



The Connect and Disconnect with Environment in Medieval India

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ABSTRACT

This paper is an attempt to study the endeavours of medieval Indian rulers to connect with the ecological settings in India and the ironical disconnect with environment this culminated into. The medieval Indian rulers faced the challenges of terrain, the flora and fauna over the vast stretch of the Indian subcontinent which they, it is said, successfully negotiated, in most cases, by their imperial expansionist forces. From the architectural style, to the maintenance and repair of fortifications, the construction of roads for 'smooth transportation of its armies and the unhindered supply of food, water and arms',¹ to the large-scale strategic deployment of war animals and military technology over time and space – all the practices illuminate the military nature of the medieval State in India which has been referred to as a 'war state'.² The successful imperial accomplishments led medieval Indian rulers to embrace 'eco-friendly' innovations³ and to construct splendiferous cities in attempts to discipline the nature. However, in many instances such efforts were visibly overpowered by the forces of nature as medieval India entered into a conspicuous relationship with its environment based on an initial understanding of 'connect' and then its antithetical 'disconnect' with the environment.

Keywords: Medieval India, Environment, Delhi Sultans, Mughals, Military, Siege, Hydraulic Structures, Fortifications, Cities, Elephants, Horses

¹ Nath, Pratyay. 2018. "Through the Lens of War: Akbar's Sieges (1567–69) and Mughal Empire-Building in Early Modern North India." *South Asia: Journal of South Asian Studies* 41 (2): 245–58. <https://doi.org/10.1080/00856401.2018.1430467>.

² John F. Richards, *The Unending Frontier: An Environmental History of the Early Modern World* (Berkeley, Los Angeles, and London: University of California Press, 2003), 26. <https://doi.org/10.2307/3985950>.

³ These included parks, *gulistans* (orchards), *bostans* (rose gardens), canals, water-supply (like the *karez* technology) and rainwater harvesting structures, and sanitation works, among others, that were built in the Sultanate era as well as the Mughal period.

To explain the dynamics of the relationship that existed between the medieval ruling elites and the environment involves a critical understanding of the works of contemporary scholars, and, later historians so that a view of the 'connect' and its antithetical 'disconnect' quotient in the relationship can be chalked out. Apart from the existing contemporary works, the translated statements and commentaries on the topic by the medieval literati also provide an insight into the contemporary military and urban milieu, as well as organization, forming an important component of the relationship of rulers with environment in medieval India.

When Zahiruddin Muhammad 'Babur', the first Emperor of the Mughal dynasty, marched towards India in 1505 along with his nomadic army,⁴ India boasted of a 'generally moderate climate' that was considered suitable for agrarian expansion along its vast river valleys where populous cities with developed manufacture and trade had come up since times immemorial. On the other hand, further northwest (Central Eurasia) and southeast (South-East Asia) of this moderate climatic belt, the environmental conditions were considered extreme and interspersed as between excessively dry-cold and wet-subtropical climates respectively. Aware of such prospering conditions, the Mughal invaders (after the rule of Sultans of Delhi, 1206-1526) began their move towards India. Babur's army of heavily armoured cavalry, light cavalry archers, infantry, and artillery made a shrewd use of the terrain. Archers were mounted at high positions on the mountains to keep the foe at a distance, while the infantry and artillery held the enemy centred at bay. Heavy cavalry with the final charge of the Mughal army then imposed a pressing defeat upon their adversaries.⁵ It is said that such combating techniques played a crucial role in the siege battles won by Babur on his way to India in Kabul (1504) and Kandahar (1507). It was a 'coordinated deployment of mounted archers, field artillery ... and heavy cavalry'⁶ — a feat that later passed into oblivion by his successors in India in the greater process of *acclimatisation* — and, the new handgun-bearing infantry that proved to be a driving force for the triumph of Mughal ruler Babur in the First Battle of Panipat (1526). Babur used the climate and topography to his advantage and laid the foundation of the Mughal Dynasty in India, a ruling lineage, that faced strong characteristics of the terrain across the Indian subcontinent during the Mughal imperial expansion. In this process, the words of Muhammad Baqir Najm-i-Sani, a seventeenth century high ranking Mughal noble, stand true in displaying the intentions that Mughals displayed in campaigns and as set forth in his 'Advice on the Art of Governance' (*Mau'izah-i-Jahangiri*)

⁴ Emperor of Hindostan Bābar, William Erskine, John Leyden, and Charles Waddington. 1826. *Memoirs of Zehir-Ed-Din Muhammed Baber, Emperor of Hindustan, Written by Himself, in the Jaghatai Turki, and Translated, Partly by the Late John Leyden ... Partly by William Erskine*. Longman & Co.: London; Cadell & Co.: Edinburgh.

⁵ Prior to the Mughals, similar military formations were used by the Sultans of Delhi as is evident from the anecdotes and writings of Fakhr-i Mudabbir, a Persian scholar and courtier who worked under the *Ghurids* and the *Ghaznavids*. Digby also refers to the heavy cavalry, armed with a bow and one or more weapons for close combat, as 'the most important element of the armies of the Delhi Sultanate'. Digby, Simon. 2004. *War-Horse and Elephant in the Delhi Sultanate : A Study of Military Supplies*. Delhi ; Oxford: Oxford University Press.

⁶ Pratyay Nath. 2019. *Climate of Conquest : War, Environment, and Empire in Mughal North India*. New Delhi, India: Oxford University Press.

“To those who seek an empire, the best dress is a coat of mail, and the best crown is a helmet, the most pleasant lodging is the battlefield, the tastiest wine is the enemies’ blood, and the charming beloved is the sword.”⁷

However, Humayun’s reign was comparatively short-lived and full of hurdles.⁸ Therefore, the onus of expanding the Empire is said to have been transferred to the shoulders of young Jalaluddin Muhammad Akbar.

The *setting* of the environment — ecology, climate and terrain — played a significant role in shaping the larger process of imperial expansion. In the 1560s sieges in the Mughal militaristic practices, strategies and war-efforts were a more frequent phenomenon in the campaigns that were conducted against forts as these were considered in North India the ‘most favourable centres of military defence’.⁹ In most cases, the forts were captured by the Mughal imperial forces through diplomatic pressure¹⁰ or by direct assault on the walls (as in Chittor in 1567-68), or due to food shortage in enemy garrisons (as in Mankot in 1557) or due to voluntary submission.¹¹ There exists an exception though which reflects on a new paradigm of ‘negotiating with the environment’ and turning the tables of the Mughal side in a battle. In the siege of Ranthambhor (1569), the natural elevation provided by the Ran Hill in the area outside the fortifications, was used by Akbar’s troops as a platform to mount fifteen *zarbuzans* (big cannons), and open fire to the interior of the ramparts. This was a forested location and in spite of the difficulty in the transportation of and the use of artillery against elevated forts, Akbar utilised firepower in combination with topography of the area to deal a severe damage to his adversary, and consequently Rai Surjan, the commander of the fort, surrendered.

Mughal military campaigns in the North - East (1574-1612)¹² under both, Akbar and Jahangir, provide another befitting example of how the region posed a serious geographical challenge before the *Timurid* descendants in India. The active Ganga - Brahmaputra River delta (in modern day Bangladesh), along with the Bhagirathi and Brahmaputra River basins in West Bengal and in Assam, was criss-crossed by rivers, rivulets and other water bodies making it difficult to be traversed, especially during the heavy monsoon rains. The struggle that the Mughal imperial forces underwent in the unknown terrain of the East and the North – East led them to devise the strategy of ‘*amphibious*’¹³ warfare. The adroit campaigners increasingly incorporated war – boats in their force which could be often mounted with artillery and were found to be manageable as these were easily transported through riverine channels. So did the number of *matchlock-men*¹⁴ who were incremented in the army as the efficiency of the Mughal cavalry suffered a severe setback in the ‘riverine, marshy, and forested terrain’. The Mughals emerged victorious in the siege of Dhubri using heavy cannons fitted in *ghurābs* (large boats) and overpowered Pratapaditya of Jessore with a blitzkrieg of

⁷ *Mau’izah-i Jahangiri*, 48, 151.

⁸ Humayun, contradictory to his name which means ‘*blessed*’, was constantly troubled by his adversaries- Sultan Bahadur (Gujarat), Sher Shah Suri (along river Ganges in Bihar) and his half-brother Kamran Mirza (who inherited Kabul and Kandahar). When he returned to Delhi in 1555 after 15 years of exile, his reign was cut short by an injury that led to his death the following year.

⁹ Pratyay Nath. 2019. *Climate of Conquest : War, Environment, and Empire in Mughal North India*. New Delhi, India: Oxford University Press.

¹⁰ Gwalior (1558–9), Awadh (1567), and Kalinjar (1569).

¹¹ Gagraun (1561), Chunar (1564), and Rohtas (1564–5).

¹² Pratyay Nath. 2019.

¹³ *Ibid*. It points to the combined use of landed and naval fleet, as the region was neither a complete landmass nor a sea/ocean in its entirety.

¹⁴ Soldiers with a handheld firearm that had to be fired by applying a lit match (matchlock gun). Source: *Britannica*

matchlock-men, some 5,000 in number according to *Bahāristān-i Ghā'ibī*¹⁵ written by Mirza Nathan, a Mughal commander who served in Bengal and Assam in the early seventeenth century. There were also expeditions where the contingent of matchlock-men exceeded the cavalry, the latter being mostly ineffective in amphibious warfare as the opposing armies were often separated by a water body and thus the probability of close combat remained low. After an area was brought under control, it had to be secured by building or occupying forts. The Mughals utilised the silt rich area in constructing makeshift fortifications, or *mud-forts*¹⁶ alongside strategic riverine spaces. Not only were these mud – forts shock-absorbent – as they could withstand the impact of a cannonball, these were easy to be erected, and could be defended by a small garrison.¹⁷ The Mughals built numerous mud-forts during their campaigns in the Bengal and the North-East region, often installed with heavy artillery. It was also the time when the ‘principally esteemed and treasured’¹⁸ elephants were used in the sieges to destroy enemy mud-forts and enemy ships. Mirza Nathan mentions their tactical use in the battle of Uhar, Kamrup, and Bokainagar.¹⁹ This was a noticeable departure from the use of horseback close combat, the primary military strength of the Mughal imperial forces. The logistical use of mud – forts, artillery, projectile weaponry in the naval warfare, and, the eventual use of elephants in the region, reinforces the notion that the Mughal campaigns were ‘naturalised’ in India.

The two most fascinating war-animals employed during the Mughal dynastic rule were the horses and the elephants. In *Ta'rikh-i Ferozshahi*, Barani glorified the medieval Delhi Sultanate of pre – Mughal period, stating that it possessed 900,000 horses.²⁰ His statement highlights the significance of cavalry in the army before the Mughals. It is said that the tropical and humid Indian climate was detrimental for the domestication of horses. As a result, Mughals placed great emphasis on the treatment of horse diseases under their rule. Various ‘equine veterinary literatures’, called *faras-namas*²¹, were compiled by the Mughals, which gave details on horse management pertaining to the quality of a horse, list of precautions about the caring and healing of horses, and instructions to look after them according to seasonal changes.²² Apart from the taming and protection of the wild animal, the *faras-namas* also shaped and strengthened popular social beliefs. A good horse was believed to repel malignant spirits and sudden death. Horses were also classified into various Hindu *castes* based on their speed, temperament and vigour. This stigmatisation and structuration of wildlife may also be seen as the attempt of the ruling elites to get people to take care of the war-animals professionally. Similar attention was accorded to war-elephants which also played a crucial role in military campaigns in the medieval period. The elephants were traditionally used in Indian warfare, apart from transporting kings and commodities, usually for inflicting ‘*shock and awe*’ charge on the enemy, demolishing gateways of forts and

¹⁵ *Bahāristān-i Ghaybī: A History of the Mughal Wars in Assam, Cooch Behar, Bengal, Bihar and Orissa during the Reigns of Jahangir and Shah Jahan*, trans. M.I. Borah, 2 vols (Guwahati: Department of History and Antiquarian Studies, 1992).

¹⁶ A local defensive technique they readily picked up from their Afghan and Bengali adversaries in the East. Jean-Baptiste Tavernier in his *Travels in India* describes one such fort ‘with several guns on each side’ at the intersection of the Padma and the Lakhya rivers near Dhaka during his visit to eastern Bengal in the mid-seventeenth century. *Ibid*.

¹⁷ Williamson, M. S. (2017, October 16). *Military Aspects of Mughal Amphibious Engagements 1571–1612*. Weapons and Warfare. <https://weaponsandwarfare.com/2017/10/18/military-aspects-of-mughal-amphibious-engagements-1571-1612/>

¹⁸ Digby, Simon. 2004.

¹⁹ Pratyay Nath. 2019.

²⁰ Digby, Simon. 2004.

²¹ For example, the *Tuhfat-al Sadr* (by Sadr-al din Muhammad Khan), *Tarjamah-i Saloteri Asban, Faras-nama-i Rangin*.

²² Choudhary, R.B. Azad. “Mughal and Late Mughal Equine Veterinary Literature: ‘Tarjamah-i-Saloter-i-Asban’ and ‘Faras-Nama-i-Rangin.’” *Social Scientist* 45, no. 7/8 (2017): 57–71. <http://www.jstor.org/stable/26380417>.

inspecting the battlefields. The elephants were found in abundance in the Deccan parts of India. Even the pre – Mughal Sultans of medieval Delhi had organised several hunts and campaigns to procure these animals. Barani speaks of elephants being passed in review before Alauddin Khilji.²³ Later, the Mughals, adapting to the local practices of warfare and the fauna in the environment, continued — if not increased — the usage of elephants in battles.

The selection of sites in the planning and construction of medieval cities also depict an active concern of the Mughal rulers to connect and reconnect with the natural setting in India. Almost all major pre–Mughal cities in Delhi Sultanate i.e. Siri, Tughlaqabad, Bidar, Bijapur, Badalgarh (Agra) and primary cities later founded under the Mughal dynasty i.e. Fatehpur Sikri, Shahjahanabad, were either built on high grounds such as the hills, ridges or a bluff²⁴ or were surrounded by semi-arid areas for strategic and safety purposes like Delhi and Bijapur.²⁵ The crucial concern of water availability was employed in the planning of new cities. This can be observed from ‘the first attempt at city building by an Islamic ruler’ at Kailughari (1287 by Jalaluddin Khilji) due to its proximity to river Yamuna and nearness to the various hydraulic structures for water management and rainwater harvesting.²⁶ Some of the remarkable constructions include the pre–Mughal *Hauz Khas* (built by Alauddin Khilji) to supply and channel rainwater to Siri, the *Satpula* (lit. seven-arched bridge built by Muhammad bin Tughlaq), a sophisticated water regulating structure that supplied water to the city of Jahanpanah, *Terah Mori* (13 sluices) and *Bawan Mori* (52 sluices) which dammed Kol lake for channeling water to Sikri, and the 250 km long canal system built by Delhi sultan Firoz Shah Tughlaq that supplied water to the city of Hissar from Yamuna and

Sutlej²⁷. Besides, medieval cities were equipped with wells, *vavs* and *baolis*²⁸ (step-wells), *talvadis*²⁹ (lakes/ponds), human or animal-powered Persian wheels³⁰ and *char-baghs*.³¹

The medieval states in India employed two most important techniques in the planning and construction of the cities – a) the *Karez* technology i.e. water harvesting through subterranean channels and b) using the knowledge of *Vastu Shastra*. Under the *Karez* technology harvesting of groundwater was done from lakes,

²³ Barani speaks of ‘612 elephants...’ being ‘passed in review before’ Alauddin Khilji ‘as spoils of Malik Kafur’s (a slave-general of Alauddin Khalji, as well as the commander of several successful raids in the Deccan) southern expeditions’, while Mahmud of Ghazna is said to have inspected 1,300 elephants at the muster of 1023-4 in one of the instances mentioned by Farrukhi, a prominent Persian court poet. Digby, Simon. 2004.

²⁴ A bluff is a type of broad, rounded cliff. Source: National Geographic.

²⁵ Sharma, Anjali, Manoj Kumar, M. P. Singh, and H. K. Mazhari. 2019. “Medieval (Islamic) Cities in India (1206–1764): An Environmental Review and Its Contemporary Relevance.” *Indian Historical Review* 46 (1): 55–85. <https://doi.org/10.1177/0376983619856166>.

²⁶ Also in reviving old ones. As, for example, Prithviraj Chauhan’s Rai Pithora was revived by Iltutmish of the Slave Dynasty by building *Hauz-i-Shamsi* (a watertank built in 1231) and *Gandhak-ki-Baoli* (a step well). Similarly, the Great Western Yamuna Canal was extended as Nahr-i Faiz, one of the principle supplies of water to Shahjahanabad. *Ibid*.

²⁷ Welch, Anthony. 1985. “*Hydraulic Architecture in Medieval India: The Tughluqs*”. In *Environmental Design*, 74-81. Retrieved from [Wayback Machine \(archive.org\)](http://www.waybackmachine.org).

²⁸ Tughlaqabad, Dinpanah and Daulatabad had several *baolis* and step-wells for harvesting rainwater.

²⁹ Built in large numbers in Palanpur, Bharuch, Surat, Vadodra and Ahmedabad (which also had the *Hauz-i Qutb* tank).

³⁰ The best example of the use of Persian wheel is in Fatehpur Sikri where an intricate system of this technique was used to lift water to the level of imperial complex on the ridge from the Kol Lake, *baolis*, tanks and wells in five stages.

³¹ These were cross-axial quadrilateral gardens using an eco-friendly practice of planting trees across rivers in the form of waterfront gardens (as in Shahjahanabad and Fatehpur Sikri).

springs and wells, available aplenty, by distributing a ‘network of sloping subterranean aqueducts’³² with vertical shafts at regular intervals to supply water to the low - lying areas. The Karez technology was introduced in India by the Bahmani sultans of Bidar, but it was under the Mughals that this technology gained popularity. The *karez* system used in Burhanpur, a Mughal outpost, made use of the gravity of natural topography to supply water through sub-surface aqueducts, which was then collected in a chamber and distributed throughout the town via clay pipes. The water harnessing systems of Bijapur, Ahmednagar, Golconda, and the *Nahr-e Ambari* of Aurangabad, feature the karez technology. Apart from supplying water at nominal costs due to dependence on gravity, it also ensured immunity from natural calamities, like floods and earthquakes, as well as erratic monsoons. Vastu Shastra is the ancient Indian science of architecture employed to make a place liveable and to work in a most scientific way by the use of directions. Vastu Shastra combines the benefits of the nature, and, its energy to attain wellness and prosperity. The planning of Shajahanabad displays a clear use of this ancient tradition. Based on the *Manasara* Vastu Shastra, the city formed a ‘semi-elliptical design called *karmuka* (bow)’ with the outer walls facing Yamuna, and various roads running through different gates representing the curved shaft and the bow string. The imperial palace fortress, that came up in Delhi, was built at the *karmuka*, the juncture of two main streets i.e. the most auspicious spot.³³It is ironical that not only did these cities deteriorate into ruination, despite large scale water harvesting and conserving mechanisms, but also ended up having adverse impacts on the environment, contradictory to their preservation.

Surprisingly, *water scarcity* was the primary cause of the decline of cities.³⁴ Many of these cities built strategically on ridges, hilltops and bluffs or in semi-arid areas like Bijapur, Fatehpur Sikri, Tughlaqabad, Daulatabad, faced challenges of water supply and scarcity due to the absence of perennial supply of water. In Delhi the *Hauz-i - Shamsi* gradually dried up due to the diversion of water from its feeding channels to upstream rivers. Moreover, when cities moved with the imperial camp, as under Akbar, the waterworks of the old capital were rendered useless, as in Fatehpur Sikri where the five - stage mechanism of lifting water declined (due to its labour - intensive nature) every time Akbar moved his capital from the city. The Medieval cities were characterised by their *extravagant* use and wastage of water in the royal and domestic households, numerous public and private baths (hammams), gardens, and agricultural farmlands. Shahjahanabad was infamous for flushing large quantities of sewer water into the Yamuna.

Climatic factors seemed to disfavour the medieval rulers and for many this proved to be catastrophic for the newly built cities. Monsoon failures caused by climatic change resulted in droughts, and, caused the abandonment of Tughlaqabad-Adilabad, Daulatabad in the 1330s and Fatehpur Sikri in the 1590s. At the same time violent flooding caused the demise of Kailughari (located close to River Yamuna) and Gauda (along River Ganga). Although the ruling medieval invaders were quick to adopt to the traditional indigenous

³² Sharma, Anjali, Manoj Kumar, M. P. Singh, and H. K. Mazhari. 2019. “Medieval (Islamic) Cities in India (1206–1764): An Environmental Review and Its Contemporary Relevance.” *Indian Historical Review* 46 (1): 55–85.

³³ Blake, Stephen P. 2002. *Shahjahanabad : The Sovereign City in Mughal India, 1639-1739*. Cambridge England; New York: Cambridge University Press.

³⁴ Sharma et al. 2019. “Medieval (Islamic) Cities in India (1206–1764)”.

sciences and technologies³⁵, and town planning methods³⁶, they neglected the fear nuance and idiom in the country that was the attached to the wrathful environment, allegorised as *Indra*, the God of lightning, thunder, storms and rains. Even the extensive and advanced *Karez* system succumbed to the erratic nature of the rainfall. This can be seen from a proposal that was made in 1599 to shift the government from Bijapur due to 'inadequate water supply in the dry season' despite the availability of widespread network of the *karez* aqueducts. The city declined hastily after it was devastated by two severe famines in 1718 and 1818-19.³⁷

Scholars have attributed the deterioration of medieval cities to their rising numbers as these were part of the process of blind urbanisation, emergence of many capital cities and several urban centres with ever increasing sizes, and the consequent ecological disturbance that ensued. For instance, the Delhi sultan Firoz Shah Tughlaq himself monitored the construction of countless manufacturing hubs, and over thirty towns which included Firozabad, that spread over an area of about 600 hectares. The city of Kailughari was erected by Jalaluddin Khilji after a huge mass of land was denuded of its vegetation and natural habitats of wildlife. Shahjahanabad under the Mughals too consisted of a completely walled area built on approximately 610 hectares of forested land which was cleared of forests and trees to make way for the settled population. In fact, cleared forested lands were increasing from the time of Delhi Sultanate itself³⁸ as trees were rapidly fell to obtain firewood and timber for umpteen construction sites.

Large and continuous supply of paper into the Mughal empire came from Sialkot, Lahore and Daulatabad³⁹ due to the Mughal obsession with writing and painting, thereby, necessitating the cutting down of more trees in these areas. Besides, locally available quartzite and good quality local building stones were used in the construction of many cities like Tughlaqabad, Fatehpur Sikri, Agra and Delhi. Opening of stone quarries and mining of minerals further reduced the green cover in the surrounding areas. All this caused disturbance in the hydrological cycle and an increment in the rapidity of climate change which resulted in low water retention capacity of the soil, increased temperatures, and higher rates of evaporation of ground water. Due to the widespread aridity, Babur complained in *Baburnama* about the 'oppressive weather of Agra' which he encountered after the Battle of Panipat -- "*We were oppressed by three things in Hindustan: first by its heat, then by its strong wind and also by its dust.*"⁴⁰ Digby highlights the reduction in supply of elephants in North India caused 'by settlement and cultivation between the early eleventh and the thirteenth centuries'.⁴¹ Lands in the East in regions like Gorakhpur were covered with 'thick belt of forests' till the sixteenth century. However, by 1780 a map of Gorakhpur prepared by British colonial officers for East India showed no

³⁵ Like Vastu Shastra and *araghatt*, precursor of the Persian wheel.

³⁶ Evident from *char-baghs*, which were a combination of 'Islamic urban design concepts' and 'the traditional Indian system of town planning'. *Ibid. The Lodi Gardens, commissioned to Ala-ud-din Alam Shah by the Lodis in 1444, comprised of char-baghs, fountains, ponds, tombs and mosques spread over an area of around 90 acres.*

³⁷ *Ibid.*

³⁸ During the reign of Sultan Muhammad bin Tughlaq, peasants were, in fact, rewarded for clearing forests in order to expand cultivation and settled agriculture. Swami, Vandana. 2003. "Environmental History and British Colonialism in India: A Prime Political Agenda." *CR: The New Centennial Review* 3 (3): 113–30. <https://doi.org/10.1353/ncr.2004.0011>.

³⁹ Divyabhanusinh. 2006. "*The Great Mughals Go Hunting Lions*". In *Environmental Issues in India: A Reader*, edited by Mahesh Rangarajan, 49–70. Delhi: Pearson Education.

⁴⁰ Stephen Frederic Dale. 2004. *The Garden of the Eight Paradises : Bābur and the Culture of Empire in Central Asia, Afghanistan and India (1483-1530)*. Leiden ; Boston: Brill.

⁴¹ This hypothesis — though supported by the records of small number of elephants captured during the *Ghaznavid* conquests in the North — stands contested if we take into account the detailed records of the capture of elephants from the early sixteenth century. Digby, Simon. 2004.

vegetation cover for the area⁴² presumably due to its rapid reclamation for cultivation and urbanisation under the name of Muazzamabad during Aurangzeb's reign.⁴³

Royal *hunting* proved to be another menace for the wildlife population inhabiting the forests of Hindustan. Jahangir, in his reign of twelve years, killed over 17,000 animals including *nilgais*, tigers, lions, gazelles and antelopes.⁴⁴ In one incident, Akbar hunted several *chital*, *nilgai*, hare, hyena, jackal, and blackbuck during a five-day hunt in 1567. Francois Bernier observes that the vast uncultivated land 'in the neighbourhood of Agra and Delhi, along the course of the *Gemna* (Yamuna)' was strictly guarded. Ironically, the area was '*protected*' by Mughals lest their game might be killed by other hunters. Many of the favourable hunting grounds of the Mughals listed by Irfan Habib — Rupbas and Bari near Agra, Bhatinda and Sunam in the Punjab, and Jodhpur and Merta in Rajasthan — were grasslands populated by lions, favourite game of the Emperors.⁴⁵ The *Jahangirnama* records an incident of a lion causing nuisance on the road linking Panipat and Karnal, where the Emperor was able to 'eliminate the evil... by God's grace'.⁴⁶ In another incident witnessed by Bernier, a lion escaped the gun of Aurangzeb and the entire army had to be deployed in search of the escaped beast. The lion's escape was considered a bad omen, while the emperor's success in killing the lion was seen as a benignant act.⁴⁷ This means that the inability to discipline the environment was considered ominous, hence, ossifying the belief that Emperors tended to establish a hegemony over the nature. Furthermore, forests were perceived as hiding places of robbers, rebels and fugitives, as well as homes of witchcraft responsible for the illnesses and injuries they frequently wreaked. A common solution to these problems was their decimation. John Fryer in 1675 witnessed a 'forest set on fire' by warring Mughal armies in Konkan to punish the country folk running from enslavement.⁴⁸

During the long marches of their campaigns, Mughal armies were always accompanied by 'woodcutters and pioneers' who were entrusted with the responsibility of 'clearing forests and levelling the ground to facilitate easy troop movement'. Manucci,⁴⁹ who marched extensively with the armies of Aurangzeb, mentions that in one such campaign "[T]here marched close to the baggage one thousand labourers, with axes, mattocks, spades, and pickaxes to clear any difficult passage" and make wide roads for the troops. Roads were ordered to be dotted with *sarays* (rest houses) and wells were dug at regular intervals to promote settlement in desolate areas.⁵⁰ In the conquests of riverine areas of the East and the Punjab Plains in the west, such contingents comprising of skilled craftsmen were instructed to make bridges and ships with the timber truncated from the site. *Tarikh-i- Aasham*, written by Talish, narrates how Mir Jumla, the

⁴² Irfan Habib, in '*An Atlas of the Mughal Empire*' refers to the extensive growth of *kans* grass and bamboo forests in the area.

⁴³ Bhargava, Meena. "Forests, People and State: Continuities and Changes." *Economic and Political Weekly* 37, no. 43 (2002): 4440–46. <http://www.jstor.org/stable/4412780>.

⁴⁴ Sharma et al. 2019. "Medieval (Islamic) Cities in India (1206–1764)".

⁴⁵ Habib, Irfan. 1982. *An Atlas of the Mughal Empire*. [Aligarh, India] : Centre of Advanced Study in History, Aligarh Muslim University ; Delhi [India] : Oxford University Press.

⁴⁶ Jahangir, Emperor Of Hindustan, and Thackston, Wheeler M. 1999. *The Jahangirnama : Memoirs of Jahangir, Emperor of India*. New York, NY: Oxford University Press.

⁴⁷ Divyabhanusinh. 2006. "*The Great Mughals Go Hunting Lions*". In *Environmental Issues in India: A Reader*, edited by Mahesh Rangarajan, 49–70. Delhi: Pearson Education.

⁴⁸ Sumit Guha. 1999. *Environment and Ethnicity in India, 1200-1991*. New York: Cambridge University Press.

⁴⁹ Manucci was a seventeenth century Venetian writer, doctor and traveller. He marched extensively with the armies of Aurangzeb in campaigns across the Mughal Empire.

⁵⁰ Orders like these can be found in Jahangir's *Dustūr ul-Amal* (rules of conduct), which was 'quite explicit about the care that Mughal officials were expected to devote to the upkeep and improvement of roads'. Sharma et al. 2019. "Medieval (Islamic) Cities in India (1206–1764)".

commander of conquests in the East, 'supervised the fight against nature himself' as workmen and soldiers were instructed to chop down dense forests.⁵¹ However, the nature, at times, also proved to be a dominant force in attenuating the expansionist campaigns, particularly in the Himalayan regions of North and the mountainous North-West. The inability of the warring state in coping with the mountainous terrain, steep roads and harshly cold climate is conspicuous from accounts of contemporaries. Abul Fazl states that the army was 'exceedingly harassed by the severe cold, the dearness of provisions, the difficult roads and the rain and snow' in Kashmir (1586), and even after the conquest of Srinagar, Mughal commanders were reluctant to continue the campaign.⁵² The military endeavours in Balkh Badakhshan, a region of the *Uzbeks*⁵³ that lay north of the Mughal province of Kabul, have been plausibly accepted by historians as 'one of the most spectacular military disasters in Mughal history'. Dotted with broken hills, rugged terrain and arid land, the Balkh-Badakhshan region posed challenges before the army of Shah Jahan in the form of heavy snowfall and steep, narrow passes. Despite several losses of men and war-animals to the warring Uzbeks and slim roads, the Mughals were able to occupy Balkh in 1646. However, the unbearable climate forced the army, now adapted to the climate of the mainland, to crawl back to Kabul, therefore, resulting in the loss of imperial valuable treasures, life and property⁵⁴, and their prestige along the way.

CONCLUSION

The entire discussion reveals the *ambivalent* attitude of the Medieval Indian rulers towards the environment. The military expansions that were marked with adaptive campaigning throughout Hindustan and the cities which characterised medieval urban planning, also environmental conservation techniques of water harvesting, not only failed but in many cases had a heavy toll on the environment. The population of lion, an animal depicted in the Mughal royal standard ironically with a rising sun, and other animals like nilgai, chital, deer, wild ass, tigers and many birds declined rapidly due to hunting, clearing of forests and destruction of natural habitats.⁵⁵ Hence, a picture of the regime of the medieval Sultans and the Mughals clearly shows a dichotomy in their responses to the environment of Hindustan. Conclusively, the sultanate and the Mughal imperial rule in medieval India is an epitome of disconnect with the nature in the guise of a connect and reconnect with environment.

⁵¹ *Ibid.*

⁵² Pratyay Nath. 2019. *Climate of Conquest : War, Environment, and Empire in Mughal North India*. New Delhi, India: Oxford University Press.

⁵³ The Uzbeks deployed 'steppe nomadic cavalry tactics that revolved around archery and enveloping tactics' against Mughal forces of Shah Jahan (1646-47). This form of evasive strategy that utilized the mountainous terrain was used by Babur when he entered the Indian subcontinent. By this time, the Mughals had adapted to military tactics of the plains of the North, characterized by charges of 'heavy cavalry, war-elephants, and matchlock-men', which ultimately failed.

⁵⁴ Inayat Khan, the chronicler who authored *Shahjahan-nama*, writes that during its return, the Mughal army was stuck in the *Tang Shahr* pass, where it had to spend one night. Owing to the severe cold and incessant snowfall, 'around 5,000 men and another 5,000 animals perished that night'. *Ibid.*

⁵⁵ Interestingly, the accounts of *Tuzuk-i Jahangiri* on the detailed observations of birds and animals from Jahangir's menagerie, were either based on the fauna that was captivated or was hunted.

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