

THE KRISHNA WATER SUPPLY PROJECT FOR MADRAS

The first planned scheme for drinking water-supply for the City of Madras was designed by Mr. Fraser, the then Special Executive Engineer, Public Works Department in 1866 and executed in 1872. He chose the nearby irrigation tanks Cholvaram and Red Hills as storages for the City Water Supply, built an anicut across the river Kusasthalaiar at Tamarapakkam, a convenient location to command these two tanks and excavated a supply channel to link them. From the Red Hills Lake water was drawn through the Jones Tower and conveyed through an open channel to the City for distribution.

Mr. Fraser designed the system for a projected population of 0.47 million. But even by the turn of the century the population was in the order of 0.54 million and this registered a very rapid growth particularly after the Second World War. The city population as per 1981 census is 3.27 million. The Expansion of the city was also there, with the growth of the several suburbs and annexure of several of the Panchayat villages and municipalities around. The Madras Metropolitan Area now controlled by the Madras Metropolitan Development Authority for planning and development measures about 1,167 square kilometers. The projected population of Madras Metropolitan Area by 2002 A.D is around 7.0 million.

The development of the City Water Supply system could not keep pace with the increase in the population. This is mainly because of the paucity of adequate water resources within a reasonable distance from the city. The only addition to the storage capacity was made in 1944 with the completion of Sathyamurthisagar commonly called as Poondi Reservoir built on the same Kusasthalaiar river which carried flows only during the North East Monsoon period of October to December. This monsoon is of course erratic and failed the supply now and then. The years in recent times when the city was in the grip of severe drought owing to the failure of this monsoon were between 1947 and 1954, 1968, 1972 to 1975, 1982 and now 1983, the worst of all.

Significant among the various attempts made during the period to improve the situation are the acquisition of the irrigation rights of the ayacut under the Cholvaram and Red Hills lakes thus making these storages available wholly for water supply and raising their full tank levels in 1969. the total capacity of the three storage reservoirs now existing is only 6.5 TMC (thousand million cubic feet). These being shallow reservoirs, the loss in evaporation is high. The availability for use at the city end has been only about 2.5 TMC on an average per annum. The safe yield from this existing system is reckoned only as 142 mld. (million litres per day).

With the growth of industries around the city it became imperative to tap the ground water aquifers around the city. The availability from this source as per the investigation made in an UNDP survey is only 117 mld. The three major well fields at Minjur, Panjetty and Tamarapakkam are already fully developed. Some of the industries may recycle used waters which is estimated to yield 40 mld. The total availability for the city water supply is thus only 299 mld. At present which works out to less than 67 lpcd. At the present level of population against the accepted norms of 125 to 200 lpcd. (litres per capita per day).

Messrs. Engineering Science, California, UNDP Consultants who drew up a Master Plan for the City Water Supply and Sewerage have worked out the daily requirements of the city for residential, commercial and industrial and institutional uses projected to 2002 AD as 1294 mld. The augmentation now to be planned thus comes to 995 mld.

River Krishna is the second largest river in the Peninsular India. Rising in Mahadeve ranges of the western ghats near Mahabaleswar in Maharashtra it runs for nearly 1400 Km. length draining the three States of Maharashtra, Karnataka and Andhra Pradesh. Some of its large tributaries are Bhima, Koyna, Varna, Tungabhadra, Malaprabha, Ghataprabha, Vedavathi, Musi, Palleru and Muneru.

Hopes of getting Krishna waters flowing south by gravity towards Madras have been entertained over a long time. But a planned project known as Krishna-Pennar Project for harnessing the Krishna waters linked with Pennar flood flows was made after flows was made after detailed engineering investigation in 1951 to irrigate 36 lakh acres in Royalaseema, Chittoor, Nellore and Chingleput District and to yield a power potential of 250 MW. The Madras Canal of this project would have brought enough water to the city besides irrigation. But this project was not taken up.

Our request for diversion of 15 TMC from Krishna River for water supply to Madras was there with the Centre ever since and also with the basin States. The Union Minister of Irrigation announced in the Lok Sabha on 23rd March 1963 that this request would be sympathetically considered by the three basin States. The Krishna Waters Tribunal which allocated the waters of the River among the three basin States and gave an award in 1973, however, did not allocate any waters from this river for Madras City Water Supply.

On the 15th February 1976, the Prime Minister of India through her own personal initiative obtained the concurrence of the Chief Ministers of the basin States and announced at the public meeting in Madras that the States of Maharashtra, Karnataka and Andhra Pradesh had agreed to spare 5 TMC each from their share of Krishna Waters to meet the requirements announcement an agreement was signed among the basin States and Tamil Nadu on 14th April 1976. After a technical scrutiny of the alternatives available it was decided in an Inter-State ministerial meeting held on the 27th October 1977 that Tamil Nadu shall be permitted to draw 15 TMC of Krishna Waters annually from Srisailem reservoir during the period from July to October through an open lined

canal. The Chief Ministers of Andhra Pradesh and Tamil Nadu again met at Hyderabad on 15th June 1978 and finalized the details for taking up the investigation of the Project.

As the investigations were in progress several technical issues and administrative aspects were frequently discussed during the Liaison Committee meetings and this Committee generally guided and monitored the progress of investigation in both the States. A scheme report has been sent to the Government of Tamil Nadu by the Government of Andhra Pradesh in September 1982. In the mean time the Government of Andhra Pradesh has been examining various possibilities of diversion of Krishna Waters to the Rayalaseema region which is a chronically famine stricken area with meagre rainfall and scanty water resources. They have also been examining the diversion of the surplus flows of Pennar to a carry over reservoir across Kandaleru to irrigate the upland Taluks of Nellore District and parts of Chittoor District which are also subject to frequent droughts. It has been considered by Andhra Pradesh and Tamil Nadu that it is most advantageous to both the States to have an integrated scheme which will not only convey the Krishna Waters to Madras but also provide irrigation in the chronically drought affected areas of Kurnool, Cuddappah, Nellore and Chittoor Districts.

The historic agreement concluded between the Chief Ministers of Andhra Pradesh and Tamil Nadu on 18th April 1983 has enabled the implementation of the scheme initiated by the Hon. Prime Minister through the co-operation and mutual goodwill among the Chief Ministers of the States of Maharashtra, Karnataka and Andhra. This is one of those rare instances in which a needy State, though not contributing for the basin is given the benefit of water supply for its principal city by the kind gesture of basin States of the river. It is a shining example of co-ordination and co-operation among the States of India marching towards National Integration.

As per this agreement,

1. Andhra Pradesh will construct the components of the scheme within its boundaries and the expenditure on the construction, operation and maintenance of the scheme will be shared by the two Governments in proportion to the utilization contemplated by them.

2. Andhra Pradesh Government will provide a storage space of 5 TMC for Tamil Nadu in the Kandaleru Reservoir and deliver 15 TMC of water less the transmission losses of 3 TMC at the Tamil Nadu border over a period of 8 months in a year in accordance with the agreed schedule. This substantially meets the need for augmentation of the supply by 995 mld. for the projected population in 2002 AD.

3. The work will be completed in a period of 3 to 6 years.

Salient details of the works in Andhra Pradesh limits as finally agreed upon are as follows:-

1. A head regulator will be built on the foreshore of Srisailem Reservoir at Pothireddipadu and an approach channel 3.4 km. in length excavated connecting the reservoir. This channel will have a capacity of 11,150 c/s to enable even the flood flows being drawn. From Pothireddypadu regulator the main canal will be excavated across Mittakandla ridge for 16.3 km. which will also have the same capacity of 11,150 c/s. This canal to be excavated across the ridge will be deep, the maximum depth of excavation being about 30 m. At the other end of this main canal a cross regulator called Banakcherla regulator will be built. This Banakcherla regulator will have three sets of opening controlled by gates, one to feed the Srisailem Right Branch Canal, another to feed Left Branch Canal and the Central opening to pass down the surplus floods when it becomes necessary which will directly flow to Kunderu River.

2. From Banakcherla Regulator the Left Branch Canal will be excavated for about 140 km. and this will have a discharging capacity of about 6,000 c/s at the head. This canal is meant for irrigating an extent of 2.75-lakh acres in the Royalaseema region and also for conveying the 15 TMC of waters intended for Madras. In the course of the canal a balancing reservoir called Velugodu Reservoir is planned. This canal at about 115th km. of its length will shoot out a branch to its left which will irrigate Sagileru Vally in which another balancing resersvoir is planned at Brahmamgarimatham.

3. The off take for Madras Water Supply will be located at Chennamukkapalle on the Srisailem Left Branch Canal at its 140th km. This regulator will hae a capacity to discharge 1,500 c/s. From this regulator a separate canal for Madras Water Supply will be excavated up to the river Pennar.

4. On Pennar, Somasila Reservoir is already under construction. The reservoir capacity will be increased by erecting shutters over the spillway in the second stage of development of the Project. This raising of the level of the reservoir by erection of shutters is also necessary for diverting waters to Madras.

5. From Somasila Reservoir a Canal will be excavated with a capacity of 10,000 cusecs for a length of about 38 km. to connect Kandaleru valley. This canal is meant for diverting the surplus floods of Pennar to Kandaleruand also to carry Krishna Waters to Madras Water Supply.

6. Across Kandaleru Valley a reservoir of capacity 54 TMC will be built. This includes a storage space of 5 TMC meant for storing waters for Madras Water supply.

7. A canal will be excavated from Kandaleru Reservoir to Poondi. The length of this canal up to Tamil Nadu will be 152 km. This canal will have a capacity of 4,000 c/s at the head gradually reducing to 1,000 c/s at the Tamil Nadu Border. This canal is meant for irrigating about 3-lakh acres in Nellore and Chittoor districts in Andhra Pradesh and for carrying the water supply for Madras.

Within Tamil Nadu limits the details of works that would be carried out will be as under:-

1. The Kandaluru Poondi Canal will be continued from Tamil Nadu border with a capacity of 1,000 c/s throughout up to its infall into Poondi Reservoir.
2. The FRL (Full Reservoir Level) of Poondi Reservoir will be raised by 2 ft.
3. The FRL of the Red Hills lake will be raised by 2 ft.
4. The FRL of Chembarambakkam tank also will be raised by 2 ft. and this tank will be used as another terminal reservoir for water supply with separate treatment works to cater mainly to the southern parts of the city (the existing irrigation under this tank will not be interfered with).
5. A link canal will be excavated between Poondi Reservoir and Chembarambakkam with a branch connecting Red Hills lake so that the flow of Krishna Waters may be conveniently handled through these three reservoirs. The link canal will also have capacity of 1,000 c/s with the branch to **Red Hills being designed for 500 c/s.**
6. The raising of the three reservoirs will yield an additional storage space of 1.68 tmc. Proposals for forming two more new reservoirs across Korattalaiyar one at Ramanjeri upstream of Poondi and another at Tirukandalam downstream of Poondi are also made which will give an additional storage capacity of 2.18 tmc. These reservoirs can be taken up at a later stage.
7. Improvements and extension of the distribution system within the city area and also in the greater Madras area with adequate provisions for expansion in sewerage system will also form part of the project.

The Madras Metropolitan Water Supply and Sewerage Board created through an Act of the Legislature during 1978 has taken over the function of the planning, development and maintenance of the Water Supply and Sewerage facilities of the Madras City from the Corporation of Madras. This Board will now plan and execute the Works in the Madras Metropolitan Area needed for the treatment, transmission and distribution of water received and stored in the terminal reservoirs at Red Hills and Chembarambakkam. This would involve complete revamping of the distribution system in the City for which proposals are being finalized. Alongside the improvements referred to in earlier paras, improvements to the sewerage system would also be carried out. This would cover improvements to the existing collection system, provision of new systems in unserved pockets. Improvements to the pumping stations, treatment facilities, etc.

The cost of the Project works in the Andhra Pradesh limits has been tentatively estimated at Rs.760 Crores. Our share of this cost will be proportion to the water utilized componentwise based on actuals and is tentatively now estimated at Rs. 200 crores. Works to be done in Tamil Nadu limits will cost Rs. 30 crores for conveyance and Rs. 206 crores for treatment, transmission distribution and sewerage planned to be taken up in the first six years. As the system grows we may have to create additional storage in the system and continue to strengthen and expand the treatment, transmission and distribution systems including sewerage until we reach the ultimate stage.

(From the pages of Souvenir released, May 1983 of the Krishna water supply project for Madras.)