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Water Conservation during the Marathas (Royal Period)

*Ekta Navnath Waghmare**

UG Student, Ramnarain RUIA Autonomous College, Mumbai – 400037, India

ABSTRACT

Since time immemorial, society, culture and heritage has influenced history and its appendages. A symposium about the impacts of wars, kings, politics, plunders and trade is inevitable but apart from that there are various other things that can change the course of history. Subjects like environment, geography, climate, diet, art and social life also plays an integral part in shaping the course of history. In a quest to find the political and economic milestones of a period, we end up ignoring the importance of society and environment. One such cornerstone of environment has been water and the role of water in world and Indian history is inexplicable. Right from the genesis of mankind to the bilateral treaties that countries sign for peace, water has been the nucleus of world politics and history. Civilizations have progressed on the basis of water resources and its availability. Thus, the aim of this research is to understand and explore the various methods and types of water conservation during the Maratha royal period. To analyze the architecture and techniques used in the past for our future endeavors. Did the Maratha kingdom under Shivaji qualify as a sustainable kingdom? What role did water conservation have in steering one of the greatest kingdoms of Medieval India? Thus, a society that knows the value of water and harnesses it efficiently ends up being one of the greatest societies to have ever existed. Maharashtra was not an exception to this rule and as a region that was prone to droughts and famines, the rulers of this region had to pay special attention the conservation of water

Keywords: water, Maratha royal period, medieval India

1. Introduction

History always talks about the past and how 'the past affects the future'. However, this paper focuses on a different question. 'Can the future affect the past?' Can our conscience and ideas about the future affect the way we perceive our history? In a world that is facing extreme environmental crisis, concepts like water harvesting, and conservation becomes really important. We have seen various schools of historiography changing their perspectives based on the timeline and phase; right from the Cambridge school of writing to the Sub-altern form of history. Knowing the gravity of climate change and global warming that the future holds, will we be ready to credit the kings and rulers who followed the rule of sustainability. Is it too soon to look at history from environment's eye or are we still expected to follow the normal path? Maharashtra's recurrent droughts have put tremendous strain on the state's water supplies. The need to explore other decentralised and localised means of harnessing and conserving water only got more crucial because of the inability of the government to provide adequate and potable water to people in both rural and urban areas. Rainwater harvesting is one such method. Water scarcity is not a new problem in India, but it has already reached an alarming level. That is when peeping into the rich and varied heritage of Maratha history becomes important. Shivaji, the founder of Maratha Kingdom is credited for some incredible achievements during his reign which includes his strategies, policies, and diplomacy. Shivaji, since his childhood, was grown up in the difficult rugged terrain of the Sahyadri and the Deccan. His childhood activities with his maval friends helped him understand the nature of deep valleys, hill-tops, escarpments, narrow plateaus, and rivers. Moreover, his knowledge about the arrival and the nature of SW Monsoon and its impact on the changing physical landscape of the Sahyadri helped him in drawing military strategies in many wars. Due to his deep interest in geography, he was able to come up with effective methods of water conservation. Interestingly, his water conservation methods have gone unnoticed because of the setting in which it was implemented. However, delving deeper into the subject provides us with many lessons on how our ancestors dealt with the changing weather patterns and the water demands by designing water harvesting structures based on the unique topography of the region. Maharashtra's hill forts teach excellent lessons in water harvesting and conservation. People in the past recognised the importance of water and established a number of methods for managing and conserving water supplies. These efforts not only satisfied people's drinking water demands, but also aided livestock and agricultural survival in areas where there were no perennial rivers and the population was reliant on rains and frequently experienced water scarcity or droughts. This aspect of Shivaji Maharaj and the Maratha kingdom opens up a

* Corresponding author.

E-mail address: ektawaghmare98@gmail.com

new dimension in environmental studies. With global warming on a rise and enhanced after effects of climate change, these methods and policies can prove extremely beneficial for the future and will also help us in understanding the infrastructural setup of the past. It has the ability to assess the importance of water compared to the other resources that previous kingdoms fought for.

2. Forts

The technology utilized in ancient Maharashtra hill forts is a typical illustration of ancient inventiveness in creating water harvesting structures to satisfy the demands of people living in hilly locations. Many were constructed during the reign of Chhatrapati Shivaji Maharaj. The forts were designed to provide a strategic advantage against the dominant enemy, the Mughals. Every hill fort functioned as an independent town where everything – from groceries to armour – was available in sufficient amount to sustain in times of an attack by the enemy. Water, too, had to be efficiently stored due to the impracticality of transporting water to the fort on the hills. These forts housed a variety of buildings, including underground water tanks, reservoirs, cisterns, and artificial lakes. The Raigad fort, one of Shivaji's largest and most important forts, contains some of the best instances of these all-weather lakes. Twelve of them are notable, both manufactured and natural. These lakes, according to experts, are formed on waterproof soil and rocks that prevent water from percolating. At the hills, the rate of evaporation is also slower. On the forts, the Marathas constructed massive water tanks capable of serving hundreds of men. Even today, after centuries of neglect, these tanks remain the primary source of water in some areas. Some tanks, such as those atop the fort of Alang, are so large that it's hard to imagine they were built by human hands. The best specimens of water tanks may be found in Pune's Sinhagad fort, where there are 48 of them. The tanks were reportedly constructed from the rocks hauled in for the fort's construction and could hold enough water to last a few months. Dressed stone walls can be seen wrapping these water tanks which seems to have been used to increase the storing capacity of the tanks. Water tanks can be found throughout the fort, however, they appear to be more prominent on the hillsides. On the slopes, it was easier to divert the run-off water into these tanks. In fact, looking for water tanks is a decent way to tell if a hill (probably) served as a fort. For example, due to the complete lack of any form of a water storage facility on Kalsubai, Maharashtra's tallest peak, we can fairly state that it was never used as a fort. On forts, there are several sorts of water cisterns: some are open to the sky, some are built-in caves in the rocks, and others are dug beneath the ground and on the slopes. Cisterns were sometimes built-in groups so that surface runoff could be channelled into the cisterns and water could be replenished and stored more effectively. A series of 24 rock-cut cisterns that may still be discovered on the Sinhagad fort is a fine example of this.

1. Raigad fort

The Raigad Fort, sometimes known as the "Gibraltar of the East" by Europeans, is a stately and visually pleasing hill fort in the Maharashtra district of Raigad. The fort is located 820 meters above sea level in the Sahyadri mountain range and may be reached through a single 1737-step stairway. Its strategic design harkens back to centuries of brilliant architecture and design. The Raigad fort, the kingdom's later capital, has a unique topography with gradual slopes that made it ideal for lake construction. The fort presently has around 12 lakes, or talaavs, and 30 rock-cut cisterns. The Gangasagar talaav, which had the highest storage capacity in the fort, was built on a slope by excavating stones (which were utilized in the fort's construction) and erecting a wall on the outside to restrict and collect water flowing from the hilltops into the talaav.



Fig. 1 – Gangasagar Lake in Raigad fort

1.1 Royal Bath

The Royal Bath's remarkable drainage system exemplifies the architectural perfection that prevailed centuries ago. It is surprising to know that it leads to an underground cellar that was used for secretive activities back in the day such as worshipping Bhavani Mata, storing loot from wars, secret dialogues, and many more interesting things. The state had plans of executing a Rs 606-crore plan to conserve and re-discover the Raigad fort. The natural slopes and gradients of the fort were utilized to collect and retain rainwater for use, according to Varun Bhamre, a conservation architect working on the project.



Fig. 2– Royal Bath in Raigad fort

2. *Rajgad Fort*

The lofty fort of Rajgad, the Maratha kingdom's first capital and considered the most impregnable, also contained water storage facilities. The fort contains two large lakes, talaavs, and approximately 39 rock-cut cisterns. The kingdom's ministers recognized the necessity of water conservation, and experts with knowledge of the water stored in the rocks, known as panades, were invited to identify the springs in the rocks. These spring-bearing rocks were subsequently excavated and blasted to reveal the springs. Chandra takes in the Rajgad fort, which has one such spring. Due to the heavy artillery sounds on the forts, springs frequently altered channels or ceased flowing, necessitating the use of rock-cut cisterns as backup storage.



Fig. 3– Chandra Tale in Raigad fort

3. *Sinhagad Fort*

Many water tanks are constructed into the framework of the hill fort of Sinhagad in Pune. These are actually rock-cut cisterns called tale or tanks that accumulate and store rainwater. When the rocks required for the construction of the forts were taken from the ground, these tanks were built. A total of 48 such takes can be seen in the fort. Dressed stone walls have been built around these tanks in some places to improve their height and storage capacity. Following the rainy season, these tanks retained water for four to six months. After the requirement for stones to build the fort was met, the excavated area of the ground was blasted at a deeper level to produce subsurface fractures that would generate groundwater in the form of springs in the cistern. A cistern built in this manner may be seen in the Sinhagad fort's Dev tale.



Fig. 4– Dev Tale in Sinhagad fort

3. Coastal Forts

In Maharashtra, the coastal region is popularly known as Konkan and consists of 4 districts, Raigad, Ratnagiri, Sindhudurg, and Thane. These coastal forts are known as island forts or Jaldurgas. Arnala Fort, Khanderi fort, Underi fort, Colaba fort, Padmadurg, Janjira, and Sindhudurg are some of the most significant coastal forts in the Konkan region. These forts are also known for their wonderful water resources. Water availability and sustainable use are inextricably tied to the history and development of culture. Maharashtra's coastal forts have shown us how to achieve it in the most distinguished way possible.

1. *KhanderiFort*

It was built by Shivaji from 1672 to 1679. He had appointed Maynak Bhandari to complete the work of the fort. 400 workers worked 24 hours for 8 years to complete the gigantic work. All this was done with the support of great manpower which required huge resources. Out of these, water was the basic resource that was already taken care of. A well and water tank is constructed close to the Bhavanimata temple. The water from the well and tank is pumped to the lighthouse which is also known as 'Deepagraha.'

2. *Colaba Jaldurg*

Colaba fort is built on a rocky island known as Mauje Navghar. Colaba roughly translates into 'surrounded by water from all the sides. The great Shivaji Maharaj wanted to build a fort on this island but his sad demise delayed the project. After 1684, his follower Bhivaji Gujjar completed his dream. Along with the fortifications, these forts house many temples viz. temple of Bhavani Mata who is known as fort goddess, temples of Shri Padmavati and Mahishasurmardini, also known as Gulbai locally. Near the temple of this Gulbai is a well-constructed pond known as "Pushkarni" or "Pokharni" which is 100 feet by 125 feet in size. There are steps that leads to the base of the tank. But there is a bigger and better pond present in the same fort known as "Padmavat Tale" close to Padmavati Temple. This is a wonderfully constructed tank constructed using stones. This structure also accompanies a well. Water percolates down from the Padmavati Tank and gets filtered during its journey from tank to well. This is an example of an ingenious method of filtration adopted by our ancestors.



Fig. 5– Colaba Jaldurg

3. *Janjira*

Janjira was a fort originally known as Medhekot and was initially built using temporary wooden structures by fishermen in the late 15th Century. Ram Patil, the head of the fishermen community, ruled over the area during this time and had built temples of Shiva and Rampanchayatan. In the 17th Century, the fort was won over by Siddis. There are two reservoirs in this fort. The bigger reservoir is close to the main door. This was a major source of water for the residents of the fort. There were many residential structures around this reservoir. Nawab's residential complex was 5 floors high and servants used to draw water through windows using very long ropes.



Fig. 5– Janjira

4. *Padmadurga*

Shivaji Maharaj attempted to defeat Siddis six times but all went in vain. This motivated him to build one more fort close to Janjira and he was in search of a place that had enough sources of water. His search ended with 'Kasa' island on which he had built 'Padmadurg'. Shivaji Maharaj had built this fort with the sole aim of taking control over Janjira. But, unfortunately during his lifetime, he could not do that. In fact, he had to witness the opposite situation. Siddis attacked Padmadurg and established their control over it. Today, Padmadurga is not in a good condition and many tanks which used to provide water to many valiant fighters of yesteryears are in a state of ruins.



Fig. 5– Padmadurga

5. *Sindhudurg*

In 1664, Shivaji Maharaj won control over a close-by town, Malvan, and appointed Hiroji Indulkar to construct Sindhudurg. The funds were arranged from Surat attacks. But Shivaji Maharaj was kept in house confinement in 1665 by Aurangzeb. So, the construction was delayed. Amongst many temples, this fort also houses one temple and that is of Shri Shivaji Maharaj. This fort is blessed with 3 wells namely Dudhbao, Dahibao, and Sakharbao. There is a perennial water tank near Mahapurush Mandir. The care of these water resources is taken by Zilla Parishad nowadays and supplies water to 30 households, a School and a few agricultural farms. According to Sayali Palande-Datar, a Pune-based environmentalist and history researcher, many of these structures are still being overlooked and misused due to a lack of concerted and adequate efforts from the government and communities. According to her, "The water stored in the forts is still useful for the surrounding villagers, tribal and migrant communities. Because of their remoteness and water availability, these locations also keep their flora and fauna, biodiversity, and species."

4. Water supply and irrigation during the Shivaji era

Maharashtra's water management practices have evolved in an environmentally sustainable manner over millennia. Local communities had an active role in the construction and operation of these decentralized systems. Rain was considered as the main source of water, most of which falls in not more than 100 hours in a year. Traditional water harvesting devices have stood the test of time and are well-suited to the environments in which they were developed. They functioned efficiently in the different social, economic, and political environments. Agriculture's reliance on rainfall makes cultivation precarious, and the country has had severe droughts in the past. There is evidence to suggest that the successive dynasties that governed the region were highly particular in building various types of equipment for the development and management of water resources for the state's well-being. Shivaji developed a strategy to conserve drinking water atop rock forts by carving out massive bowls in rocky streams to make big reservoirs. Their stony remains show how scientifically aligned these artificial water bodies were with the movement of the sun, so as to minimize evaporation. During the Shivaji era, all forts had a nearly identical water supply system. According to his position in the administration, each person was given a set amount of water. Water carriers known as 'panke' would manually carry the water from the tanks or lakes to the individuals, who were paid according to their workload and the person who hired them. Evidence shows that water was used with utmost care on the fort.

1. Kohli Tanks

A tiny group of peasants known as the Kohlis built 43,381 water tanks in the Maharashtra area of Bhandara between 250 and 300 years ago. Until the government took over in the 1950s, these tanks were the backbone of irrigation in the area. It is still crucial for sugar and rice irrigation. The tanks came in a variety of sizes, with arrangements for bringing water to residents' doorsteps.

2. Bhanadaras

Check dams or diversion weirs are constructed across rivers. Their presence raises the water level of rivers, causing them to flow into channels, according to a traditional Maharashtra system. They can also be used to hold water and create a big reservoir. The water supply from a bandhara erected across a tiny creek would normally endure for a few months after the rains. They are constructed by villages or private individuals who were given rent-free land in exchange for their public service. Most Bandharas are defunct today. A very few are still in use.



Fig. 6– Bhanadara

3. Phad

The community-managed phad irrigation technique, which is common in north-western Maharashtra, is thought to have originated around 300-400 years ago. In Dhule and Nasik districts, the system worked on three rivers in the Tapi basin: Panjhra, Mosam, and Aram (still in use in some places here). The system starts with a bandhara (check dam or diversion-weir) built across a river. Kalvas (canals) branch out from the bandharas to deliver water into the crops. The length of these canals varies from 2-12 km. Each canal has a discharge capacity of approximately 450 litres per second. Charis (distributaries) are constructed to transport water from the kalva to various parts of the phad. Water is carried to individual fields by sarangs (field channels). Sandams (escapes), kalvas, and charis all help to drain excess water. The water reaches the kayam baghayat (agricultural command area), which is normally separated into four phads, in this manner (blocks). A phad's size can range from 10-200 ha, with the average being 100-125 ha. The village chooses which phads to use and which to leave fallow each year. Only one type of crop is allowed in one phad. Sugarcane is often grown in one or two phads, while seasonal crops are grown in the remaining phads. This guarantees a healthy crop rotation system, which keeps soil fertility high while reducing the risk of waterlogging and salinity. The phad method has resulted in a one-of-a-kind communal structure for water management.



Fig. 7– Phad

5. Irrigation

Chhatrapati Shivaji had followed the policy of encouraging farmers to undertake irrigation of their lands, wherever possible either by reclamation of land, digging open well or storing water. Irrigation of land was the only solution to improve production and increase the revenue of king. As the maximum land under the Marathas depended on the monsoon rains, which being erratic and uncertain- needed extensive efforts to irrigate the land on large scale. The land cultivated on monsoon water was called Jirayat whereas the irrigated land was called Bagayat. The Bagayati land used the water of either dam or lake by way of canal which was called Patasthal land. This type of irrigation was possible, because construction of dam or lake near a river was feasible and almost all villages participated in such construction of dam for common use. On other hand digging open well was very expensive, it was not possible for every cultivator to undertake it. Moreover, there was no guarantee that the open well would strike water. Even then one who succeeded in striking water and irrigated his land with the open well water that land was called Motasthal land. But such irrigation was limited. Therefore, Government often tried to construct a dam or lake for the use of all people and recovered the expenditure by way of taxes in long term. Some the king also paid for repair of such dams and lakes. Thus, the irrigation was the only way for the Marathas to make people prosperous and increase the revenue of the Government in multiplicity.

6. Local involvement for maintenance

The government recently announced intentions to convert these forts into heritage hotels in order to boost tourism in Maharashtra. Environmentalists, historians, and conservationists, on the other hand, have resisted this, claiming that it will lead to commercial exploitation of forts, disrupt the ecological balance of the fort's surroundings, and put the forts out of reach of the general public. A more sensitive form of tourism or eco-tourism, for the development and maintenance of the forts, would be a better option than turning them into 'tourist destinations'. Involving the local people who require water from these forts is also equally important. Santosh Hasurkar, the founder of Durgaveer Pratishthan, an NGO that works to clean and maintain forts as well as improve public knowledge and engagement in fort restoration, agrees that local participation in fort maintenance is the way to go. According to him, the government or the NGOs alone cannot do everything. The local people and the visitors to the forts need to be educated and sensitized on the huge and ecological importance of these sites. That would help in conserving this a valuable resource for our future generations. "We still use water from Dev take for drinking and cooking," says a peasant who produces zunkabhakar (chili chutney and jowar flatbread) for tourists on Sinhagad. It is cool, pure, and good to taste. In times of scarcity, villagers also use this water." It's past time to recognize and protect the role that these water harvesting devices play in satisfying the water demands of a number of settlements on hilltops that face severe water scarcity during the summer.

7. Conclusion

After reading about the various methods of water conservation during Shivaji and the Maratha's reign we can conclude that Shivaji was not just a king who focused on expansion but he was also a leader who understood the problems and hindrances of the kingdom and his people. The environmental sustainability of a society is extremely important and a leader who implements effective measures deserves credit. Keeping in mind the water scarcity of Maharashtra, these methods must have proved vital in holding the army and forts together. Steps must be taken to highlight this aspect of Shivaji Maharaj and inspire youngsters to come up with new techniques and methods of water conservation. Talks about the inclusion of Shivaji Maharaj's water conservation policies in the Maharashtra state syllabus are already and that is positive. However, the current condition of these ponds, lakes, and tanks

highlights a major issue in the governance and mentality of our country. To guarantee that these places are effectively safeguarded and preserved, steps must be done. We have glorified many rulers for their brilliance in administration, and bravery in warfare but these causes and aspects become nugatory in the 21st century. Considering the present condition, environmental studies and analysis must be given more importance. Shivaji was way ahead of his time when it came to environmental reforms and this added to the glory of the Maratha kingdom. The sustainability of the aforementioned forts and Maharashtra cities paved way for a smooth administration. Therefore, as lovers of history, it becomes our duty to view the past from different dimensions. The environment is an integral part of our world and examples of leaders like Shivaji prove that it occupied the same value during medieval times too.

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