the functioning schemes and eight were selected from the defunct schemes.

19. In the case of 32 per cent of the hand pumps selected for the study, the population of the village was more than 2000 and for 28 per cent of the hand pumps, it was in the range 501 to 1000.
20. 61 per cent of the villages in which high capacity bore wells were located were having population in the range 501 to 1,500 out of which 42 per cent villages were in the population group 501 to 1,000, while the rest 19 per cent villages were in the population group 1,001 to 1,500.
21. Out of the 110 high capacity bore wells selected from those which were functioning according to the records, seven were in fact defunct since long while 12 bore wells were temporarily defunct. Similarly, two out of the 60 low capacity bore wells were defunct since long and 17 (28.3 per cent) were partially defunct.
22. Out of the 21 high capacity bore wells which were found to be defunct at the time of survey, nine were defunct because the pumps had a fault, three were defunct because the source had gone dry while nine were defunct due to local disputes and other reasons. Out of the 19 defunct low capacity bore wells with hand pumps, nine were defunct because the pumps had a fault, five were defunct because the source had gone dry, while five were defunct due to other reasons.
23. The main reason for the bore wells with electric pumps to be defunct was 'the pump being under repair'. In addition to that, the other equipments being out of order was also a reason.
24. In respect of all the 110 bore wells with electric pumps, the assets of the bore wells as mentioned in the records were existing in place. In the case of two bore wells with hand pumps, assets of the same as mentioned in the records were not existing in place and some of their equipments were reported to be taken away by the officers.
25. The project cost of 53 per cent of the high capacity bore wells was in the range of Rs.25,001 to Rs.50,000, while that of about 22 per cent bore wells was in the range of Rs.50,001 to Rs.75,000.
26. The work of installation of about 59 per cent of the high capacity bore wells was completed within three months, while that of 12 per cent bore wells was completed with six months. However, the installation of 39 (20 per cent) wells took more than six months and for nine out of these bore wells, it took a period of more than two years to complete.
27. As regards the low capacity bore wells, work of installation of about 90 per cent of the bore wells was completed within one month and that of six per cent bore wells was completed within two months. Work of none of the bore wells exceeded five months.
28. In the case of 64 per cent of the high capacity bore wells, the water supply had started within 3 months. In the case of additional 7 per cent of the high capacity bore

wells, the water supply had started within 6 months. In the case of low capacity bore wells, both the periods required for completion of work of the bore wells and those for starting the water supply were the same.

29. In the case of 42 per cent of the 110 high capacity bore wells in which water supply was in operation at the time of the survey, no other bore well was taken within a radius of 100 meters. The water supply from 53 per cent bore wells within 100 meters' vicinity of which other bore well was taken was not adversely affected while in only five per cent of such bore wells the water supply was adversely affected due to this reason. In the case of only two (3.3 per cent) of the low capacity bore wells, the water supply was adversely affected due to this reason.

30. Twenty-one out of the functioning high capacity bore wells selected for the study were found to be defunct at the time of survey and in the case of 10 (47.6 per cent) out of them, it was possible to revive the water supply. The expected cost of repairs was upto Rs.1,000 each for three of the bore wells, however, it was more than Rs.1,000 each for the rest seven bore wells.

31. It was observed that there were no complaints in the case of 65 (59 per cent) of the 110 high capacity bore wells, while there was a complaint regarding shortage of water in summer in the case of 14 (13 per cent) bore wells. Also there were complaints of the following types such as absence of proper planning on the part of village panchayats, no timely repairs, absence of employee from duty etc. Similar complaints in general were recorded in the case of low capacity bore wells.

32. Out of the 110 high capacity bore wells with water supply in function, 51 (46 per cent) had gone temporarily defunct within two years prior to the survey date and the reasons therefor were short circuit in motor, occurrence of fault in the pump, break in electricity supply, worsening the condition of pipe line, lack of water in the summer etc. The same reasons held in the case of low capacity bore wells being temporarily defunct. The proportion of the low capacity bore wells having gone temporarily defunct within a period of last two years was 27 per cent only. The main reasons for the bore wells going defunct were worsening the condition of washer of the pump, breaking of the rod, chain etc.

33. It was reported in 15 of the 17 selected districts that no alternate arrangement of water supply was made in case the water supply from the bore wells had stopped. Such alternate arrangement was reported to be made in only two districts.

34. The difficulties in implementing this scheme at Panchayat Samiti level are the local disputes, no carrying out of even minor repairs, non-availability of locations with source of sufficient water, insufficiency of planning by village panchayats, no appointments of workers, no proper availability of electricity supply etc.

35. The officers at Panchayat Samiti level in the districts of Ratnagiri, Jalgaon, Satara, Sangli, Aurangabad, Osmanabad, Yavatmal, Akola and Nagpur reported that they got good co-operation from all the village panchayats in implementation of this

scheme. It was reported that no co-operation of the village panchayats was received in Dhule, Wardha and Bhandara districts, while some of the village panchayats co-operated and some did not in the remaining districts.

36. The common complaints of the beneficiaries were reported to be frequent occurrence of faults in the electricity pumps and not carrying out repairs thereon in time, no timely payment of electricity bills by the village panchayats and insufficiency of water supply. It was reported that there were no complaints of the beneficiaries in Dhule, Sangli, Wardha and Nagpur districts.

37. It was observed that there were complaints like frequent occurrence of breaks in electricity supply, electricity voltage being low and not getting electricity connection early about the Electricity Board. There were no complaints about the Electricity Board in the districts of Ratnagiri, Dhule, Jalgaon, Sangli, Aurangabad, Yavatmal, Nagpur and Bhandara.

38. The reasons as reported for non-acceptance of transfer of the scheme by the village panchayats were unfavourable financial position, non-availability of technicians for repairs at local level and non-completion of the work of the scheme.

39. In the rainy season, the water supply from 62 per cent of the functioning high capacity bore wells was as per the design, that from 10 per cent of the bore wells was more than that according to the design, while the water supply from 28 per cent bore wells was less than that expected according to the design. In the winter season, the proportion of bore wells supplying water as per design was 53 per cent, proportion of those supplying water in excess was nine per cent and in 38 per cent bore wells, the water supply was lower than that as per design. It was observed that in summer, 53 per cent bore wells were supplying water as per design, nine per cent were supplying water in excess, while the water supply from 38 per cent bore wells was lower than that according to the design. This information regarding water supply was available only in the case of 103 of the bore wells.

40. In the rainy season, the water supply from 47 per cent of the 55 low capacity bore wells, for which the information was available, was as per the design. In seven per cent bore wells it was more than that according to the design and it was less than that in 46 per cent bore wells. It was observed that in winter, the proportion of bore wells supplying water as per design was 40 per cent, that of supplying water in excess was five per cent, while 55 per cent bore wells were supplying water lower than that as per the design. In summer, only 28 per cent bore wells were supplying water as per design, while 72 per cent were supplying water less than that. The information about the water supply was not available for summer in Latur district and for all the three seasons in Dhule district.

41. In the villages in which the bore wells selected for the study were situated, there were other bore wells also. In the 135 villages in which the selected high capacity bore wells were situated, there were in all 136 high capacity bore wells and 420 low capacity bore wells, out of which 132 (97 per cent) and 314 (75 per cent) respectively

were successful. In the 68 villages selected for low capacity bore wells, no high capacity bore well was taken. In these villages, in all 317 low capacity bore wells were taken and 269 (85 per cent) of them were successful.

42. In the case of 25 per cent of the high capacity bore wells, requirement of water of 101 to 150 families was fulfilled from each of them. 13 per cent of the bore wells fulfilled the water requirement of 76 to 100 families each, while 17 per cent bore wells fulfilled the same of 51 to 75 families each. The proportion of bore wells supplying sufficient water to families more than 150 was 18 per cent. Out of the low capacity bore wells, the maximum proportion i.e. 28 per cent bore wells were those fulfilling the water requirement of 21 to 30 families and those supplying water to more than 50 families each were 25 per cent.

43. In the case of 75 per cent of the 110 high capacity bore wells, the electricity bills of the bore wells were being paid regularly. The electricity bills of 11 per cent bore wells were not being paid regularly, those of four per cent bore wells were not at all received by the village panchayats, while those of 10 per cent bore wells were observed to be being paid by panchayat samities.

44. Water charges were not charged to in all 13 (12 per cent) of the high capacity bore wells from Sindhudurg, Aurangabad, Yavatmal and Nagpur districts. The water charges were being recovered for only 42 (38 per cent) bore wells from the remaining districts, but no fixed or common rates were applied for the same. In the case of hand pumps also, water charges were not made applicable to 10 (17 per cent) of the bore wells, from six districts, out of the 60 bore wells selected for the survey. The rates of water charges varied from Rs.2 to Rs.30 per family per year.

45. It was reported that the water from 95 per cent of the 110 high capacity bore wells was free from pollution. Water from only five per cent bore wells was observed to be salty. Also water from 97 per cent of the 60 low capacity bore wells was observed to be of good quality and that from only three per cent bore wells was observed to be salty.

46. It was reported that the electric pumps installed on high capacity bore wells were started and switched off in time in the case of 88 per cent bore wells; however, no taps were observed to be fixed on the stand posts of 10 per cent of these bore wells resulting in wastage of water. Wastage of water was reported in the case of five per cent of the hand pumps.

Beneficiaries of the bore wells:

47. From the families which were taking benefit of the selected 110 high capacity bore wells, 535 families were selected for the study and also 295 families from those taking benefit of the selected low capacity bore wells were selected. The requirement of water of these families per person per day was 42.8 litres and 40.9 litres respectively.

48. It was observed that the need of water of 429 (80 per cent) of the families getting benefit of the high capacity bore wells was fulfilled upto 75 to 100 per cent. So

also, the need of water of 212 (72 per cent) families getting benefit of low capacity bore wells was fulfilled upto 75 to 100 per cent.

49. For 356 (66 per cent) of the families beneficiary of high capacity bore wells, the distance of the scheme from their houses was maximum 25 meters. Out of the rest of the families, 16 per cent families had to walk a distance of 25 to 50 meters for fetching water and for nine per cent families this distance was 51 to 100 meters, while for another nine per cent families the distance was more than 100 meters.

50. Seventy-seven per cent of the beneficiaries of high capacity bore wells opined that the scheme was good, while such percentage of beneficiaries expressing good opinion about the scheme in the case of low capacity bore wells was 68 per cent.

Defunct bore wells

51. Out of the 25 defunct high capacity bore wells selected for the study, 40 per cent were defunct for a period of more than 60 months, followed by 28 per cent bore wells defunct for 49 to 60 months. Out of the eight defunct low capacity bore wells, 75 per cent were defunct for more than 60 months.

52. It was observed that the main reason for the bore wells being defunct was going dry of the source of water. Such high capacity bore wells were 44 per cent, while low capacity bore wells were 75 per cent. The other reasons for the schemes being defunct were such as occurrence of fault in electric pump or in other equipments etc.

53. In the villages in which the selected defunct high capacity bore wells were situated, there were other 31 high capacity and 93 low capacity bore wells out of which 74 per cent and 81 per cent respectively were successful. In the villages in which the selected defunct low capacity bore wells were situated, there were other 40 bore wells out of which 73 per cent bore wells were successful.

7. Recommendations:

1. The records of the scheme should be kept up-to-date and complete in all respects.
2. At least one person from every village in which the scheme is implemented should be trained under TRYSEM so that immediate repairs can be carried out in case of occurrence of fault.
3. Availability of spare parts for the scheme should be ensured.
4. The machinery and equipments installed on the bore wells which are defunct for more than two years due to getting dry of the source should be immediately installed in other scheme and wastage of Government funds should be avoided. However, in this regard, the Director, Groundwater Survey and Development Agency, Maharashtra State has given following remark. "With a view to increasing the flow of water from the bore wells the source of which has decreased or gone dry, non-conventional measures like hydro-fracturing, sectional blasting, artificial recharging etc. can be applied. As many of the low capacity bore wells are rejuvenated by applying measures suitable from these, question of wastage of Government funds as mentioned above does not arise. If there is not sufficient increase in the flow of water even after implementing the above mentioned non-conventional measures, then only it may be appropriate to reutilise the water lifting equipment and its accessories elsewhere".
5. Water cess should be made compulsory. The rates of water cess should be uniform and should be decided by the Government.
6. Bore wells should not be taken at the places where the water from the source is not potable due to oversalting.
7. The equipments required for conducting chemical analysis of water should be made available to the agencies implementing the scheme and chemical analysis of water should be conducted regularly at regular intervals for each and every bore well.
8. More attention should be provided to security of the scheme.
