

# The Historical Sustainable Cities In India: A Survey Of Sustainable Practices Followed In Cities Of India In Ancient And Medieval Times

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## Abstract

The role played by India in achieving the sustainable development goals by 2030 is extremely crucial owing to its large but impoverished population. It is necessary for India to achieve these goals so that the world can achieve them. India is currently lagging in many of the goals, targets and sub-targets. But there was a time when India was the centre of sustainable lifestyle. Indian cities were well planned with remarkable sanitation and cleanliness. The excellent drainage system of Harappan cities is well known to everyone. The cities were divided into various layers with the most important structures located on citadel. The great bath of Mohenjodaro, the great granary of Harappa, the water conservation tank of Dholavira and the dockyard of Lothal are living examples of sustainable practices in those sustainable cities.

The imperial city of Pataliputra is another example of a sustainable city. The city administration comprised of thirty members which was divided into six committees. There was a separate committee for registration of births and deaths. Similarly, the life of Kanyakubja as described by Hiuen Tsang reflects the sustainable lifestyle of the ruler as well as the people of the city.

The early medieval age was categorized as dark age by many historians. But these ages have also produced remarkable cities. Anhilwada (present day Patan, Gujarat) was capital of Solanki dynasty of Gujarat in which we can find Rani-ki-Vaav which is an excellent water conservation tank accessible to the population of the city. Similarly, Bhoj of Parmar dynasty constructed several lakes, tanks and ponds in his capital city Dhar.

It was the imperial city of Vijayanagar that can be described as textbook example of a sustainable city. The city was surrounded by seven walls. The agricultural farms in the vicinity which fed the city were fortified. The city was well planned into residential, commercial and military areas.

This paper analyses the sustainable structures, practices and lifestyle that existed in the prominent cities of ancient and medieval India.

**Keywords:** Sustainable cities, Sustainable production, Drainage, Irrigation, SDG Primary and Secondary sources

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The primary sources in this research include the archeological as well as literary sources. The major findings from the excavated sites of Indus valley cities - Mohenjodaro, Lothal, Dholavira and Harappa are primary sources. The ruins of Vijayanagar and Anhilwada are also sources of this research. The primary literary sources include the Arthashastra of Kautilya, Indica of Megasthenes, Si-yu-ki of Hiuen Tsang, etc. The accounts of foreign travellers such as Duarte Barbosa, Abdul Razzaq Samarqandi, Nicolo di conti, etc. are also taken into account.

The most important secondary sources used in this research are the works of historians Romila Thapar, A.L. Basham, R.S. Sharma, Satish Chandra, Nilakanta Sastri, etc. The information about ancient Indian and early medieval cities is obtained from the works of Thapar, Sharma and Basham. Whereas the information about Vijayanagar is obtained from the works of Nilakanta Sastri.

## I. Sustainable City - Its Structure And Practices

The SDG 11 of 'sustainable cities and communities' defines "a city dedicated to achieving green, social and economic sustainability as a sustainable city". For achieving this goal a city must achieve other SDGs such as clean water and sanitation (SDG 6), Quality Education (SDG 4), Good health and wellbeing (SDG 3), Industry innovation and infrastructure (SDG 9), Responsible consumption and production (SDG 12), etc. The sustainability of a city is visible in its structural design as well as in the practices of its residents. This paper investigates whether the cities of ancient and medieval India were sustainable cities on the basis of their

structure, design and practices. Several sustainable practices adopted by early Indians were not restricted to urban areas but were widespread in the countryside as well.

## **II. Sustainable Cities In The Harappan Civilization: An Enquiry**

The structure of Harappan cities varied in different regions. In majority of the cities, there was a citadel on raised platform which consisted of several important structures such as the great bath (Mohenjodaro) or the great granary (Harappa), etc.<sup>1</sup>.

The drainage system was well developed. The drains were covered and pits were present in order to clean the drain. Every house had a bathroom which also had pit connecting it to the drainage system of the city. The sewage system was a great achievement on Indus people and the drainage system was more efficient than the Roman Empire<sup>2</sup>. Conservation of water was crucial to these cities. The presence of water conservation tank in Dholavira shows the practice of storing and saving water.

The existence of these cities was based on the agricultural surplus which allowed people to pursue secondary and tertiary activities. The surplus agricultural produce from the countryside fed the population of the city. This surplus produce was stored in the granaries which were located in the citadel. Hence evidence of sustainable consumption is found in these cities.

These cities were centers of trade and manufacturing. The bead making industries found in several cities of Indus valley civilization is an example. The Sumerian records show the Harappa - Mesopotamia foreign trade. The presence of dockyard in Lothal shows the infrastructural development in the cities.

## **III. Pataliputra And Kanyakubja - A Survey Of Ancient Capital Cities**

Pataliputra was the capital city of two great empires - Mauryan and Gupta Empire. The city was parallelogram in shape of 15 km length and 2.5 km breadth and was enclosed by wooden walls having 570 towers and 64 gates. Around the walls there was a water ditch having breadth of 600 feet and depth of 45 feet which served for the purpose of defense as well as that of a sewer<sup>3</sup>. At the excavated site of Kumhrar, *Arogya Vihar* is found which is considered as an ancient Health and wellness centre founded by *Dhanvantari*.

The most striking feature of this city was its administration. The city was divided into numerous blocks which were further divided into wards. Each ward comprised about ten to forty families. The head of ward was called *Gopa* and that of the block was called *Sthanika*. The head of the city administration was called *Nagaraka* who was assisted by city judge (*Pradeshtha*) and police chief (*Rakshin*). There was a city council consisting of thirty members which was divided into six committees each consisting of five members each. The functions performed by these committees were registration of births and deaths, registration of foreigners, industries and crafts, quality of manufactured goods, trade and commerce and collection of municipal taxes. There was special emphasis on fire prevention and protection as the city was built mostly from wood.

Kanyakubja was the capital of Harshavardhan and would later become the capital of Gurjar-Pratiharas. The city was ten kilometers in length and three kilometers in breadth. The city consisted several water tanks, gardens and even a museum. The ruler Harshavardhan himself had a sustainable lifestyle. He donated all his belongings after every five years except a loincloth which he wore as his dress. The example was followed by the upper sections of Kanyakubja. The rich opened several hospitals which provided free of cost treatment. Land grants were given to educational institutes and intellectuals<sup>4</sup>.

## **IV. Early Medieval Cities In India**

The cities of early medieval period were strongly fortified citadels surrounded by agricultural fields, ponds and lakes. Dhar in Malwa and Anhilwada in Gujarat are examples of the same. The Parmar dynasty of Dhar had built numerous water management structures such as Munj Sagar in Dhar and Bhojtal in Bhopal. Similarly, the water conservation structures of Anhilwada are world renowned. Rani ki Vav constructed by Solanki dynasty in 11th century is UNESCO World Heritage site as it is a seven storied stepwell. Raja Bhoj of Parmar dynasty established Sanskrit college in Dhar for the study of language, literature, History, Philosophy, religion, etc. This college still exists and is now known as Bhojshala.

A form of local self-governance also started in early medieval cities. Nagaram was the name of assembly of merchants belonging to a city in the Chola Kingdom. Nagaram was an urban variant of Ur and Sabha which were prevalent in villages of Chola kingdom. Similarly in North India a body comprising of

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<sup>1</sup> Thapar R. (2002). The penguin history of early India. Penguin Books. Page 82.

<sup>2</sup> Basham A.L. (1963). The wonder that was India. Orient Longman. Page 17.

<sup>3</sup> Sharma R. S. (2005). India's ancient past. Oxford university press. Page 184.

<sup>4</sup> Mahajan V.D. (1960). Ancient India. S Chand. Page 601.

Nagarseth (Nagarshreshtha), Nagarkayastha and Nagarkulika became significant in decentralized urban administration.

### **V. Vijayanagar - The Model Sustainable City**

The city of Vijayanagar was the capital of the Vijayanagara empire (Karnataka Samrajya) from 1336 to 1575. Accounts of foreign travelers mention seven fortifications before the gates to the royal palace. The large area between the first and third fortifications contained agricultural fields, gardens and residences. There were countless shops and *bazaars* (markets) filled with people from different nationalities between this fortification and the palace<sup>5</sup>.

The agricultural land in the vicinity of the city was fortified and protected by the state. The city could handle long periods of siege due to availability of food and water supply within the city<sup>6</sup>. A significant population of the city were involved in cultivation of fertile tracts of the Tungabhadra River. These fortified fields produced a diverse range of food crops although paddy fields were predominant.

The construction of major irrigation works during the 15th century under Emperor Deva Raya and under Emperor Krishna Deva Raya in the early 16th century was one of the main reasons why the city flourished and expanded. A number of water conservation tanks, reservoirs and canals were built in the city and its vicinity. The Kamalapuram tank and the Hiriya canal both of which still exists were most significant sources of water.

There was a separate area for market place distinct from palace area, sacred area and residential area. The most flamboyant area of the city was the market of precious stones. Portuguese traveler Dominigo Paes gave the following description about the city: -

" The people in the city are countless in number, so much so that I do not wish to write it down for fear it should be thought fabulous. What I saw seemed as large as Rome and very beautiful to the sight; there are many groves of trees within it, many orchards and gardens of fruit trees and many conduits of water which flow in the midst of it, and in places there are lakes."

There were numerous roads running throughout the urban core of the capital. The major roads are said to be forty feet wide whereas the roads leading to temples or fields were about ten feet wide. Archaeological sources suggest use of Chinese porcelain in houses occupied by rich traders. Hence the city was rich in infrastructure as well.

### **VI. Conclusion**

On the basis of above-mentioned illustrations based on archaeological evidences and backed by literary accounts it can be said that the Indian cities of ancient and medieval times followed certain sustainable practices. Cities such as Harappa and Mohenjodaro in Bronze age, Pataliputra in the ancient period and Vijayanagar in the medieval period can be classified as sustainable cities according to their structural layout as well as lifestyle and practices of its people. Modern cities can learn from the practices followed in ancient and medieval cities of India. The most notable among these practices are the self-sustainable consumption in Vijayanagar, the water management in Dhar and Anhilwada, the drainage system in Harappa and Mohenjodaro, etc. It can be argued that these cities would not have declined if they were really sustainable. But, the causes for decline of these cities were unavoidable. According to recent findings it is believed that the main cause of decline of Indus valley civilization was prolonged drought due to Climate Change. On the other hand, the city of Vijayanagar was sacked and burned by invaders after military defeat of the army in the battle of Tallikota. The above-mentioned situations arose due to unavoidable natural or geopolitical causes. Hence, the mere fact of their eventual decline does not question its sustainability. These cities survived for several centuries which itself is a remarkable achievement.

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<sup>5</sup> Sewell R. (1900). A forgotten empire. George Allen and Unwin. Page 88.

<sup>6</sup> Ibid. Page 89.

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