



Ecological Wisdom In Medieval Assam: Water Management, Tank Construction & Present-Day Environmental Lessons

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Abstract: Medieval Assam, especially under the Ahom rule (13th–18th centuries), witnessed the emergence of sophisticated ecological knowledge system embodied in its water management practices. Although the practice of tank & pond construction existed before, it was during the Ahom era that water management evolved into a well-organised & state sponsored ecological practice. The large artificial tanks constructed by Ahom kings & queens highlighted the Ahom's close relationship with nature & their understanding of environmental balance. This paper investigates the engineering & ecological wisdom embedded in such traditional water systems, their construction techniques & societal role & ecological impact — long term environmental impact offering valuable insights for present day Assam, which is frequently confronted by floods, water scarcity & climate change.

1. INTRODUCTION

Ecological wisdom, particularly the management of water resources, has long been integral to the development of human civilizations & so in Assam, this tradition extends deep into antiquity. However, in Assam it was during the medieval period that these water management practices became highly structured, organised & state sponsored, leaving behind enduring examples which still exist today as testaments to their ecological foresight & engineering skill. The history of medieval Assam is largely synonymous with the rise & consolidation of the Ahom dynasty, which ruled the Brahmaputra Valley for nearly six centuries. Their long reign not only shaped Assam's political & cultural fabric but also fostered a distinct ecological worldview. The Ahoms governed with a deep understanding of the land and its rhythms, adapting to floods, fertile plains & changing river courses with remarkable resilience.

Their policies, architecture & agricultural systems reflected a harmonious relationship with nature — one of the finest expressions of this ecological wisdom was the construction of large artificial tanks (Pukhuris) such as Joysagar, Sivasagar, Gaurisagar, Rudrasagar etc. These served multiple functions. More than just water reservoirs, they embodied a sustainable design deeply rooted in the region's geography & culture.

In an era when Assam is increasingly facing climate change, annual flooding, groundwater depletion & unplanned urban growth, the Ahom model of ecological governance invites renewed attention. By revisiting their management practices this study seeks to uncover not just historical facts, but enduring lessons in sustainability

2. OBJECTIVES:

- 1.To explore the traditional water management practices in medieval Assam.
- 2.To analyse the construction, structure & multipurpose functions of prominent Ahom era's tanks.
- 3.To assess the contemporary relevance of these traditional systems in addressing present day issues such as water scarcity, flood control & sustainable development.

3. METHODOLOGY:

This study is conducted using a descriptive and analytical approach, grounded in a historical perspective. The research relies primarily on secondary sources such as books, research thesis, journal articles & historical studies related to medieval Assam & Ahom ecological practices. These sources have been critically examined & interpreted to understand the environmental wisdom reflected in the Ahom era's water management systems. The paper also follows a case study approach to examine selected historical water bodies from the Ahom era.

4. WATER SYSTEMS IN MEDIEVAL ASSAM:

In the past the indigenous people of Assam nurtured a profound relationship with their natural surroundings & historically embraced a riverine culture shaped by the rhythm of the Brahmaputra and its tributaries. The Ahoms, after establishing their rule, adopted & enriched this ecological tradition. Water was central to their way of life — both a vital resource & a sacred element. From royalty to nobility and commoners alike, the harnessing & conservation of water resources were regarded as essential to sustaining daily life, agriculture, religious rituals & community well-being. One of the hallmarks of this era was the construction of numerous water harvesting structures, particularly the digging of tanks of varying sizes (locally known as Pukhuri). These initiatives reflected not only a utilitarian purpose but also the Ahom's' ecological wisdom & respect for nature's cycle.

Major Water Bodies of the Ahom Period:

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|---|---|---------------------------|
| 1. Achubulia Pukhuri | 20. Burhagohain Pukhuri
(under King Chandrakanta Singha) | 40. Ligiri Pukhuri |
| 2. Aghoni Pukhuri | 21. Chaara Pukhuri | 41. Mechagarh Pukhuri |
| 3. Aideu Pukhuri | 22. Cheuni Pukhuri | 42. Mechlou Pukhuri |
| 4. Athabari Pukhuri | 23. Demow Pukhuri | 43. Mitha Pukhuri |
| 5. Athaisagar Pukhuri | 24. Dergaon Pukhuri | 44. Monkhamor Pukhuri |
| 6. Baduli Pukhuri | 25. Dhai Pukhuri | 45. Nahar Pukhuri |
| 7. Bamun Pukhuri | 26. Dhitai Pukhuri | 46. Neo Gohain Pukhuri |
| 8. Bangal Pukhuri | 27. Gabharu Pukhuri | 47. Nitai Pukhuri |
| 9. Bauli Pukhuri | 28. Gargaon Pukhuri | 48. Numali Pukhuri |
| 10. Bejdolloi Pukhuri | 29. Gouri Ballabh Pukhuri | 49. Padum Pukhuri |
| 11. Bejor Pukhuri | 30. Gourisagar Pukhuri | 50. Panibeel Pukhuri |
| 12. Bhogdai Pukhuri | 31. Joysagar Pukhuri | 51. Petudhowa Pukhuri |
| 13. Bishnusagar Pukhuri | 32. Jethi Pukhuri | 52. Phulcheng Pukhuri |
| 14. Bogidol's Pukhuri | 33. Joha Pukhuri | 53. Phulpanichiga Pukhuri |
| 15. Borkala's Pukhuri | 34. Karotowa Pukhuri | 54. Rahdai Pukhuri |
| 16. Borkola Pukhuri | 35. Khemdoi Pukhuri | 55. Rahdhala Pukhuri |
| 17. Borpatra Pukhuri | 36. Kordhowa Pukhuri | 56. Rajmao Pukhuri |
| 18. Borborua Pukhuri | 37. Kunwari Pukhuri | 57. Rangachila Pukhuri |
| 19. Burha Gohain Pukhuri
(under King Chakraddhaj Singha) | 38. Lakhmi Pukhuri
(Kalugaon) | 58. Rongpur Pukhuri |
| | 39. Lengibar Pukhuri | 59. Rudra Sagar Pukhuri |
| | | 60. Rupahi Pukhuri |

61. Sa-dhowa Pukhuri	66. Solal's Pukhuri	71. Sukan Pukhuri (Demow)
62. Senchowa Pukhuri	67. Sonari Pukhuri	72. Taokak Pukhuri
63. Senduri Pukhuri	68. Sondar Pukhuri	73. Teliadonga Pukhuri
64. Sibasagar Pukhuri	69. Sontola Pukhuri	74. Tenga Pukhuri
65. Silpukhuri (Guwahati)	70. Sukan Pukhuri (Batbari)	75. Thaora Pukhuri

5. CASE STUDIES OF SELECTED TANKS:

1. Joysagar Tank: Joysagar Tank is one of the finest hydraulic achievements of the Ahom period and is regarded as among the largest man-made tanks in India. Constructed in 1697 during the reign of King Rudra Singha in memory of his mother, Joymoti Konwari, it reflects royal devotion and engineering excellence. Located about five kilometres from present-day Sivasagar town, the tank extends over more than 300 acres, with its elevated water level demonstrating advanced embankment and water-regulation techniques. The complex includes three important temples—Joysagar Joydol (Keshavnarayan Vishnudol), Joysagar Shivadol, and Joysagar Devidol—along with Ghanashyam's House and Sibsagar College, now upgraded to Sibsagar University. Beyond its commemorative role, the tank supported irrigation, ritual practices, and nearby settlements through a stable year-round water supply, reflecting the Ahom integration of ecological planning with cultural and institutional life.

2. Sivasagar Tank: Sivasagar Tank, locally known as Sivasagar Borpukhuri, is a major water body constructed during the Ahom period in the eighteenth century. Located at the centre of present-day Sivasagar town, it was excavated under the patronage of Queen Ambika, consort of King Siva Singha. Spreading over about 120 acres with a depth of nearly 64 feet, the tank exemplifies large-scale hydraulic engineering without modern technology. Situated near the Sivasagar Sivadol complex, it became the cultural and spatial core of the town. Despite dense urban surroundings, the tank has maintained a stable water level, reflecting effective water management. Its survival highlights the durability and ecological wisdom of Ahom hydraulic practices.

3. Gaurisagar Tank: Built by Queen Phuleswari Konwari, Gaurisagar Tank beautifully illustrates the fusion of religious devotion with ecological consciousness. Encircled by temples, sacred groves, and planned plantations, the tank functioned simultaneously as a holy landscape and a vital water resource. It supported ritual activities, provided water for nearby settlements, and contributed to groundwater recharge. The design reflects how spiritual beliefs and environmental stewardship were integrated in Ahom landscape planning.

4. Rudrasagar Tank: Commissioned by King Lakshmi Singha, Rudrasagar Tank was conceived not merely for aesthetic and ritual purposes but also as a strategic reservoir ensuring water availability for surrounding agricultural and residential areas. Its expansive layout, controlled embankments, and proximity to royal and religious structures reveal deliberate planning to integrate utility with grandeur. Rudrasagar thus represents the Ahom vision of water architecture as both a functional necessity and a symbol of royal authority.

PURPOSE:

The construction of tanks during the medieval period served a wide spectrum of purposes — sacred, commemorative, social & ecological. Many were excavated to honour fallen warriors & ministers, or to commemorate military victories, reflecting both reverence & remembrance. Some tanks were built in memory of revered royal figures, such as Joysagar Tank, commissioned by Rudra Singha in memory of his mother Joymoti. Beyond these commemorative intentions, tanks played vital roles in daily life. They provided drinking water, supported agricultural activities like soaking paddy shoots (kothiya), used for religious rituals including cleansing, sacred offerings (mah prasad) & funeral rites. Some tanks were designated for specific royal practices such as cleaning ceremonial robes, washing royal garments, nurturing fish & hosting events like boat races (Naokhel). Certain tanks such as the Ho-dhua Pukhuri were used in royal funeral customs — specifically for ritual washing of bodies.

6. RULES & RITUALS IN TANK CONSTRUCTION:

The construction of tanks during the Ahom period followed some elaborate rules owing to their strategic, ecological & ritual importance. The responsibility for overseeing such works primarily lay with the Borphukan, assisted by officials like Hazarikas, Saikias & Boras. The Paiks were employed for actual digging. Before digging began, magico-religious methods were employed to locate the water-bearing soil. Mohan Deodhai Pandits, believed to have mystical powers, performed a ritual involving mustard oil lamps placed atop wooden planks arranged within a ritual square grid. The lamp that extinguished was believed to mark the centre of the pond. An alternate method involved walking around the site with a burning mustard oil lamp; the spot where the flame blew out marked the pond's centre. Once excavation was completed, purification rituals followed. A large copper plate was placed at the tank's base along with a nag (serpent) stone, soil extracted from bel leaves, ground charcoal to cleanse the water. A pole called Nagmari was fixed atop the plate — believed to symbolise Nag or Nagini, spiritual forces of energy & protection. Some tanks were named after this ritual, like Rakhhowa & Rahdhala. Temples (devalayas) and doul were often built on the banks of tanks to enhance their sacredness, discouraging misuse.

7. ENVIRONMENTAL SIGNIFICANCE & DECLINE OF TRADITIONAL WISDOM:

The ponds and tanks of the Ahom period were not only feats of engineering & spiritual symbolism but also vital ecological assets. They sustained groundwater levels, supported biodiversity, regulated microclimates & provided water security in dry periods, reflecting the Ahom's deep ecological awareness. However, the British period marked their decline, as colonial policies favoured canal irrigation & sidelined indigenous systems. Post independence, urbanization, population growth & neglect further worsened the situation. Many historic tanks became encroached, polluted or divided up, erasing both their cultural & ecological significance.

8. LESSONS FOR THE PRESENT DAY:

The tanks & ponds of medieval Assam stand as reminders of a time when human life & nature were closely interwoven. In today's context of floods, droughts & climate change, they offer lessons in conservation & resilience. Therefore, the lesson for our time is clear: protect what remains, revive what has been neglected & integrate this traditional wisdom into modern water policies.

CONCLUSION:

The great tanks & ponds of the Ahom period stand as remarkable achievements that served the welfare of society as well as the environment. Built without modern machinery, they fulfilled practical, cultural & ecological needs for generations. As these heritage structures now face neglect, it is our duty to preserve & revive them — not only as memories of the past but as valuable resources for a sustainable future.

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