

CHAPTER - 19

WATER SUPPLY & SANITATION

19.1 The State is poorly placed in terms of availability of water resources. It has only 1.16% of the surface water and 1.70% of the ground water resources of the country. Average rainfall in the State is 531 mm against national average of 1200 mm. This too is erratic in occurrence, resulting in frequent drought conditions. In absence of adequate surface water sources, there is over reliance on ground water. Gross annual draft of ground water in the state is 13 BCM against recharge of only 10.4 BCM.

19.2 Due to these adverse conditions, Rajasthan is severely affected with drinking water supply problems. In south-eastern hilly region, ground water is available only in selected valley part and water table fluctuates rapidly due to rocky geographical formation of the area. In years of continuous drought reservoirs of the area dry up and create severe critical water crisis. The west Aravali area is desert, having scanty and erratic rainfall and often faces drought conditions. There are only a few reservoirs in the area, soil strata is basically alluvial with limestone and allied sedimentary rocks, which are good aquifers. The increased demand of water for agriculture, industrial and domestic uses is fast depleting the ground water reserve and deteriorating the water quality. The available water has high TDS, salinity fluoride and nitrate contents. The Gang Bhakhra Canal system, Indira Gandhi Canal System in the north-western part and now Narmada canal system in southern part are the only reliable drinking water sources in the region.

19.3 In addition to the above geographical problems, high population growth rate, its sparse distribution has aggravated the task of providing safe drinking water. On account of these problems, about 70% habitations of the State are problematic from the point of view of potable drinking water.

19.4 Rajasthan already accounts large poor water quality areas. Increasing pollution by industrial units, big and small, unregulated mining and even over-extraction of water from deep wells also add to the water quality problem in a number of districts. Intensive surface water irrigation many a times causes water-logging and increased salinity, which are major environmental threats. The incidence of water logging and salinity depends upon factors such as quantity of water used, intensity of irrigation, soil drainage characteristics, depth of water table, etc. Similar problems have also been observed in some of the medium and minor irrigation projects. These problems can be tackled to an extent, as has been attempted in IGNP area, with extension of area under irrigation command and reduction in quantity of water used, large-scale plantation and, conjunctive use of surface and ground water.

19.5 Deterioration of the ground water quality is far more serious. Rajasthan is particularly handicapped in this regard, largely because of the over-dependence on ground water. Following table compares the magnitude of the problem in Rajasthan to the rest of India:

Table 19.1 Comparison of Ground-water Quality, Rajasthan and Rest of India

Particulars	India	Rajasthan			
		Villages	Habitations	Total	% of country
Multiple quality problems	25,092	9,572	9,067	18,639	74
Only fluoride	31,306	4,477	4,515	8,992	29
Only salinity	23,495	3,235	2,193	5,428	23
Only nitrate	13,958	4,211	3,671	7,882	56.5
Only iron	1,18,088	79	52	131	0.1
Only arsenic	5,029	0	0	0	0
TOTAL	2,16,968	21,574	19,498	41,072	

19.6 To prepare drinking water supply schemes based on surface is the utmost priority of the State Government to provide safe drinking water to the people. High priority would be given to the suitable schemes to mitigate the problem of saline and fluoride water. Conventional sources of water such as wells, babadi, anicuts, ponds and tankas etc. would be augmented in a big way. A State Policy would be prepared not only to increase water capacity of these sources but also to keep water safe in these conventional water sources.

19.7 The State Government would also accord high priority to connect regional water supply schemes to villages, towns and habitations as much as possible. Remote areas are proposed to be covered through Rajiv Gandhi Drinking Water Mission. Rain water harvesting for conservation of rain water would be encouraged.

Rural Water Supply

19.8 Presently, 85% rural water supply schemes are dependent on ground water. Break up of the type of rural schemes is as below:

Table No. 19.2

S. No.	Type of Scheme	No. of Villages Covered	Percentage
1.	Piped Water Supply Scheme	1974	5.00
2.	Pump & Tank Water Supply Scheme	3752	9.43
3.	Regional Water Supply Scheme	9747	24.51
4.	Hand Pump Scheme	21105	53.09
5.	TSS	1174	2.95
6.	Diggies & Others	1981	5.00
	Total	39,733	100.00

19.9 Over the years, the ground water situation has become a matter of concern due to over extraction for agricultural purposes. This has led to severe depletion in ground water table and deterioration in water quality, making a large number of drinking water sources unsustainable. Apart

from this, large geographical areas have high concentration of dissolved chemicals like; Fluoride, Chloride etc. making it unsafe for drinking purposes. To solve the problem of drinking water in such areas, a number of drinking water supply projects based on surface water sources have been taken up in hand.

19.10 Under "Bharat Nirman" 77,052 habitations were identified as problematic habitations in respect of drinking water, as on 1st April 2005. As on 31.03.09, 68738 habitations have been covered. A large number of habitations, out of this are having multiple quality problems. With the taking up of the surface water source based projects, drinking water problem of a total of 27,658 habitations has been addressed. Most of which belong to the remaining habitations to be covered under "Bharat Nirman". It is targeted to cover the remaining habitations by the financial year 2012-13.

19.11 Due to the limitations of quality and quantity, the ground water sources can no longer be considered dependable in Rajasthan. Major coverage, therefore, shall be from surface water source based projects. Chambal River and its tributaries, Indira Gandhi Canal System and Narmada Canal are the only dependable perennial surface water sources in the State. Due to limited number of reliable surface source, these projects involve long transmission systems and are, therefore, highly capital intensive, requiring substantial funds and longer time for completion. Surface sources are being adopted as the most sustainable and reliable source to avoid slipping back after achieving coverage.

Urban Water Supply

19.12 Supply of safe hygienic and potable drinking water to urban population is undoubtedly the top priority of the State Government. All the 222 towns of the State have been benefited with drinking water supply system. But the service level in different urban water supply systems and the quality of supplied drinking water still needs a lot of efforts in terms of improvement and consumer satisfaction. The main thrust in the XI Five Year Plan is on providing reliable, self-sustaining drinking water supply with adequate service levels to the urban areas and as per prescribed norms.

19.13 Against an outlay of Rs. 5,085.93 crores for the sewerage & water supply sector in the Eleventh Five Year Plan, an expenditure of Rs. 2156.64 crores was incurred in the year 2007-08 and 2008-09 and an expenditure of Rs. 1397.36 crores is likely to be incurred during the year 2009-10. A provision of Rs. 1232.31 crores has been kept in the Annual Plan 2010-11. The break-up of likely expenditure during 2009-10 and outlays kept in 2010-11 for the Sewerage & Water Supply sector are as follows:

Table No. 19.3

(Rs. in crores)

S. No.	Scheme	XI Plan Outlay	Anti. Exp. 2009-10	Proposed Outlay 2010-11
1.	Urban Water Supply	2402.40	450.60	555.00
2.	Rural Water Supply	2670.58	945.91	676.40
3.	Training Instt. for Eng. Subordinates	3.45	0.85	0.91
4.	Low Cost Sanitation	9.50	-	-
	Total	5085.93	1397.36	1232.31

Major Water Supply Projects:

19.14 There are 67 sanctioned major water supply projects to cover 68 towns, 7986 main habitations and 983 other habitations. Out of this, 12 projects have already been completed and two projects partially completed. As on March 2009, 18 towns, 1391 main habitations and 310 other habitations have been covered.

19.15 A sum of Rs. 684.20 crores has been proposed for major water supply projects (rural+urban) in the Annual Plan 2010-11. The details of some of the important major projects are given below:

Jaipur Water Supply Project from Bisalpur

19.16 The project has been prepared for water supply for Jaipur city from the Bisalpur dam. The project consists two parts. First part of the project for transmission of water from Bisalpur to Balawala reservoir, 15 Kms. south of Jaipur, is being executed by Urban Development Department with loan assistance from ADB. The total cost of this part is Rs. 556.00 crores. Second part of the project for transfer of water from Balawala to various distribution centers of Jaipur city, is being executed by PHED from JBIC loan assistance. Total sanctioned cost of the transfer system is Rs. 580.00 crores, out of which Rs. 343.00 crores is JBIC loan. The project was originally targeted for completion by December, 2008. Bisalpur transfer network would be connected to different parts of the town by March 2010, starting from February 2009. Completion of entire project is likely by March 2011 including the work of improvement of existing distribution system and reduction in non-revenue water to be taken up now.

19.17 A provision of Rs.200.02 crores had been kept for the Eleventh Five Year Plan. Total expenditure of Rs.388.15 crores has been incurred up to March, 2009. During the financial year 2009-10, an expenditure of Rs. 150.60 crores is likely to be incurred and during the financial year 2010-11, a provision of Rs. 155.00 Crores has been made.

Jawai-Pali Pipeline Project

19.18 This project has been sanctioned to save water losses in open canal to provide safe drinking water to additional 531 villages and 10

towns of Pali district, by converting existing canal system into pipeline from Jawai dam.

19.19 Total expenditure of Rs.175.16 crores has been incurred up to March, 2009. A provision of Rs. 11.45 crores has been proposed for this project in the Annual Plan 2010-11. Part of the pipeline has been commissioned in March 2009.

Barmer Lift Canal Water Supply Project

19.20 The project has been taken up for construction of main infrastructures i.e. raw water storage, treatment plant, clear water storage, pumping stations and 180 Kms. long transmission line for providing drinking water to Barmer city and 412 villages of Barmer and 161 villages of Jaisalmer district. Total cost of the project is Rs. 688.66 crores. Source of water for the project is Indira Gandhi Main Canal. Work on this project is under progress through turnkey contracts. A provision of Rs. 28.00 crores has been kept for this project in the Eleventh Five Year Plan 2007-12. A provision of Rs. 1.90 Crores is proposed for the Annual Plan 2010-11.

Bisalpur Dudu Phulera Project (Phase-I)

19.21 The project envisages global coverage of 1,488 villages of Jaipur, Tonk & Nagaur districts and 7 towns namely Chaksu, Sambhar Lake, Phulera, Narena, Malpura, Niwai and Todaraisingh. Total revised cost of the project is Rs. 678.87 crores. The work of two transmission pipelines has almost been completed. A provision of Rs. 83.98 crores has been kept for this project in the Eleventh Five Year Plan. Total expenditure of Rs.172.33 crores has been incurred up to March, 2009. An amount of Rs. 10.00 crores is proposed for the Annual Plan 2010-11.

Chambal-Sawai Madhopur-Baler Water Supply Project

19.22 The project envisages providing drinking water to Sawai Madhopur town and 636 villages. The source of water for the project is Chambal River at Mandrayal. Estimated cost of the project is Rs. 468.18 crores. The work of raw water pipeline has been started and work under progress. A provision of Rs. 137.00 crores has been kept for the Eleventh Five Year Plan 2007-12. Total expenditure of Rs.155.95 crores has been incurred up to March, 2009. A provision of Rs. 1.00 crore is proposed for this project in the Annual Plan 2010-11. The delay in project has accrued mainly due to delay in environmental clearance by the Hon'ble Supreme Court, received in October 2008, for construction of Intake Well on Chambal River. The work of main infrastructure system is likely to be completed by March 2011.

Ramganjmandi-Pachpahar Water Supply Project

19.23 The project is envisaged to provide drinking water to 220 villages of Ramganjmandi, Pachpahar and Bhainsroadgarh tehsils and 4 towns.

Sanctioned cost of the project is Rs. 196.00 crores and it is being part funded by NABARD, under RIDF. The work of this project is nearing completion. A provision of Rs. 40.36 crores has been kept for the Eleventh Five Year Plan. Total expenditure of Rs.143.42 crores has been incurred up to March, 2009. A provision of Rs. 4.75 crores is proposed for this project in the Annual Plan 2010-11.

Ajmer Bisalpur Water Supply Project Phase-II

19.24 This project is part funded under JNNURM. It has been designed for augmentation of water supply for Ajmer & Pushkar towns for the design year 2031. Total cost of work sanctioned under the project is Rs. 359.46 crores. A provision of Rs. 764.32 crores has been kept for this project in the Eleventh Five Year Plan 2007-12. Total expenditure of Rs. 3.37 crores has been incurred up to March, 2009. A token provision of Rs. 0.01 lac is proposed for this project in the Annual Plan 2010-11. The work of the project is under progress and the main transmission system up to Ajmer would be completed by March 2010. Remaining work of pipeline from Nasirabad to Beawar would be taken up after 2009-10.

Nagaur Lift Water Supply Project

19.25 The project has been sanctioned to solve drinking water problems of 5 towns and 502 villages of Nagaur district. Total cost of the project is Rs. 761.00 crores. A provision of Rs. 85.00 crores has been kept for the project in the Eleventh Five Year Plan. Total expenditure of Rs.235.55 crores incurred up to March, 2009. A provision of Rs. 35.00 crores is proposed for this project in the Annual Plan 2010-11. Work of the main transmission system would be completed by May 2010 and work on the cluster distribution system is proposed to be taken up in the financial year 2010-11.

Pokran Phalsoond Balotra Lift Water Supply Project

19.26 This project has been framed to provide drinking water to Pokran, Balotra and Siwana towns and 580 villages of Barmer & Jaisalmer districts. Total cost of the project is Rs. 1084.83 crores. Off-take point for this project has been taken up at Nachna Phata on IGMC. A provision of Rs. 96.00 crores has been kept for the project in Eleventh Five Year Plan 2007-12. Total expenditure of Rs. 31.85 crores has been incurred up to March, 2009. A provision of Rs. 10.00 crores is proposed for this project in the Annual Plan 2010-11.

19.27 Presently work of raw water reservoir, filter plant, clear water storage reservoir is under progress awarded on 23.07.08 for Rs.318 crores for Package-I. Preparation for remaining proposals for TS is under progress. Land at HW-1 Nachna allotted, process of land allotment for RWR at Biliya and other major head works is under progress. Rs.30.00 lacs has been deposited to IGNP, Phalodi for construction of Out-Let at RD-1253.5. Rs.12.87 crs deposited for electric connection. Land has been

acquired for all 18 OHSR and Pump Houses. Works of Railway/Road crossings is under progress. The work on the transmission system is likely to be completed in the financial year 2010-11 and the work of extension of main pipeline up to Balotra and the work of cluster distribution system shall be taken up in phased manner.

Dewas Water Supply Scheme

19.28 The project consist construction of 2 dams near Akodra and Madri villages of Jhadol & Girwa tehsils respectively of Udaipur district. The revised cost of the project is Rs.379.19 crores. Execution of the work on this project is in progress and being executed by the Water Resources Department. A provision of Rs. 38.08 crores has been kept for the project in Eleventh Five Year Plan 2007-12. Total expenditure of Rs.29.64 crores has been incurred up to March, 2009. A provision of Rs. 50.00 crores is proposed for this project in the Annual Plan 2010-11.

Chhapi Jhalawar-Jhalrapatan Water Supply Project

19.29 The project is under implementation to provide drinking water to 2 towns & 164 villages of Jhalawar district from Chhapi dam. Total cost of the project is Rs. 108.44 crores. A provision of Rs. 55.00 crores has been kept for the project in the Eleventh Five Year Plan. Total expenditure of Rs.141.73 crores has been incurred up to March, 2009. A provision of Rs. 9.00 crores is proposed for this project in the Annual Plan 2010-11. The work of transmission part of the project is nearing completion and work of cluster distribution system under two turnkey contracts is more than 50% complete.

Narmada canal based Water Supply Projects

19.30 This project has been prepared to provide safe drinking water to 441 villages & 2 towns of Jalore district. Total cost of the project is Rs. 321.18 crores consisting following three phases:

- i. **Sillu Project (Rs.1.61 Crores)** - SPR Work (Infra) is almost completed & 22 MH & 29 OH benefited through existing distribution system.
- ii. **DR Project (Rs.129.63 Crores)** - Proposed to be taken up on annuity basis. Preparation of annuity document is under process.
- iii. **FR project (Rs.303.38 Crores)** - Work awarded for Rs.310.12 crores and pipeline work is under progress. The work at Tetrol head works could not started due to problem in land acquisition.

19.31 A provision of Rs. 79.00 crores has been kept for the project for the project in the Eleventh Five Year Plan 2007-12. Total expenditure incurred up to March, 2009 is Rs.81.43 crores. A provision of Rs. 30.00 crores is proposed for this project in the Annual Plan 2010-11.

Desalination Water Supply to Jayal tehsil of Nagaur from Matasukh Mines

19.32 This project has been prepared to provide safe drinking water to residents of 120 other habitations of Jayal tehsil of Nagaur district. Total cost of the project is Rs. 124.37 crores. Total expenditure of Rs.45.22 crores has been incurred up to March, 2009. A provision of Rs. 30.00 crores is proposed for this project in the Annual Plan 2010-11.

Safety measure works for Ajmer Bisalpur

19.33 This project has been prepared for safety of Ajmer-Bisalpur pipe line & other works. The total cost of the project is Rs. 26.52 crores. Total expenditure of Rs.0.98 crores has been incurred up to March, 2009. A provision of Rs. 0.40 crores is proposed for this project in the Annual Plan 2010-11.

Tiwari Mathania Osian

19.34 This project was sanctioned on 13-7-07 for an estimated amount of Rs. 305.15 crores to benefit 113 Main Habitations and 285 Other Habitations with safe drinking water. The project work shall be taken up in phases. Its source of water is Rajeev Gandhi lift canal. A provision of Rs. 25.00 crores is proposed for this project in the Annual Plan 2010-11.

Reorganisation of Urban Water Supply Scheme Jodhpur

19.35 Jodhpur town is getting its water supply from Rajeev Gandhi Lift canal & adequate raw water is available for the town for the demand of 2016. However around 25% of the area of town receives drinking water once in two days. Augmentation/re-organization of distribution system of Jodhpur town with specific emphasis on work related to management of source and its transfer to places of shortage, distribution network improvement is urgently required. The estimated cost of the project is Rs. 549.55 Crores. A provision of Rs. 100.00 crores is proposed for this project in the Annual Plan 2010-11. The proposal for external funding assistance from AFD, a French funding Agency, has also been submitted to MoUD on 05.07.09.

Chambal-Bhilwara Water Supply Project

19.36 The estimated cost of the project is Rs 1020.00 crores. This project is envisaged to provide safe drinking water to all the 9 towns and 1688 villages of Bhilwara district and 68 en-route villages of Chittorgarh district with Chambal river, near Bhainsroadgarh upstream of Jawahar Sagar as source. The proposal for external funding assistance from World Bank has also been sent to GoI (MoUD/MoRD) on 16.10.09

Narmada-H Off-take point to Gudamalani:

19.37 This project is envisaged to provide safe drinking water to 371 villages based on surface source of Narmada Canal.

NABARD Assisted Water Supply Projects

19.38 The following Projects are being funded by NABARD under RIDF:

Table No. 19.4

(Rs. in crores)

S. No.	Name of the Project	Total Sanctioned Cost	NABARD loan sanctioned	Exp. up to March, 09
1	Ramganj Mandi Pachpahar	196.00	68.57	68.73
2	Jawai Pali pipeline	634.79	86.75	89.76
3	Dang Area	116.84	76.56	6.56
4	Chhapi to Jhalawar	199.81	125.52	98.52
5	Jayal tehsil of Matasukh	150.18	127.65	45.00
6	Bagheri Ka Naka	194.92	87.20	69.07
7	Gulendi Jhalawar	44.94	32.12	0.00
8	Kalikhari Jhalawar	61.61	44.38	1.00
9	Ummaid Sagar Dhawa	429.69	170.44	22.95
10	Tibba Area of Suratgarh	31.74	36.75	3.99
11	Dewas WS Project PH.II	379.19	268.91	20.00
12	Keru-Beru-Joliyali	32.01	24.22	0.00
13	Indroka Manak lao Dantiwara	308.00	137.43	31.63
14.	Indroka Manak lao Khangta	89.46	86.10	0.00
15	Bisalpur Dudu WS Project	678.87	174.11	35.26
16	Chambal Bhartpur	166.60	130.41	11.31
17	Tinwari Mathania	305.15	259.38	0.00

New Initiatives:

19.39 **Private Partnership Based Projects:** Looking to the funding constraint, it is proposed to take up following projects on Annuity/PPP basis:

(Rs. in crores)

S. No.	Project Name	Estimated Cost	Structure (BOOT/BOT)	Remarks, if any
	Urban Infrastructure			
1	Bisalpur-Tonk-Uniyara Drinking Water Supply Project for 2 towns (Tonk & Uniyara) and 436 villages in Deoli, Uniyara and Tonk Tehsils of Tonk district	385.00	BOT with Annuity based payments	NIT published for Request for Qualification (RFQ)
2	Water Supply & Sewerage Project for Udaipur town	1000.00	DBFOT	Presently, NIT for Consultancy (Selection of Technical Consultant) has been invited for preparation of feasibility report of the project.

19.40 **Borrowings through Rajasthan Water Supply & Sewerage Corporation (RWSSC):** For completion of major drinking water supply projects huge investments are needed. To supplement plan allocation for these projects and for their time bound completion, it is proposed to

borrow Rs.2000.00 crores from Financial Institutions in a span of 2-3 years, through Rajasthan Water Supply & Sewerage Corporation (RWSSC) created through an act of legislation.

19.41 The funds to be borrowed would be utilized for specific water supply projects having a defined revenue stream to take care of timely payment of interest and repayment of loan. However to provide a definite security to the lender, the Government of Rajasthan has in-principle agreed to provide its guarantee for payment of interest and repayment of borrowings.

19.42 **External Aided Projects:** Presently following three projects have been submitted for external assistance to GoI;

- **Nagaur Lift Project, Phase-II:** The proposal amounting to Rs.2013.19 crores has been submitted to MoRD, GoI on 21.07.06 for external assistance from World Bank.
- **UWSS, Jodhpur:** The proposal amounting to Rs.549.55 crores has been submitted to MoUD, GoI on 05.07.09 for external assistance from AFD, a French Funding Agency.
- **Chambal-Bhilwara Project:** The proposal amounting to Rs.1020.00 crores has been submitted to MoUD, MoRD & GoI on 16.10.09 for external assistance from World Bank.

19.43 Apart from the above projects, following projects are also proposed for external assistance from World Bank:

- **Aapni Yojana Phase-II:** To provide benefit to 6 towns & 444 villages of Churu & Jhunjhunu Districts, proposals of amounting to Rs.1100.00 crores is proposed to be submitted to World Bank.
- **Cluster Distribution Work of Chambal-Sawai Madhopur-Nadauti Project:** To provide benefit to 636 villages of Karuali & Sawai Madhopur districts, from work transmission under progress, proposal of amounting to Rs.540.00 crores is proposed to be submitted to World Bank.