

DAULATABAD-A WATER SUPPLY OVERVIEW

*S. R. Somawanshi **D.N. Jagdale ***G. S. Dakhore

Devagiri is very famous and known for its medieval hill - cum - land fort which is most significant of all the forts of India. It helped in shaping the culture of medieval Maharashtra. The history of Devagiri on the point of town planning and water supply view, it is necessary to consider first cycle of Indian urbanisation. It is evident from the significant part of town planning through - out the ages. So far as the Hindu town planning is concerned water supply was an integral part of town planning. Most of the medieval towns are situated either on the banks of rivers, lakes or artificial tanks or reservoirs, so that citizens were not worried about the water supply. But in course of later history because of the constant and unexpected, uncertain war situation the tendency of selecting the naturally protected sites for capitals or political headquarters increased. The natural protection includes the coverage of thick forests, hills, deserts this type of selection was good, only on the defence point of view, so we find some capitals at high altitudes but problem of water supply arose there. The opinion of Islamic kings was different than Hindu kings, for protection and defence or to relinquish from damages and casualties number of artificial devices, such as construction of fortification walls, one within the other, huge bastions with strong gates, baricades and battlements. In medieval period and particularly in Islamic, most of the centres are located at a very high altitude hence the founding fathers had to toil very hard to carry, water at the height. In south region the problem was so serious. Care of water at these centres is still common features and Devagiri is not an exceptional case.

Concerning to the water supply schemes at Daulatabad, most of the contemporary historians and travellers even, known for their detailed narrations are silent the reason is very clear, the sources of water supply were guarded secretly hence nobody even known the sources of water supply. As a top priority the fort and its outskirts including the suburbs of Devagiri and Kataka. In exploration It is found out that there were different schemes of water supply were in existence, such as fragments of earthen or stone

conduits, remnants of silting cum filtering chambers, portions of water towers, open channels, remains of small bunds and walls, tanks - cum - wells, pressure relief towers, number of small and big cisterns and reservoirs, but all of them were badly affected and it seems there is no mark of such resources. Various water supply schemes were implemented at different period.

Water supply during the period of Yadava-It is already stated that the yadavas were the founders of the fort and city. The capital i.e. township included the citadel hill and Suburbs of the towns of Devagiri. At the foot of the present fort might be reserved for the civil population. and Kataka Shulibhanjan mountain be marked for the army. At the top of the hill barring rain there is no other source of water. The rain water was stored in two rock - cut cisterns presently known as Moti - taka and Hathi - taka both having very small storage capacity with adequate monsoon, the stored water at the top would suffice for two hundred persons for the whole year. The citadel might be the emergency resort was useful during the times of difficulty. The construction method of this tank is suggestive of their Yadava association. The four big tanks are remarked after the Muslim occupation of Devagiri and their current names are Parion - Ka - Talab and - Ab - Pash - Dara.

Yadava's Devagiri might be a thickly populated town extending up to the areas of these present villages. In short wells, rock cut cisterns and tanks were the sources of water supply. In the period of Mahmud Tughlaq, he invited foreign engineers and architects to assist the indigenous experts and with their joint efforts he designed the new city Daulatabad. During this small span large number of structures, private and public were erected. Tughlaq was the second person after Bhillan who tried to convert this township of the Yadava into an imperial city. The contemporary writers like Ferishta, Ziauddin Burni and Amir Khusrau wrote, it was a metropolitan city of international repute, population increased, Increase in population warranted a guaranteed supply of water. To make the necessary arrangement pertaining to the water supply of the city.

It seems that Qataluq - Khan managed to divert water from the mausala tank towards the fort.

Water supply and Bahamani Occupation-For one and half century Daulatabad was under the procession of Bahamani dynasty. For the purpose of water supply some wells in or outside the fort were sunken deep. Past water supply systems renovated but it is not so clear what he had done in case of water supply.

Water supply and Nizamshahi of Ahmadnagar-Successive occupation of Nizamshahi political activities, trade and commerce reached to the highest point. It resulted in to tremendous increase in population. It was the responsibility to supply water.

Mughal malik - Ambar started the work extra reinforcement right from the top of the hill. He constructed a beautiful place that is called Baradari. But so far as water supply is concerned there were two types at reservoirs situated in the northern valley but they were at a very low level It had used in limited purposes so Malik Ambar came to the conclusion that rain water could be the possible alternative. But how to collect the rain water and where to store. It was main problem. and secondly it is was collected and stored then how to carry to the tip points of the citadel. He was a born hydraulic genius and he had the courage to accept such challenges. After considering the problem of Daulatabad he devised a mati culown scheme and executed it with full confidence so to collect the rain water coming from the top small masonry diversion bund was constructed at the foot and along the altitude of the hill. The dimension of the bunds are 750 mm. x 450 mm. x 2000 mts. Thus served the purpose of diversion of the rain water coming from the top of the mountain. The rain water in this way diverted and accumulated at the lower end of the diversion bund where a receiving - Cum - filtering chamber was provided. The level difference between the receiving chamber and the discharging chamber was considerably high. Hence by means of simple gravitational force he was successful in conveying water towards the royal residence.

The receiving chamber incorporated two filtering chambers of different dimensions. They are one below the other. The upper chamber is in brick and lime mortar while the lower one is in dressed stones. The lower chamber has two openings of different diameters where two stone grills were fixed. Tower which were prepared for water supply. These towers served the

functions of discharging water and an open channel ending in the section at the foot of the escarpment runs from the opposite hill and end into the weirs adjacent to the escarpment. They connected the two ends by means of gravitation.

Details - About the Different schemes of water supply First line of water supply

1) Bund- In this system a bund to divert the runoff water was constructed in stone and lime mortar. It is a wall of 750 mm. in height 450 mm. breadth plastered from inside it's ground level of wall a bed concrete of 1000 mm. in breadth. 300 mm. in depth. length of the wall 1.5 km. all these things incorporate to facilitate the run of towards receiving chamber The bund was reinforced at several points where it received water from the streamlet directly coming from the top of the hill.

2) Receiving chamber-It is strongly built rectangular plastered from both sides. It was built in two sections. In the upper section water coming from the adjacent hill and at lower section there was the arrangements for filtration. Western corner of the chamber there are two holes which open in an underground filtration chamber built in stone and lime mortar. At the bottom of this underground chamber two stone grills were fixed from where two pipelines carry the filtered water down-wards the fort.

3) This method of joining was common in Terracotta pipes-To know the method of layout of the pipe lines a trench is taken at convenient point. The trench exposed that there is lime casing of fast lime concrete around both the pipes, there is the layer of mud. Both these are underground pipe lines and gravitational force is sufficient to carry water in the fort. It is suggestive of the fact that it was a later device specially introduced by Malik Ambar.

Out Let-It is a tower of 5.5 m. height plastered from both the sides. It is square tower and received water drawn by the above conduits. From top of this tower open channel carried water in to the moat, where it was stored in the section.

Lifting Arrangements-At convenient places provision was made to lift water by means of bullocks. This type of scheme was devised only for the royal complexes.

Second Line of water supply-The new scheme was introduced to provide water to sector between the kalakota and mahakota. In this scheme three weirs

were constructed in the valley towards north. A masonry dam was thrown at a required level to retain rain water coming from the opposite hill. To ensure the supply towards this dam controlled channel was provided at the bottom of the upper most reservoir. A small rock - cut chamber was provided to receive water coming through the above channel. A regular conduit was fixed at the mouth of the rock - out cistern. The conduit carried water directly in to the fort where by means of distributary towers it was circulated through out the sectors. It was successful scheme of water supply.

Third line of water supply-To assure permanent water supply the open channel was connected to an outlet fixed at a specific height at the end of the third weir. The open channel took water to a filtration chamber constructed just ahead of the Ellora - Gate. The channel ended in a conduit which took water in to the fort. Number of pressure relief towers were fixed

on these lines from where water supply was branched off in disered directions. At a tower near Chand - Minar there are seven distributories which carried water to seven different places.

Fourth line of water supply-To supply water to the general habitation a separate scheme was executed. It was based on an open channel which originated from the bottom of the above reservoir A controlled gate at the bottom of the reservoir, from where the channel starts, was fixed. This arrangement helps to collect the run-off while meandering towards the filtration chamber. offer that it was carried by a regular conduit of 20 cms diameter which entered the fort through Ellora Gate.

Except these all there were other schemes utilised by different rulers for water supply such as distribution chambers water pressure filtration fountain locking system, crossing the Nala Hathi Haus, wells, etc methods / Schemes were popular in medieval times.

REFERENCES

1. Piggot Stuart, Some Ancient Cities of India Oxford 1945-P, 85.
2. Kunte, B.G. Bahamani Rajyacha Itithas. Bombay 66 pp 1 -28 King J.S.The history of the Bahamani Dynsty London 1900 P.
3. Dr. R.S. Morwanchikar, Devagiri - Daulatabad An Archaeological Overview
4. Radhye - sham, Kingegomof Ahmednagar Delhi 1966 P. 298 Shahnawaz Khan, Haish - ul - Umra Vol. V-pp. 279-85 Elliot & Dowson. Vol. III-P232.
5. Kutulq Khan water supply arrangements Hussain M- Rise & fall of M.Tughluq - London 1989.
6. Legends of Beliefs current in present Daulatabad Forts by the Authors.
7. The story of Water.
8. Gazettes of Bombay presidency