

The Taking and Making of a Forest —Socio-Ecological Transformations of the Aravalli Hills, India

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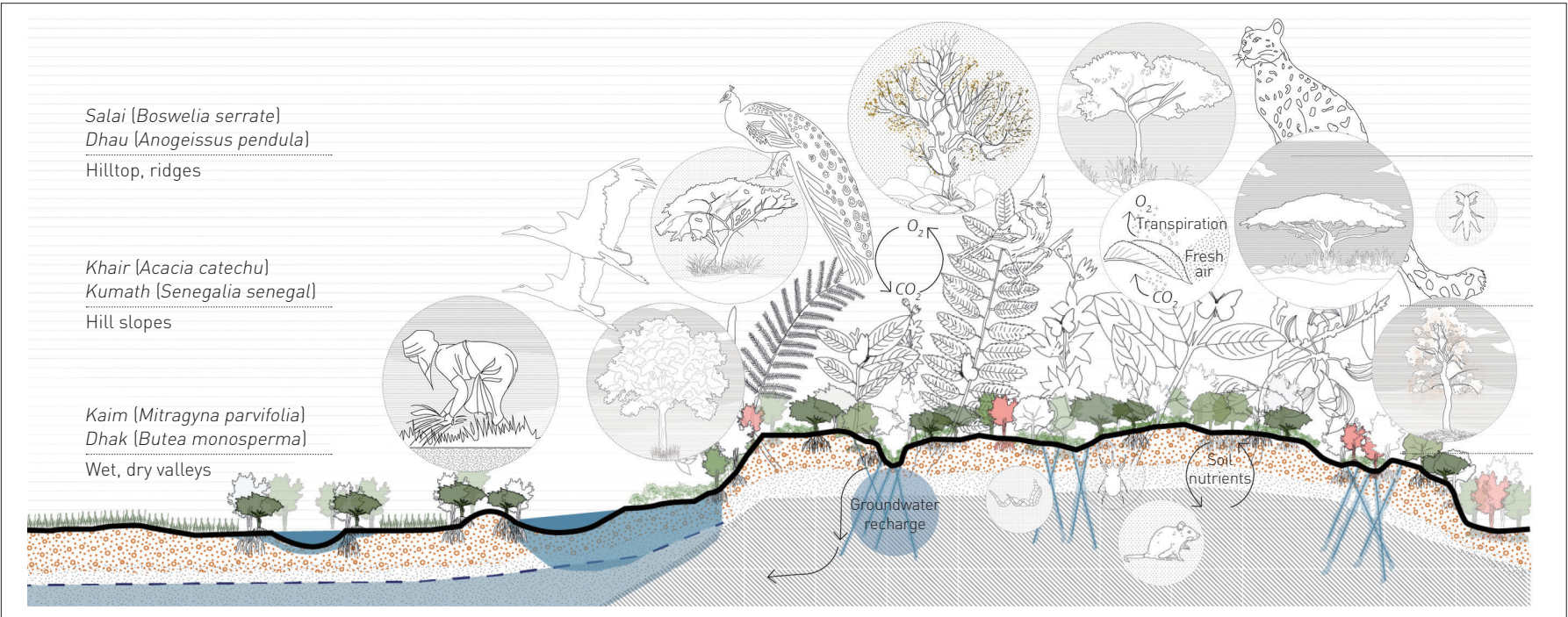
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GRAPHICAL ABSTRACT



HIGHLIGHTS

- The case study of Aravalli Hills reveals how layered histories continually transform nature/culture relations
- “Wastelands,” a (post)colonial/economic land use category, undermines all meanings of forests
- Indigenous terms and local knowledge reveal the heterogeneous, adaptable, and fluid natures of landscape
- Community forests “enclosure” transforms inhabited and active into observed and passive landscapes

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India

The paper argues that “wasteland” as a colonial land-use classification of India’s Aravalli Hills and its forest system in peri-urban Delhi and Gurgaon dilutes their socio-ecological contributions to the regional landscape. Over time, the land-use designation has become a means to convert “wastelands” to ecologically insensitive “productive” use. The paper critically describes successive socio-ecological transformations of the Aravalli Hills with respect to colonial and post-independence land management policies and various episodes of socio-environmental transformations, with a focus on its forests. The research applies learnings from various disciplines towards understanding urban environments and engages

the lenses of landscape and urban planning, as well as social and environmental sciences. The paper contributes to building knowledge and recognition of the socio-ecological values of forest “wastelands” in India and broadens the discussion on their future within a transforming urban landscape. The case study provides invaluable lessons for other contexts where the natural resources, particularly forests, are threatened by development.

EDITED BY Tina TIAN, Yuting GAO

1 Forests as “Wastelands”?

Fortunately, in recent decades, forests have been high on the global agenda regarding broader environmental concerns. By now it has become common knowledge that forests mitigate global warming, protect water sources, host rich biodiversity, and contribute to economies. Much less well touted are facts revolving around their links to local, particularly rural, livelihoods and their importance in socio-cultural beliefs and practices^{[1][2]}. There is an array of metrics that have been developed to promote re-forestation and afforestation^{[3]~[6]}. Yet, at the same time, according to the UN FAO, net forest loss (deforestation plus any gains in forest over a given period) over the decade since 2010, was 4.7 million hm² per year. Deforestation rates were significantly higher: 10 million hm² of forest was cut down each year^[7]. The transformation of forests into agricultural land and urban uses, including parks and recreational forests, dramatically undermines the necessity of forests for humans and non-humans. In the world’s most rapidly modernizing and urbanizing regions, the loss of forests is particularly alarming.

The research builds on “ecologies of urbanism” analytics as proposed by Anne Rademacher and Kalyanakrishnan Sivaramakrishnan^[8], which emphasizes the plurality of urban nature and analyses overlapping biophysical and social processes for a comprehensive understanding^[9]. To understand the evolution of theories on nature-society relations, the approach draws from the

analytical frames as discussed in the works of Erik Swyngedouw’s emphasis on the socio-ecological processes in city transformation^[10], James Collins’ underscoring the importance of a multidisciplinary approach to study urban ecosystems^[11], Matthew Gandy’s political ecological approach to understand urban nature^[12], and Bruce Braun’s focus on the non-human dimension of urban geographies^[13].

The focus on one case study, the Aravalli Hills in the outskirts of India’s capital city will reveal the complex histories of forests and their transformation. This case is representative of nature in urban systems, which are experiencing spatial transformations due to urbanization and competitive neo-liberal real estate markets. These transformations often include deforestation, “parkification,” landscape homogenization, and environmental gentrification, as extensively-documented in cities across North America, Europe, and Asia^{[14]~[17]}. The paper reflects on the historical, social, and biophysical processes which resulted in various patterns of landscape present in the Aravalli Hills. It is argued that a historically contextualized territorial transformation can give insights into evolving human and non-human relations and provide an opportunity to imagine an urban future through ecological restoration. The paper aims to build a recognition of the numerous socio-ecological values of these natural landscapes and to broaden the discussion on their future as new commons while widening the vocabulary of places of nature within the urban landscape. Without a doubt, there are lessons to be learned from its processes of deforestation and reforestation.

The research relies on the analysis of archival data, a review of the relevant literature, and observations from the fieldwork conducted in 2021 and 2022.

2 The Case of Aravalli Hills

In the semi-arid environment of the Delhi-Gurgaon region, the Yamuna River and Aravalli Hills are the most monumental and significant landscape elements. The Aravalli Hills are the oldest fold mountains in India, running a length of 670 km, through four states, including the Delhi-Gurgaon region^[18]. Delhi is a historical and present capital and a megacity with a population of 16.78 million^[19]. Gurgaon represents one of the many new Neo-liberal era cities of India, driven by the information technology boom. In recent decades, it grew from an agricultural village to an assemblage of high-rise towers and residential enclaves. A great socio-economic and cultural dichotomy exists in its urban-rural patchwork development, which was an agro-pastoral landscape only a few decades ago. Its giant construction escalation is due to its proximity to Delhi (approximately 30 km) and land laws facilitating land acquisition and radical landscape transformation^[20]. Along the newly developed patchwork of high-rise towers and agricultural fields stands the Aravalli Hills—a crucial geological feature in India’s northwest terrain regarding their contribution to climatic conditions of the region.

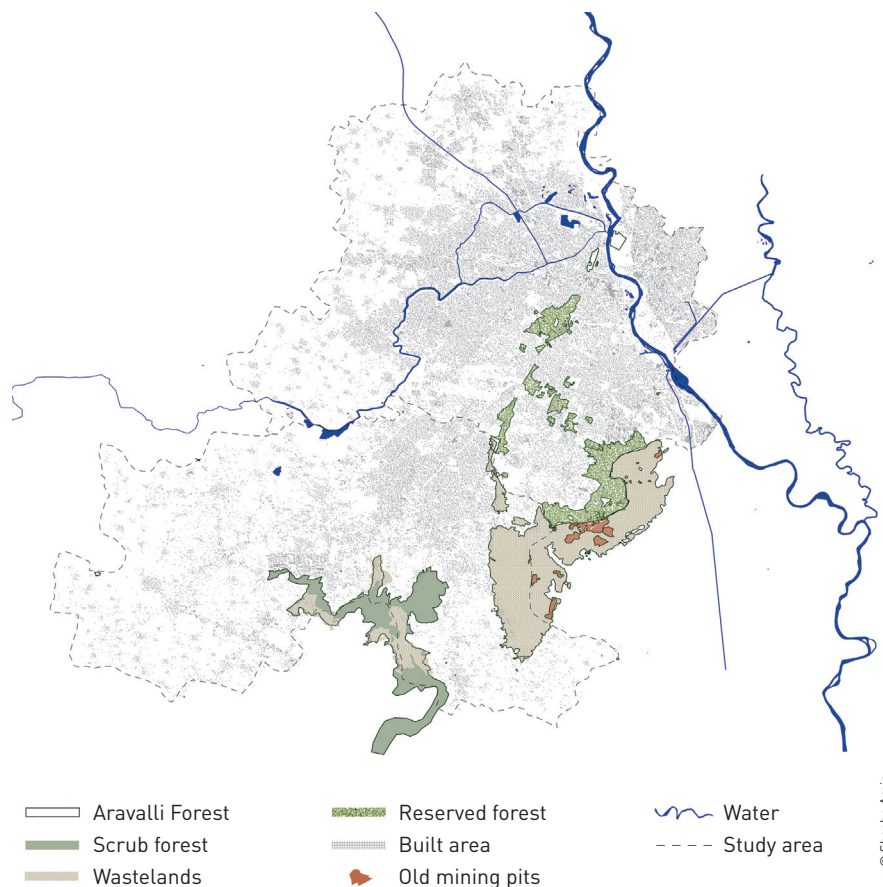
The hills have a tropical dry forest with subcategories of thorny and dry-deciduous forests^[21], also defined as “monsoon forests”^[22]. Once a continuous landscape^[23], it has been fragmented by urban growth and restructuring over time. The forest terrain is rocky, with steep slopes and low-nutrient soil, resulting in drought-tolerant vegetation with a lighter upper canopy, deep root system, and stunted growth. The terrain’s three-tier structure includes ridges and steep slopes, gentle slopes, and valleys, with *Dhau* (*Anogeissus pendula*) as its keystone species^[22]. As observed on the field, the trees are leafless in the summer, rendering the landscape in shades of brown, which turns into lush green when the trees begin to leaf at the onset of the monsoon, a time when the region receives almost 90% of its rainfall. A few parts of the hills have seasonal streams and a high moisture content which support evergreen species. There are other parts with sandy soil and sparse vegetation of grasses and shrubs^[24]. A diversity of wildlife is present in the forest, including mammals, avifauna, and amphibians. The forest is also part of a leopard corridor that stretches through the four Aravalli states^[25]. The rainfall run-off from the hills is harvested behind constructed embankments called *bandh* and ponds called

johad. The hills have rich mineral reserves and strongly layered rock geology, leading to their exploitation by legal and illegal mining of limestone and sandstone. Presently, the forest itself, at least on paper, is regulated through various designations and land use classifications assigned by the state, including regional parks, wildlife sanctuary, biodiversity parks and wastelands^[26].

During colonial and post-independent urban development periods, the classification of the hills in Delhi evolved from wastelands to “reserved forests”^[24]. However, the hills in Gurgaon remain classified as “wastelands.” These wastelands with rich biodiversity are also village common lands, where local communities continue to derive their sustenance. Their classification as wasteland allows the usurping of the village common lands and turning them into urban infrastructure such as water treatment plants, waste collection points, and roads.

Meanwhile, the history of the hills sustaining human life can be traced back to the Stone Age^[27]. The quartzite stones from the hills were used for making Paleolithic tools^[27]. In the Neolithic Age, the domestication of animals gave way to pastoralism, making the semi-arid and rocky landscapes of the Aravalli important grazing lands^[27]. Early Hindu rulers established kingdoms on the hills around the 8th century, taking advantage of the high elevation for security and using hill stones for constructing fortresses^[28]. A Sultanate period of Muslim rulers followed. Four of Delhi’s seven historical cities were established on the Aravalli Hills, including “Lal Kot” and “Qila Rai Pithora” by Tomar and Chauhan Rajputs, “Siri” from the Khilji Dynasty, and “Tughlakabad” from the Slave Dynasty^[27]. Though water scarcity was a prominent issue for the historical cities, the strategic high elevation (for defensive purposes) and availability of stone attracted rulers. Later, for the Muslim rulers, the banks of the Yamuna River were the preferred sites for city building, and the status of the hills was diminished—they became a hinterland^[29]. In 1803, under British rule, the Delhi Division (including the Gurgaon District) was annexed to the northwest province^[30]. Historically, the non-luxuriant scrub forest of the hills largely remained unappreciated due to constant comparison to the curated Persian and English gardens by the Mughal and British rulers.

This paper argues that the colonial and contemporary land use classification of a significant part of the hills as “wasteland” (Fig. 1) is insufficient to reflect the socio-ecological qualities of the hill’s heterogeneous landscapes. While inciting notions of emptiness, the classification of “waste” obscures the layered land uses and the land users of such commons. It has further become a tool for the governing authorities to claim ownership of the common lands of villages; subsequently, the community is



1. Various land use classifications of the hills in Delhi-Gurgaon region as assigned by governing agencies (Data source: Land Use Land cover database 2016; Wasteland Atlas of India-2019, National Remote Sensing Centre, India).

excluded, while various extractive methods like illegal mining and deforestation negatively impact the region's socio-ecology.

3 Common Lands Beyond Homogeneity of Classification as “Waste”

The conception of “wastelands” in India is intertwined with the alienation of people from their common lands and the invalidation of the local land use terminology. During the colonization of India (1858 to 1947), the British idealized the productive, utilitarian, and aesthetic landscape. John Locke's ideology of devaluing uncultivated land as waste, in need to be improved through human labor, remained influential in guiding property laws and revenue policies in India and other British colonies.^[31] The uncultivated landscape and common lands which could not be taxed were seen as “wild,” “waste,” and “barren”^[32]. Wastelands were also perceived as where harboring criminals and social outcasts, reflected in the Criminal Tribes Act of 1871, which labelled the entire pastoral communities

of the hills as criminals^[33]. The colonial classification of common lands as “waste” obscured the existing multi-formities of land uses and, eventually, the land users. As scholar Vittoria Di Palma has extensively studied^[34], the category of “waste” reinforces the interpretation of a barren, degraded, and lifeless landscape needing “productive” management. It perpetuates negative connotations of landscapes as being devoid of human and non-human life. Colonial classifications were based on simplification and homogenization, which contrasted with the local vocabulary that reflected the heterogeneity, distinctness, and histories of each place^[35]. The local terms symbolize living practices and social relations^[36]. The common lands in villages of the Delhi region were collectively defined as *shamilat-deh* (common lands) and comprised of *banjar kadim* (cultivable fallow), *ghair-mumkin* (uncultivable fallow), and *gora-deh* (lands around the settlement) based on uses. These lands were reserved for village cattle grazing as well as transhumance. However, *banjar kadim* was sometimes cultivated to mitigate climate uncertainties and natural risks^[37] and was turned into *banjar jadid* (new fallow). The local terms reflected a degree of fluidity and diversity of usage in contrast to the rigidity of colonial classification. The thorny scrub forest disregarded as wasteland by colonial authorities was extensively used by the villagers of both agricultural and pastoral communities. In the initial years of land settlement, forests were regarded as an obstruction to progress, and the focus was on the extension of agriculture by forest removal^[38]. The uncultivable nature of the Aravalli Hills initially kept them away from major colonial interventions. However, the extension of Indian railways and the transfer of capital to Delhi proved to be the turning points in their socio-ecological transformation.

The colonial category of “waste” found its way into the land policy discourse and practice of Independent India. A national wasteland development board was established to convert wasteland into more “productive” and “valuable” uses through evolving policy goals like food security, energy security, and the reduction of land degradation^[39]. Classification approaches to define wastelands continue to ignore the people who occupy these lands and how they use them. Continuous ignorance of the human dimension of wastelands has further resulted in the loss of traditional knowledge and practices associated with managing these commons^[39].

4 Aravalli Hills as Common Lands—Late 18th and Early 19th Century

The late 18th and early 19th-century landscape of Delhi-Gurgaon was an assemblage of varied land uses, collectively managed by

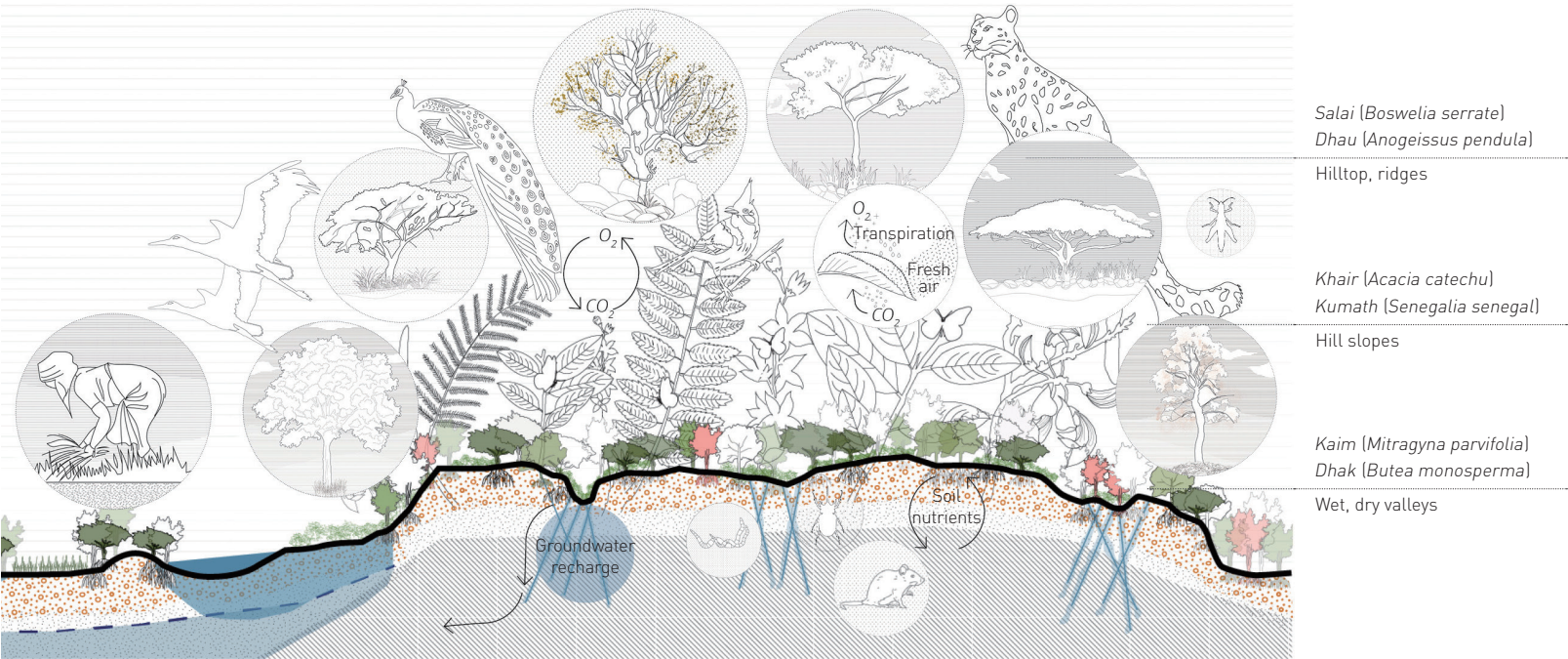


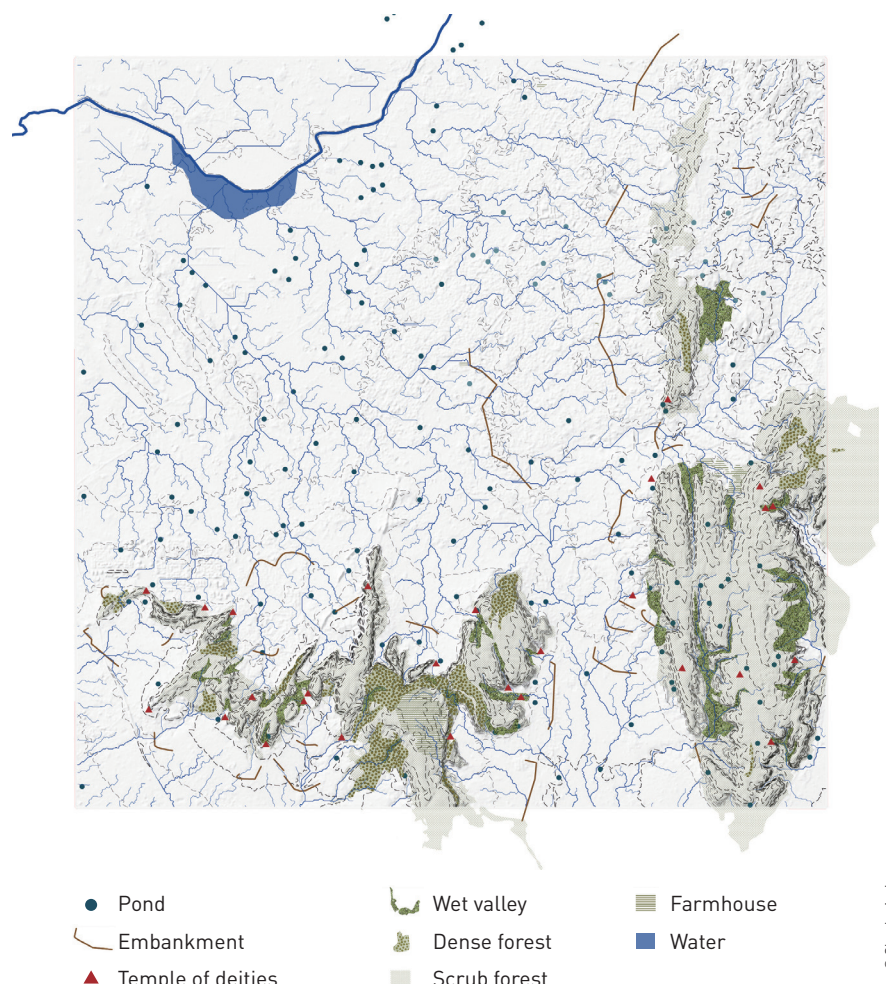
2. View of Mangar *Bani*, a sacred/natural forest in Mangar Village, the white temple shrine is emerging from the dense canopy of trees.
3. The ecology of the Aravalli Forest with feedback loops of local flora and fauna and underground water movement through fissured hills.

communities^[37]. The rocky grounds and low-nutrient soil of the hills were less suitable for agriculture and were appropriated as grazing lands by nomadic and settled pastoral communities, including the *Gujjar* and *Meo* ethnic groups. The pastoral landscape, adjoining cultivated regions and community forests, was part and parcel of a socio-ecological balance that worked as an interdependent resilience system that mitigated natural hazards like drought^[35]. In the dry regions of Delhi and Gurgaon, due to less productive soil and water scarcity, agriculture was risky and had uncertain returns. Over time, the conditions led to the development of an agro-pastoral

system, where agriculturists and pastoralists became mutually dependent on a flexible and risk-sharing system of natural resource use. The pastoralists followed the agricultural cycle, where once the crops were harvested, cattle could graze without restrictions on their fields. The collective system of fallow fields and hills provided a large territory of grazing lands for goats and cattle^[35]. The hills were commonly held and managed through an intricate system of customary laws and social institutions.

Local communities derived their sustenance from the hills and forests. As per the spiritual beliefs of locals, the natural resources of the forests are blessings from the forest deities. The deities are further associated with protection from disasters and shelter for several non-human species. The local communities attach spiritual and cultural values to these forests and take responsibility for conserving these natural environments by declaring parts of them as “sacred forests.” These forests are referred to by multiple names in various regions of the Aravalli, like *Bani*, *Rikhiyas*, *Devbani*, *Orans*, and *Kenkari*. In the Delhi hinterlands, the sacred forests are referred to as *Bani* derived from the Sanskrit word “Van” meaning forest (Fig. 2). The *Bani* is associated with protecting a watershed and is located near a spring or aquifer. The presence of water is associated with purity and the practice of cleansing before praying^[40]. The sacred forests have minimal human intrusion and restricted grazing, which leads to the presence of rich biodiversity of flora and fauna (Fig. 3). The system of sacred forests helped maintain ecosystem equilibrium. The Gazetteer of Gurgaon





4. The socio-ecological system of the Aravalli Forest, showing stream network analysis juxtaposed with temple locations and traditional water infrastructures, including ponds and embankments in the study area.

District^[41] mentions *Dhau* as the “special tree of the hills” along with other species like *Karil* (*Capparis aphylla*), *Raunjh* (*Prosopis spicigera*), *Khair* (*Acacia catechu*), and *Dhok* (*Butea Frondosa*). Archival documents like the Gazetteers of Delhi^[30] and Gurgaon^[41] further mention abundant wildlife, including leopards (*Panthera pardus*), blue bull antelopes (*Boselaphus tragocamelus*), black buck (*Antelope cervicapra*), chinkara (*Gazella bennettii*), snakes, wolves (*Canis lupus*), and jackals (*Canis aureus*), in and around the hills. Communities survived on the wild grains, millets, seeds, and fruits from the drought-resistance flora of the forests during famines (like those recorded in 1860, 1868, and 1878); these foods continue to be part of local cuisine. *Bani*, the sacred forests, continue to exist in the Aravalli Hills, with local communities practicing the age-old landscape conservation and management traditions. The sacred forests and their ecologies function in relation to and are embedded in the surrounding landscape. The presence of other forests, grazing

areas, and agricultural lands is also important for the resilience of the sacred forests and provides habitats and movement corridors for non-human species^[42].

Community commons including natural and human-created resources like ponds, wells, and fallow lands for grazing and sacred forests, along with settlement areas, are all part of an integrated and resilient village system (Fig. 4). Communities hold deep relationships with the landscapes and have contributed to their preservation through local knowledge acquired over generations. The landscape of the hills was comprised of shared community customs and ideologies interpreted by various land use practices and terminologies.

For the Mughal rulers of Delhi, the forest differed significantly from the curated and designed landscapes of their Persian gardens. However, abundant wildlife in the hills, surrounding forests, and marshy lands provided plenty of opportunities for royal hunts^{[43][44]}. Before long, there was a networked system of leisure in the hills, marked by *Shikargah* (hunting lodges). Several royal ones were constructed on the hills, which sought nevertheless to maintain the “wild” nature of the hills. The insertion of the *Shikargah* modified the wilderness into a favorable and comfortable environment for the royals. While the hunt itself was a highly political act and display of dominance, the extensive landscape transformation to establish the *Shikargah* was also a way to reorder nature and impose political significance^[45].

5 Claiming and Appropriating the Hill Commons in the Colonial Period (1803 to 1947)

The transformation of the hills during the colonial period was marked by sequential events of land classification, taking over the commons, and arboriculture practices driven by an “ideology of improvement.” The land settlement of the Delhi Division by the British Revenue Office applied the binary classification of “cultivated” and “waste” to the heterogeneous landscapes of the region. The Aravalli Hills, which were once part of a multifunctional landscape, became fragmented into village common lands with private shares. Due to the absence of timber and other commercially usable species, the hills were classified as “uncultivable hills/uncultivable waste”^[46]. Although initially rendered worthless, the forest resources (vegetation fit for firewood and minerals) became valuable with the 1862 introduction of the railway^[47]. The hills could provide construction materials and fuel. Through new statutory reforms like the Wasteland Claim Act of 1863 and the Indian Forest Act of 1865, the forest was reclaimed, literally and



5. New Delhi during the early stages of construction: a view showing levelling operations in progress of preparing the site, circa 1910-1930.

figuratively, by the colonial administration. Local villagers were again excluded in the new appropriation of common lands, which were crucial for their livelihood. During the early 20th century, the hills were extensively mined to provide the construction materials for the new capital of British India (Fig. 5). A large part of the hills (around Delhi and beyond) was rendered barren, with continuous deforestation, mining, and grazing^[48].

The latter part of the 19th century saw the rise of parks and green open spaces for the health and recreation of the European population^[49]. The imposition of European social practices by the colonial administration and concerns for the public health of its military troops, officials, and civil population resulted in a demand for green open spaces in Delhi. The need was also influenced by medical health trends in nineteenth-century Britain, which laid a great emphasis on fresh air, access to sunlight and better sanitation facilities in its industrial cities^[50]. Due to its British influence, Delhi also witnessed a growing focus on the “improvement” of sanitary conditions, which had direct spatial implications on the city and its landscape. Over time, the British population moved away from the native city, which was considered unsanitary, towards the hinterlands to have better ventilation and access to large green spaces^[49]. There was a rise in the development of sports venues, like polo grounds and race courses and recreational areas like reserved forests and public gardens, considered essential for better physical and mental health^[51]. There were also commemorative structures from the First War of Independence (termed as “mutiny” in the colonial lexicon) like the Nicholson and Mutiny Memorial, the latter was built on the Aravalli Hills. All these spatial

interventions resulted in the deforestation of the hills and replanting with non-native, visually appealing trees^[52]. The increase in spatial interventions like creating sports grounds and gardens for leisure through public greens gave rise to a new cultural landscape largely reserved for local elites and Europeans.

During the colonial period, in the process of the physical transformation of the hills, the ecology and the native flora and fauna were significantly altered. In the latter part of the 19th century, an evergreen species was planted on the hills to provide a backdrop for the new British capital; it was also a great source of fuelwood and charcoal—the fast-growing, drought-tolerant invasive foreign plant species is called “vilayati kikar” (*Prosopis juliflora*), which was selected for afforestation due to its similarities to native plantations^[53]. It was introduced to the hill ridges by British forester William R. Mustoe, who was in charge of planting the new capital^[54]. In 1884, The Indian Forester magazine mentioned the arrival of *Prosopis juliflora* seeds from Jamaica and planted it at Saharanpur Botanical Gardens^[55]. The introduction of *Prosopis juliflora* led to a complete alteration of the indigenous forest. Although earlier attempts to plant many non-native species failed, *Prosopis juliflora* survived the harsh weather of the hills and grew with aggressive intensity and volume. Unlike the diverse native monsoon forests, the evergreen *Prosopis juliflora* forests lack the biome diversity and strong cultural associations for the local community^[56]. The plant has substantial negative implications in reducing the richness of native species under its canopy and increases the mortality of native species because of a significant amount of plant leaf litter^[57]. Leaves are shed and replaced throughout the year, reducing the undergrowth and soil nutrients^[58]. The evergreen nature of the species also leads to excessive groundwater extraction.

The main goals of afforestation efforts, executed at various moments during the colonial period, were to achieve scenic landscape, ecological conservation and cooling of the local climate^[52]. Grazing was prohibited in the new afforestation areas, leading to a growing conflict with villagers. During the British era, the forests lost entire species of several wild animals from hunting, including jackals, which were killed under order of the municipal commission of Delhi since their constant howling bothered the inhabitants of the Viceregal Estate^[59]. The absence of tree diversity also led to the disappearance and imbalance of other fauna. The British interventions created entirely new urban landscape morphologies through institutional changes, land use changes, and afforestation with the imposition of non-native species. The new landscapes were created through specific preferences and visions dominated by the discourse of imposition, nostalgia, and consumption.

6 Post-independence Hills—A Landscape of Enclosures (1947 to 2010)

Post-independence, village common lands, including categories of waste, came under the prevue of the village *panchayat* (elected village councils) according to the Punjab Village Common Lands Act of 1961. The act effectively dissolved the involvement and shared responsibility of local communities.^[60] In the early years of post-independence, Delhi saw a large influx of refugees, which increased the city's population. The city's industrial growth also added to this rise in population with a rural-to-urban migration of workers^[61]. Parts of the hills were acquired and developed as residential and institutional areas to accommodate the rising population. In a parallel process of conserving the hills, in 1980 and 1994, the remaining common lands and wastelands under Delhi's administration were converted to "notified forests" (under the Forest Act of 1927), covering an area of approximately 7,800 hm². However, the term "forest" in this context remains debatable since the wilderness has since been transformed into a more controlled and predefined landscape of "regional park" as defined in the Delhi Master Plan of 2001 and 2021 to provide "safe" and "green" environments for its rising urban population^{[62][63]}. This period was also marked by the beginning of the citizen protests of construction in the hills and the creation of parks; they demanded conservation. Citizen environmental groups were formed and comprised mainly urban residents. They engaged in activities like awareness campaigns through nature walks, bird watching, and lobbying for a policy change to "preserve" the natural habitat^[26]. This was also the beginning of the region's "preservation" discourse which advocated for an undisturbed nature as an antithesis of urban space by drawing boundaries and regulating access and land use practices.

In a negotiated outcome, the north and central parts of the forests in Delhi were developed as urban parks, while the southern part, a rehabilitated mining landscape, was turned into a network of so-called biodiversity parks and a wildlife sanctuary^[26]. Initially, the restoration of the wastelands and rejuvenation of the post-mining landscape was initiated through afforestation by various government agencies. The National Wastelands Development Board (NWDB) was established in 1985 under the Ministry of Environment and Forest to reclaim wastelands and bring them under productive use. The non-native and invasive *Prosopis juliflora*, with its quick growth, great canopy extent, and evergreen character, was once again selected to create the new forests (Fig. 6). Over time, the planned invasion by *Prosopis juliflora* resulted in the territorial-scale biotic homogenization^[64], where the species spread to agricultural and grazing lands beyond the forest. Afforestation of non-native and ecologically inappropriate species had negative implications on flora and fauna diversity^[65], hydrological flows, and the nutrient cycle, reducing the territory's overall resilience in terms of its resistance to diseases when compared to a diverse native forest.

As should be clear, the early afforestation efforts by the state have mainly focused on increasing the canopy density, which could then be used as statistical proof of increased forest cover. The increase in the green canopy has also been viewed as beneficial to combat the city's growing noise and air pollution^[66]. Mining was banned by the imposition of strict laws in Delhi in the 1980s, pushing the quarries beyond the administrative border to the peripheral hills in Gurgaon. Later, in 2004, the mining ban was extended to Gurgaon and the surrounding region. However, mining illegally continues to feed the construction industry and build the ever-growing megacity and its periphery^[67]. A 2017 survey by the



6. A post-mining view of hills, showing the vast extent of *Prosopis juliflora* in the Delhi-Gurgaon region.



7. A herd of goats grazing in the Aravalli Hills, in the background are cars of residents from Delhi-Gurgaon, visiting the hills for the weekend recreation.
 8. Mapping transformation of the hills through the three periods.

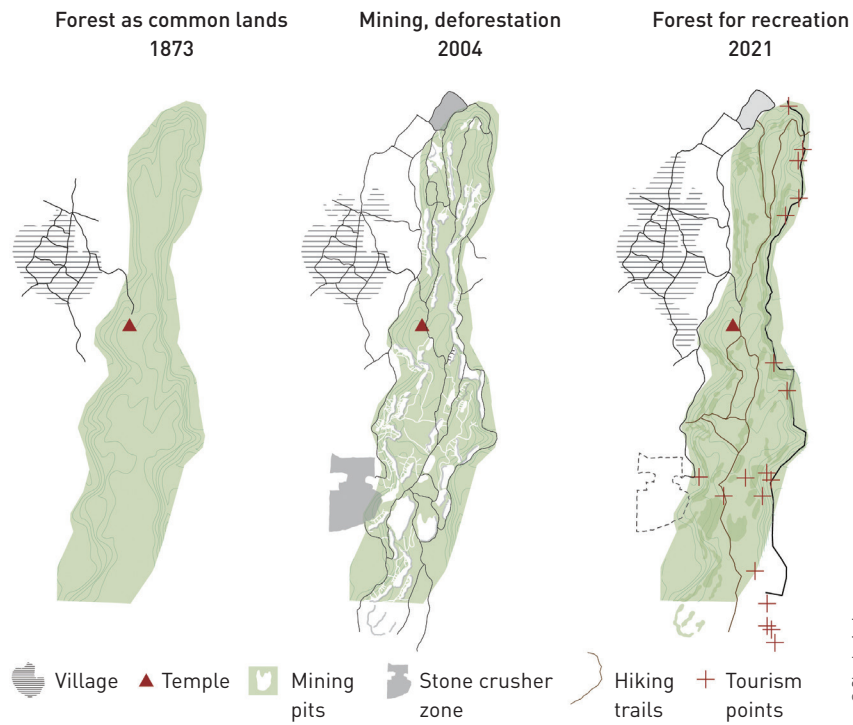
Wildlife Institute of India (WII)^[25] recorded 14 wildlife species, including the leopard, hyena, and golden Jackal, existing in Gurgaon and the surrounding Aravalli region of Haryana State. The Aravalli Hills is a crucial and last remaining habitat for the wildlife species of the region, frequently spotted and documented by several contemporary wildlife experts. A connected system of agricultural fields and forests in peri-urban areas of Delhi-Gurgaon provides a crucial ecosystem for the survival of various species^[68].

7 Contemporary Management Practices (2010 to 2022)

Today, the Aravalli Hills, and particularly its forests, continue to face excessive pressure with growing urbanization, as a large part of the hills lacks any legal protection. In the post-independent planning of Delhi, many forest areas were cleared to provide space for housing, institutions, urban recreation, mobility, and military infrastructure. In the case of Gurgaon, a city that incrementally grew through private development and without a comprehensive planning vision, the hills were largely ignored. They stood as isolated witnesses to the urban sprawl, which was slowly and steadily inching toward them. Yet, to date, the Aravalli Hills of rural Gurgaon largely remain as village common lands under the state government, despite the fact that their official land use classification remains “wasteland.” A substantial number of rural populations continue to derive their sustenance from the forest. Villagers, the urban poor, and families of agricultural laborers depend on the forests for fuelwood. As well, the pastoral communities of the

region and transhumant grazers continue to use these landscapes for grazing and water source (Fig. 7). *Bani* continue to exist mainly in the remaining common lands in the peri-urban and -rural areas of Delhi-Gurgaon. However, their sanctity has been compromised under the pressures of societal and urban transformations. *Bani* and associated religious shrines are mainly visited by villagers, while the parts of hills converted into parks are more popular with and frequently visited by urban residents.

Contemporary urban development in the hills is driven by catchphrases like biodiversity conservation, green corridors, and city forests, which reflects in a growing number of regional “biodiversity” parks. These environmental initiatives of the state and of “corporate environmentalists” support a narrative of the “preservation” and “enclosure”^[69] and continued resource accumulation where rural commons are diverted towards urban infrastructure, and a forest turns into an urban park. Compared with the historically open and connected landscape, a landscape of enclosures leads to fragmentation and discontinuity, which greatly impacts the movement of flora and fauna, eventually resulting in ecological imbalance. Growing urbanization around the Aravalli Hills and the urban elite citizens, also known as “bourgeois environmentalists”^[48], are transforming the forests into a “peri-urban park system” for the “safety,” health, and recreation of urban citizens. Today, the hills are traversed by a network of running trails, hiking routes, viewpoints, and “eco-cafes” for “weekend recreation” (Fig. 8). In a



recent development, the state has proposed approximately 40 km² of Aravalli’s village common lands to be converted into a “wildlife safari” to boost tourism and provide employment opportunities. The safari would include large, fenced enclosures for animals, many of which will be relocated from various zoos. Environmentalists are concerned about the scale of transformation and damage to the native flora and fauna that the project would invariably cause and are petitioning for a national park as the preferred option for wildlife conservation^[70]. Portraying the entire process as “development,” the discourse of emptiness is continued by ignoring the present ecologies and imposing an alien system. In the meantime, the land use transformation related to the rural to urban-oriented infrastructure has been a constant threat to the peri-urban landscape of the Delhi-Gurgaon region, compromising the fragile and crucial ecosystem. Contrasting social engagement of new urban and local rural communities with the hills creates contested and varied landscape morphologies of the hills.

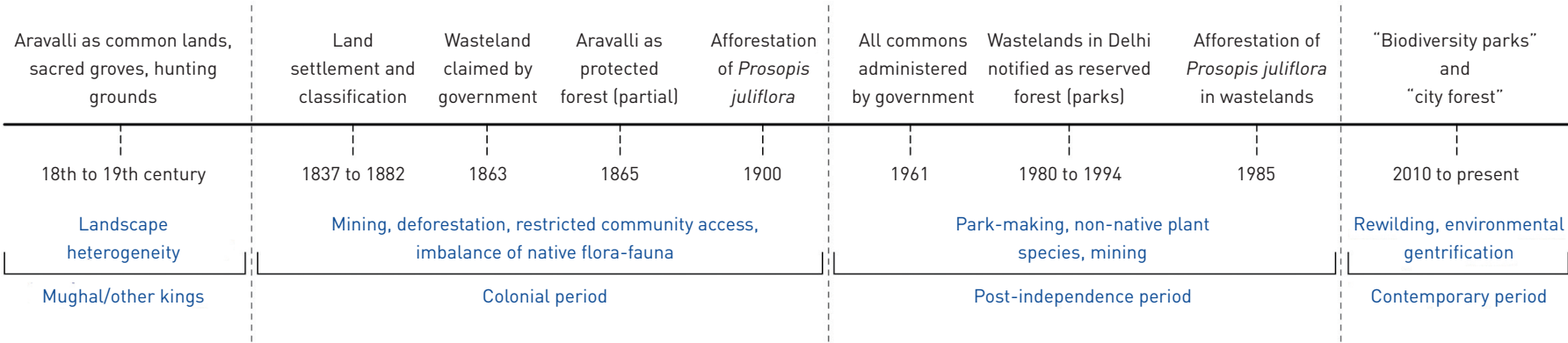
8 Lessons From the Taking and Making of a Forest

The evolution and intersection of the nature-society dynamics through various periods reveal forest appropriation moving from a sacred and functional landscape towards an aesthetically pleasing and consumable landscape (Fig. 9). The early period of coexistence of settlement and local practices with the landscape ecologies of the hills offers lessons for contemporary times. Community engagement and spiritual affinity with nature through common lands and sacred forests resulted in a socially constructed landscape embodied in a system of ecological equilibrium. However, the indigenous social practices began to decline with rigid colonial land use classification, strict state-led institutions, and the progressive enclosing of forests.

Post-independence environmental initiatives were unfortunately aligned with earlier colonial legacies of “preservation” through “enclosures.” Presently, neo-liberal global cities like Gurgaon are popularizing the notion of “bringing back nature” to push a politically-correct agenda of sustainability, livability and to obtain a high score with metrics such as the green city index^[71]. The rush to such benchmarking is reflected in the growing number of “biodiversity parks” and “city forests” in the study region. However, the policies, plans, and projects merely include a very specific kind of (managed and highly controlled) nature, with considerable human interference and a safe distance from wildlife, rendering the notion of “new wilderness” merely symbolic^[72]. An aesthetically pleasing and evergreen landscape continues to take preference over socio-ecological qualities. Enclosing the community forests and turning them into parks transforms inhabited and active landscapes into observed and passive landscapes. Unlike the indigenous community-inhabited and managed landscapes which are multifunctional and flexible, the new park landscapes do not have a critical relationship with either inhabitants or non-human species. For the urban residents of new cities like Gurgaon, the hills remain isolated from their everyday spatial, cultural, and material practices, leading to an ever-widening lack of social cohesion and environmental affinity. This results in a pervasive lack of knowledge concerning the management and conservation of the hills’ landscapes, ultimately impacting their resilience.

In the contemporary discourse of nature consumption, the prevalence of “waste” and “emptiness” has become strategic leverage for the State to enforce an agenda of planned and controlled spaces for a select few. This paper has attempted to build recognition of forest and hill ecologies which counters the notion of “wastelands.” It has been critical of rigid land use classification and

9. A timeline of significant events since pre-colonial periods illustrating the socio-ecological transformation of Aravalli Hills in Delhi-Gurgaon region.



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protocols, such as “reserved forests.” It suggests the discontinuation of viewing landscapes merely from the perspective of utilitarian simplification, as begun by the colonial state^[73], and as an antithesis to urban space and to instead understand them in relation to their socio-ecological importance embedded within larger regional landscape systems. The traditional vocabulary of the landscape and practices within it, still in use by local communities, was derived from the juxtaposition of ecological and socio-cultural values and incorporated spatial and temporal landscape changes. Indigenous terms reveal the heterogeneous, adaptable, and fluid nature of the territories, developed with extensive local knowledge of living with the landscape. Moreover, it must be acknowledged that local knowledge is living, dynamic, and constantly adapting to developmental changes.

In the contemporary era of cascading crises—environmental and societal among them, a renewed understanding of the nature-culture relationship of the past could contribute towards the adaptation of the commons. As Emilio F. Moran and Elinor Ostrom^[74] mention, the future of “wastelands” along with other common pool resources, demands reassessment of institutional frameworks to incorporate social-ecological knowledge and contribute towards a more adaptive and inclusive design and management. A socio-ecological approach is crucial for analyzing urban and environmental transformations and resulting urban nature morphologies that incorporate both human and non-human species.

The case of the Aravalli Hills utilized a lens of socio-ecological transformation to reflect on the reciprocal and integrated relationships between socio-cultural and biophysical patterns. The lessons gleaned from the case reveal that the layered synchronic and diachronic narratives of territory were, and often remain, contested. By recognizing local knowledge of the socio-ecological importance of the Aravalli Hills’ forested “wastelands,” the paper presents an opportunity to reflect on their possible futures. Beyond conservation enclosures and eco-parks, collaborative grounds or 21st century commons could be established as a link between scientific and local knowledge to achieve a renewed socio-ecological balance. The future of such places of neo-nature could be places of social cohesion, shared ideologies and cultural diversity, ecological sensitivity and adaptation. The paper invites researchers, experts, and managing authorities to develop a new vocabulary to counter the notion of forested “wastelands,” inspired by sensitivity, equity, and affinity to human and non-human ecologies.

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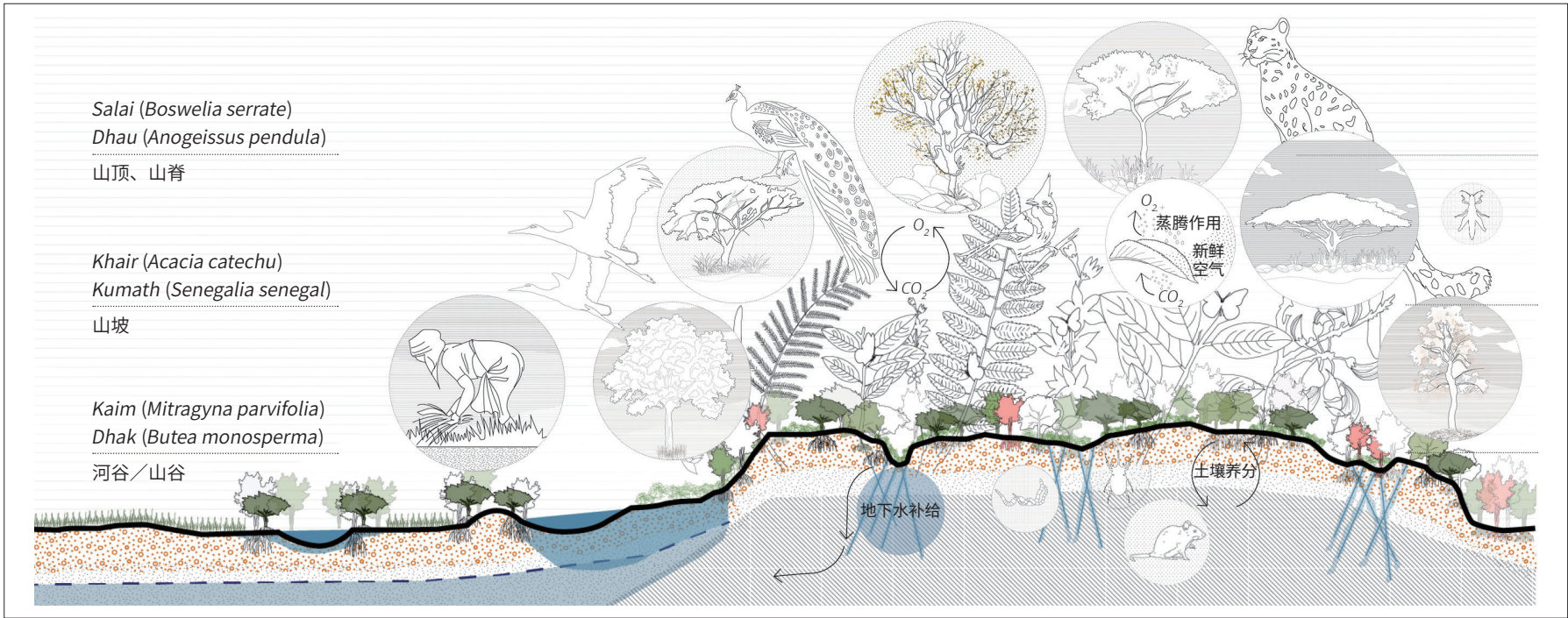
森林的掠取与保育——印度阿拉瓦利山的社会—生态变化

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图文摘要



摘要

本文认为，印度所沿袭的殖民时期土地利用分类系统——将阿拉瓦利山及其在德里和古尔冈近郊的森林系统划分为“荒地”的做法，贬损了森林对区域景观的社会—生态贡献。随着时间的推移，土地利用分类导致了“荒地”向生态敏感性较差的“生产性”用地的转化。本文批判性地回顾了阿拉瓦利山在殖民时期和独立后，在土地管理政策上持续的社会—生态转型，以及一系列与森林相关的社会—环境转型事件。研究基于景观和城市规划，以及社会科学和环境科学的视角，运用了不同学科的知识来解读城市环境。本文有助于提升人们对印度“荒地”森林的社会—生态价值的了解和认识，并激发我们讨论其在不断转型的城市景观中的未来可能性。印度阿拉瓦利山的案例研究将为其他同样因城市发展而受到威胁的自然资源——特别是森林——提供宝贵的经验。

文章亮点

- 阿拉瓦利山的案例研究揭示了当地自然 / 文化关系在不同历史时期下的持续演变
- 将森林归为“荒地”——（后）殖民主义 / 经济土地利用的一个类别——大大贬损了森林的价值与意义
- 当地土语和地方知识揭示了景观的异质性、适应性和流动性
- 社区森林的“封闭”将可栖居的、主动的景观转变为仅供观赏的、被动的景观

关键词

荒地；神圣森林；土地利用分类；社会—生态转型；公地；森林管理；德里—古尔冈；印度

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