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TITLE: Influence of Chalukya architecture on Hampi stepwell

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Introduction

ndia has a long tradition of human interventions in the management of water for agriculture because of the country's distinctive climate, intense monsoons followed by protracted droughts. In search of water human beings have settled on the bank of rivers. But river valley civilization is not the complete description of civilization on India. It had 200000 tanks in South and Central India. Research works on Saraswati civilization has been recently documented and published to indicate that a rich and still earlier civilization than that of Indus valley civilization existed in India. In the famous epic Mahabharata, there is a reference to different types of water storage structures such as wells, tanks. kunds, etc and it was believed to be an act to please the God to construct these structures for the benefit of public. The River Ganga, Yamuna and Saraswati were regarded, as Goddesses and sculptures and idols are available in different parts of India including world famous caves of Ajantha and Ellora. These caves are located in Maharashtra near Aurangabad (regional head quarter). Barava structure in Maharashtra is one of the sustainable water storage structures planned and developed in Medieval period. It has influence on the stepwell construction in Hampi.

Development of Water Storage Structures in Maharashtra

During the period of Yadava kings in Maharashtra, large numbers of temples were constructed with characteristic style of architecture. When the stones were quarried for the construction of temples, the pits so formed were used to create water storage structures. It was reported to be the beginning of Barava construction. In medieval India, reference to these hydraulic structures is also found in Marathi literature and folk literature in various ways. In medieval period from 8^{th} to 13^{th} century, the temple institution was at the focal point of religious, social and cultural activities. Dance and musical concerts, lectures/debates were arranged in the temples. Hence the temples were receiving donations/offerings from the devotees and landlords and kings awarded revenue rights from few villages for the maintenance of the temples. This had resulted into overall development of the temples in terms of richness of style of construction, beautification and architecture. Since water is a basic need, water storage structures were also simultaneously developed along with temples. For performing religious activities/rituals in the temples, small diameter wells (less than 1 m) called Aad, were constructed in the

temple campus. Religious/spiritual leaders were responsible for establishing religious faith about taking holy bath in the temple campus after offering prayers to the God and also on festival days. This has resulted in the development of Kallol, Kund, Pushkarani and Barava in the temple campus. In many cases cost of construction of these structures was approximately equal to that of temple. Further these water storage structures were used to glorify the campus and add grace to it. Moreover these structures were maintained from the funds of the temple.

For maintaining purity and sanctity of the water storage structures, water deities were installed in the recesses within it and various sects in their scriptures attached religious significance to it. At the religious places in Maharashtra called Tirthas, Barava/Pushkarani/Kallol are obviously found.

Apart from temples there are places in Maharashtra where Baravas were constructed by the landlords/dukes/military heads to cater the basic needs of the society (For example Ambad in Jalna, Ambajogai in Beed, Manchar in Pune district,). The inscription at Manchar in Pune district gives the details of the landlord and praises its ancestors and then describes the city where it was constructed. Then it mentions the objective of construction as providing a facility in drought period for the society (1344AD). This inscription establishes the period of construction of Barava and role of religion in motivating people in creating common water facility as charitable act.

Spiritual leaders (Rishi) had contributed in the scientific development of these systems. Varahamihira's Brahatsanhita (550AD) presented a simple method of obtaining potable water from contaminated source of water. Vishwamitra and Kashyap gave the methods of construction. Parmar King Bhoj's book 'Samarangan Sutradhar' in 1000-1050AD and Shri Bhuvan Dev's book 'Aparajit Prichcha' in 1175-1250 AD gave the details of classification and methods of construction of Barava, wells and tanks. 'Samarangan Sutradhar' had described three characteristics of Barava; utility, sustainability and beautification. In the later part, perfect engineering structures were developed by the Sthapati (Chief engineer) by identifying sustainable water sources. The Baravas were recharged by providing tanks on the upstream. These water storage systems indicate that the knowledge of Geology, Soil engineering, Construction Engineering and Structural Engineering was available with the Sthapati responsible for the construction of Baravas.

Civil Engineering Aspects of Barava

The Baravas in Maharashtra were surveyed for studying the structural and hydraulics aspects. Classification of storage structures can be made on the basis of nomenclature, style, utility, number of entrances, number of recesses for installing deity etc.

i) Pond ii) Aad iii) Well iv) Kallol v) Barava vi) Kunda vii) Pushkarani.

Barava is a constructed pond with dressed stone masonry having 3-7 landings and steps for arriving at the landings. Conventionally its dimension was 18m*18m, but over a period of time various sizes; large and small, depending on local geographical conditions were used. Baravas are usually square in form but rectangular and octagonal forms are also found. A rectangular Barava at Mukhed (Nanded) was built near Dashratheshwar temple in 12^{th} century during the period of King Vikramaditya Chalukya. It is having single entrance of 1.2m wide on North side. Its dimensions are 16m*10.5m. The depth of

bed from ground is 6.7m. At the entrance on both sides there are canopies measuring 2m*5.4m. Steps are provided at both the corners for getting down to the second landing. The inscription at Mukhed in Kannada script has been published and it belongs to the Chalukyas of 12th century. Square Barava at Yevati in Nanded district with one entrance is worth considering. There is a Lord Shiva temple adjoining the Barava with 4 landing stages and entrance to the south. Pond size is 1.5*1.5m.A special feature is the five recesses provided in the compound wall for the deity. There had been the statue of Lord Vishnu. There is arrangement for drawing water from it by using leathern bucket. The octagonal Barava at Marlak in Nanded district has one entrance and four landings. There are seven recesses for deities on all sides. The dimensions are 11.7m* 17.5m including entrance. Baravas with four entrances are more popular. Mahur in Nanded district is very famous as a 'Shakti Peetha'(Potent Divine) of Goddess Renukadevi .There are many reservoirs on the hill called as Matru tirtha , Sarva tirtha, and Bhanu tirtha. Thirth signifies the importance attached to it in terms of religious faith. The inscription at Mahur has indicated the period of construction as 1279 AD (Yadava dyanasty). The size of Barava at Mahur is 15.8m*15.8m. The township Ambad in district Jalna developed in the period of Yadava is famous for five Baravas with beautiful architecture and good construction. It is in good condition even today after 800 years. The Pushkarani, a large Barava measuring 80m*80m is one of those Baravas which has not suffered any damage. The Barava at Pingali, district Parbhani has four entrances and measures 25.6m*25.6m. It has compound wall, recesses for the deity with artistic pinnacle. Barava with pavilion is another beautiful type of structure found at Mahakala, district Jalna, Mukhed and Upala district Osmanabad. These pavilions were used for musical and dance performances before the God. These structures have improved further in the later period.

Stepwell at Hampi

The Vijayanagara Kingdom had developed various hydraulic structures by taking advantage of natural topography and scientific techniques to convey water from hilly area to urban habitat. This has resulted into large number of storage structures and conveyance system. The stepwell found in archeological excavation in 1980, near the King's palace had a resemblance with the stepwell of Mukhed in Mahatashtra state. The stepwell is of square shape and was completed in five stages with diminishing dimensions inside. Generally stepwell has a source of water in the form of recharge received from tank in its upper reaches. But this is an exception to this. It was supplied with water from an inland source of water through a masonry canal system. The canal is in good condition even today. The construction of the stepwell was planned and completed in a prefabricated manner because of war situation in the Vijayanagara during the period of construction. The prefabricated construction technique could complete the work in relatively less time. The dressing of stones used in the construction work was done in advance and away from the site for its safety. The dressed stones were numbered in a particular manner to indicate their position in the stepwell. This had enabled simultaneous construction in different parts of stepwell and speedy completion. The stepwell at Mukhed still receives the recharge from upper reaches through aquifer and is in use. In terms of landings, construction technique, jointing, recesses, access to water and water deities, influence of the Chalukya architecture is established on the stepwell at Hampi.

Conclusion

The Baravas in Maharashtra belong to the period from 8th to 13th century. Most of them are square in form but rectangular and octagonal forms were also in vogue. The entrances to Baravas vary from one to four with various sizes, shapes and design. The Kunda has only one landing but Baravas have 3 to7 landing stages reducing in size and length in descending order. In medieval India, while developing townships, the construction of Barava was considered essential. Arrangements were made for leathern buckets and water wheels to draw water and use it for drinking and limited irrigation. In terms of artistic sense and construction techniques, they have been outstanding and reached the perfection by the end of 12th century. The stepwell at Hampi of 14th century obviously establishes the influence of the Chalukya architecture and moreover closely resembles to the stepwell of Mukhed.

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Figure 1 Square Barava with Lord Shiva temple in it at Ambad district Jalna

Figure 2 Square Barava with the arrangement of taking water from it at Ambad

Figure 3: Octagonal stepwell at Maralak district Nanded

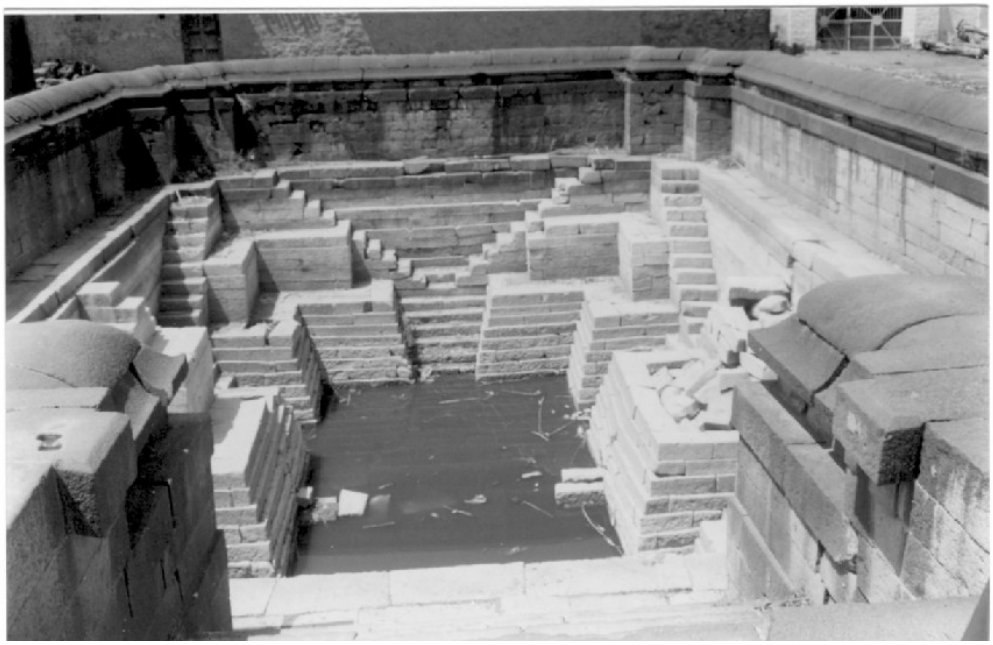

Figure 4: The stepwell at Mukhed constructed during 12th century