

Investigating the relationship between riverine landscapes and sociocultural practices: the case of Sabarmati river, India

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Abstract

Indian rivers have exerted a substantial influence on the progress and growth of urban regions while simultaneously being held in high esteem and celebrated within religious and mythological frameworks. Consequently, individuals in this region have upheld deep socio-cultural ties with their rivers throughout historical development. The physical attributes and ecological condition of these riverine landscapes play a crucial role in influencing the relationship they establish with the human population, thereby enabling a wide range of socio-cultural activities. The mentioned activities can be classified into two primary categories: daily activities that contribute to an individual's sustenance and financial earnings and periodic activities that involve customs, rituals, communal assemblies, and agricultural or harvest festivals. However, the execution of present urban development initiatives in the country has led to the commodification of rivers, consequently causing (and resulting in) changes in socio-cultural dynamics. This research investigates the case of the Sabarmati River to acquire knowledge about the changing perspectives of individuals concerning the river and its function in enabling socio-cultural practices. The historical and developmental trajectories of Ahmedabad and Gandhinagar have been notably shaped by the socio-cultural connections that individuals have established with the Sabarmati River. Throughout history, the river has served as a multifunctional resource, facilitating various activities such as laundering and dyeing garments, engaging in agricultural practices, hosting public gatherings such as fairs, and organizing processions along or across its riverbed. The area along the river, previously utilized as a space for various activities, has transformed and is now designated as a restricted zone referred to as the riverfront.

The research commences by examining the concept of rivers within urban areas and the evolving perceptions surrounding them. A thorough analysis of the socio-cultural connections seen at various points and subsequently mapped follows. The study involves the collection of primary data through the use of observations, the recording of physiographic landscape patterns, and conducting interviews with residents following the framework outlined in the Public Biodiversity Register (PBR). The findings of this study illustrate that the process of rapid urbanization and the uniform development of riverfront areas have led to a disconnection from the water of the river. In contrast, the rural surroundings along the

Sabarmati River still exhibit a deep respect for the river and effectively utilize it as a valuable resource.

However, the unintended repercussions of the development along the riverfront have affected the surrounding region. Investigating other Indian rivers through a similar lens and presenting their connections to riverine landscapes could aid in the protection of these natural systems and lead to better-informed land use and development.

Keywords: Sociocultural Practices, Perception, Riverine Landscape, Rural Settlements, Urbanization

1. Introduction

Early human civilizations were supported and sustained by rivers. Throughout history, rivers have played a pivotal role in sustaining human populations by serving as a vital source of sustenance and hydration. They have provided sustenance and financial resources to human societies. The growth of some Indian towns can be attributed to their proximity to renowned rivers. Contrary to the prevailing worldwide perception of rivers as gorgeous landscapes often framed and photographed, Indian rivers have a position of deep reverence. The rivers mentioned above serve as conduits for profound myths and interconnected cultural narratives. Ghats, which are stepped embankments, provide direct ingress to rivers in India. Rivers in India have experienced a decline in their condition due to inadequate management despite their profound spiritual importance in the country's everyday life and religious practices. The formerly esteemed rivers have undergone a transformation where they are now primarily seen as visual attractions, subject to exploitation, manipulation, and damming. Consequently, these rivers have become repositories for sewage, agricultural runoff, and industrial effluents.

The rivers have been strategically managed to provide aesthetically pleasing riverfronts that elicit a positive sensory experience for human observers. Regrettably, the alteration in the physical shape of these rivers has resulted in the disturbance of their riparian ecosystems. Numerous urban hubs along these river systems prioritize the development of the urbanized section of the river within their jurisdictions, disregarding the broader implications for the whole riverine region. The phenomenon of rivers becoming commercialized can be attributed to the transition from a focus on spiritual sanctity to an emphasis on aesthetic attractiveness.

Understanding the profound cultural significance of these Indian rivers is crucial. Indigenous communities maintain spiritual and subsistence connections with their rivers, even in metropolitan and semi-urban settings where these connections may have been disregarded. The prevailing narrative fails to acknowledge the role of rivers in sustaining collective cultural memory within a culturally intricate country such as India. This study aims to investigate the temporal evolution of individuals' perceptions towards rivers. This research investigates the impact of shifting views on the relationship between the community and the Sabarmati River.

2. River as a landscape that evolved organically

The majority of landscapes in India consist of natural features that convey religious energies, resulting in a profound sense of immersion. The formation of a river occurs gradually as it traverses the terrain, causing erosion and altering the surrounding beaches and valleys. The convergence of flora, animal, and human populations in these areas facilitated the emergence of early civilizations and cities. Numerous religious locations in India are close to rivers and other water systems. The association between the presence of water and the holiness of a ritual in India signifies the symbolic significance of water in specific cultural practices. The sacred riverine environment in India is shaped by several associations, such as the presence of vegetation in wooded regions, which holds symbolic significance for life and fertility, as well as its therapeutic properties.

River landscapes are distinct ecosystems that rely on continuous or intermittent interaction with watercourses for their existence. From a geographical perspective, the spatial boundaries of these areas can be characterized as extending along floodplains. The riverine terrain is home to several significant vegetative communities that support various animal species. The presence of riparian vegetation in river ecosystems has profound significance due to its multifaceted functional contributions to the geomorphological, physical, chemical, and biological aspects of the river system. Currently, the term "riparian area" is only used to describe the locations close to the riverbed that are characterized by the presence of riparian vegetation. Riverine landscapes, particularly the segment that includes riparian vegetation and biodiversity, get less recognition within our nation. The present trajectory of research and design methodologies for riverine landscapes in India demonstrates a focus on morphological transformations guided by proficient land-use strategies. These methods assert their ability to ensure and maintain the richness of biological variety.

The agriculture sector is the primary source of livelihood for a significant proportion of the population in India. Water, whether sourced from rivers, rainfall, natural lakes, or other similar sources, is widely recognized as a crucial resource for maintaining sustainable livelihoods. Disruptions to these aquatic systems or alterations in precipitation patterns have a detrimental impact on agricultural yields and crop distribution. Hence, the provision of alternate water sources has consistently been deemed necessary. Most conventional water harvesting and conservation devices are specifically built to function as water structures on a modest scale. However, a significant contributor to the water supply is the perennial river, which transports freshwater. Rivers demonstrate their effectiveness inside regions where they naturally occur and maintain a continuous flow.

Consequently, people dwelling along the riverbanks have increasingly favored traditional water management techniques due to their enhanced reliability and efficiency. The conceptualization of traditional practices and landscape design was rooted in the principle of "learning from the river," whereby the design approach sought to effectively adapt to the influences of the flowing river and promote the sustainable preservation and enhancement of ecosystem services and biodiversity. The prioritization of research on knowledge co-production, co-living, and collaboration, which involves the integration of diverse sources and forms of information to solve a particular issue, has emerged as a critical focus in efforts to increase sustainability transitions. The integration of scientific and indigenous knowledge has significant importance in the realm of environmental governance, especially within the vast expanse of land administered by Indigenous¹¹ peoples. In addition, there are instances where two distinct types of habitats or successional phases converge and blend. The integration of cultural knowledge can be observed in implementing practices along ecological margins. The acquisition of this information has the potential to bolster the resilience of communities at the grassroots level. Water availability for human use and transportation plays a crucial role in determining the placement of habitation sites.

¹¹ Indigenous is capitalized throughout when used, either as an adjective or a noun, to refer to Indigenous people, following the accepted norm in Australia and New Zealand. Source: Johnson, J. T., Cant, G., Howitt, R., Peters, E. (2007). Creating anti-colonial geographies: embracing indigenous peoples' knowledge and rights, *Geographical Research*, pp. 117-120.

The dynamic between the water's edge and the city frequently presents challenges, as it simultaneously serves to divide and connect valuable natural systems with urban expansion. The concept of hybridization has been recognized as a vital aspect of the mediation of land-water systems, referring to the integration of natural systems with urban development activities and initiatives. The prevailing political structure, economic considerations related to land use, aesthetic preferences, and social customs significantly shape the developmental perspective on land-water mediation. The use of an integrated strategy for the management of such landscapes is not a novel notion. Throughout millennia, traditional cultures have employed a holistic approach to managing natural resources to fulfill societal requirements effectively. Behaviors and procedures have been created to effectively utilize natural resources without engaging in exploitative behaviors, hence allowing for the potential for rejuvenation. The redefinition of development and the adoption of novel techniques for developing and protecting these regions should involve iterative processes that effectively combine social and economic development with biodiversity protection and climate change mitigation. Recognizing and protecting the boundaries where land and water interact, as well as the patterns and processes that occur within these areas, enhances our understanding of the significance of these landscapes and fosters a deeper appreciation for the intricate and diverse characteristics shown by riverine environments.

The margins or transitions between ecosystems, known as river edges, frequently display notable levels of species richness or biodiversity. In ecological terminology, margins refer to areas that serve as transitional zones between distinct ecosystems.

3. Reading a landscape

The term "landscape" has evolved, drawing from various European languages such as "landskip," "land craft," and "landschap." These linguistic origins have contributed to diverse interpretations of landscapes across history, cultures, and academic fields. As the Oxford Dictionary defines, "landscape" encompasses what one observes when gazing upon an extensive land area, particularly in rural settings, emphasizing its distinct visual character. Geographers Denis Cosgrove and Stephen Daniel (Da Cunha, D. 2018) view landscapes as "cultural images," serving as pictorial representations or symbolic depictions of the surrounding environment. In contrast, historian John Dixon Hunt¹ categorizes landscapes into three distinct classifications: wilderness or first nature, infrastructure or second nature, and garden or third nature. Anthropologist Tim Ingold offers a holistic perspective, asserting that a landscape is not merely nature or a symbolic representation but the world as perceived by those who inhabit and dwell within it. (Olwig, K. & Ingold, T. 2019) Architect Ian McHarg contends that landscapes embody both natural and cultural elements. (MacHarg, I.L. 1971)

The multitude of meanings of landscape poses a challenge in pinpointing a definitive definition. The report draws upon the perspective of geographer Donald Meinig, as described in his work "The Interpretations of Ordinary Landscape," which characterizes landscapes as collections of ordinary features that intricately showcase the development and character of a society. (Meinig, D. W. 1979) He emphasizes that landscapes extend beyond natural scenery and are not necessarily objects of admiration but rather subjects of observation.

Meinig demonstrates that all landscapes convey cultural values, social behaviors, and individual actions that have left their imprint on specific localities over time.

In Meinig's interpretation of Jackson's work, he highlights the integration of community and environment within the landscape and emphasizes that one has to live in it to understand it.⁴ Similarly, Tim Ingold asserts that landscapes serve as enduring records and testimonies to the lives and endeavors of past generations that have inhabited them, perpetuating a reflection of evolving societies. (Olwig, K. & Ingold, T. 2019) The landscape is a composite of permanent and dynamic elements, from invariant forms to fleeting expressions of animal life, all interwoven to constitute the landscape. Understanding the meaning within landscapes can be achieved by examining these forms and objects that provide insights into the perspectives of inhabitants. However, individuals from diverse backgrounds in the same context will likely interpret it differently.

The temporality of landscapes significantly influences perceptions of place, encompassing seasonal alterations, biannual and annual activity changes, and cultural shifts. Comprehending cognition in perception and culture plays a pivotal role in exploring the intricate relationship between time and place within the landscape.

4. River and its Connotations

According to The Oxford Dictionary, the term "river" is described as a natural watercourse that extends linearly over the land and ultimately reaches the sea. The river, as a natural occurrence, has been inextricably intertwined with human history since the first traces of human civilization. The comprehensive record-keeping of rivers highlights the significant influence they have on the daily lives of human beings. Serving as catalysts for progress, these entities have played a crucial role in facilitating the development of agriculture, the establishment of intricate societies, the growth of economic endeavors, and even the advancement of metropolitan areas.

Throughout history, human civilizations have tended to establish their settlements close to riverbanks, requiring them to make adjustments in order to cope with the fluctuations in seasons, occurrences of floods, and patterns of water flow. Over time, rivers have undergone a transformation whereby they have evolved from their natural state into commodities that are subject to human control. Implementing land-water segregation has emerged as a prominent approach in floodwater management. The demarcation in question has had a profound impact on the interaction between humans and water, which plays a crucial role in how water resources are seen, understood, and managed. The delineation known as the "river edge" has solidified as a discrete object with tangible, visual, and engineering characteristics at a certain period. The user's text is already academic. As a result, floods, traditionally considered natural elements of river systems, are now viewed as disturbances to urban environments due to the rivers exceeding their established limits. The user's text is already academic. The riverbank in modern contexts exhibits several aspects, functioning as a focal point for developing riverside areas and commercial usage.

The idea of the river margin in the Indian setting emerged relatively recently, along with the introduction of cartography methods by Alexander. The user's text is already academic and does not require any rewriting. In contrast to the indigenous viewpoint that perceives the

world as interrelated, indigenous populations initiated classifying the environment into distinct elements, such as mountains, rivers, and hills. One possible way to rewrite the user's text to be more academic is: "The user is Nevertheless, notwithstanding this dynamic structure, rivers continue to maintain their inherent association with the surrounding terrain. The rivers of India exert a substantial impact on the surrounding communities, traversing both legendary and tangible domains, hence upholding their lasting importance.

5. The Riverine Edge

India's riverine landscapes are unique not just due to biological activities but also due to their deep relationships with residents. These landscapes reflect regional cultures, impacting residents' lifestyles and religious beliefs. Rivers play a significant role in this narrative, tying people to their environments. (Kanhare, P. S., & Grover, A. 2024) In India, the riverine fringe supports various activities that depend on river supplies. The "point of hybrid" between the water's edge and the urban landscape. This interface links and divides natural systems and urban fabric. In his work, Cunha explains how terrestrial topography was articulated to fit the river's path, creating land-water boundaries and landscape components. Water is integral to the landscape and society. Its many uses stem from livelihood, sustenance, and religion. This inherent bond is especially evident for women, who used the river edge for bathing and laundry. These women then carried the water for drinking and cooking (Arya, M. 2019)—culturally significant Indian spiritual and religious sites along these rivers. Water symbolizes life and fertility in India, forming deep bonds with the sacred terrain.

Various locations along the river's course evoke distinct and varied connotations, as the activities undertaken in these areas contribute to the transformation of the riverine landscape. Certain activities, such as riverfront developments and urban projects, can have detrimental effects on the landscape, while others contribute to its preservation and sustainability. The perceptions and affiliations established with the river through these activities exhibit a temporal dimension, wherein daily household tasks such as cooking, laundry, bathing, and religious rituals conducted along the riverbanks foster profound associations with the landscape. In contrast, activities that occur periodically, be it biannually or annually, utilize the spatial resources afforded by the river for diverse purposes, such as fairs and festivals, with less direct emphasis on the river itself. In these instances, the river assumes a more peripheral role, acting as a backdrop or setting for these intermittent events. The nature and depth of engagement with the river landscape thus vary significantly depending on the temporal rhythms and functions associated with the activities in question.

6. Research Methodology

This research serves as a primary source documentation project. This study primarily aims to understand the changing perspectives of those living in rural areas along the Sabarmati River due to the riverfront construction project in Ahmedabad.

The study begins with a thorough literature review to provide a solid foundation. This review aims to get a full grasp of the many conceptual frameworks that are pertinent to the research. The present study initiates by delving into the concept of "riverscape," which is seen as an integral part of the broader landscape. Subsequently, the literature review transitions to a comprehensive analysis of the Sabarmati River in Gujarat. Utilizing primary sources such as archival documents, namely historical pictures, and maps, this part aims to chronicle the historical development of the river and elucidate the socio-cultural connections between the local community and the river.

The primary methodology employed in this work entails qualitative analysis. Evaluating several locations along the Sabarmati River employs a dual approach in its methodology. The preliminary stage of the site inquiry involves fieldwork, utilizing research methods such as participant observation and structured interviews within the context of the Public Biodiversity Register (PBR). The third phase of the investigation is a comprehensive examination of the physiographic characteristics. The investigation begins with collecting photographic documentation that captures the unique characteristics found at ten designated sites along the Sabarmati River. The recordings adhere to established frameworks in the People's Biodiversity Register (PBR).

The Biodiversity Management Community oversees the implementation of the PBR, which is primarily focused on the systematic documentation and preservation of local biodiversity, indigenous traditions, and the interrelationships between the community and its natural environment. This study utilizes the Peoplescape, Landscape, and Waterscape paradigm proposed by the PBR to analyze the interaction between the Sabarmati River and the residents. The investigation encompasses site pictures, systematic observations, and meticulous recordings to examine the socio-cultural connotations linked to the river. The collected data has been transformed into visual documentation, including photographs, graphics, and land-use matrices, in order to analyze the distinct features of each location.

a. Physiographic Observation

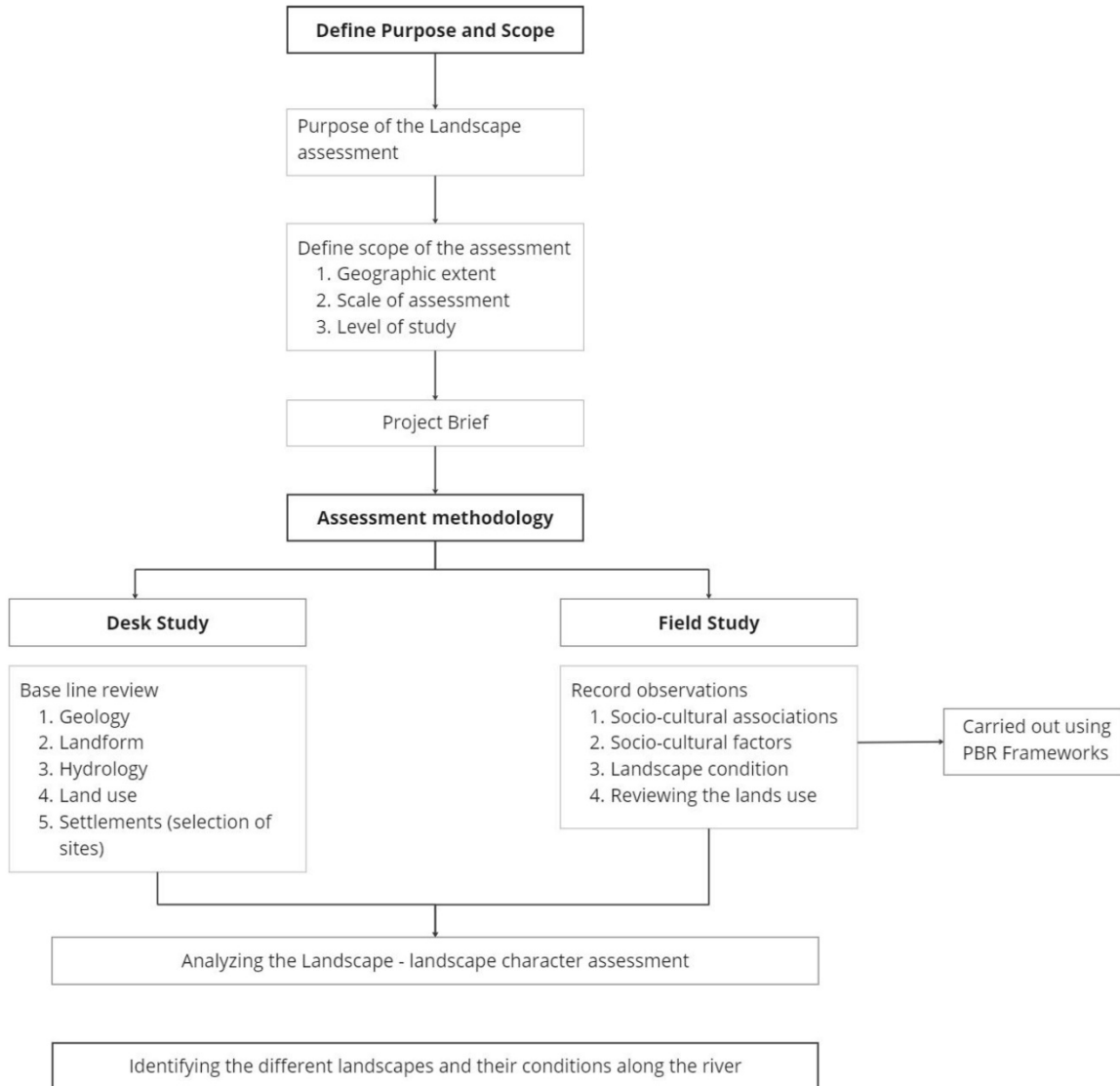


Figure 1: Conceptual Framework

Source: Author 1

b. Interviews

The third phase of the field study includes conducting on-site interviews. The persons chosen for this study predominantly consisted of rural residents, including villagers close to commercial facilities such as tea stalls and betel nut sellers. Additionally, those involved in buffalo herding were included, as well as those who were questioned within their own houses. The data collected from the surveys was organized into a narrative framework, which proved to be a beneficial method for understanding the site from the perspective of the local inhabitants. The survey questionnaire underwent adjustments in response to the feedback provided by the interviewees.

The questionnaire for the research was as follows:

1. How long have you been living here? Moreover, How many people live in this village?
2. What is the occupation of the people in the village?
3. Is there a need for more water in the village? Moreover, How do you use the water of Sabarmati? Or What are the other sources of water in the village? How was the water of Sabarmati used in the past?
4. Do you worship the river Sabarmati? Furthermore, What are your thoughts about the development (dams, canals) that the government has done along the river? Has it improved the accessibility of water?
5. Does your village get flooded during the monsoon season? What do you think? Has the condition of Sabarmati improved or deteriorated? Etc.

c. Physiographic analysis

The physiographic analysis is conducted after collecting all data acquired during the field survey. The research encompasses two independent phases, with the first phase being an examination of satellite images obtained during a specific time frame. This study involves an analysis of grain and water based on satellite imagery to understand the changes occurring in these areas over time. The subsequent stage entails a comprehensive examination of photos and graphics of the landscape, intending to comprehend the present state of the sky cover, ground cover, flora, and water within the region. This method provides a comprehensive viewpoint on the alterations in the landscape resulting from human interventions and developmental endeavors.

7. The case of Sabarmati

The Sabarmati River originates close to Udaipur, emerging from the Dhebhar Lake in the Aravalli highlands. Traversing the cities of Ahmedabad and Gandhinagar in Gujarat, the river proceeds westerly for 371 kilometers until converging with the Arabian Sea at the Gulf of Khambhat. During its course, the Sabarmati River undergoes alterations in its terrain. The geographical region starts at the Aravalli hills and then transitions into a level and gently rolling expanse beyond Dharoi. The distinctive geographical features of the region render the river susceptible to alterations in its path, resulting in recurrent flooding within the vicinity. The river's seasonal attributes provide a diverse range of activities on its banks and within its riverbed.

The historical trajectory of the Sabarmati River has consistently been interconnected with the historical development of Ahmedabad. Ahmedabad, a compact fortified settlement close to the Karnavati village, acquired the epithet "Gateway of the West" during the era of British

colonial dominance owing to its advantageous location on the Sabarmati River. During the sixteenth to seventeenth centuries, the Sabarmati River was a crucial conduit for transporting commodities such as indigo, textiles, and saltpeter by traders.

During the summer, the arid riverbed of Sabarmati has traditionally served as a site for agricultural practices (as depicted in Figure 2), as well as for operations such as fabric dyeing, laundry, and drying conducted by the dhobis. Additionally, the riverbed has functioned as a venue for various social gatherings ranging from fairs and circuses (as illustrated in Figure 3) to serving as a significant location for Mahatma Gandhi's movements. In 1915, Mahatma Gandhi founded the Gandhi Ashram, which is alternatively referred to as the Sabarmati Ashram, situated on the northeastern side of the river. Subsequently, in the year 1930, he orchestrated the esteemed Dandi March, alternatively referred to as the Salt March, along the river's periphery, therefore solidifying Sabarmati's pivotal role in India's quest for independence. Ahmedabad, a city in India, acquired the epithet of the "Manchester of India" during the 1930s and 1960s (Pandya, Y., & Rawal, T. (2002) The urban center had reached its zenith of progress, as several enterprises established their operations along the eastern and southern banks of the river.

As the urban center expanded, the river gained prominence. Photographers in the 1960s were drawn to the visual spectacle of vibrant textiles undergoing the processes of dyeing, drying, and washing along the riverbank. During this period, renowned architects such as Le Corbusier and Louis Kahn were extended invitations to conceive the urban layout and architectural structures of the city. Le Corbusier artfully depicted the river as a "scenic display of cloth dyers engaging in the process of washing and drying their cotton materials on the sandy banks, accompanied by herons, buffalo, and partially submerged donkeys seeking respite from the heat." The Sabarmati Riverfront project was initiated with the conceptualization of an



Figure 2: Agricultural practices on the dry river bed of Sabarmati (Pathan, 1970)
Source: Living waters museum



Figure 3: Circus on the dry river bank of Sabarmati (Desai, 2000)
Source: Living waters museum



Figure 4: Cloth treating, washing and drying along the banks of Sabarmati (Patel, 1960)
Source: Living waters museum

ecological valley for the river's trajectory, as proposed by the renowned French-American architect Bernard Kohn. The construction of the Sabarmati Riverfront in Ahmedabad, spanning a length of 11 kilometers, commenced in the year 1999. The Sabarmati Riverfront's innovative and ambitious architectural design has garnered global acclaim. The development in question has emerged as a prominent exemplar of waterfront development on a national scale.

Nevertheless, within present-day circumstances, the primary impression of the Sabarmati River mainly revolves around a restricted 11-kilometer stretch that encompasses the Sabarmati riverbank. This perception overlooks the river's lengthy course through diverse landscapes and human populations. The communities situated close to the river persist in their dependence on its waters for home and agricultural needs. The enduring existence of ancient temples situated along the Sabarmati River, deeply rooted in local legends and traditional narratives, serves as a significant historical witness. It is worth mentioning that in the present day, cultural events of a modern kind, such as fairs, circuses, and exhibits, continue to be held in the vicinity of the river.

However, the consistent alteration of the 11-kilometer riverside has resulted in the gradual erosion of the socio-cultural connections between the local inhabitants and the river. The continuous water flow in the 11-kilometer river stretch is maintained via water from the Narmada canal. The uninterrupted provision of water has impeded the river's inherent course, transforming it into a manufactured waterway.

8. Research Inquiry

The Sabarmati River has long been intertwined with profound social and cultural affiliations over several historical periods. In recent times, there has been a notable change in attention on the 11-kilometer segment of the Sabarmati riverside. The river demonstrates a meandering trajectory as it navigates through various topographical landscapes and human settlement regions. Historically, the populations residing close to riverbanks have relied on water supplies to fulfill their household and agricultural requirements. Furthermore, it is noteworthy to mention that the Sabarmati River harbors a wide range of historic temples that are intricately connected to legendary myths and indigenous culture.

In the present era, the riverbanks are utilized as venues for various events, including fairs, circuses, and exhibitions. This statement raises questions regarding the fundamental comprehension of the inherent characteristics of a river. To what degree may an 11-kilometer portion of a river be considered a determining element in shaping the overall identity of such a river? The main aim of this research is to examine and record the sociocultural interdependencies seen at various sites along the Sabarmati River, excluding the specific 11-kilometer stretch of the riverbank.

The study started with a comprehensive on-site examination, including nine discrete sites, which extended from the Dharoi Dam to the Gulf of Khambhat, meticulously charting the trajectory of the Sabarmati River. Contrary to the initial assumptions, the field excursions to these regions yielded unique and significant insights. Subsequently, a decision was taken to concentrate on five out of the nine places to conduct a thorough investigation of the

sociocultural linkages between the inhabitants and the Sabarmati River in these areas. The selection of these locations was predicated upon the diverse array of activities and interactions occurring along the different segments of their respective rivers.

The five chosen locations were subjected to a thorough investigation, wherein their connections with the river were classified into three main dimensions: developmental, religious, and resource-based. The research began with an early phase to understand the fundamental relationships between the inhabitants and the river in these locations. It is crucial to highlight that a comprehensive study was conducted on all five sites, utilizing diverse research approaches outlined in the research methodology section. However, to provide a comprehensive grasp of the topic, this discussion will concentrate solely on specific sites as illustrative examples of different situational scenarios.

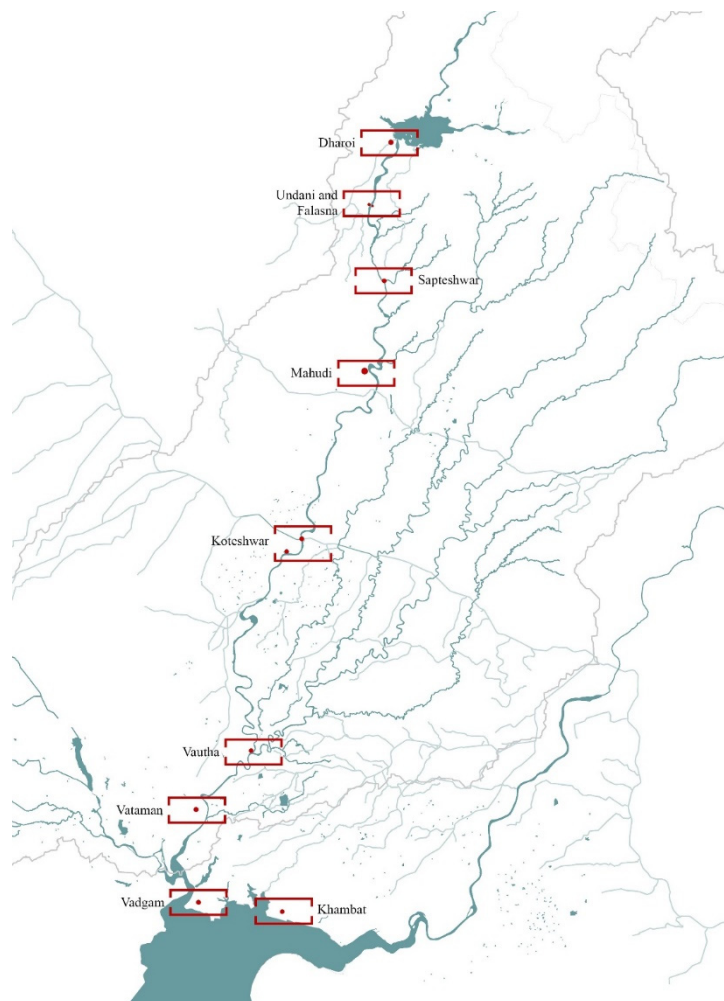


Figure 5: Selected sites along the stretch of Sabarmati
Source: Author 1

Table 2: Preliminary associations identified during on-site investigations
Source: Author 1

Sites	Sociocultural activities
Dharoi	Dam, Agriculture
Undani and Falasan	Acriculture, washing and bathing
Sapteshwar	Temple
Mahudi	Derasar, agriculture, sand mining, cremation
Koteshwar	Agriculture, fishing, recreation
Vautha	Agriculture, animal bathing and grazing, fair
Vataman	Agriculture
Vadgam	Agriculture
Khambat	Animal husbandry

9. Site Observations

The site observations chronicle several aspects of the hamlet, including its occupation, prominent landmarks, water supplies, and landscape conditions. These observations are conducted to comprehend the community's relationship with the nearby river. In the case of Dharoi, the findings indicate that the dam's construction constituted the predominant undertaking in the immediate neighborhood of the river, resulting in the separation of the village from the river as a consequence of relocation. On the other hand, at Mahudi, the river was primarily associated with sand mining and cremation rituals, as evidenced by a derasar (temple) situated in a such that its rear faced the river.

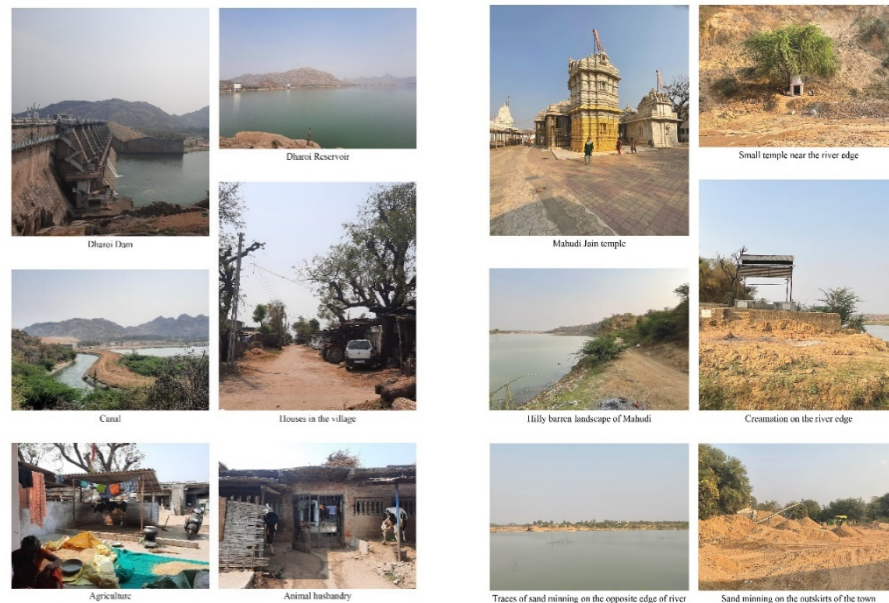


Figure 6. Site Observation of Dharoi (left) and Mahudi (right)

Source: Author 1

The observations conducted at Koteshwar indicated the presence of many activities, including fishing, temple visits, and agricultural practices, taking place along the river's shore. Significantly, despite its proximity to the river, the people in Vautha mainly depend on water obtained from a local water tank for their everyday operations. The primary functions of the river in this particular area are primarily restricted to animal grazing and bathing activities. Moreover, Vautha is also recognized as the home of the annual Vautha Fair, a highly significant regional event. The fair, which takes place on the banks of the Sabarmati River, attracts many participants from many geographical areas.



Figure 7. Site Observations of Koteshwar (left) and Vautha (right)
Source: Author 1

Satellite Study and Land use Matrix

Satellite technology and applying a land use matrix are employed to assess the occupancy and land use patterns to support the analysis of changes occurring in the designated areas. In the particular setting of Dharoi, a significant observation was the consistent stability found in land use patterns over a prolonged period. However, the observed land use pattern may be attributed to the displacement of the village, which emerged as a crucial element exerting a substantial impact on the existing dynamics. As a result, the peasants' connection to the river mostly revealed itself through its utilization in agricultural practices. In the context of Mahudi, while it was classified as an urban area, the immediate vicinity of the river needed to be fully used. The riverside in this particular setting exhibited a primarily desolate landscape, a noteworthy observation that has persisted over several years. In the specific setting of Koteshwar, it is evident that despite the overall development of the village, traditional land use methods continue to be dominant. In the region of Vautha, it is evident that although the land usage has remained unchanged for a considerable duration, the portion allocated for the fairground stays unutilized for the remainder of the year.

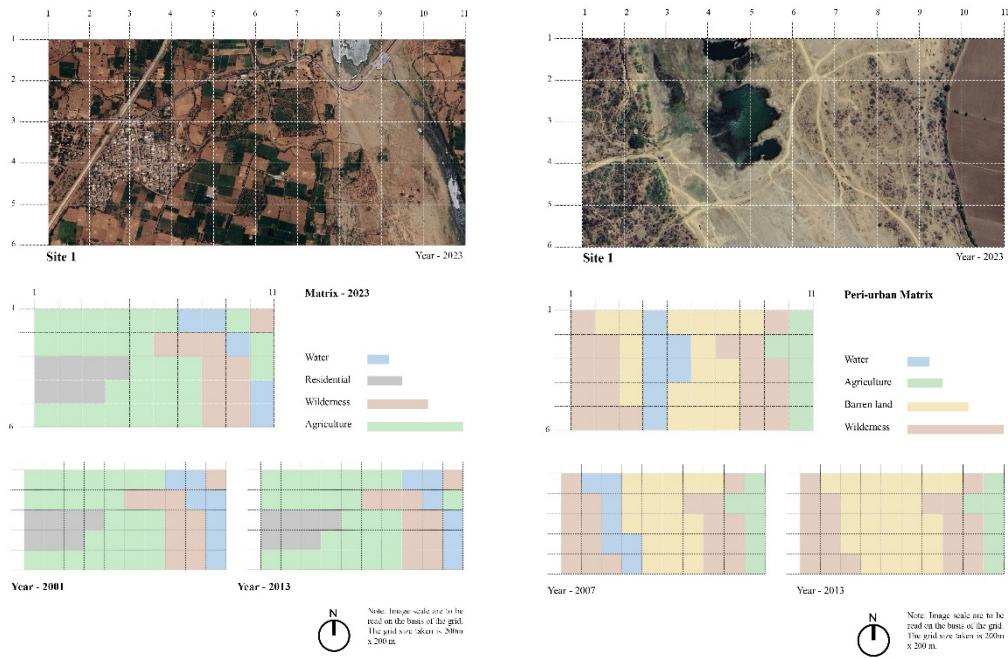


Figure 8: Land Use Matrix of Dharoi (right) and Mahudi (right)
 Source: Author 1

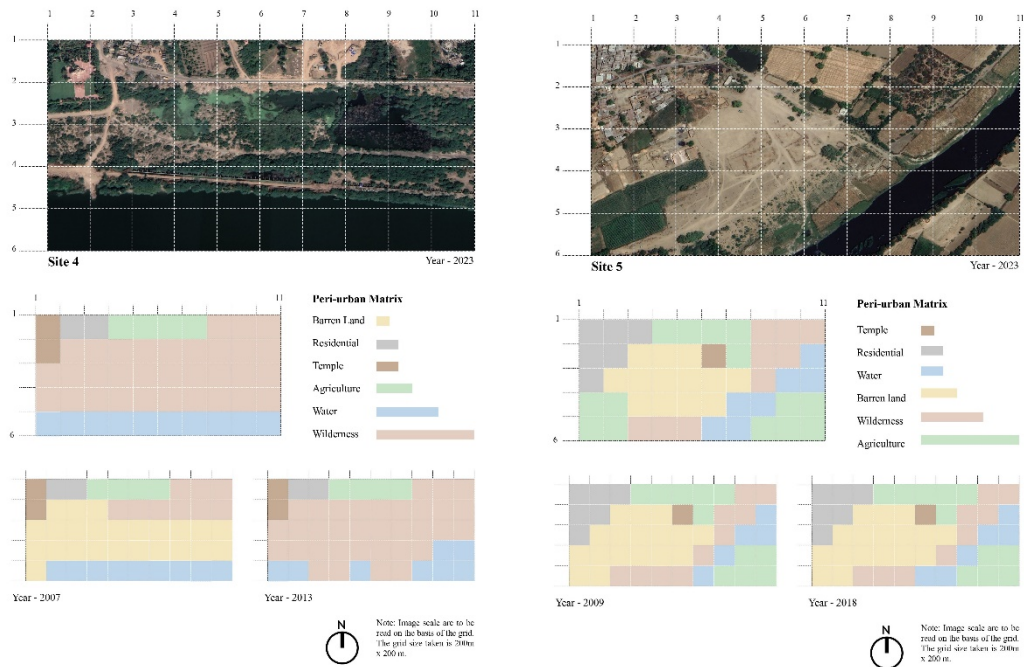


Figure 9: Land Use Matrix of Dharoi (right) and Mahudi (right)
 Source: Author 1

Landscape Analysis and Grain Map: The terrain investigation, in conjunction with the grain map, yielded valuable insights into the environmental conditions present at the selected sites. In the case of Mahudi, the longitudinal research indicates little fluctuations in the vegetation; however, the grain map analysis demonstrates a decline in vegetation quality. Specifically, the site, once characterized by verdant scrubland, has predominantly transformed into arid coarse scrubland. The examination of Koteswar reveals a noteworthy increase in vegetation despite the transition from a rural settlement to an urbanized metropolis. On the contrary, in the instances of Dharoi and Vautha, there is evidence of a deterioration in landscape quality, resulting in a decreased utilization of river water.

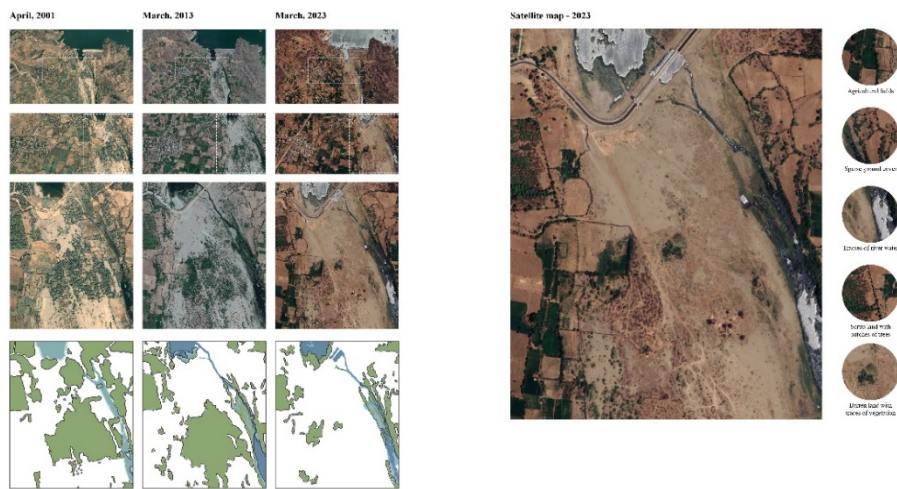


Figure 10: Landscape analysis and Grain map of Dharoi

Source: Author 1



Figure 11: Landscape analysis and Grain map of Mahudi

Source: Author 1

10. Reading Landscape

In order to gain a comprehensive understanding of the local community's connection to the riverine environment at each site, an analysis is conducted on the many forms and items present within the riverscape. This examination provides valuable insights into the predominant viewpoints held by the residents towards their surroundings. In the case of Dharoi, the region prominently showcases the transformation of the river's course within the topography, transitioning from mountainous terrain to gently rolling flat plains.

The town of Mahudi has a topography marked by undulating terrain, a scarcity of moisture, and a dry climate, resulting in limited visible advancements in the proximity to the river. On the other hand, the Koteshwar region has abundant vegetation despite the ongoing developmental endeavors, as evidenced by activities such as fishing and youngsters engaging in river bathing. In contrast, the Vautha site is characterized by a desolate scrubland terrain, predominantly designated to host the yearly fair, with minimal practicality during the remaining months.



Figure 12. Landscape analysis and Grain map of Koteshwar

Source: Author 1



Figure 13. Landscape analysis and Grain map of Vautha

Source: Author 1

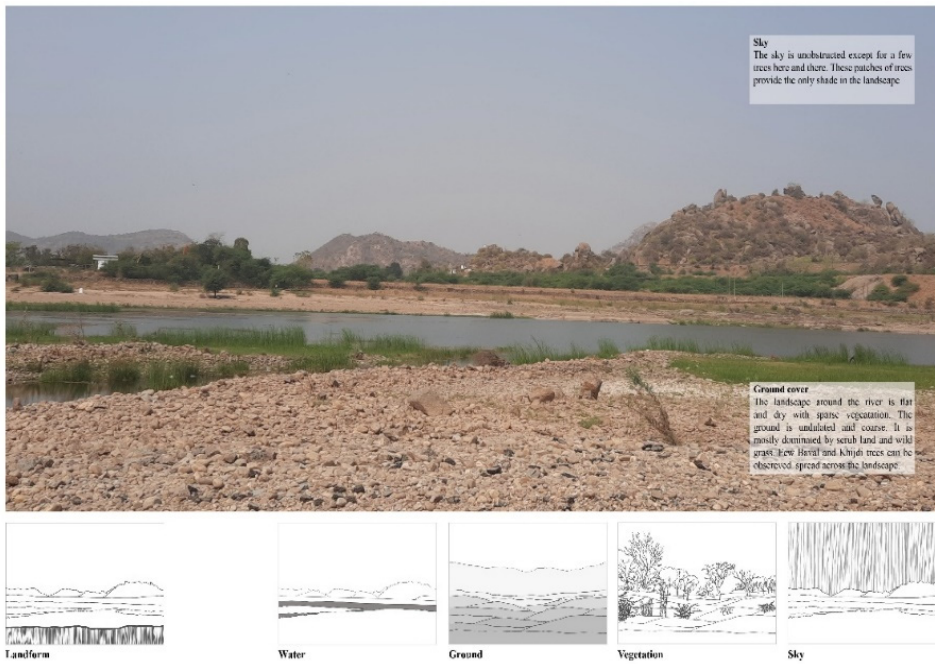


Figure 14: Reading the landscape of Dharoi
Source: Author 1

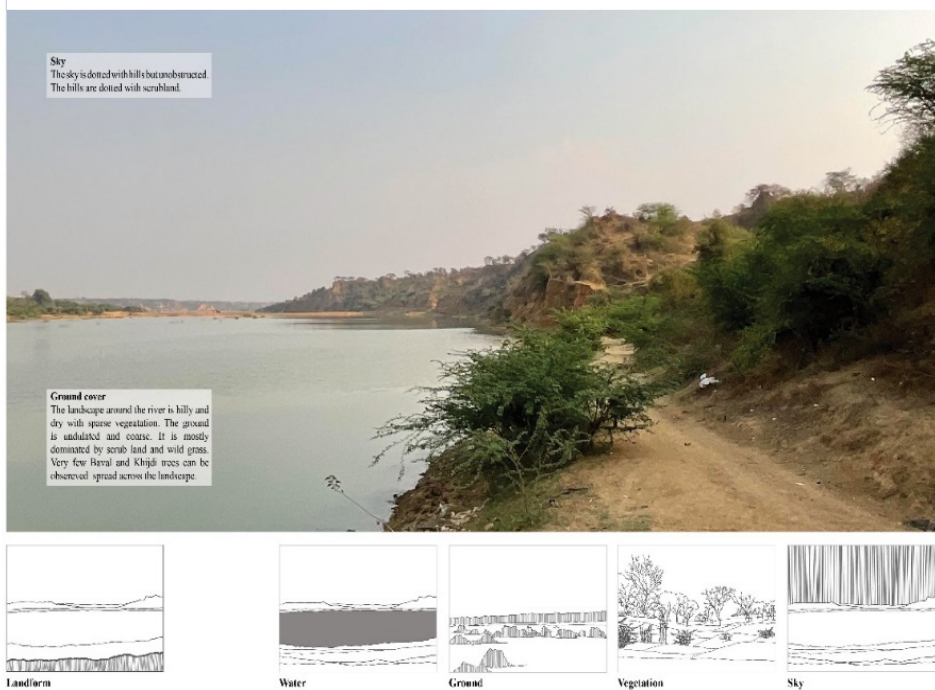


Figure 15: Reading the landscape of Mahudi
Source: Author 1

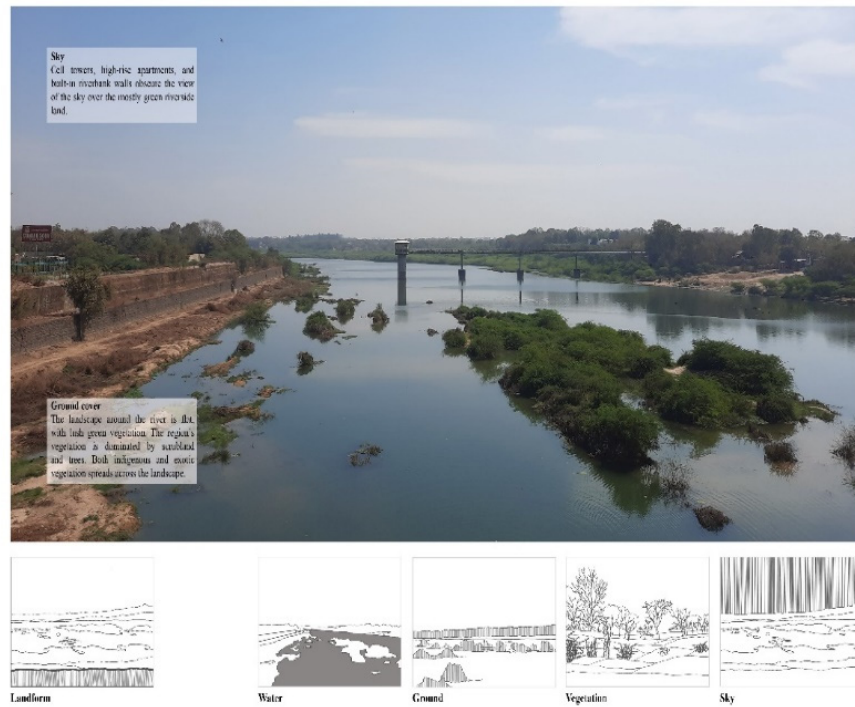


Figure 16: Reading the landscape of Koteswar

Source: Author 1

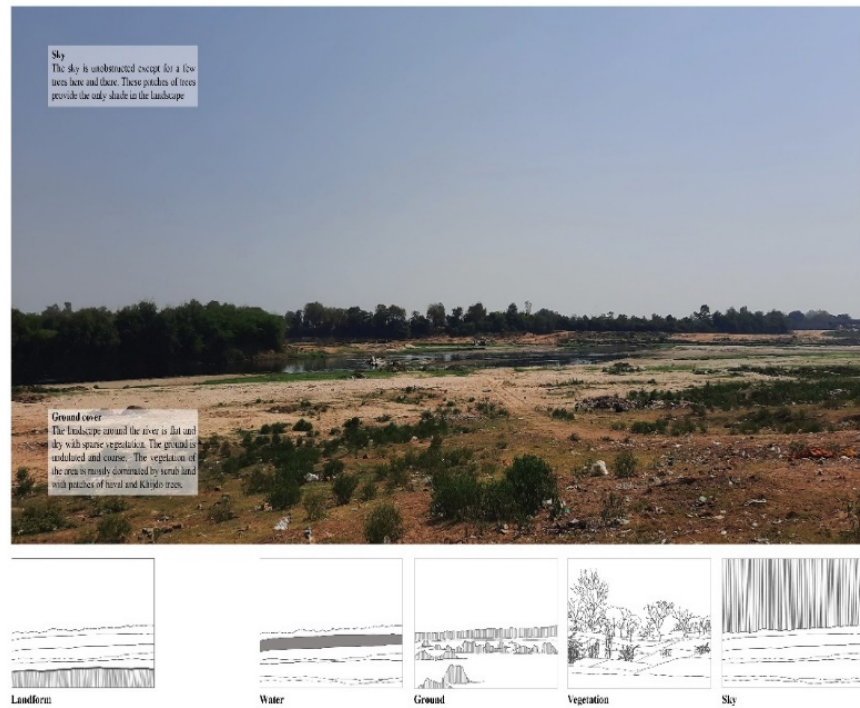


Figure 17. Reading the landscape of Vautha

Source: Author 1

attributed to the riverbank, as it has begun to surpass the river itself in terms of its value, converting it into a commodifiable object highly valued for its visual attractiveness.

The view of the Sabarmati River altered the context of Vautha. The construction of the riverfront structure has had a profound impact on the community's perspective of the river, which was previously mainly used for activities such as washing and swimming. Currently, the Sabarmati River is well recognized as being contaminated and unfit for many uses, limiting its use mainly to agricultural and animal husbandry endeavors.

The conducted extensive analysis highlights the significant impact of the sustained presence of water on fostering a stronger connection between the local population and the river. Conversely, concomitantly, the deterioration of water quality downstream of Ahmedabad has played a significant influence in defining the perception of the river as being polluted. The findings above offer empirical support for individuals' perceptions of a river are intricately intertwined with the intricate and multifaceted network of socio-cultural connections within the surrounding riverscape.

Table 3: Cumulative analysis of the findings in the five selected sites

Source: Author 1

Site	Sociocultural Practies	Site Observations	Landscape analysis	Collated Associations
Dharoi	Agriculture	No visual or physical connection with water	Construction of Dam an Reservoir	River as a resource
Undani and Falasan	Agriculture, ritualisatic practices, daily chores	No change	Presence of water throughout the year	River as a resource
Mahudi	Ritualisatic practices, cremation, agriculture, sand mining	No connection with the river (visual or physical)	Shift from green vegetation to dry vegetation	River as a resource
Koteshwar	Agriculture, temple, fishing	Visual connection	Increase in vegetation along the edge which is being replaced by riverfront	River as a resource and commodity (recreation)
Vautha	Agriculture, temple, animal husbandry, fair	Lack of physical connection, only visual	Degradation in the quality of vegtation	River as a resource and recreation

12. Conclusion

The objective of this project was to gain insight into the dynamic connection between persons and rivers by employing socio-cultural mapping techniques along the Sabarmati River. In this endeavor, the riverscape was seen as a complex cultural landscape inextricably intertwined with the essence of human existence. The perspective held was that the landscape is subject to continuous change, influenced by the everyday activities of its inhabitants. The primary objective of this study was to enhance our understanding of how individuals see rivers and their connection with human beings. This knowledge can potentially guide the development of environments that include socio-cultural memory. It is essential to elucidate that although the study acknowledges the presence of many socio-cultural linkages along the river, it deliberately concentrated on those intricately associated with the river itself. Moreover, the present study emerged from a more comprehensive investigation of the changing dynamics of rivers in India; nonetheless, it abstains from sweeping generalizations about the situation. However, it functions solely as a case study that examines the condition of rivers in India, focusing specifically on the Sabarmati River. The comprehensive investigation underscores the enduring influence of water in fostering a deep bond between residents and the river. In contrast, the simultaneous degradation in water quality downstream of Ahmedabad has been a contributing factor to the prevailing view of the river as being filthy. The findings mentioned above provide evidence that the way individuals see a river is closely connected to the dynamic web of socio-cultural linkages present within the surrounding riverscape.

Nevertheless, despite the dynamic nature of the river's circumstances, it is apparent that the residents residing in rural regions continue to hold the river in high regard and engage in acts of reverence towards it. The Sabarmati River catalyzes socio-cultural activity in this context. For example, the continued engagement in socio-cultural activities in Undani, Falasan, and Koteswar has been essential in preserving the river's natural environment. Significantly, the region of Koteswar has had a notable increase in vegetation over time. On the other hand, in regions such as Mahudi, there has been a notable decline in the quality of the landscape due to a reduced level of interaction with the river. It is crucial to understand that within the complex fabric of Indian culture, rivers play a dual role as facilitators and guardians of socio-cultural connections. These associations, in turn, contribute to conserving the riverine landscape.

13. The Way Forward

This generates questions concerning the notion of a river. The intrinsic nature of a river and its corresponding boundaries is a topic of authentic investigation. To what extent does the notion of a river depend exclusively on the tangible presence of water, as opposed to the establishment of riverbanks and delineation of boundaries? Does the identity of a river become undermined when its water stops flowing? Is the perpetual flow of water the distinguishing characteristic of a river, setting it apart from other aquatic formations? Within the framework of the Sabarmati, the fundamental nature of the river was not just determined by the simple presence of water or the precise demarcation of its boundaries. In contrast, the river acquired a sense of liveliness due to the complicated web of socio-cultural relationships carefully constructed and cultivated over several generations.

The perception and connections around the ecological valley vision proposed by Bernard Kohn may have had a different evolutionary trajectory compared to the riverside idea, prompting a consideration of its potential impact. Is the realization of an ecological valley feasible 62 years after the commencement of the project, considering the significant impacts of riverfront development on river ecology and the affected individuals? These investigations are of significant importance in the conservation and rejuvenation of rivers, acknowledging their fundamental and ever-changing function within the socio-cultural fabric of human civilization.

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