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Taming the Female River: A Gendered Environmental History of the Chenab

Abstract

By situating it within the longstanding traditions of gendered and anthropomorphized understandings of rivers in South Asia, this article explores how local communities in Punjab viewed the River Chenab as a maada (female) river, owing to its fertility, fluidity, and unpredictable yet nurturing floods. Drawing on local and British archival sources, the article traces the heterogeneous and negotiated precolonial environmental relations around the Chenab. It explains how these were strained and altered under a colonial environmental transformation grounded in the ideas of productivity and hydraulic order. This article foregrounds the understudied role of river-training schemes in altering the Chenab's morphology and seasonal rhythms and argues that environmental transformation of the Chenab led to a symbolic shift: the river, once perceived as a fertile and unpredictable female force, was reshaped into a regulated, mechanical system under the paternalistic Punjab administration and colonial hydraulic regime.

***Keywords*:** Gendered ecological transformation, Colonial Hydrology, Environmental History, River Training, Punjab

INTRODUCTION

Why is the environment anthropomorphized? There are cultural and symbolic practices that imbue natural elements with human and predominantly gendered attributes. Such attributions have served to imagine nature as part of social structures for thousands of years. Several languages assign gender to natural phenomena based on a wide array of factors, ranging from the sound of the word to philosophical inspiration and gendered social structures. When complex meanings are assigned to anthropomorphized language about nature, they do not merely reflect abstract cultural concepts but also shape how communities perceive, use, and relate to their environments. Thus, anthropomorphizing of nature is deeply rooted in cultural epistemologies that link the environment to human social life. When applied to specific landscapes, such as Punjab, we can see how local communities used symbolic frameworks to visualize ecological features not only as sites of gendered meaning but also of spiritual significance and of socio-political negotiation. Specifically, considering the case of rivers in Punjab, in pre-colonial times, the environmental relationships among people, land, and rivers not only defined cultivation practices and settlement patterns but also informed the symbolic and cultural meanings attached to the rivers themselves. Such relationships have received scholarly attention in the literature on the environment in South Asia, which refers to the artistic and ecological character of South Asian rivers. This literature shows that fertility, fluidity, and emotional depth are associated with the feminine principle in environmental phenomena in local South Asian cultures and societies. The idea of sacred framing of rivers

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resonates with Vandana Shiva's (1989) ecofeminist interpretation of *Prakriti* as the creative female principle of nature, which defines the cycles of giving and renewal that underpin both ecological balance and social sustenance. Shiva particularly considers modern irrigation a masculinist and reductionist project in which nature is subdued, and communities living in harmony with the rivers are displaced. Amita Baviskar's (1995) *In the Belly of the River,* which looks at the River Narmada's representation as goddess for the larger Hindu community and mother for the local Adivasis that live along the river, brings forth a more nuanced understanding of the relationship between local communities and their environment and also looks at the interests, contradictions and conflicts that drive these interactions. Diana Eck (2012) in *India: A Sacred Geography*, traces the longstanding tradition of personifying rivers such as the Ganga and Yamuna as goddesses whose nurturing and purifying powers link geography with divinity.

Merchant's analysis of how early modern Europe transformed nature from an organic, often feminine presence into a mechanistic resource is also crucial for understanding colonial environmental thought in South Asia. In *The Death of Nature* (Merchant, 1980), she shows how metaphors of domination that are tied to the rise of scientific rationality and have gendered overtones have legitimized the control and subjugation of natural processes. It has been argued that the epistemic shifts in science similar to those Merchant identified were not confined to Europe; they were transferred through imperial structures to the colonies (Arnold, 1996; Prakash, 1999; Adas, 1989). In this sense, Merchant's framework helps us understand how the gendered, relational, and sacred meanings that were attached to rivers in South Asia came into tension with a Western worldview that saw the environment as an object of mastery and extraction. This understanding helps link works that specifically discuss colonial hydrology as a triumph of science in colonial Punjab.

Keeping this context in mind, we can compare the local, historically rooted understanding of rivers with studies of the colonial period, which reveal how the fluidity of local environmental relations was undermined by a colonial administration with a mechanistic, utilitarian view of nature. Gilmartin argues that British engineers and administrators viewed river waters as a resource that needed to be subjugated to extend state control through colonial science, and that this process encapsulated the struggle to achieve productivity against a wasteful nature (Gilmartin, 2015) . Flood control policies similarly sought to exclude natural processes via massive technological systems, a tendency which Weil argues aligns with the modern 'techno-chauvinism' (Weil, 2006). Weil's arguments of river training measures for the River Indus share many similarities with the discussion presented in this article and will be discussed in detail later. His argument about techno-chauvinism resonates with Vandana Shiva's understanding of how technology embodies a mindset that privileges domination, control, and abstraction over relational, ecological, and communal (and feminist) ways of knowing. Thus, while anthropomorphized and gendered understandings of rivers have long shaped local ecological practices and cultural imagination in South Asia, colonial interventions recast these fluid relationships through another gendered ethos based on mastery, productivity, and imperial progress. However, as Baviskar reminds us, alongside symbolic representations of nature in local communities, we should also look at the situated interests, conflicts, and negotiations that structure everyday interactions between

communities and their environments (Baviskar, 1995) . Thus, this article also looks at the precolonial relations around the river as complex and heterogeneous. In examining the gendered ecological transformation, this work explains how colonial hydraulic regimes did not simply manage water but also redefined the river's identity, agency, and relationship with riparian communities.

RESEARCH METHODOLOGY

Building on current literature, this article addresses the broader question of how hydrological changes introduced in the colonial period impacted the environment. By focusing on the River Chenab, it asks about the local environmental relations between the river and local communities. It explores how they changed under colonial interventions that prioritised fixity over fluidity. This is done by analysing the spatial, ideational, and environmental understanding of the River Chenab in local communities, and then comparing it with the shift in the river's understanding by the colonial engineers and administration. This comparative analysis helps us understand the impact of the hydraulic interventions introduced in the colonial period.

RESULTS & DISCUSSION

The article primarily relies on documentary sources. This includes Punjabi texts and translations of Sanskrit texts to understand local environmental vision and practices. Colonial-era records of local agricultural practices helped to make this argument. Colonial texts include reports and published works by revenue officials, engineers, and surveyors, as well as official correspondence viewed at the India Office Records at the British Library and the Punjab Archives in Lahore. These records provide detailed insights into the workings of the colonial government, its policies, and projects. Data from these local and colonial sources was triangulated with other sources and analysed using principles of historical criticism.

The Environmental Context

Water is the identity of Punjab. It not only defines its geography but also its society and the lives of its people. Besides the six major rivers, Indus, Jhelum, Chenab, Ravi, Sutlej, and Bias, their valleys are also traversed by several seasonal streams and torrents. These water bodies have nurtured the land for centuries, supporting agriculture for a population that learned to adapt to the flow of water that waded through the plains with a will of its own. All major rivers have meandering courses. Together, they form a river system that merges at various points. Finally, the waters of all these rivers are carried out of Punjab by the Indus, which drains into the Arabian Sea after crossing another five hundred miles through the province of Sindh in the South. Because of the shifting courses, the valleys between these rivers are overlaid with fertile silt, but the arid highlands away from the rivers are cultivable only with artificial irrigation. Riparian regions take advantage of floods and inundation canals as well as a high-water table, but are also subjected to river action. The rivers routinely swallow large swathes of land on one bank and throw up on the other, allowing for a fluidity in property that was characteristic of riparian villages in the pre-colonial period.

Chenab as the Female River

From ancient times, rivers in South Asia have been understood through feminine metaphors. *The Nadistuti hymn in the Rig Veda mentions the Sapta Sindhu, or seven rivers, which are grammatically feminine,* and invokes them for their sacred significance. Askini, the ancient name of the Chenab, is also praised in this hymn and later celebrated as a life-giving entity whose waters carry healing potential, just as the great river Sindhu, the oceans, and the mountains do. However, in ancient sacred texts, Askini is not considered a goddess like several other eastern rivers, including Saraswati and Ganges (Pandey, 1949; Rig Veda, 1896).

Chenab's later representation in historical literature continues to connect it closely with feminine metaphor and themes of love. There is a local saying, Chenab Ashiqan, Ravi Rashkan te Sindh Sadiqan, meaning Chenab is the river of lovers, Ravi the river of the sumptuous, and Sind of the truthful. There are several *Qissas* (folk romantic tales) associated with the Chenab valley, which it shares with the Ravi. The tale most closely linked with Chenab is that of Sohni, who drowned in it while crossing it on an earthen pot to meet her lover Mahiwal. In this epic tale, Chenab symbolizes the obstacles in the path of those who challenge societal norms, but its waters also liberate. Since the *Qissa* is a genre that brings together themes of earthly romance with divine love, the Chenab here is the river of life that separates the soul from God yet also serves as the medium for reunion. The river thus engulfs life and death for the people living on its banks (Shah, 2017) . Similarly, in Waris Shah's *Heer Ranjha*, the Chenab is more than a setting; in fact, it becomes a participant in human emotion, symbolizing endurance and liberation (Shah, 2006; Sayyid, 2003). Such mystic and symbolic understanding of rivers, particularly of the Chenab, is held across religious communities in Punjab.[1] The *Qissas* also link Chenab with female emotion and love, as all female protagonists, Sohni, Heer, and Sahiba, live on the banks of Chenab. In contrast, the male protagonists are not tied to the land or the river but are itinerant as traders, pastoralists,

[1] In recent times the symbolism of the rivers was particularly evident during the Muslim-Sikh riots when Punjab was portioned in 1947 to incorporate Muslim dominated Western part in Pakistan and Sikh dominated Eastern part in India. The famous poet Amrita Pritam, who hailed from Gujranwala which is a city on the banks of River Chenab, wrote how Chenab embodied destruction and hate that engulfed Punjab while addressing the famous Muslim sufi poet Waris Shah

Rise! O' narrator of the grieving;
rise! look at your Punjab
Today, fields are lined with corpses,
and blood fills the Chenab

Someone has mixed poison
in the five rivers' flow
Their deadly water is, now,
irrigating our lands galore
Amrita Pritam, *Aj Akahan Waris Shah Nu* [Today I ask Waris Shah].

or wanderers.[2] Geographically speaking, the Chenab is the second-longest river that flows through Punjab. Owing to soil quality and hydrological variation, the Chenab had long flowed in wide, shifting channels, its active bed spanning several miles during flood seasons. Its relationship with agricultural land changes with its course. It originates as a mountain stream and combines with various streams in Kashmir until it enters Punjab, cutting through the massive alluvial plains, allowing drainage to spread over several hundred meters at times, creating channels that isolate considerable tracts as islands. Even in its upper reaches in the Punjab plains near Wazirabad, the river can swell to as much as 5 kilometres, with a main channel depth of up to 15 metres during the flood season. Its floods are sandy in this region, although the course is relatively well defined until Chiniot. It becomes more tumultuous as the River Jhelum drains into it at Trimmu, after which it spreads like a fan. As it comes into contact with the saline soil of Jhang, it creates patches of infertile soil which the British found particularly repugnant (Jhang Gazetteer, 1884, p. 5).

Chenab's most fertile areas are in its lower reaches, where silt spreads over several miles in flood season. Owing to this, it was called the *maada* [female] river in the regions of Muzaffargarh and Multan. Characterization of the Chenab as female and its metaphorical link with female emotion were indications of its fertile waters. This was particularly compared with other rivers that merge into it. The Sutlej was specifically called the *Nar* or Male River because of its relatively stable course and less fertile silt. Chenab's fertility was considered superior to Indus, as goes the saying: *Darya Sind sona leve te kalai deve, Darya Chenab kalai leve te sona deve*. Indus takes gold and gives tin; Chenab takes tin and deposits gold (Darling, 1928, p. 110; Muzaffargarh Gazetteer, 1908, p. 7).

The Muzaffargarh Gazetteer described the riparian belt along the Chenab as long, silty strips that were annually flooded and renewed by side-channels (dhands and dhors), with whole villages shifting to raised platforms (machan) during the summer inundations, which were not considered anomalous but woven into agricultural and social processes. Chenab's seasonal transformations embodied renewal, reproduction, and resilience, reflecting a culturally feminized idea of abundance that was celebrated in local agricultural communities.

Traditional approaches to riparian agriculture around the Chenab

As discussed above, Chenab's floods were traditionally regarded as a living rhythm that shaped both the fertility and uncertainty of riparian life. Its floods were celebrated as seasonal blessings as the local saying in Muzaffargarh goes: "*Je bor awe tan bakhat vadhdwe, Je na awe tan soka khawe*" If flood comes, it increases our luck; If it comes not, drought consumes us (GOP, 1908, p. 7).

Each season, Chenab's waters renewed the land by spreading fine silt that enriched the fields, leached surface salts, replenished wells with fresh water, and scattered the seeds of trees and useful grasses. However, the same flow could shift suddenly, bringing destruction. Thus, while Chenab's floods were an important resource that increased the productivity of riparian agricultural lands, living along the river had its own risks. Firstly, while the floods bring silt,

[2] Mirza from the Qissa Mirza-Sahiban was a pastoral nomad of the Kharral tribe while Sahiban was a landholding family along Chenab.

they could also scour the land or bring sand, making the land infertile. If floodwater moved over saline tracts and then entered fertile lands, it became harmful because the water became brackish (kala pani), damaging crops. While houses were usually built on higher plinths to protect against floods and often protected by ring embankments, a heavy flood could nevertheless destroy them. Riverbank erosion submerged fields and houses, and at times, entire villages. The floods allowed only for a winter/spring crop in the areas too close to the river.

In precolonial times, the riparian people did take measures to reduce such risks. Where possible, inundation canals were dug, which not only carried floodwater inland but also regulated flood intensity. The canal heads were protected with embankments. While floods could be controlled to a large extent with these mechanisms, riverbank erosion posed a greater risk. At times, the banks were covered with thick *belas* (jungles) that prevented the river from flowing. Erosion, in which silt from one bank was eroded and deposited on the other bank, happened where the channel or the bank was curved. Such a channel could devour 50-100 feet per day (Bellasis, 1912, p. 2). When the river deposited silt to create a new bank or island, it was quickly covered with jungle or given over to cultivation. Many times, these new banks were above the flood level and were not submerged again for several seasons (Bellasis, 1912, p. 5). Generally, the local practice was to let the jungle flourish for some time so that it could strengthen the soil before it was cleared for cultivation. Because the silt was deposited from one bank to another, forming a new landmass, the process was considered a transfer of land from one bank to another. The property rights on such land were regulated through a custom called *lein-dein* or give and take, under which the property continued to belong to the original landholders. This was a cross-river property that brought the population on opposite banks together.

Since such land was at continuous risk, it was generally held by underprivileged groups such as the lower castes in the village, or leased out for grazing and cultivation to nomads who moved to the riverine villages from the interfluvial highlands in the summers. These groups, with the support of the village community, then migrated across the river to claim the newly emerged lands when needed. Thus, the river action created a fluid property that was integrated into a hierarchical village society. While the underprivileged group dealt with the vicissitudes of the river, larger landholders cultivated their lands at relatively safer locations where medium-level floods deposited gold. However, even they could be betrayed by the river when it chose to fill their lands with sand instead of silt. Often, the riverine landholders had links to other villages and could move to another location if their land was affected by floods, erosion, or soil depletion, and return after some years. This riparian life was not marked by absolute harmony, but as Baviskar noted in the case of communities living along the River Narmada, conflicts and hierarchies were important factors in defining the community and its environmental relationships. Through these complex interactions, the Chenab's feminized fertility was reflected in the social organization along its banks, where the river's generative power shaped patterns of cultivation, mobility, and interdependence within riparian life. These patterns of environmental relations changed during the colonial period with the advent of more encompassing state control and the implementation of

technology - two developments that are often considered paternalistic, masculine, and reductive.

Colonial Encounters

The British colonisers had two major preoccupations with the rivers: expanding communications for better territorial control by building bridges across rivers and protecting the rail and road network from floods; and to limit the influence of river in defining the agricultural property so that riparian lands fell in line with a stable property regime that placed the population in a decipherable matrix and ensured smooth revenue collection and state control. These two aspects aligned with the administrative approach, which N. G. Barrier labelled ‘paternalist’ and relied on a philosophy characterized by centralized, bureaucratic, and ‘fatherly’ rule by British officials over Punjab.

Early colonial administration of the Punjab acknowledged its agricultural potential, particularly for cash crops used in British industries. However, the uncertainty of its rivers and agriculture was a significant concern. There were proposals to improve agriculture in the province as well as navigation for internal and external commerce (Smith, 1849, p. 7). The colonial engineers sought to replace the dynamic, natural hydrology of the Punjab plains with artificial channels that promised stability and control. Some early projects, such as the Bari Doab Canal, were introduced to secure cultivation against the vagaries of the seasons, drought, and famine. However, the tension between the old riparian rhythms and the new engineered landscapes was a significant issue for early administrators.

The colonial encounter, therefore, reconfigured the fluid interplay between water, land, and mobility that had long defined riparian life, but could not completely erase it. This section discusses how these issues were dealt with in various ways. While attempts were made to establish definite property rights, a flexible revenue policy was adopted to prevent over-taxation and subsequent desertions by the cultivators. However, a more permanent change in environmental relations was introduced with the hydraulic engineering works as discussed in this section. Owing to its abundant water supply, its active riparian population, and its location in the province with large swathes of cultivable land available for irrigation, Chenab became the locus of both hydraulic engineering works and paternalistic administrative changes.

Definite Property Rights

While the rivers' inefficiency for both navigation and agriculture was a concern for the colonial engineers and the provincial administration, the latter was also concerned with the nature of riparian property, which, as discussed, was aligned with the rhythms of the rivers, particularly along the Chenab. The British Colonial rule in India prioritized secure property regimes in land, eliminating forms of ownership that seemed too fluid or that were deemed unproductive. Riparian agriculture, with its shifting property and floating population, was a disagreeable feature of local agriculture. For instance, soon after the annexation of Punjab to the East India Company territories in 1849, the Commissioner of Multan wrote to the Punjab government:

> The custom hitherto obtaining along these rivers, the Ravi and Chenab, regarding the right to increment, appears to be that the land thrown up is considered as belonging to the estate opposite, from which land may have lately been abraded. If abrasion had formerly taken place on the side of the present increment, it is considered a restoration and belongs to the owner of the estate on that side. This custom is productive of much inconvenience and endless disputes. I should strongly recommend the adoption of the custom obtaining throughout the Gangetic provinces, viz., of the main stream being the boundary (Tupper, 1881, p. 284).

His proposal was accepted; the custom was redefined in the villages under river action at the time, and the principles of *lein-dein* were abandoned. However, in later years, when the custom regarding the alluvial and diluvial on riverbanks was recorded by Lewis Tupper, a civil servant working on his independent inquiry into customary law, 210 villages out of 281 confirmed that *len-dein* was their actual custom. Tupper believed that the 71 villages that accepted the river's deep stream as their boundary had developed this custom under British rule, enforced by the government during the early settlement operations. Most villages along the Chenab traditionally observed *lein-dein*. Even though the river defined the sarkars under the Mughals and the Sikhs, the fluctuating village boundaries could lay across the river. Tupper found it astonishing that *lein-dein* was practiced along the River Sutlej as well, which meant that the village boundaries kept shifting from one state to another, that is, between the Khalsa and Bahawalpur states (Tupper, 1881, p.5). This showed the level of control (or lack of it) exercised by the pre-colonial states in the region. The communities decided property-related issues without state interference. Since, in most riparian villages, revenue was collected from headmen rather than individual landholders, state functionaries were not concerned with the location of land for revenue purposes. Such independence was not compatible with the colonial state, which tended to exercise greater control over its subjects. Although the initial settlements imposed collective revenue demands on villages, documentation of individual rights was an important part of village revenue records. Thus, issues related to the shifting of property had to be addressed.

Colonial officials observed that along with property, the subjects were also on the move. A revenue settlement officer noted about the cultivators living around the river Chenab in the Jhang district:

> The non-hereditary cultivators are in no way attached to the soil; on the contrary, they are continually on the move, either from the well cultivation to the *sailab* [flood], or from bad to fertile soils. Even proprietors often quit their estates to join their brotherhoods in the Khangarh district to take to the easier cultivation near canals; or else they move off to the *Kachcha* [river bed] of the Leiah district in seasons when the Indus may have fertilised by its deposit a tract larger than the ordinary. Even the owners show but little attachment to their properties (GOP, 1884, p. 93).

Often, the properties of absentee landholders were taken up as government wasteland during settlement operations. When these landholders returned, they had to petition for the return of their lands. Thousands of acres of such lands were taken up and were not always returned to the petitioners (PRACP, 1877).

By redefining customary riparian tenure and fixing boundaries to the 'deep stream,' the colonial state attempted to transform a fluid, community-based relationship with the Chenab into a rigid, bureaucratic property regime. This shift represented the broader paternalistic logic of Punjab administration, in which the state sought to discipline both land and people in a framework of efficiency and order. Stabilization of dynamic property forms disrupted the ecological reciprocity between the riparian communities and the river, which was based on temporal and spatial flexibility that coincided with the Chenab's natural cycles. It replaced it with a landscape of surveillance, documentation, and interference.

The need to establish rigid property rights was necessary to maintain state control and to simplify revenue administration. Similarly, the ability to collect fixed revenue in cash for successive years was the primary objective of land revenue management under British rule (GOI, 1905) . However, fixed revenue was incompatible with the fluctuations in local agriculture. The cultivators frequently requested remissions. Fixed assessment in the *sailaba* lands also led to heavy indebtedness in some riparian villages (Lyall, 1880) . Within thirty years of revenue administration, it became evident that, besides the usual remissions and reductions of revenue, a system of fluctuating assessments had to be put in place by the introduction of smaller fixed revenue equal to that on unirrigated land, along with a water rent assessed every year. Fluctuating assessments were introduced as a pragmatic response to the uncertainty inherent in riparian agriculture. This arrangement was more of a compromise between bureaucratic control and agricultural reality. While the colonial state sought to establish a secure revenue system, it recognized that absolute control over the assessment was not possible in regions subject to constant environmental change. The fluctuating assessments thus balanced fiscal stability with ecological variability.

In this way, flexibility of *lein-dein* was reinterpreted through colonial administrative reason, in a way consistent with Prakash's argument about adaptation of colonial science to native logic and cultural understanding (Prakash, 1999) . The riverine landscape was transformed into a bureaucratically intelligible terrain with fixed boundaries while simultaneously claiming that fluctuating assessments were restorations or clarifications of 'custom'. This hybrid approach was, however, less applicable to engineering interventions, which could provide a more reliable revenue base and greater control over ecology and society.

Embankments

Embankments were early manifestations of colonial engineering before the introduction of more widely recognized canal networks in Punjab. As Weil has shown in the case of Indus, river training through embankments was the arena in which colonial engineering became a dominant approach to dealing with environmental phenomena (Weil, 2006, p. 16). In the case of Chenab, the process of building embankments began not as a way of controlling the floods but to protect infrastructure. Indus defined the Western periphery of the Punjab's river system, but Chenab was central, and major communication lines cut through its valleys. In the mid-nineteenth century, the embankments protected the expanding colonial communication network, particularly the Grand Trunk Road, railway lines, and telegraph systems that bound the province to the imperial center (Mathur, 1973, p. 108). In 1853, engineers working on the Grand Trunk Road across the Rechna Doab advocated for massive embankments extending

as far as Wazirabad in the upper Chenab valley to stabilize the roadbed and secure floating bridges during periods of high water (Sarkar, 1926, p. 18). Later, these works were reinforced with the construction of the Alexandria bridge in 1876. With the expansion of commercial and administrative traffic, similar protective works were introduced downstream, particularly at Multan, where the Sher Shah Bridge was constructed in 1889. Such works were celebrated as hallmarks of Punjab's infrastructural modernization (Sarkar, 1926, p. 16). These early embankments gradually inaugurated a regime of river training.

Thus, the construction of embankments along the Punjab rivers in the late nineteenth century began a gradual but significant transformation of the natural floodplains. The subsequent introduction of the Chenab Canal system further intensified these changes, leading to the expansion of embankments. Canal irrigation altered local hydrology, raising water tables in some areas while depriving others of silt-bearing floods.

The Chenab Canal vs. The Chenab River

Embankments and canals led to a fundamental shift in the flow regime and morphology of the Chenab, altering its seasonal rhythms and flooding patterns, displacing the social and economic practices of riparian communities whose livelihoods depended on the flexible ecology of flood agriculture.

The Chenab Canal, inaugurated in 1892, irrigated 1.8 million acres with its branches and distributaries. Thousands of villages were populated with migrants brought from eastern Punjab, who were from the supposedly best agricultural castes of Punjab, mainly *Jats* and, to some extent, *Arains*, leading to the dispossession of local nomad groups (Bhattacharya, 2018, pp. 339-384). The villages aligned along the straight distributaries of the Chenab Canal epitomized state control. Both nature and colonial subjects were brought under strict state control, allowing for a stable production regime. In 1896, only four years after the Chenab Colony was launched, the landholders from the riverine tracts of Chenab forwarded a petition to the government listing the following grievances (PRAP, 1897, p.85):

1. The loss of *sailab* [floods] in the Chenab Bet [riparian tract] owing to the opening of the canal.
2. The restriction of their grazing area
3. The desertion of their tenants.

To this, the colonization officer responsible for allotting lands in the Chenab Colony responded: 'We cannot bring a whole *doaba* [interfluvial plain] under cultivation without upsetting the existing order of things, and where many gain, some must inevitably suffer.' (PRAP, 1897, p. 86).

A report produced by the Chief Engineer at the irrigation department, which, in his own words, was 'neither very scientific nor very accurate', claimed that while the canals were designed to practically use up the entire winter weather supply of the rivers, they did not appreciably affect the river discharges during flood season (PRAP, 1902, p. 655). However, the people from riverine tracts continued to claim that the canals had affected the nature of floods and impoverished their lands. Writing in 1925, Malcolm Darling noted that the

Chenab was no longer carrying gold into the soils of the Southern districts. The construction of canals further north reduced both flooding and siltation, leading the Chenab to lose its reputation (Darling, 1928, p. 97).

The floods were also affected because of the expansion of embankments constructed to protect the canals. As discussed, before 1892, Chenab was trained and confined between embankments at two major points, Alexandra Bridge in Wazirabad and the Sher Shah Bridge in Multan. After the inauguration of the Chenab Canal and its distributaries, flood embankments were constructed along the Chenab to convert the flooded area into canal-irrigated land. These embankments ran parallel to the riverbank at a distance to prevent erosion and were several hundred miles long (Bellasis, 1912, p.6). These were at times breached to allow the river to inundate cultivable land. Belasis, an engineer at the irrigation department, noted:

> When any new line of flood embankment is under consideration, the people should always be consulted. An embankment may shut off the floods from land which has hitherto benefited from them, and the people may prefer the old arrangement to the new. A single rabi crop in the year (the rabi is generally the more valuable crop), with freedom from canal assessments, may suit them best. Their villages or homesteads are usually placed on high ground or protected by local ring embankments. There may thus be a temptation for the people to cut the embankment, a straightforward operation because the men who watch it can be evaded or bribed. For the above reasons, the location of a flood embankment should be carefully considered, and there should be no delay in supplying canal water to the affected lands.

The chief engineer, Sidney Preston, also noted that the river appeared drier in the winter season because the entire water supply was diverted to the perennial canal. He believed that this may have caused some cultivators and revenue officers to believe that the inundations had also been materially reduced by the operations of these large canals (PRAP, 1902, p. 662). Inundation canals along the river used by riparian communities were also affected. The water was drawn for the perineal canals, and, particularly during the winters, the entire river water supply was directed to the perennial canals. In contrast, the river received some water from the catchment area below the canal, but the water reached the riparian lands too late for sowing the highest crop and dried up too soon for its maturation (PRAP, 1902, p. 661).

The impact of canals on the River Chenab was permanent. The nature of its relationship with the population on its banks changed drastically. Although it was not rigorously trained like the European rivers, like the Danube, it was nevertheless tamed in sporadic phases. Its own importance diminished as its offshoots carried off its water away from its banks. In present-day Punjab, all districts along rivers are visibly underdeveloped while canal-irrigated lands thrive. Even though canal-irrigated lands have their own environmental issues, such as waterlogging and salinity, they have better infrastructure, road and railway access, and developed markets. The situation is further exacerbated by the division of the Indus Basin, allowing India rights over the water of three rivers: Beas, Sutlej, and Ravi, and Pakistan over Chenab, Jhelum, and Indus.

CONCLUSION

Colonial administration triggered environmental changes in Punjab through revenue and property regimes and through technological change. In the case of the River Chenab, these transformations meant that its flow was controlled and its morphology and floodplains were altered, affecting its fertile, replenishing, and nurturing nature. The river that had once symbolized the feminine force of nature, love, freedom, and divine connection in Punjab's folklore was an instrument of production and control in colonial imagination. However, we should keep in mind that precolonial riparian life was also shaped by complexity and hierarchy because riverine land was constantly shifting and at continual risk. The river's fluidity created a correspondingly fluid property regime embedded within village hierarchies, in which mobility, vulnerability, and unequal exposure to the river's volatility were central features of everyday life.

Colonial interventions could not eliminate this variability, and the limits of administrative reform led officials to retain flexible assessment systems, acknowledging, although reluctantly, the persistence of environmental uncertainty. However, where fiscal reform had to compromise, the hydraulic transformation succeeded. The network of canals and embankments permanently altered the Chenab's flood regime, sediment flow, and social landscape, producing a more fixed and regulated environment that encapsulated the colonial ideals of stability and control. The colonial state tamed the Chenab to secure its revenues and extend its power, but at the cost of severing the ecological and cultural relationships that had long bound communities to the living, feminine rhythms of the Chenab. While the symbolism was not completely erased, by prioritising the fixed environmental regime of canal irrigation, the Punjab government effectively bypassed the old, gendered understanding of the river to introduce another gendered ethos based on domination and control of nature.

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