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Dwarka Lost and Reclaimed: Planning for a Resilient Landscape

Heena Gajjar and Amita Sinha

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Heena Gajjar was a University Olmstead Scholar in 2015 and graduated with a Masters in Landscape Architecture from University of Illinois at Urbana Champaign, USA. She is currently working as a landscape designer with

Sasaki Associates in Watertown, MA.

✉ archeenagajjar@gmail.com



Amita Sinha, is a Professor in the Department of Landscape Architecture at the University of Illinois at Urbana Champaign, USA. She is the author of *Landscapes In India: Forms and Meanings* (University Press of Colorado, 2006;

reprinted by Asia Educational Services, 2011) and editor of *Landscape Perception* (Academic Press, 1995) and *Natural Heritage of Delhi* (USIEF and INTACH, 2009). Her co-edited volume *Cultural Landscapes and Heritage Conservation in South Asia* will be published by Routledge in 2017.

✉ sinha2@illinois.edu

ABSTRACT

The coastal peninsula of Okhamandal in Gujarat, India is a popular pilgrimage destination, especially the holy city of Dwarka established by Krishna and swallowed by the sea upon his death. The environmental history of the region is marked by a continuing tussle between humans and nature in reclaiming land from sea. Archaeological findings and changes in the shoreline suggest repeated inundation and rebuilding. Presently, threatened by rise in sea levels due to climate change and desertification due to salt ingress. One of the four major holy sites across the Indian subcontinent, this landscape of immense cultural significance is visited by nearly two million pilgrims annually. The ongoing infrastructure development is harmful to its fragile ecologies and disturbs the ambience of its sacred sites. It is proposed that the lapsarian approach to landscape design guide the conservation of Dwarka and other pilgrim sites in Okhamandal. This will promote resiliency, encourage a faith based environmental ethic, and sustainable management of sacred sites.

Introduction

The region around the Gulf of Kutch and Khambhat on the west coast in India is particularly vulnerable to climate change. Sea ingress is noticeable in the low-lying areas in the Great Rann of Kutch and below in the tiny peninsula of Okhamandal, home to the pilgrim city of Dwarka and other sacred sites. Okhamandal embodies significant cultural heritage as the site of all India pilgrimage and of archaeological discoveries of historic and proto-historic settlements dating back to 1500 BCE. Its cultural landscape is shaped by archetypal images and ritual enactments that celebrate mythic events. From a historian's perspective, the landscape is a palimpsest containing relics that need to be excavated and dated to piece together the historic narrative. Both ways of seeing contribute to its immense

It was a fabulous golden city-*svarna nagri*, also known as *Dvaravati*- the door to eternal bliss. As per the legend, the shining city rose from the sea, designed by the divine architect Viswakarma, and rivaled the heavenly Amaravati in its splendor.

significance as a site of cultural memory. At the tip of the arm of the Gulf of Kutch covering an area of 780 sq. km., Okhamandal has suffered repeated inundations due to seismic events, cyclones, and also the slower sea ingress through the low-lying areas on its shoreline (Figure 1). The state is developing infrastructure on a large scale at Dwarka to meet the requirements of increasing amount of pilgrimage. The current model of infrastructure based urban development is not sustainable and will not be able to withstand catastrophic



Figure 1: Location of Okhamandal

events. We propose an alternative model in which heritage conservation practices are leveraged towards building resilient ecosystems.

The Myth of Dwarka

The fabled city of Dwarka, like the myth of Atlantis, has captured the Hindu imagination for centuries. It was a fabulous golden city-*svarna nagri*, also known as *Dvaravati*- the door to eternal bliss. As per the legend, the shining city rose from the sea, designed by the divine architect Viswakarma, and rivaled the heavenly Amaravati in its splendor. The land on which it was built was wrested from the sea by Krishna,¹ Vishnu's incarnation, who had taken birth to destroy evil and restore the moral order in *dvapar yuga*. Dwarka is mentioned in a number of medieval *puranic* texts—Vishnu, *Bhagwata*, and *Matsya Puranas*. In *Harivamsa*, epilogue to the *Mahabharata*, Dwarka is described as a *varidurga*- a fortress in water and *dronimukha*- a port at the confluence of a river and sea. It was naturally protected by hills and sea on three sides and

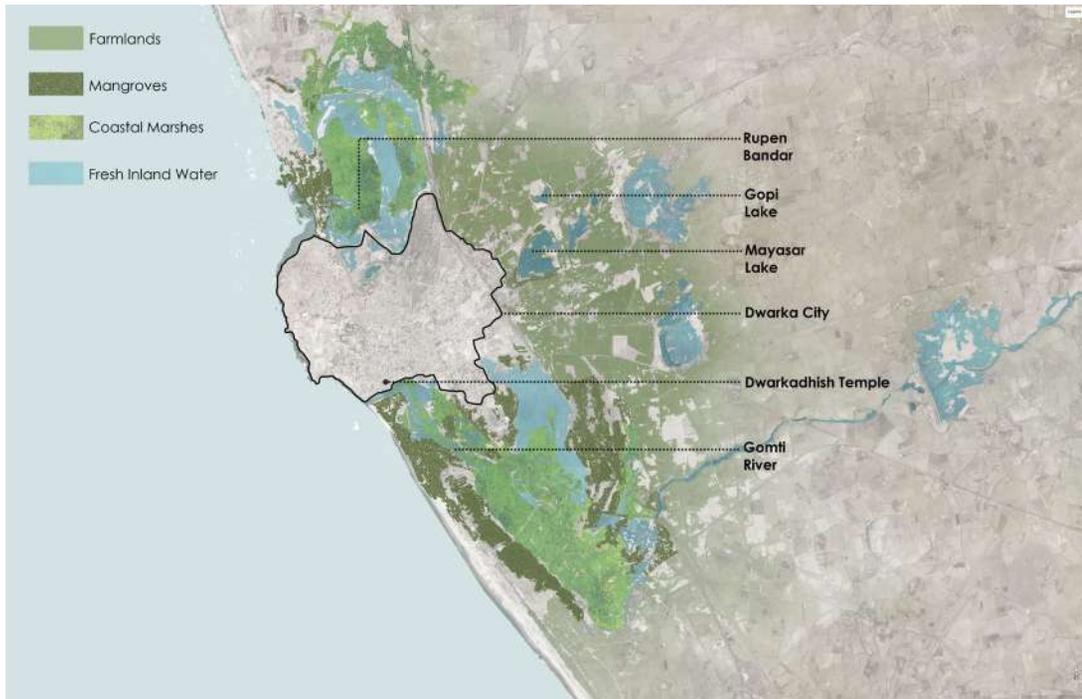


Figure 2: Dwarka as an archetypal island

fortified by a wall with four gateways. It was divided into eight sectors by broad streets lined with magnificent marble palaces according to the principles of *vastu shastra* (Rao, 1995).

Legend has it that Dwarka was destroyed and rebuilt seven times, each instance of building mimetic of Krishna's establishment of the archetypal golden city and every destruction a replay of the original cataclysmic event.

Dwarka's destruction by the sea is attributed to the community's decline into decadence and infighting. Krishna himself was killed by a hunter who mistook him for a deer at the coastal settlement of Prabhas (modern Somnath) after his kinsmen fought each other to death. A huge tidal wave rose from the sea and swallowed

Dwarka (Eck, 2012). With that *Dvapara Yuga*, the third epoch in the Hindu cycle of creation and destruction of the universe, ended and the fourth, the present age of *Kali Yuga*, began.

Legend has it that Dwarka was destroyed and rebuilt seven times, each instance of building mimetic of Krishna's establishment of the archetypal golden city and every destruction a replay of the original cataclysmic event. Dwarka's destruction by the sea marking the end of an epoch and beginning of another is symbolic of the Hindu belief in eternal cycle of time and its manifestation in space. Time in this worldview is cyclical and begins anew when the universe is created following its dissolution. The memory of genesis (*shrashti*) and apocalypse (*pralaya*) is preserved in the coded language of myth (Chandrasekharam, 2007). The divine hero

Krishna is instrumental in building a perfect city but is helpless in preventing his community from committing moral transgressions that hasten its end. The city as a seat of *avatar*, like the Vedic altar of sacrifice, must be built and destroyed and rebuilt (Couture, 2003). Dwarka is believed to have been rebuilt seven times and each occasion of rebuilding is a commemoration of the original act and its creative force.

Mythic Dwarka is the archetypal 'golden city', built on land wrested out of the sea by Krishna, and a testament to his divine power over natural forces. Krishna in his human incarnation is superior to Varun, the god of sea and Agni, god of fire, whose temples line the seashore along with Dwarkadhish Temple in present day Dwarka. Yet nature wins, and the sea swallows the beautiful and perfect city. In a fable similar to that of lapse of humans in the Judeo-Christian belief and their exile from the Garden of Eden, the moral transgressions of the residents are blamed for this destruction. The quest for utopian Dwarka inspires the rebuilding of the temple city in every epoch brought forth by ceaseless turning of the wheel of time.

Landscape of Pilgrimage

Archetypal images deeply rooted in the collective unconscious and expressed through building are significant in the making of cultural landscape of Okhamandal. Images of island and axial pillar signify cosmogony and emergence of land from the waters. Island is a recurring motif in Hinduism with the Indian subcontinent conceived of as an island called Jambudvip. The images of axial pillar linking the three worlds of earth, heaven, and underworld, are powerful because they signify victory over destructive forces of nature and

creation of order out of chaos. These primordial images are charged with profound meanings communicated in stories of places. The spatial practices of pilgrimage—circumambulatory movement in walking, bathing in water bodies, worshipping in temples and shrines, among others—regenerate the cultural landscape and its sacred powers.

Okhamandal joined by a narrow isthmus with the mainland appears to be an island. Moreover since the highest elevation of this plateau is only 45.75 meters above sea level, its low-lying areas are filled with water during monsoons and storm events (Desai and Clarke, 1923; Shah, 1938). The unknown Greek author of *Periplus of the Erythraen Sea* written in the first century,

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describes Baraca (Gulf of Kutch) as having seven islands interspersed with the Rann (salt marshes) and sea (Schoff, 1912).² Dwarka is actually on a high mound at the confluence of River Gomati and sea with marshlands and water bodies around it. During the monsoons the low-lying areas are completely inundated accentuating the island effect (Figure 2).

Promontories at the confluence of rivers or of river and sea signify land emerging from the cosmic ocean at the beginning of time. The archetypal image of the world pillar fixing the primordial mound floating in the cosmic ocean represents the paradigmatic act of cosmogony



Figure 3: Sun setting over Dwarkadhish Temple

(Irwin, 1983). Temple spires at promontories on the coastal edge in Okhamandal are modeled on this image and symbolically mark the emergence of land from the watery chaos (Figure 3). The archetypal image of the axial pillar is found inland at the edge of water bodies as well. At Gopi Talav and Nageshwar, in northern part of Okhamandal, the landscape is fashioned in this image as it is in many sites in Braj where Krishna spent his youth. The pond in a clearing in the forest is a space marked by interiority and signifies plenitude and nourishment.

In circumambulating Dwarka and Okhamandal, pilgrims are reaffirming the sacred emergence of land and demarcating it with their movement.³ Dwarka's most celebrated temple of 16th century, dedicated to Krishna as *Dwarkadhish* was, according to legend, originally built by Krishna's grandson, Vrajabh, ruling in Mathura. Pilgrims begin the circumambulation of sacred sites in Okhamandal from a square behind this Dwarkadhish Temple. Fifty-six steps from the temple lead down to the River Gomati where pilgrims bathe, worship, and perform rituals (Figure 4). They wade through the river during low tide to the island called Panchkund,



Figure 4: View of Dwarka ghats

formed by sediments deposited by the sea, and visit the five wells dedicated to the five Pandavs (of Mahabharata). They visit Rukmini Temple on the outskirts of the city, where according to the legend, Krishna's arrow brought forth fresh water to quench the thirst of his chief queen Rukmini when they both were travelling to meet the sage Durvasa (Figure 5).

Travelling further, pilgrims take the boat from Okha to the island of Bet Dwarka, also known as Shankhodhara, named after conch shells found there in profusion. A satellite settlement to Dwarka, it has many temples including one to Dwarkadhish and Shankhodhara where Vishnu is worshipped in his incarnation as a fish.⁴ From the conch shaped island, they cross the sea again to Gopi Talav where the temple and pond behind it commemorate the reunion of cowherdresses (*gopis*) of Vrindavan with Krishna. Pilgrims circumambulate the pond and ingest the soil and engage in *raas lila* (enactment of episodes from Krishna's life). Further on to Nageshwar, to visit Shiva Temple containing the *iyotirlinga* surrounded by the primeval forest Darukvan as mentioned in *Shiv Purana*, and then ending the journey at Dwarka where it began.



Figure 5: Pilgrims walking towards Rukmini Temple

Dwarka in History

Dwarka's recovery in face of catastrophes is a remarkable testimony to its cultural resilience. Myth and history agree on this but differ in conceptions of time and space and their connection with landscape. History, an objective account of actors and events, is chronological with a fixed point of beginning against which all that is subsequent is measured. The division into protohistoric, historic, medieval, colonial, and post-colonial in Indian history describes the linear progression of time. This arrow of time linking past, present, and future presupposes no return to origin unlike mythic time that is forever looping back in an endlessly recurring cycle (Eliade, 1954). The landscape is treated as a palimpsest and treated as an archive to be mined for deciphering the age of objects and their possible uses in times gone by. Relics as fragments of complete structures are pieced together and interpreted to tell the story of the past never to return.

The story of Dwarka, lost and reclaimed from the sea, has inspired and intrigued countless generations of Hindus. In the twentieth century, it has motivated archaeologists to prove the

veracity of the myth and make it history through scientific explorations. Sites with claims to being Krishna's Dwarka have been excavated since the 1960s and archeological findings are published in numerous articles and books. The present day Dwarka appears to be the likeliest candidate for the mythic city, although evidence of its historicity is inconclusive. That it was part of a network of settlements in protohistoric period (1800 BCE to 1500 BCE) in Okhamandal peninsula is attested by archaeological research (Figure 6).

The presence of creeks and seasonal rivers in the coastal region of Saurashtra in Gujarat where Okhamandal is situated, allowed harbors to be built and sea trade to flourish since ancient times.⁵ Stone and iron anchors and fragments of stone walls and bastions have been found on the seabed at a depth of 7-10 meters in underwater

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exploration 1 to 1.3 km seaward of the present day Samudranarayan Temple in Dwarka. Rao (1999) surmises these may be remains of the ancient submerged Dwarka, planned as a fortified settlement with six sectors on the banks of the River Gomti whose bed in the past had extended into the sea. A natural ridge running parallel to the shore where a number of anchors were found had served as a wharf in what would have been a very busy port in the protohistoric period. Other archaeologists disagree, pointing out that underwater structures are of dressed

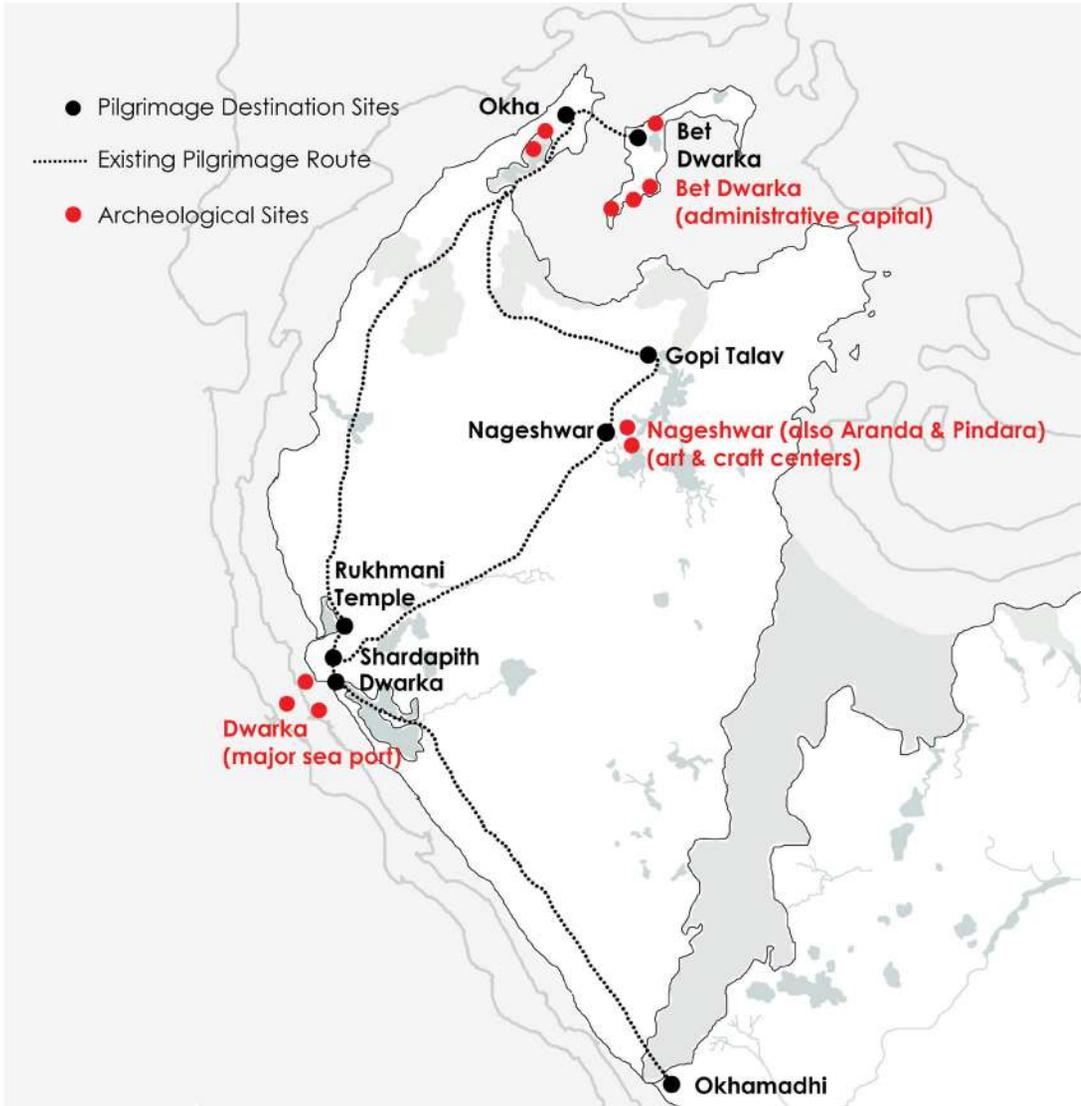


Figure 6: Archaeological sites in Okhamandal

stone and likely of recent origin although the anchors are much older suggesting that Dwarka had been a seaport at least since the third century BCE (Gaur, Sundaresh, and Vora, 2008). Excavations in Dwarkadhish Temple in Dwarka yielded remains of five successive temples built since the beginning of the millennium (Rao, 2001).

What about Dwarka being swept away by the sea? Archaeological research is once again inconclusive in substantiating this as a fact. The estuarine delta environment in the Great and Little Rann in Kutch above Okhamandal has evidenced erosion and redistribution of sediments caused by sea level fluctuations since the late Pleistocene/early Holocene epochs.



Figure 7: Krishna devotee

Transgression and regression of sea caused changes in shoreline evidenced by artifacts found in intertidal zones. Sea level would have been higher than the present level in the protohistoric period since many Harappan coastal towns such as Lothal in the Gulf of Khambat are now located in hinterland. It declined by 2-3 meters in Bet Dwarka around 1300 BCE resulting in land reclaimed from the sea on the northern and eastern part of the island and its connection with mainland. Sea level rose again around a thousand years ago submerging coastal sites of the historic period. The shore has advanced landward by 550 meters in the last 130 years (Gaur, Sundaresh, and Tripathi, 2004; Gaur, Sundresh, and Vora, 2007).

In Okhamandal, coral reef fossils have been found inland near Dwarka and Gopi Talav, and below surface in Mithapur, pointing to tectonic disturbances in the region. The Gulf of Kutch has also been seismically active with major earthquakes recorded in the recent past (1819, 1956, and 2001). Rajendra et al. (2003) have identified a seismically generated sand blow in Bet Dwarka near a thrust fault suggesting an earthquake 2000 years ago.⁶ While more studies could prove Dwarka was submerged by a giant tsunami, it is more likely that ancient harbors in Okhamandal became non-navigable due to changes in coastal morphology.⁷

There are major gaps in the history of Dwarka between the protohistoric and historic periods. Dwarka's destroyed earlier temples were dated by digging trenches in the forecourt of Dwarkadhish Temple; offshore excavations on the seabed at Dwarka and in the intertidal range in Bet Dwarka revealed artifacts whose age was determined through carbon and thermoluminescence dating. Their use value in the present is limited to their

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survival from another time and what they tell us about it. Yet the story, unlike the myth, is never complete and gaps continue to persist waiting to be filled by promise of further research.

Dwarka's popularity as a pilgrim destination began to grow since the ninth century when the saint philosopher Adi Shankaracharya chose it as the site of Sharadapith, one of the four major monasteries for the study of Vedanta doctrine of Hinduism (Sen Gupta, 2003). Dwarkadhish Temple became the prime target of Islamic iconoclasm and was ransacked by Muhammad

Dwarka is a site of memory as an enacted landscape of pilgrimage and an archive of fragments buried underground and scattered on the seabed at the coastal edge. Place myths, temples and shrines, pamphlets, local folk art, and songs create and buttress memory of Krishna's heroic feats and his eternal city.

Shah in 1241 CE and the Gujarat Sultan Mahmud Begarha in 1473 CE (Davidson and Gitlitz, 2002). The sixteenth century saint Vallabhacharya is believed to have hidden the deity in a stepwell during one of the Islamic invasions and installed it in a temple in Bet Dwarka. Dwarkadhish Temple was looted during the 1857 Uprising and later restored by Gaekwad rulers of Baroda state. Today Dwarka is a thriving pilgrim town of 38,873 residents visited by nearly two million pilgrims annually (Figure 7). Its temples and those at other sacred sites in Okhamandal are thriving centers of worship and receive government aid in their upkeep.

Site of Memory

Dwarka is a site of memory as an enacted landscape of pilgrimage and an archive of fragments buried underground and scattered on the seabed at the coastal edge. Place myths, temples and shrines, pamphlets, local folk art, and songs create and buttress memory

of Krishna's heroic feats and his eternal city. Oral traditions have been tenacious in keeping those memories alive yet there appears to be the need to authenticate the past through empirical knowledge. Myths enacted by the devotee are successful in reliving the past in the present and are in that sense 'living history' although considered to be works of imagination by historians. In the quest to turn myth into history, archaeologists have sought to 'prove' the existence of historic Dwarka and Krishna through material remains. In translating myth into history through empirical research, reconstruction of past events is given a factual basis and therein lies its appeal. The psychological immediacy of the enacted myth is complemented with the detached perspective used in documenting history. In this reconciliation of myth and history, Dwarka becomes a representational space—of myth, symbols, traditional spatial practice— as well as a space of representation—of timelines, taxonomies, and networks that describe empirical knowledge systems.⁸ Both two ways of seeing and remembering the past inform the present and should be considered in projecting Dwarka's future.⁹

Heritage at Risk

Pilgrim sites on the coastal edge of Okhamandal are vulnerable to the projected sea level rise of 1-2 meters by 2100 CE due to global warming.¹⁰ The melting of polar ice caps is predicted to alter the isostatic balance in the earth's crust resulting in greater frequency of high magnitude earthquakes in structurally unstable areas accompanied by rising levels of sea. The fluctuation of Saurashtra coastline due to transgression and regression of sea since the last ice age coupled with the history of tectonic



Figure 8: Engineered coastal edge at Dwarka

activity in the region, make the possibility of Dwarka being drowned by the sea for the eighth time not entirely improbable.

Coral reefs and mangroves protect the shore from tidal surges and increase its stability. They are essential to the biodiversity of the coastal marine environment as breeding grounds for fishes, crustaceans, and algae, and for bird nesting. Mangroves are being cut down by locals for fuel wood; plus an engineering approach is used to stabilize the shoreline in Dwarka with concrete tetrapods to reduce coastal erosion (Figure 8). New urban development in the low-lying marshland and scrubland around the city has disturbed the local hydrology and is causing creeks and streams to dry up. The damming of streams upstream has reduced fresh water and increased salinity in Okhamandal. Salt ingress, i.e. movement of saline water into fresh water aquifers, is a major issue in Okhamandal

since the 1960s caused by subsurface sea water intrusion and vertical percolation of saline water (Figure 9). It is predicted that by 2025 there may be no fresh water available if the present rate of over extraction of ground water continues resulting in salt ingress at the rate of 30 hectares per year.¹¹ Coastal erosion and salt intrusion disrupt the coastal ecology and reduce the landscape's ability to adapt and recover from sudden catastrophes as well as slower disturbances caused by climate change.

Lapsarian Landscapes

In recent years Dwarka has seen new development—roadways, beachfront, bridges—meant to increase access and provide recreational facilities to pilgrims. The Government of India is promoting sustainable development of twelve pilgrim cities across the country including Dwarka under the National Heritage City Development and Augmentation

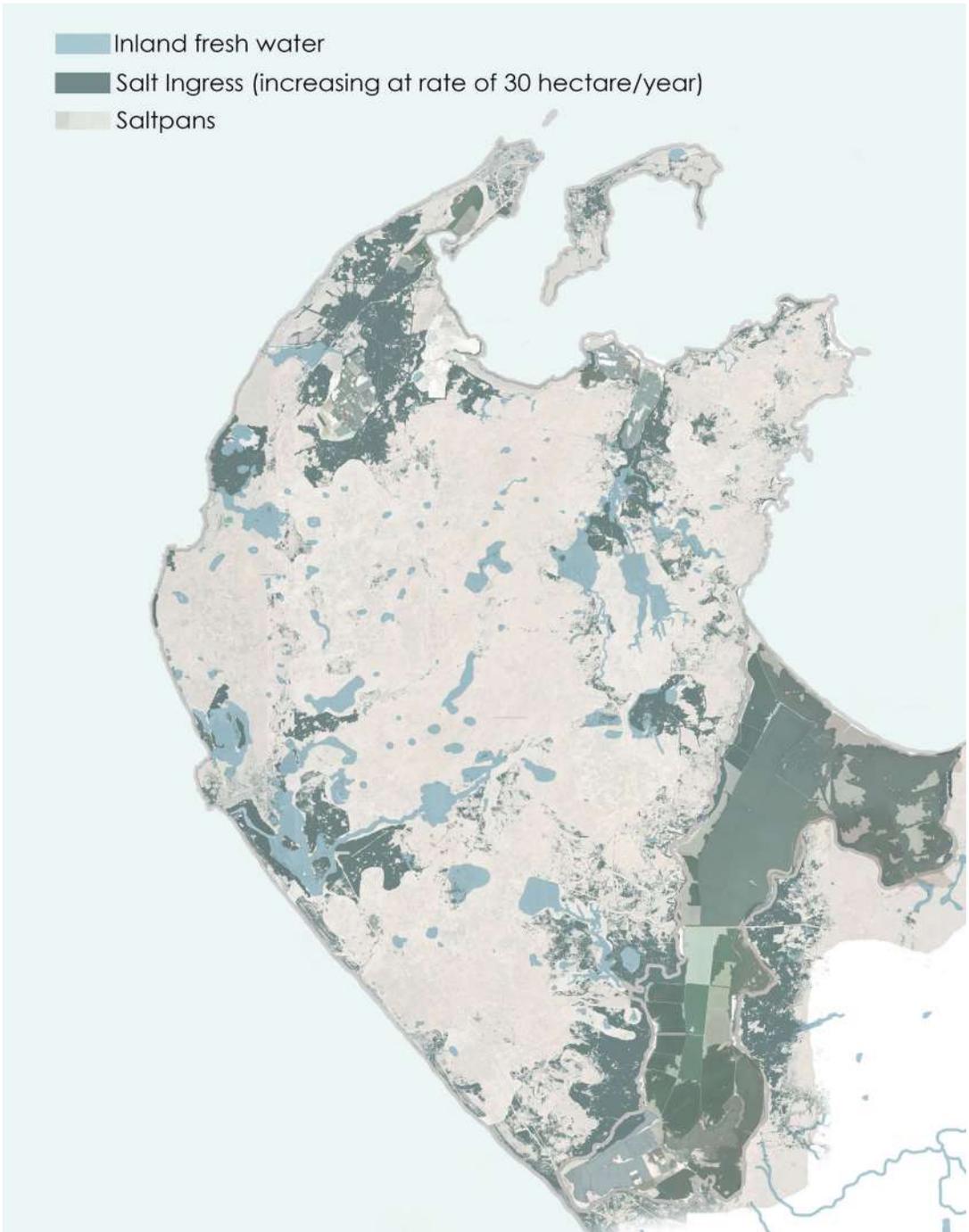


Figure 9: Salt ingress in Okhamandal (source: GIS mapping by Heena Gajjar based upon report by Coastal Salinity Prevention Cell)

Yojana popularly known as HRIDAY.¹² The focus is on developing infrastructure for the increasing pilgrimage with little thought to understanding the sacred landscape as part of the regional ecosystem. Today the pilgrim city is developing rapidly with massive investment in its infrastructure of roadways, bridges, and sea walls. Domestic pilgrimage is the biggest economic engine driving its development. Okhamandal's vulnerability to sea level rise and its slow desertification will impact the immense cultural heritage of Dwarka and other sacred sites, a fact not being taken account in state sponsored urban development. The engineered infrastructural model of development of pilgrim sites is geared for resisting nature, not working with natural systems. It is linear and hierarchical, relies on fossil fuel for its energy sources, pollutes ground, water, and air, and has little capacity to adapt

The answers lie in acknowledging the legacy of the myth of Dwarka's destruction by the sea caused by human transgressions, but moving beyond in applying scientific research to generate innovative solutions to problems posed by climate change.

and regenerate on its own. Its ability to recover from extreme events and absorb disturbances without destabilizing is questionable. In the ongoing efforts to dominate nature with modern technology and build an eternal city, the question remains- will it be sustainable as environmental problems caused by climate change accelerate? Is there a way to avert or delay the inevitable catastrophe as foretold by myth? How may the new understanding of ecology and a different way of viewing nature increase resilience of its cultural landscape? The answers lie in acknowledging the

legacy of the myth of Dwarka's destruction by the sea caused by human transgressions, but moving beyond in applying scientific research to generate innovative solutions to problems posed by climate change.

Resilience thinking is about understanding the complexity of cultural and natural systems and their capacity to change in response to new conditions while still maintaining their functionality.

David Hays (2015; pp. 9-10) describes the lapsarian approach to landscape as abandoning the ideal of perfect nature, the garden in Eden associated with the fall of man in Judeo-Christian thought, and embracing the idea of imperfect nature in ecological theory.

"In a "lapsarian" approach to landscape design, dynamic systems are manipulated without thought to static ideals. The lapse on which this approach depends is an intentional failure to generate and be guided by stable design images (e.g. Edenic paradigms, picturesque formulas, climax communities)."

Infrastructural landscapes based upon softer, looser ecological systems rather than fixed engineered structures perform better in that they have a greater capacity to adapt and regenerate (Belanger, 2016). Resilience thinking is about understanding the complexity of cultural and natural systems and their capacity to change in response to new conditions while still maintaining their functionality. The emergence of resilience as a central concept in ecology, landscape, and urbanism is tied to growing concerns about climate change (Lister, 2016). It is the key to sustainability (Walker and Salt, 2006).



Figure 10: Coastal marshlands

Proposed Approches

In operational terms, this means that instead of erecting static barriers such as walls and levees in the vertical plane, dynamic coastal infrastructure in the horizontal plane should be planned for (Hill and Barnett, 2007). The regional ecosystem of the Okhamandal peninsula defined by its coastal edge, mudflats, and estuaries should be considered in planning for future growth of Dwarka and other sacred sites (Figure 10). Coastal landforms should be able to shift in response to changing hydraulic conditions as the sea level rises and achieve a dynamic equilibrium. The living coastal infrastructure will respond to higher level of wave action through migration of landforms, for example, mudflats would migrate landwards with increase in coastal energy levels and be replaced by sand beaches (Crooks, 2004). Since coastal wetlands provide valuable ecological services—flood protection and support of marine life- building upland wetlands will

compensate their loss from sea level rise. Currently, the Marine National Park and Wildlife Sanctuary in the Gulf of Kutch covers 42 islands including Bet Dwarka and intertidal zone supporting coral reefs, mangroves, creeks, mudflats, and sand shores.¹³ Additional protection is ensured under coastal regulation zone designated under the Environment

In planning for the future of Okhamandal within the lapsarian approach, conservation of cultural heritage should be guided by ecological thinking while acknowledging the legacy of enacted myths and oral traditions.

Protection Act (1986) covering coastal land up to 500 meters from high tide line and 100 meters along rivers, creeks, and estuaries subject to tidal fluctuations. We propose that the scope of protection be increased by designating Okhamandal as a cultural and natural heritage



Figure 11: The proposed coastal edge at Dwarka

conservation zone, an eco-island where new infrastructure solutions can be tested leading to sustainable urban development.¹⁴ More comprehensive measures should be undertaken to address coastal erosion, for example coastal plain at the confluence of Gomati River with Arabian Sea can be reclaimed by replanting mangroves and establishing floating islands from recycled waste generated from pilgrim activities in Dwarka (Figure 11).¹⁵

Intense precipitation during the monsoons means there is not enough time for infiltration and most of the water flows into the sea. The Coastal Salinity Prevention Cell in Gujarat Government is fighting salt ingress by constructing check dams in streams, farm ponds, percolation wells and tanks, and planting salt tolerant crops such as sugar beet and date palm in coastal areas.¹⁶ This ensures that the coastal edge works as a sponge by holding fresh water and recharging the ground water table, thus suppressing salt ingress. These low cost

community-based strategies should be applied on a larger scale to improve their effectiveness in reducing salinity. GIS mapping of soils by the first author showed increase in salt ingress and fallow land between 1960-2015. In our projective planning for 2060 we propose rainfall harvesting and ground water recharging measures that will suppress salt ingress. Fresh water availability will increase the vegetative cover and attract more precipitation in the arid region.

Krishna Consciousness to Redefine the Pilgrim Trail

“Instead of imitating static ideals, the lapsarian approach prioritizes events and experience. Lapsarian landscape fosters interaction between humans and natural systems”
(Hays, 2015; p. 10).

In planning Okhamandal as a resilient cultural landscape, it is essential to involve

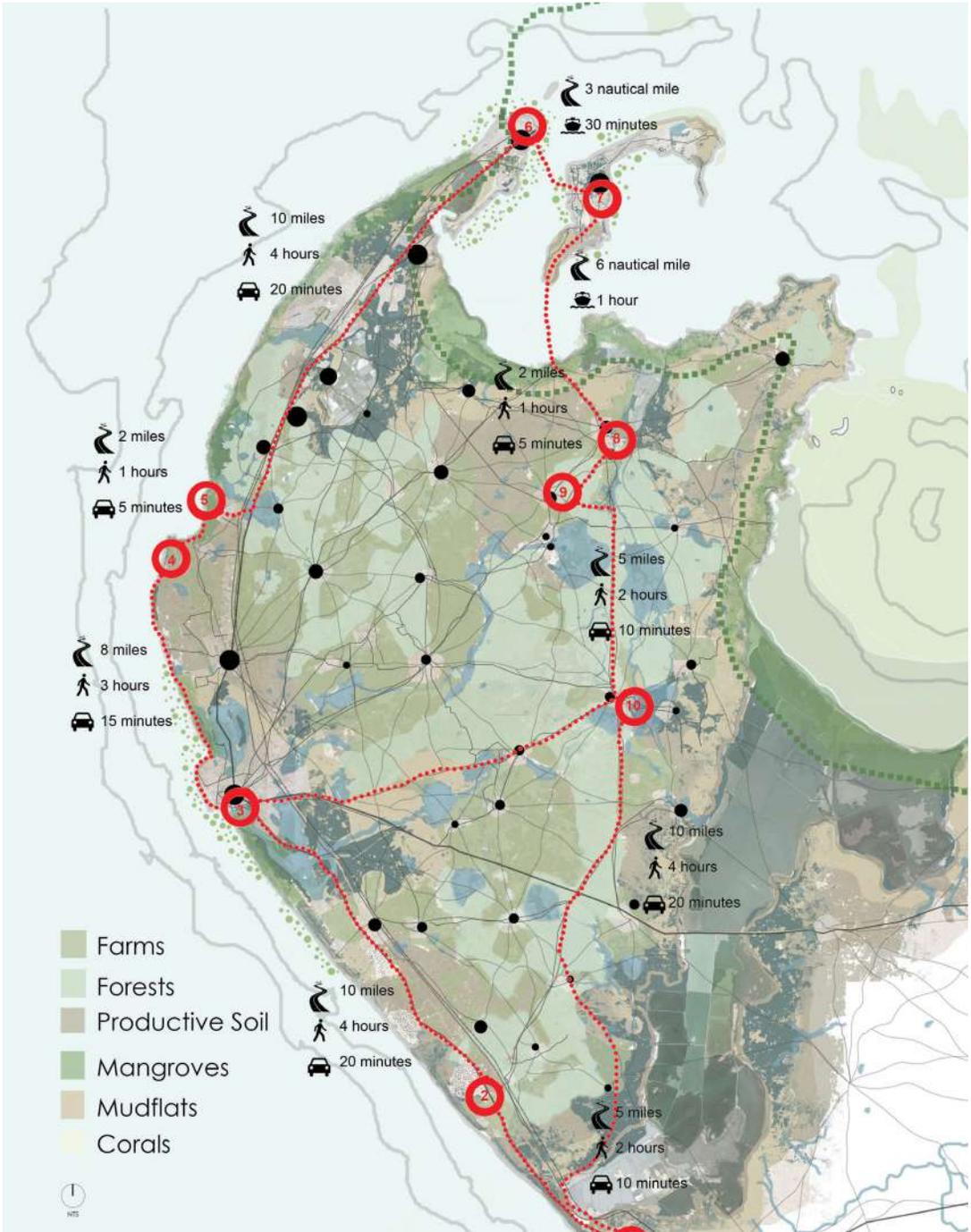


Figure 12: Proposed Eco-cultural Heritage Trail

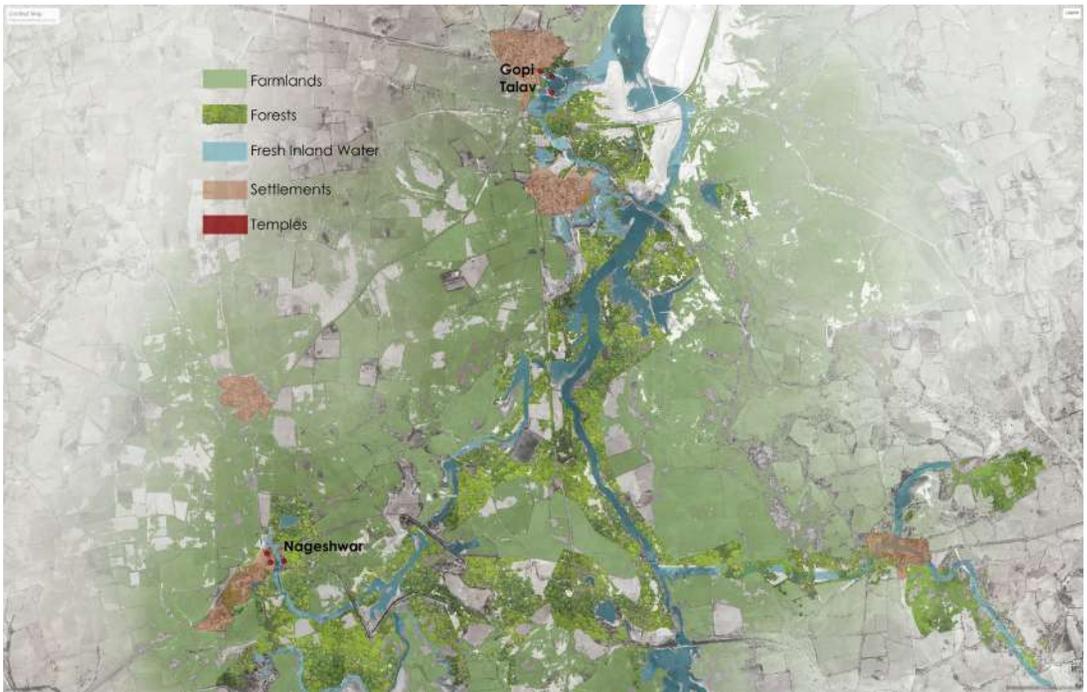


Figure 13: Integrated water catchment for Gopi Talav and Nageshwar

local communities and pilgrims in the process. We propose an eco-cultural heritage trail, in which the pilgrims will be able to experience the landscape in walking and close interactions with nature (Figure 12). A heightened awareness of the environment, ‘Krishna consciousness’ can be induced as they visit sites associated with the life of Krishna, listen to discourses on environmentalism and spirituality, and participate in eco-restoration projects. “Krishna consciousness”, a way of seeing and relating to nature, can be cultivated through close attention to natural processes and by developing a caring and reverential attitude. This would be the basis for an environmental ethos rooted in past traditions and conversant with present realities. Today, as salt ingress is threatening to turn Okhamandal into a desert, fresh water bodies with mythic associations can

be revived to restore the once verdant landscape. Krishna’s image as a proto-environmentalist can play a useful role in developing a pilgrimage circuit that links the existing temples with groves and wetlands. The rich repertoire of place myths will grow over time, as pilgrimage traditions are seldom static.

Most pilgrims take the tourist bus from Dwarka to visit other temples in Okhamandal and come back in a few hours. There are very few opportunities to have close interaction with the landscape as premium is put on obtaining *darshan* (ritual sighting) of deities in the temples. Pilgrims who step down from Dwarkadhish Temple through the *moksha dvar* to the *ghats* on Gomati will see the sun setting over Varun Temple rising out of the sea.¹⁷ If they take the path behind the temples



Figure 13A: Detail of Gopi Talav

at Nageshwar and Gopi Talao, they will come upon hidden ponds in groves. If they walk the entire circuit, they will see many temples on the coast and inland rising out of the waters, and experience the local flora and fauna. But few do as there are no rest stops or signage and the walking path is not well defined.

In our planning proposal, the existing trail is extended beyond the existing loop—Dwarka, Bet Dwarka, Gopi Talao, Nageshwar—to include the sacred site of Okhamadhi at the southern tip of the peninsula. The journey on foot on this longer loop of 105 km will take nearly a week to complete. Rest spots proposed on the trail include reclaimed sites where salt ingress has been checked through wetland restoration and planting. Gopi Talav and Nageshwar Talav are proposed to become

part of the regional scale macro-catchment for harvesting rainwater and recharging the ground water table (Figures 13, 13 A, 13 B). Gopi Talav is believed to be the site of Krishna’s dance with *gopis*, and a place similar in form and meaning to the garden groves of Braj that represent a now lost environmental ethic (Sinha, 2014).¹⁸ We propose to reclaim it as a cultural space of ritual enactments and festivals celebrating the birth of Krishna (*Janmashtami*). The performative spaces generated from dancing *garba raas* and playing with colors during Holi festival will add vitality and renew the cultural landscape. An abandoned stone quarry reclaimed as stepwell, solar and wind farm, underwater archaeological exhibit, and bird sanctuary are proposed as rest spots that will engage the



Figure 13B: Detail of Nageshwar

pilgrim in understanding natural processes and environmental history of Okhamandal.

Conclusion

Human (and divine) actions sought to build a 'center' in the tiny peninsula of Okhamandal on the western edge of the Indian subcontinent, in marginal land on the seacoast. In spite of environmental catastrophes and social upheavals, Dwarka remained a center, even as it was on the periphery, within the polycentric sacred geography of Hinduism. Its repeated rebuilding demonstrates the tenacity of place memories and cultural commitment to mimic Krishna's foundational act in reclaiming land from sea. The illusion of stability communicated by ancient sea forts and modern floodwalls and their failure in overcoming high magnitude natural disasters and slow encroachment by the sea necessitates a paradigm shift in landscape planning and design. In planning

for the future of Okhamandal within the lapsarian approach, conservation of cultural heritage should be guided by ecological thinking while acknowledging the legacy of enacted myths and oral traditions. This means that images reified in static structures that resist and dominate nature should be discarded in favor of new images that represent resilient landscapes. ■

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Notes:

¹ The lovable child and adolescent cowherd grew up in the pastoral community of Yadavs in Braj and came into age by killing his evil uncle Kansa in Mathura and restoring the throne to its rightful heir. Krishna and his clan of Yadavas left Mathura upon repeated attacks by Jarasandh, king of Magadha. Krishna established his kingdom in Dwarka where he is worshipped as Dwarkadhish, ruler of Dwarka, and Ranchor, one who left the battlefield. In the epic *Mahabharata* Krishna was the charioteer of Arjun, one of five Pandav brothers in the grand battle between the cousins Pandavs and Kauravs. The dialogue between Krishna and Arjun became *Bhagavad-Gita*, the seminal text of Hinduism in which Krishna is a wise sage and guru enunciating the meaning and purpose of life to Arjun and reveals himself as *Brahma*, the ultimate transcendent reality (Arnold, 1899).

² S.R. Rao (1999) described them as Suvarna Tirtha, Bet Dwarka/Shankodhara, Narayanapura, Arambhadvara, Dhenuka, Okha, and Purvadvara. This suggests that Okhamandal landscape was perceived traditionally as an island nested and duplicated at smaller scales alluding to the pattern of self-similarity found in nature.

³ Dwarka in the west is one of the four char *dhaams* (four abodes or seats in the four cardinal directions) that every Hindu is enjoined to visit once in a lifetime. The clockwise circumambulation by pilgrims of the four *dhaams* defines the sacred geography of India (Eck, 2012). Two other *dhaams*—Puri (east), and Rameshvaram (south)—are also at confluences of river and sea, while Badrinath on the north is on a hilly range rising out of the waters (Bhardwaj, 1973). The fluvial aspect of sacred sites is further reiterated through building of large water tanks within the temple complexes.

⁴ According to the medieval Sanskrit text, *Padma Purana* Vishnu took the form of a fish (*matsya*) and rescued the Vedas hidden in the sea from the demon Shankhasura.

⁵ The island of Bet Dwarka in Okhamandal was inhabited by Late Harappan settlers in the 19th c-15th BCE as indicated by relics such as a seal engraved with a

composite animal (bull, unicorn, and goat) motif, copper fishhook, and two inscribed potsherds. The availability of chank shells in profusion in the Gulf of Kutch meant that Bet Dwarka and Nageshwar became centers for production of a variety of objects—beads, bangles, ladle, spoon, and seals—made with shells (Gaur, A. Sundresh, and V. Patankar 2005). Bet Dwarka had a flourishing overseas trade in the early centuries of the CE, as discoveries of amphora (pottery ware for wine and olive oil used in the Roman empire) and stone anchors reveal (Gaur, Sundaresh, and Vora, 2005).

⁶ The Harappan site of Dholavira in the Rann of Kutch suffered a massive earthquake around 2200 BCE that along with siltation may have caused its demise.

⁷ Archaeologists believe the decline of Harappan societies was caused by climate change. The retraction of Ghaggar-Hakra River, a tributary of Indus, and the weakening of monsoons, for example led to the demise of settlements on its banks and migration of its population eastwards (Giosan et al, 2012).

⁸ According to Lefebvre (1991) representations of space are produced by knowledge systems while representational spaces are symbolic, linked to art and hidden side of social life.

⁹ Dwarka and Okhamandal were studied in three site visits in 2008, 2014, and 2015. The sacred sites were visually documented, and pilgrims and stakeholders were interviewed. Mapping of water bodies, vegetation, trails, and settlements was done to do projective planning of Okhamandal for 2060. Remediation strategies were developed to address coastal erosion and salt ingress. Design scenarios for existing and proposed rest stops for the pilgrim on the proposed eco-cultural heritage trail were developed. The report can be accessed at: https://issuu.com/heenagajjar/docs/journeys_in_the_cultural_landscapes

¹⁰ <http://www.climatecentral.org/>

¹¹ *Ecological Profile for Coastal Talukas of Gulf of Kachch*, Report by Gujarat Ecological Society, 2014. Retrieved 20 December 2014, from <http://gesindia.org/>

¹² <http://Hridayindia.in/hriday-cities/>

¹³ Nilanjana Biswas. *The Gulf of Kutch Marine National Park and Sanctuary: A Case Study*. Unpublished report by International Collective in Support of Fishworkers. Retrieved from <http://aquaticcommons.org/2077/1/Kutch.pdf>.

¹⁴ Hodson and Marvin (2010) describe eco-islands as experiments in sustainable development using renewable sources of energy and recirculating resource flows. Treasure Island in San Francisco Bay and the island county of Tuvalu in Pacific Ocean are being planned to generate their energy from renewable sources by 2020.

¹⁵ Rossano (2015) reviews six river widening and floodplain expansion projects in Switzerland, France, Germany, and the Netherlands for preserving the dynamic estuarine landscape. Instead of levees controlled flooding is advocated for resilient landscape design.

¹⁶ Coastal Salinity Prevention Cell Annual Progress Report, 2012-2014 (<http://cspc.org.in/>). Salt panning is also increasing the rate of ingress. Increase in soil salinity and aridity has led to the reduction of native species forest cover and propagation of the invasive weed *Prosopis Juliflora*.

¹⁷ The number of pilgrims in Dwarka increased by 23% from 2012 (1,436,488) to 2013 (1,770,438) according to Gujarat Tourism (<http://www.gujarattourism.com>). In response to the increase in domestic tourism, the sea front is developed as the famous Chowpatty Beach in Mumbai and a pedestrian suspension bridge has been constructed to link the ghats with Panchkund Island. Pilgrims do not appreciate the new look. As one of them remarked to the first author in January 2015, "This place is not Mumbai, it is Dwarka. Krishna's Dwarka!"

¹⁸ Krishna had directed the cowherders to venerate Govardhan Hill in Braj instead of the distant sky god Indra because its vegetation provided food for their cattle. He had lifted the Hill on his finger to protect the community when angry Indra sent incessant rains causing floods. He had fought and subdued

the serpent Kaliya living in waters of the Yamuna River and had killed the many demons in animal forms lurking in the wilderness. In these allegorical legends, Krishna destroyed the evil forces of nature and promoted reverence of the bountiful natural landscape that sustained his community. Krishna's deeds and sayings as exemplars of right values and actions are relevant in contemporary times and its environmental concerns (Haberman, 1994; Luthy, 2016)

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