3 Smriti Van, Bhuj

Conceptualizing the Thematic Content for the Proposed Museum at Smriti Van, Earthquake Memorial Project at Bhuj

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Smriti Van Earthquake Memorial Museum

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Preamble

'Break a vase', says a poet, 'and the love that reassembles the fragments is stronger than the love which took its symmetry for granted when it was whole'. The January 26, 2001 earthquake of Gujarat snuffed out 13,805 lives in seconds and destroyed property and infrastructure worth billions of rupees. The Smriti Van Memorial will give finality to the loss of human beings by being a lyric of loss. A visual manifestation of hope and courage.

The Smriti Van Earthquake Memorial and Museum (SEMM) will be an emotive experiential space that explains the phenomena of earthquake with a unique exhibit treatment, reflecting the essence of the land- its kachchhiyat that will celebrate Ma Ashapura's mitho mehran. The self-portrait of Kachchh as reflected in the line – dhingi dhara, dhinga dhor, dhingi boli, dhinga bol* – will be the guiding spirit of the Earthquake Memorial and Museum complex.

**This earth is firm, these animals are tough, this speech has strength, and this language is strong - of Kachchh. Mitho mehran is the sweet ocean and Ma Ashapura is the goddess of Kachchh.*

Executive Brief

Overlooking the town of Bhuj, the Bhujiyo Hill has been the gateway to Bhuj for centuries just as the city of Bhuj has been a natural gateway to Kachchh for centuries past. On the site stands a 17th century Gateway and a running wall on the Bhujiyo Hill. Taking after the great Solanki architectural traditions of Gujarat, this is amongst the few examples of Hindu gateways still standing in India and will serve as a metaphorical entrance to the Smritivan Earthquake Memorial and Museum. In Buddhist and Hindu traditions, gateways signify knowledge and passage of time.

Kachchh has been a gateway to Sindh in the west, to Gujarat on the east. Kachchh harbours a gateway to the mysterious Indus Valley Civilization in that it is home to the Dholavira. If Bhujiyo is a gateway to the military past of the region then Kachchh is a gateway to the oceans and the world beyond its maritime past and present. Finally, Kachchh is a gateway to the great Rann. The Bhujiyo Hill is also the seat of the mythical celestial serpent and houses an active temple of Bhujangdev, whose worship is a centuries-old living tradition.

While the site offers its own significance, the Memorial and Museum would serve as twin anchors of collective memory of struggle, tragedy, resilience, transience of life, triumph of the human spirit and hope.

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Section: 1

Institutional Vision and Mandate

- **Memorial**
- **Living Museum**

Jewish Museum, Berlin

Die Museumsinsel, Berlin

Tate Modern Museum, London

Louvre Museum, Paris

The experience and the aftermath of a devastating earthquake is neither simple nor easy to comprehend and remains inherently fractured as the destruction it wreaked. As much as it will provide a place that explains seismic activity and its estimated $5.6 billion impact to property and infrastructure, this Museum will be a place for us to revisit that experience and weave a coherent narrative that ended 13,805 lives with an unprecedented degree of abruptness. The memorial will offer comfort and finality to loss; a place of remembrance that gives the living a means of moving on with life. As a mausoleum of life, it will embody the reality of this particular tragedy, transience of human existence and instill a sense of urgency in leading meaningful lives. Exhibiting tragedy is difficult and memorials are never neutral spaces as they assist societies in promulgating narratives on individual and collective experiences. The pain gives way to passion and passion to patience and patience in turn, gives us the strength for shared responsibilities.

Memorials have generally been defined in the western tradition as physical markers of memory, especially memories of loss that might be intense and therefore, a matter of public or national importance, calamity that might be sudden and often hard to conjure, cataclysmic and irreversible. The memorials are timeless markers of shared past enshrined in the spirit that evokes its commemorative remembrance. The idea of the memorial originates essentially from a pre-photographic and pre-phonographic era in the West, when there were no technologies available to capture an event as it was actually unfolding. Any attempt to remember such events would therefore require that the person actively remembering it mentally reconstruct an image of it, and then physically represent that image in a tangible representation of form. In the absence of a literal likeness, the memorial therefore had to take on an abstract, metaphorical, symbolic expression.

The memorial in India has historically taken an iconic or architectural form and in the Hindu-Jain tradition celebrates abstract values rather than the person, compared with a more individualistic focus in the Islamic-British Colonial eras. The idea of the Indian memorial fits very conventionally into the general pattern of memorial-making worldwide -in other words, we would be hard-pressed to find something uniquely “Indian” about an Indian memorial beyond its decorative iconography, perhaps evolving with tools of technology for creative expression.

For instance, prior to modern-day engineering, the memorial in pre-colonial and colonial urban Indian societies tended to experiment with scale and sought lasting materials- often carved stone. Examples of these are the commemorative stone paliyas of Gujarat and Kachchh, and the deified tribal totems from Northeast India, generally raised to commemorate valour in battle. Partly owing to the Hindu idea that the body was transient and that it lost material meaning upon death, memorials to the non-Kshatriya deceased were never self-referential, and never literal in their remembrance of the person who had died, but always abstractly celebratory. Of significance is the fact that both the chhattedis of Bhuj as monumental markers sponsored by royal patrons, and the paliyas of warriors in the king’s employ display two different scales of remembrance in the same culture pitched at different audiences.

Idea of a Museum

The International Council of Museums (ICOM)- an extended professional association under the aegis of UNESCO, to which the Union of India is a State Party, defines the museum as 'a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment'. This definition of a museum and the provisions of the Indian constitution can provide the framework for the institutional mandate of the Smritivan Earthquake Memorial and Museum even as it takes on a different connotation, given the associated Memorial within the premise, commemorating a tragic loss of life.

There are four museums in Bhuj: the Kachchh Museum, the Aina Mahal Museum, the Sharad Bagh Museum, and the Kachchh (or Bharatiya) Sanskruti Darshan Museum. All of these fit the conventional mould of what a museum should look like or enshrine. They are passive object-oriented collections based institutions with chronologically linear narratives with no element of interactivity and technology driven extensions. The Kachchh Museum, Sharad Bagh Museum, and Aina Mahal were all established on royal diktat and funded by the Royal Exchequer, and so their collections include artifacts commissioned by the Royal household for everyday use by master craftsmen and ethnological examples of representational craft drawn from the region for their uniqueness. Smritivan has the advantage of drawing from the living traditions and bring about a generational shift in appreciating culture, values and memories.

To define **living heritage** one has to first appreciate the value of tangible material culture and the intangible lore, traditions, liturgy and rituals that form a train of memories and practices handed down over the generations not physically manifest.

The 1993 UNESCO Convention for the Safeguarding of Intangible Cultural Heritage defined **intangible heritage** as the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artifacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage. This intangible cultural heritage, transmitted from generation to generation, is constantly recreated by communities and groups in response to their environment, their interaction with nature and their history, and provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity…The 'intangible cultural heritage', as defined above, is manifested inter alia in the following domains: oral traditions and expressions, including language as a vehicle of the intangible cultural heritage; performing arts; social practices, rituals and festive events; knowledge and practices concerning nature and the universe; and traditional craftsmanship" (UNESCO, 2003:2)

There is the Intangible Cultural Heritage that once used to live and was practiced in an original natural and social context that has since disappeared due to the natural evolution of societies. Consequently, the once-complex holistic tradition has now been reduced to cultural symbols. The other is the Intangible Cultural Heritage that is still liv-


Salar Jung Museum, Hyderabad

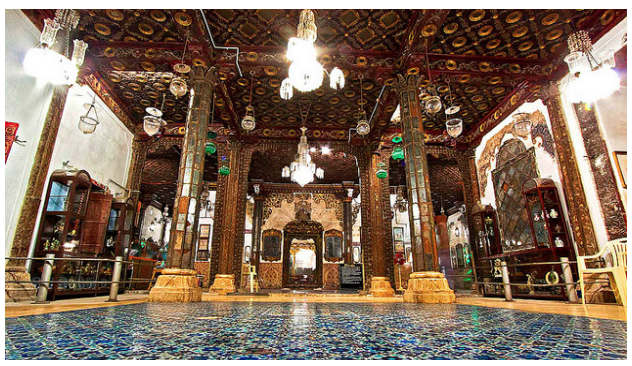

Prince of Wales Museum, Mumbai


State Government Museum, Chennai


Victoria Memoria`l Museum, Kolkata


Kachchh Museum, Bhuj


Prag Mahal, Bhuj


Aina Mahal, Bhuj


Prag Mahal, Bhuj


Sanskar Kendra, Ahmedabad

ing and being practiced within its natural and social context even to this day. This type of Intangible Cultural Heritage is viewed as both traditional and contemporary in the sense that the traditional culture and folklore form a living culture that is still a vibrant and self-identified part of their cultural lives. This type of Intangible Cultural Heritage is not simply about the past, but also about the present, and therefore, its future continuum.

The Living Museum offers a counter-point to the Memorial with the celebration of living traditions that keep history and heritage alive in unique ways. Cultures spring from our relationship with the land. The adaptations people make in their places build living traditions, which are continually evolving and contribute to a regional and local sense of place. Celebrating these traditions—these human connections to place—is a cultural imperative which is often overlooked by conventional planning and design. Great design comes out of listening and asking questions. It is a means for telling powerful stories in physical form.

The exhibit experience in a living museum speaks to the concerns and aspirations that unite indigenous people. The wealth of knowledge brimming from intangible resources informs and inspires those who have chosen a journey of great challenges and greater rewards. The path of life knows no finite borders or clear maps. There are only moments in time throughout the journey where we find safe places to be who we are and to define ourselves in our own terms. The museum will play a vital role as both a haven and hub for many beautifully radiant forms of expression. The hemispheric scope of perspectives presented will affirm GSDMA's commitment to education and public service, which transcends boundaries and narrows distances between people.

Museums and memorials strengthen the bonds that connect generations. We remember ourselves in these places and dream about who we want to be. At their best, these places are homes for cultural expression, dialogue, learning, and understanding. They serve the communities and people who sustain them, as well as wider audiences, by stimulating cultural activism and continuity that endures for the sake of all our children. The voices in this compendium speak of the celebration and struggle that emerge from sustaining and expanding community outreach and learn from the wisdom imbued in their stories.

Section 2

Approach and Methodology

- **Architectural Design/Build**
- **Exhibit Design/Build**

Architectural Design

Vastu Shilpa Consultants distinguishes itself in its approach to design by a conscientious focus on achievement of the client's objectives in the project. We seek a balanced synthesis of the functional, the intellectual, the aesthetic, and the pragmatic aspects of architecture. We pursue a high order of architectural possibility but take seriously the budget, schedule, and process constraints inherent in most projects. The design solution would resonate with the institutional vision and grounded in sound engineering, building science, and sustainability requirements.

The building will be visually vibrant in its vocabulary and will strive to avoid stylistic trends and seek instead, qualities that are timeless and universal built upon sensitivity to place and the solemn context. We believe - as articulated by Louis Kahn - that in each design problem there is an essential nature which must express itself in form. We try to make that interpretation intellectually accessible to the buildings' users.

Facilities Planning

The need for new facility often requires associated infrastructure development with significant changes to the site and access domain in the vicinity. These can include changes or growth in functional needs, program, audience demographics, support logistics, organization, and context. It is essential that facility planning be well integrated with and responsive to the dynamics of institutional development.

It is vital to recognize the importance of this interrelationship and its role in structuring a process to enable all facets of institutional planning to come together in a logical and creative sequence drawing on a team of professionals to assist institution building through a valid planning process. Cultural resources management ensures that comprehensive attention is paid to issues relevant to facility planning. The emphasis will be on assisting GSDMA to articulate and achieve its own vision recognizing the uniqueness of this institution and communities/diverse audiences it seeks to serve.

Functional Programming

The single most powerful tool by which an organization can control the outcome of an accommodation project is a well thought out, realistic, and well articulated statement of project objectives and requirements. This is the basic purpose of a functional program and its primary output. Such a document, also referred to as a needs statement, functional plan, design brief, or architectural program, serves to define the design and planning problem and to demonstrate its rational basis to potential funding and approving agencies.

The purpose is not to design the solution but rather to define the design problem. The process we use relies on an appropriate involvement of the users themselves, consultation with audiences and stakeholders, involvement of outside content experts where appropriate, and coordination by competent and experienced programming consultants. We emphasize the capturing of the in-house knowledge and experience of the organization, as well as the perceptions of visitors and members;

the preparation of the organization for meaningful participation in the review of development and design options; and the engagement (gaining the commitment) of the users and sponsors in the building project.

Exhibition Planning

The nature of the subject matter makes exhibition design a bit challenging as it involves building a connection between the Memorial space and the Museum galleries with its multiplicity of themes and sub-themes. The interpretation of heritage, presentation of artifacts and works of traditional art and craft, provision of access to these objects, their meaning and voice requires careful thought.

The ability to translate the interpretive plan into a meaningful spatial exhibit concept would be a vital step in the process. The exhibit experience has to be produced, installed and tested for user-interface and clarity in order to create an experience that is uniquely Indian- one that resonates with indigenous needs of the people and the spatial literacy of the place.

Design of cases and fixtures must incorporate basic principles of preventive conservation where applicable and operational practicality. However, it is important that this design be subservient to the larger conceptual framework of the narrative. The architecture of exhibition spaces, judicious use of interpretive media, verbal and non-verbal cues, print, graphics, elements of interactivity and immersion must be a sensitive combination of creative content treatment.

Sourcing of Artifacts

Institutional Planning needs to commence a step ahead of the Exhibit Design/Build process so that the Governing Board ratifies a Collections and Acquisitions Policy, among others. The policy will provide a framework for assessing and acquiring the museum's core collections, establish condition reports, determine conservation requirements, preservation and restoration needs. This in-turn will also determine the associated modes of display and casework that will accommodate the needs, environmental conditions and insurance premiums with due documentation. The second article of the code of ethics of International Council of Museums (ICOM) states that museums have a duty to acquire, preserve and promote their collections to safeguard natural, cultural and scientific heritage. UNESCO defines collections as objects acquired, conserved and preserved because of their potential value as examples, as reference material, or as objects of aesthetic or educational importance. While various government departments, including Forestry, Mining, Geology, Tourism, Information and Broadcasting, and Commerce could be active partners in providing material towards research and interpretive planning, the following institutions may be approached for possible loan and research sources:

- **The Kachchh Museum**

The Kachchh Museum, formerly known as the Ferguson Museum (named after its founder Sir James Ferguson, Governor of Mumbai during the rule of the British), was built in 1877 and has a good collection of artifacts, depicting the history and culture of Bhuj and its

Exhibition Space

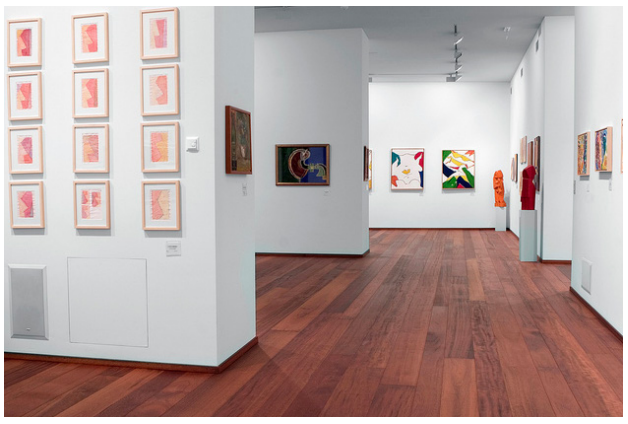


Exhibit Display Area

Exhibit Display Area

Kachchh Museum, Bhuj

Interior View of Kachchh Museum, Bhuj


Kachchh Museum, Bhuj


Interior View of Aina Mahal, Bhuj


Aina Mahal, Bhuj


British Museum, London


British Museum, London

surroundings. It is also the oldest Museum in the state of Gujarat. It is directly under the Government of Gujarat and it can be the chief source of artifacts for SEMM. Many artifacts presently in storage (among these are 18,000 coins of Kachchh dynasties which have never seen the light of the day along with sculptures representing various traditions; military artifacts like guns and spears,; folk art of significance and textile collections) can be used for augmenting the interpretive and exhibit needs at the new facility.

- **Aina Mahel Museum and the Palace**

The Aina Mahel Museum and the Palace can be a good source of artifacts for reference and research. A review of their storage collections of military history, textiles, photographic plates, old cameras, photographs, and specimen of folk art, coins and others could be potentially secured on long-term loan.

- **Print and Media Archival footage**

Footage from the international media organizations like the BBC, CNN, Doordarshan and others who had comprehensively covered the event can be the source for the archival material. Similarly, the local media outlets like the Kachchh Mitra can play a crucial role in strengthening the archives of the memorial and museum galleries. The objects belonging to the victims of the 2001 earthquake can be accessed through a local media advertisement campaign.

- **The British Museum**

The British Museum's 70,000+ artifact Asian Collections Department possesses original maps, manuscripts, diaries and other objects relating to the maritime history of Kachchh. Reproductions and recreations can also augment the pursuit of loans and repatriation through an intergovernmental memorandum of understanding that facilitates cultural exchange, research fellowships, field-work, digital archival sharing, documentation of intangible heritage and study exchange programs.

SETU- The Bridge to Connecting Communities

Documenting and displaying the intangibles of Living Heritage will be central to the community outreach initiatives closely tied to the museum programming. Using SETU centres to uplink live, layered content, the SEMM will continually gain relevance and strengthen ties to the communities of Bhuj and Kachchh while offering a unique opportunity to make history and be part of the continuing narrative.

The recent advancements in audio and video recording technology have resulted in enhanced quality at reduced costs. This has also generated a large base of media users whose skills can be fine tuned for the purpose of documentation. As the Bhujjio hill is likened to the lighthouse of Kutch, Smrutivan can be developed as the beacon of knowledge. Appropriate training can be imparted to local youth who can feel the pulse of the communities and partake in their documentation. We live and create history by our observations, actions, initiatives and connections to the land and our vocations. The live content at Smrutivan galleries will always be a work in progress given the rich and diverse life-skills and analytical abilities conferred by the region. Agricultural practice, ship building and navigational skills, adaptation

to diverse ecosystems and the co-existence with flora and fauna, craft and craftsmanship and their evolution over time; and crucially the new emerging Kachchh, post earthquake is akin to recording history from the primary sources.

Material Culture and Living Heritage

Kachchh is often referred to as the largest studio on the planet. Each ethnic group is the source of tacit knowledge and traditional wisdom. The SEMM can close the gap between museum collections and the narrative of everyday life in the central space between the two exhibit epicentres of creation and destruction. This celebration of life and living traditions will infuse a sense of vigour to the mission and mandate of the Memorial Museum as elaborated in the exhibit approach.
The success of any such infusion will rely on the effectiveness of the framework provided for programming and its presentation in-line with the overall approach towards a meaningful exhibit experience. Living traditions, crafts, socio-cultural practices, festivals, prayers, customs, traditions, music, song, dance, association with nature will need to be continually harnessed by the SEMM education and outreach staff in conjunction with schools, NGOs and those who strengthen the rich, diverse fabric of Kachchh.

Acquisitions and Retail

Much of the “live” creation and custom designs can be acquired by SEMM to be retailed both within the museum shop and on-line through an active hyper-linked website for local, regional, national and international clientele. Shared revenue models could further enhance on-going community partnership with local resources, talent and community assets. These would include not only the crafts, textiles, books, images and others in the repertoire of product catalogues, but also videography and filming of living traditions and associated rights and royalties.

Interpretive Planning

The art of telling a compelling story is a communication process referred to in the museum parlance as interpretive planning. From the minimalist Object/Label format of classical museums, the last three decades or so, has seen significant evolution to accommodate technology, advances in research, cross-referencing and levels of layered interactivity. What many museums optimistically refer to as interpretation, is only information woven around inert objects. The interpreters need to bring these inert objects to life, engage a diverse demographic, connect with the meta-narrative and move audiences in a profound way. While advances in technology has added to many means and methods] including dynamic web-enabled hand-held devices that transcend linguistic and literacy barriers, some of Tilden’s basic principles of interpretive planning continue to be relevant to effective narration of an exhibit experience (see Appendix: References).

These hinge upon broadly accepted parameters of:

- Identifying communication goals and objectives
- Visitor Orientation
- Main storyline and sub-themes


Outdoor Exhibition


Exhibit Display Area


Display of Exhibit Panels


Outdoor Exhibition


Exhibition Space


Exhibition Space


Exhibition Space


Interactive Touch-Based Displays


Aina Mahal


Diorama

- Adding perspective
- Introducing intangible heritage, where applicable
- Integration to the meta-narrative
- Linear/ Non-Linear/ Layered thematic treatment
- Passive/ Interactive/ Immersive Content
- Engaging the senses
- Analyzing Visitor fatigue and user ergonomics
- Making it Memorable

It is important to table the Draft Interpretive Plan and visitor flow patterns to sample audiences for formative evaluation to receive valuable feedback that can help create a better exhibit experience for the casual and serious visitor, the adult and the young, for those who have been affected by the earthquake to those who have never experienced one and its aftermath, for the literate and the illiterate, those who skim through galleries with indifference and impatience and to those who linger. The Formative Evaluation is typically followed by a Summative Evaluation post-installation to check on variance and accommodate evolving audience needs.

Exhibit Design

Once the content and storyline are woven into the available artifacts and props, the exhibit experience can be conceived with a greater degree of clarity within the gallery space available for each thematic treatment. This is usually a 3 step process generating three deliverables that allows greater control on project costing, procurement and completion timelines. These three stages are:

Concept Design	CD
Schematic Design	SD
Final Design	FD

The Final Design package will identify dimensions, material finishes, electrical requirements, multi-media integration and other specifications needed for the Tender Package preparation and Tender Notification for Exhibit Production and Installation, to be released/issued under the Supervision and Administrative charge of Vastu Shilpa Consultants. Depending on the complexity of the Final Design, the Bid package may provide three separate components for core exhibit fabrication, Audio-Visual Media Integration and Passive/ Interactive Graphics.

Post-Tender Award/Engineering-Production

The selected firm(s) may be required to produce Engineering Drawings for Exhibit Production and prototyping as needed. Vastu Shilpa Consultants will ensure creative input and provide necessary guidance during the production and AV integration process to meet design-intent. GSDMA appointed Project Director will oversee the deliverables, submittals and review schedule. After production, the exhibits will be assembled and inspected for quality assurance and functionality before shipment to the site. Installation may commence with the comple

-tion of exhibit gallery spaces to allow for required integration into the building.

Upon completion of exhibit installation and AV systems check, Graphics will be installed in a dust free environment. Artifacts will be brought in from storage into temperature/humidity controlled environments in the final stages followed by final building/exhib-its integration inspection, punch-list mitigation and sign-off by the Vastu Shilpa Consultants and handed over to the GSDMA.

GSDMA

As part of the deliverable process, The GSDMA will take owner-ship upon sign-off and will be entitled to complete set of As-Built Engineering Drawings, Exhibits Warranty and Maintenance Manu-als and trouble-shooting protocols. The incumbent Smrutivan Staff will receive training on maintenance and upkeep requirements.

Section 3

- **Narrative and Thematic Treatment**
- **Conceptual Framework of Content**
- **Visitor Approach**

Satellite image of Kachchh region

Map of Kachchh Region


Bhujiyo Hill, Bhuj


Bhujiyo Hill, Bhuj


View of the City, Bhuj

The interim report considered 2 alternatives to a visual metaphoric reference. While subsequent meetings and creative sessions by the core team members have consolidated this notion into a single unified cohesive approach, it is important to appreciate the thought process that evolved over discussions.

Some believe that Kachchh derives its name from the shape and morphology of the land that was determined by a geological fold that brought a 'tortoise' out of the sea! The tortoise is apparent in the central ridge that runs from east to west, along which the town of Bhuj is situated and forms the hump of the tortoise. The Bhujiyo Dungar is the seat of the celestial serpent and houses an active temple of Bhujangdev, whose worship is a centuries old living tradition. The celestial serpent is worshipped to keep earthquakes away.

To the people of Bhuj, this hill is more than a geological formation; it is their identity raised to a sacred dominion. Diverse castes living in the region of Bhuj come to this hill to perform post- marriage rituals. Overlooking the town of Bhuj, the Bhujjio hill has been the gateway to Bhuj for centuries just as the city of Bhuj has been a natural gateway to Kachchh for centuries past.

The Bhujjio today enjoys a locational advantage. The silhouette of the hill is captured in one's mind the moment one enters Bhuj. Every corner, every place in the city is marked with the Bhujiyo Dungar in the background. Its visibility from all sides makes it an integral part of the city and its people. The manner in which Bhuj seems to be growing today, with Madhapar and Bhuj undergoing both expansion and transformation, the Bhujjio Dungar presents itself as an opportunity to protect the natural habitat. It provides the city an opportunity to enjoy a vast expanse of open land which in the coming years would be a scarcity. The Dungar is envisioned to be a 406 acre expanse of natural green in the middle of bustling and ever-growing Bhuj. The Kachchhi attitude of resilience is what the Dungar attempts to advocate, efficiently managing the resources, especially water and working with the natural contour of the land. The Dungar is not only a part of Bhuj but is also a place that all Kachchhis associate themselves with.

The different institutions that have been planned within the Smrutivan Memorial such as the Library and Documentation Center and the Arts & Conference Facilities, are all aimed towards the propagation of Kachchh. A new cultural landscape would emerge because of these institutions. One imagines, the city coming back to the Bhujiyo Dungar. Children playing hide-and-seek amidst the trees, senior citizens enjoying their evening stroll, health conscious citizens on their morning jogs, lovers enjoying the sunset, families coming to the check dams to pay homage and remember their lost ones and Naga Panchami being celebrated with all its grandeur– a fitting tribute within an earthquake memorial site representing continuum.

A Walkthrough the Smriti Van Memorial Museum Experience

The Smriti Van Earthquake Memorial and Museum will offer a unique exhibit experience, unlike any other, that addresses the visitor need for the

- Informative
- Evocative
- Emotive
- Reflective
- Memorable

Enter a circular space through temple like archways where wind-chimes or bells create a singularly unique acoustic ambience atop the Bhujio hill. Across the perimeter, a semi circle of five gateways make way for the exhibit experience. The approach is simple and easy to discern for the average visitor. Based on a trinity of focal points, the visitor moves from the orientation space into the gateways leading to the exhibit experience of the Land, the flora and fauna, the People into a transition space where living traditions are celebrated. Life is interrupted by the earthquake experience plunging the harmonious ways into chaos, disorientation and despair, only to rise like a phoenix from the ashes with the spirit of resilience and hope.

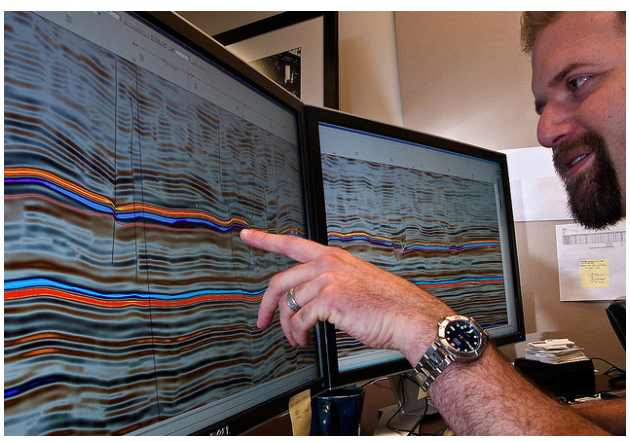
The ORIENTATION space will provide an interactive timeline that offers a preview of the exhibit content leading to five GATEWAYS. The galleries gird two “epicentres” of creation and destruction. Snake-like strands of Bhujang Dev course through the middle of the twin epicentres representational of the extended helix of the DNA that comes together in a celebration of the Living Tradition in the heart of the SEMM. The rising gallery elevation of the first epicenter holds a counter-point in the sunken geo-theatre girding the second epicentre.

For those visitors interested in a sequential, chronological, linear experience, they have a choice to walk through the history of the land, its flora and fauna, the diversity of its people, its rich history and its vibrant living traditions. This flow is deliberately interrupted by the Earthquake experience in the GEODOME total immersive chamber.

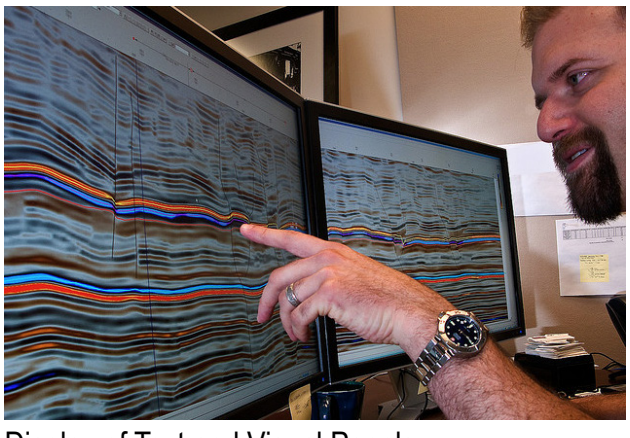
For those visitors who are short on time or wanting to choose the way they want to experience the exhibits, they have a choice of entering the Gateway of their interest as well as navigating between the four exhibit clusters and the memorial space. The exhibits will be a combination of artifacts, visual graphics, text panels, interactive and immersive environment treatments and a compelling narrative braced with intangible heritage that celebrates a living culture and its continuum overcoming adversity. In addition to Arts, History, Crafts and Culture, there is also a forward thrust on science, technology, innovation and discovery. The destructive power of the 2001 earthquake, the role of the GSDMA that brings a sense of humility and hope…as visitors retrace the full circle back to the reflective orientation space

Gateway to the Memorial

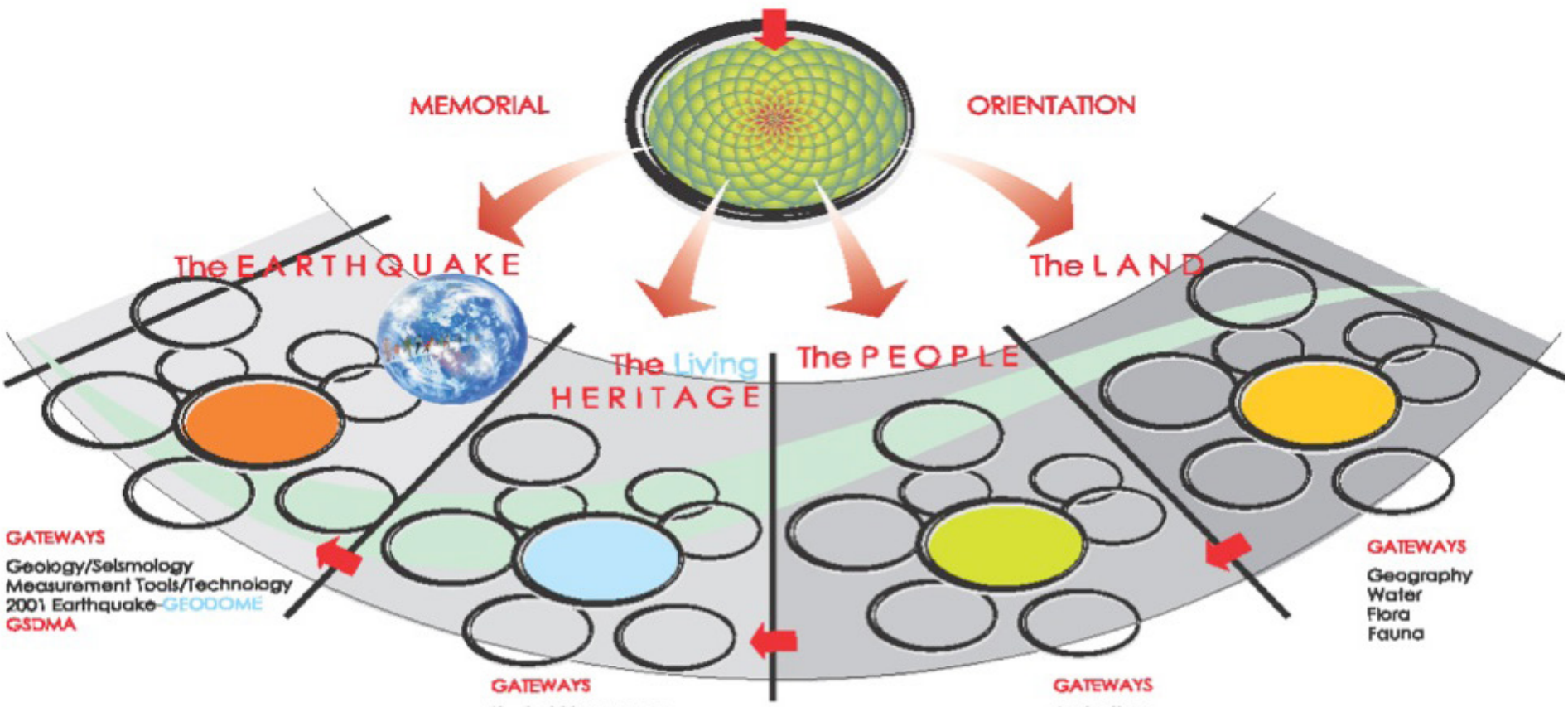

Geodome


Interactive touch Displays monitoring Siesmic Activity

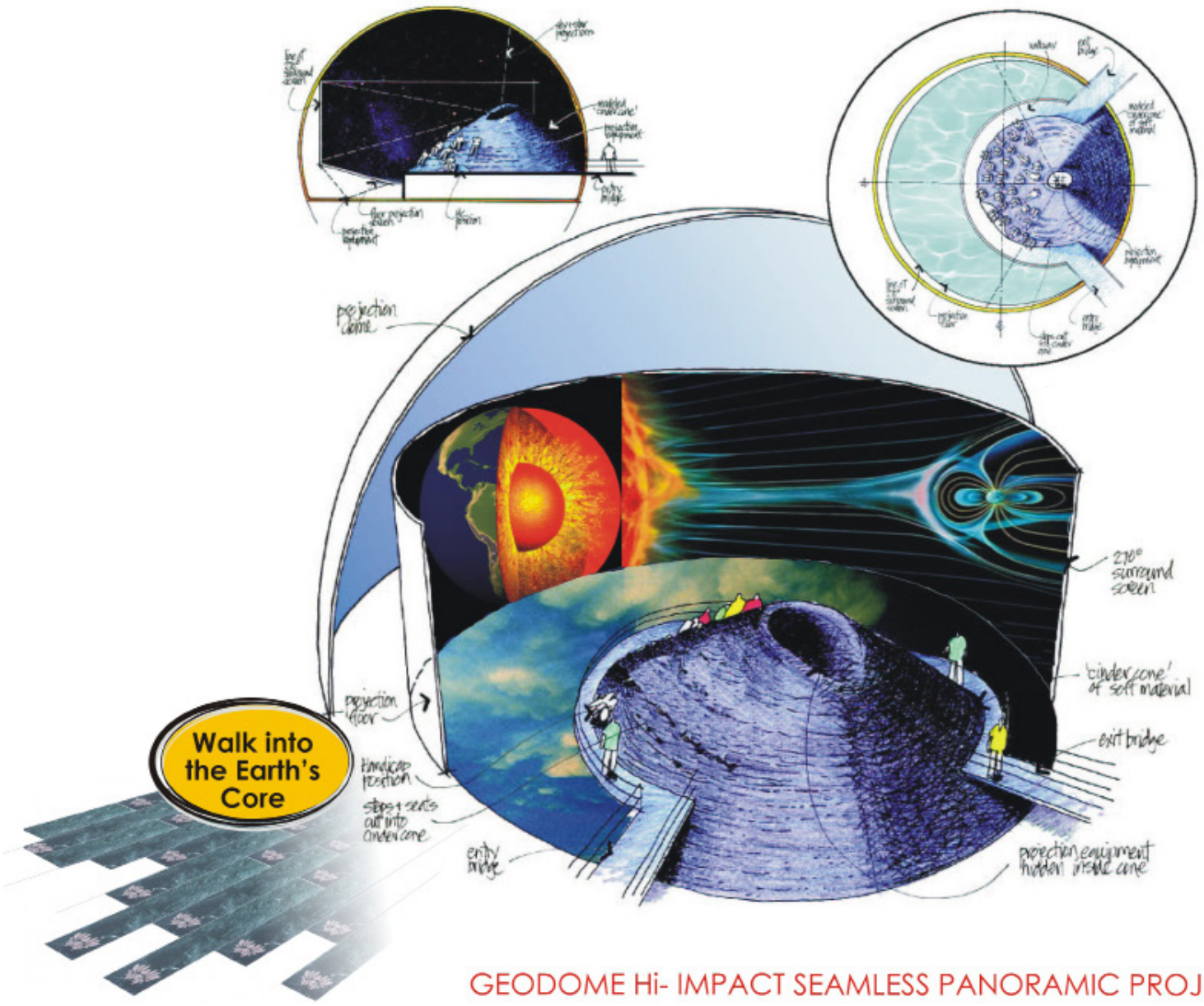

Combination of Artifacts, Visual Graphics, Text panels


Display of Text and Visual Panels

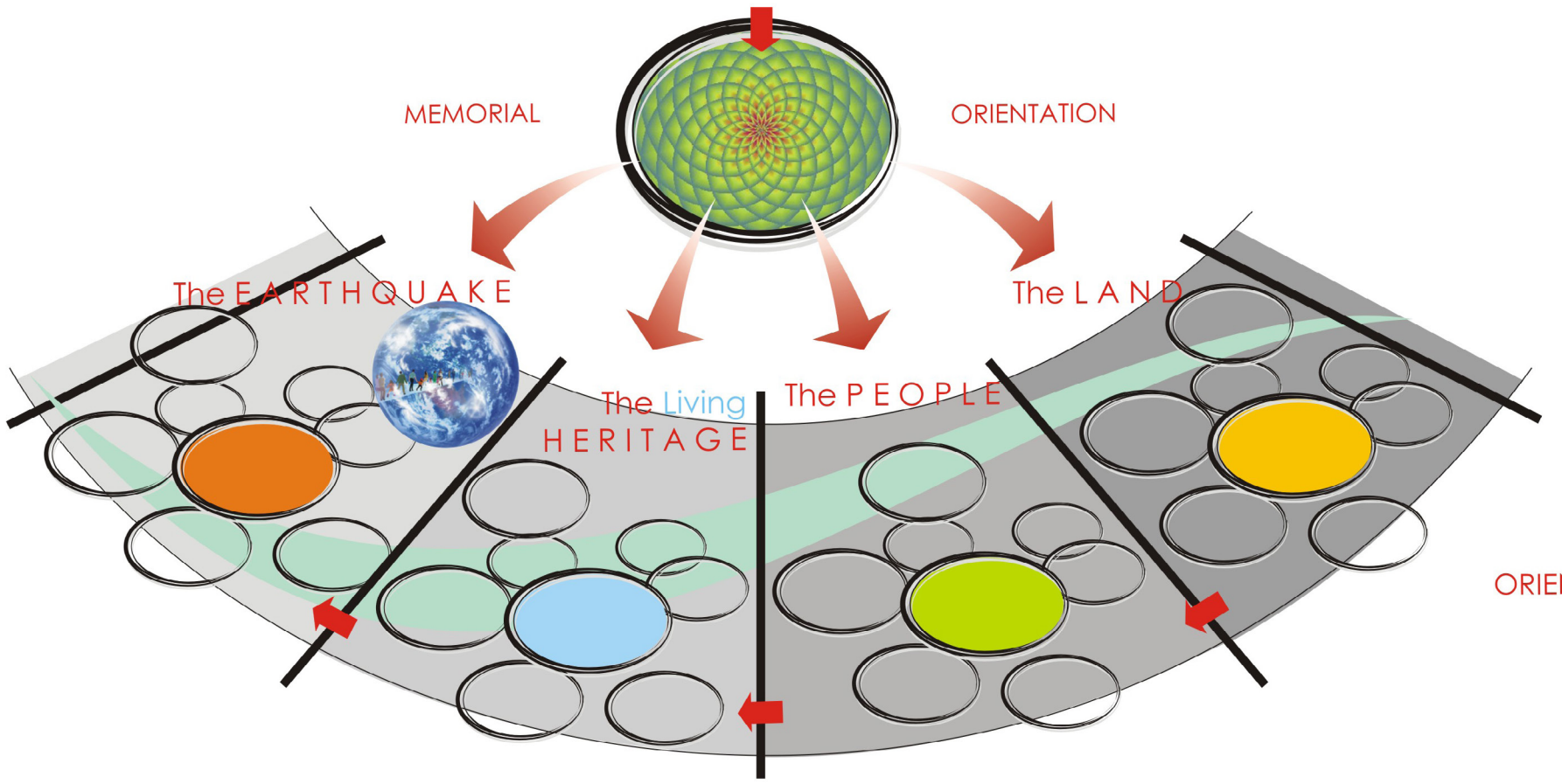
ORIENTATION TO EXHIBIT GALLERIES: TEMPLE OF TEARS LEADING TO THE 'LIVING LIGHT' EXPERIENCE

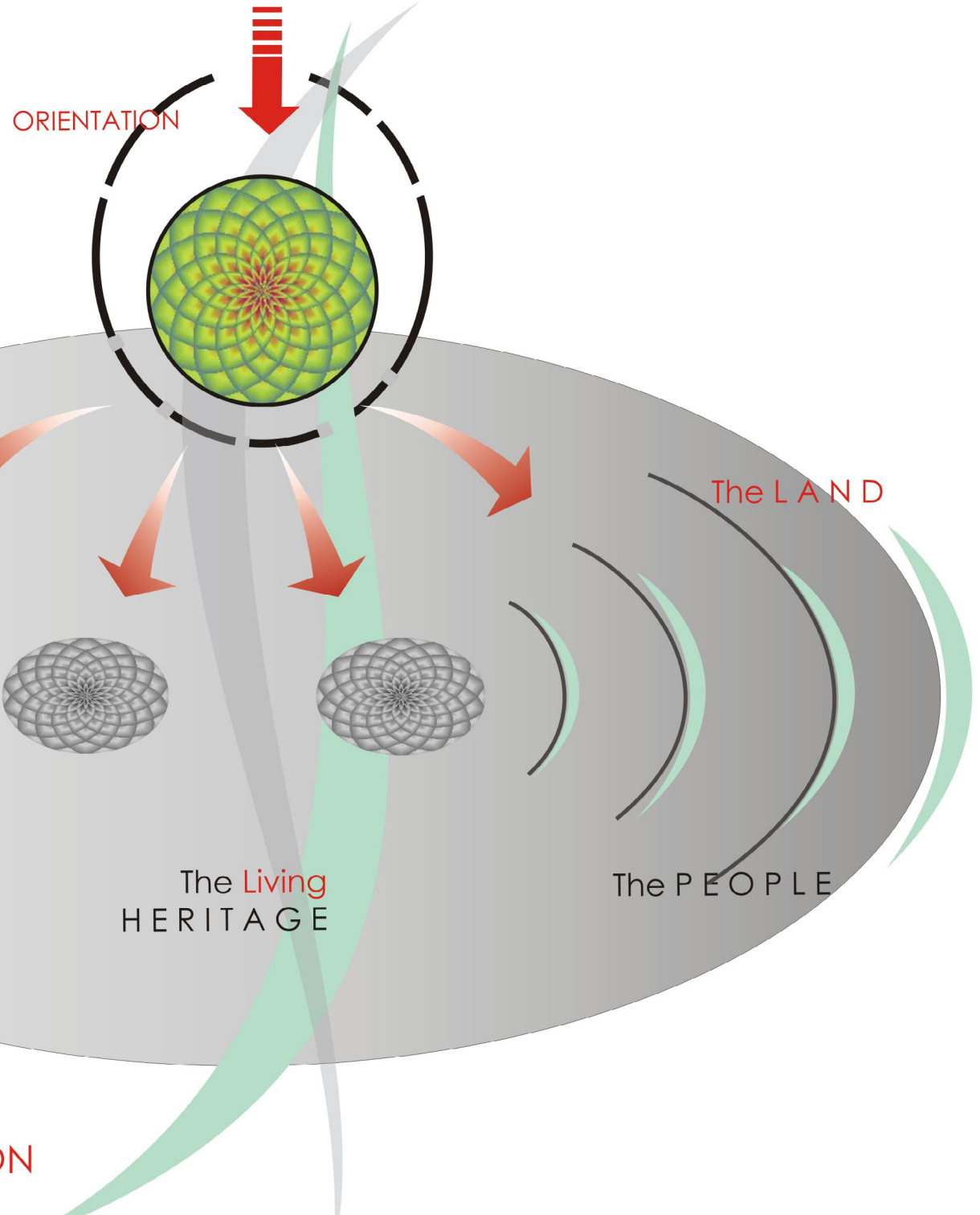


MEMORIAL/MUSEUM EXHIBIT EXPERIENCE CONTENT: LINEAR and NON-LINEAR FLOW

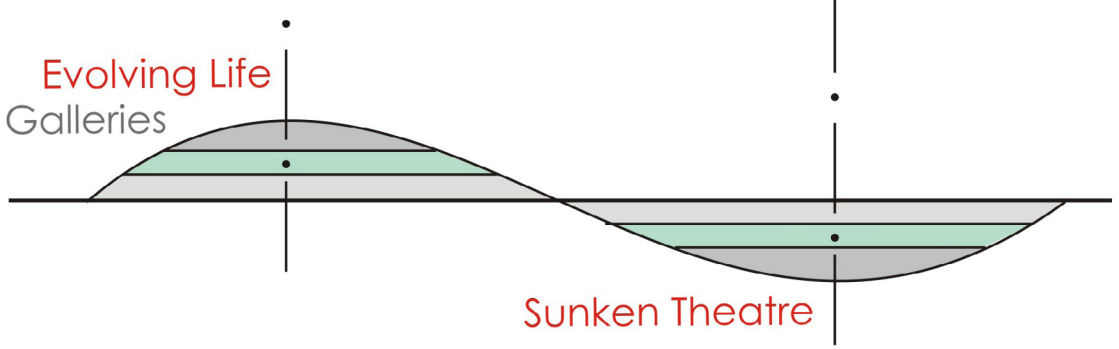


GEODOME Hi- IMPACT SEAMLESS PANORAMIC PROJECTION





Twin Epicenters of Creation and Destruction flowing into the Living Heritage Exhibit Experience akin to the coiled Bhujang Dev



Earthquake Gallery

dome-screen exterior of sunken multimedia theatre

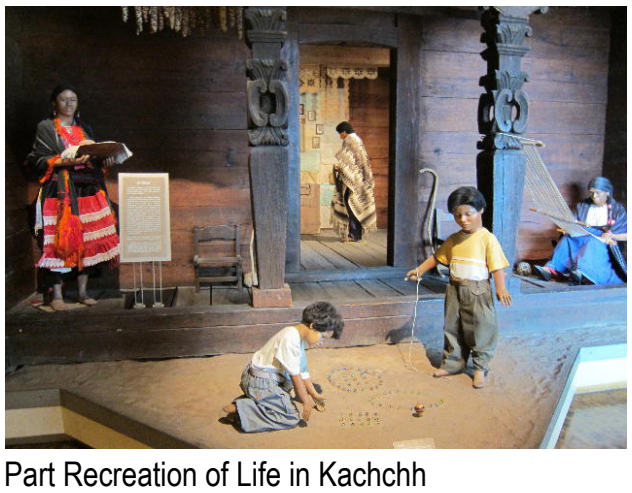
paliyas-memorial stones

REFERENCE RENDERING/ IMPRESSION : EXHIBIT GALLERY ON BHUJ EARTHQUAKE


Typical Kachchhi Wall Painting


Maharoa Of Kachchh Region


Banni Women


Part Recreation of Life in Kachchh

Social and Political History

The visitor is introduced to the Bhujiyo Dungar itself, Bhuj's geologically ancient outcropping emblematic of creation myths, city experience, and natural settings all at once. Visuals and sounds announce the historical sitting of human settlements and political institutions in the region with Bhuj as its socio-political heart.

Institutions and culture:

Key figures from the history of Kachchh come alive as visitors are told how history helps to trace the contextual underpinnings for the rise of institutions and key figures that were responsible for the development of cities, traditions and artifacts. Faintly, in the background, emerge the strains of a 15th-century ballad commemorating Jam Punvro, sung by women of the Banni, as a collage of early Kachchhi watercolour paintings dating to the 18th century illumines the walls that envelop the visitor. Voices sing ballads or narrate stories from the Kachchhi histories, tracing the coming of the Jadejas to the region and the establishment of Rao Khengar's line down to the British Residency and post-Independence years. Maharao Lakhpatji's legacy of art, architecture and political achievement emerges amid the portraits of the Raos and Maharaos on the wall. Nineteenth-century sepia photographs of the Kachchi landscape, paintings and portraits of key men and women of the time, familes of royal correspondence and memorabilia are positioned around the space. The space resonates with sounds of swords and shields clashing, a British Colonial agent negotiating a trade agreement with local merchants, and a performance of the nagaara and dhol outside the Bhuj Darbargarh. Performers/mannequins dressed as 16th- to 19th-century courtiers, just emerged from a royal kacheri, and are busy using objects as props to enact key moments from the history of Kachchh.

Significant Human Settlements:

Anjar and Mandvi: Visitors may proceed either to displays on the historic city of Anjar north of the Gulf of Kachchh or that of Mandvi along the southern coast. The visual sweep of both cities' ancient histories pre-dates Bhuj's pre-eminence as the city of modern-day political power by a thousand years, and shows how their social diversity first nurtured the beginnings of Kachchhi culture. Displays describe how building craftsmanship was first developed in Anjar, how maritime trade transformed Mandvi into a powerful port of trade and shipbuilding commerce, and how local legends and beliefs such as that of Jesal and Sati Toral, and the settlement of different community groups preempted the foundation myths and legends of Bhuj and intimately connect the development patterns of all three cities together.

Transition Space:

The path from both Anjar and Mandvi converge on to a city oddly reminiscent of Bhachau, with its busy, historic streets immediately prior to an earthquake on the morning of Republic Day, Jan 26th, 2001. The early-morning sounds of dogs barking, the lowing of cattle, water being drawn from wells, the Maldhari on his city/village milk run, and a school bell summoning children to a flag hoisting at school present a picture of ordinary life coming awake in an otherwise bustling town.

The Earthquake (simulation)

The world comes to an abrupt stop at 8:30 am – at which point, noticeably, for several seconds, there is complete silence as the region's animals are first to experience an earthquake happening, and the clamour of early-morning activity dramatically fades out. In the silence, visitors experience the ground beneath them first almost imperceptibly buckle and rise, and then the vibrations and undulations intensify rapidly, followed by the sounds of crashing furniture, shouts of alarm, and the deafening roar of falling stones rend the air, while a sense of destruction engulfs them. Just as suddenly, there is utter and complete silence. The visitor smells the sickeningly sweet smell of bleach, and the unique smells of Kachchhi yellow dust mixed with the sound of rooting boars giving way to the cadences of a traditional lament, sung again by women of the grasslands and accompanied by a solitary instrument. Gradually, as the city comes to its senses, the blankness dissolves into a maelstrom of sound and simulated destruction – and a sense of emptiness and quiet. The transition from history to the present is marked by collages that represent a mix of mayhem.

Transition Space:

Almost as though it were a déjà vu to some primordial, prehistoric beginning far in the recesses of Kachchh's memory, visitors hear the deafening sound of rushing water, the howl of the wind, and an absolutely intense heat that envelops them, symbolic of a range of calamities but also of fundamental churnings in the earth, these being symbolic of the same prehistoric violent churning and transformation that continue to characterize natural disasters in Kachchh. This transition leads the visitor into a new zone of experience, on the geological and natural formation of Kachchh as a land-and-water mass.

Geo-hydrology

In the prehistoric night of Kachchh, as molten lava flows freely and fiery reds and oranges light up the darkness of primordial space, visitors hear the sound of thunder, lightning, and a lone voice softly singing Kachchh's creation myth as a metaphor for both generation and regeneration (a narrative link between destruction and origination) as the darkness around them transforms ever-so-gently into a red glow. Visitors experience how geology has geographically transformed the region from prehistoric times to the modern era. Most of Kachchh's formation under the sea forms the basis not only of its geological shape and structure, but of its most crucial asset, water. This section explains how the region's geomorphology and hydrology unlock the key to understanding how people survive with scarce resources, and the fact that cultures have been shaped around the fact of such scarcity.

Transition Space:

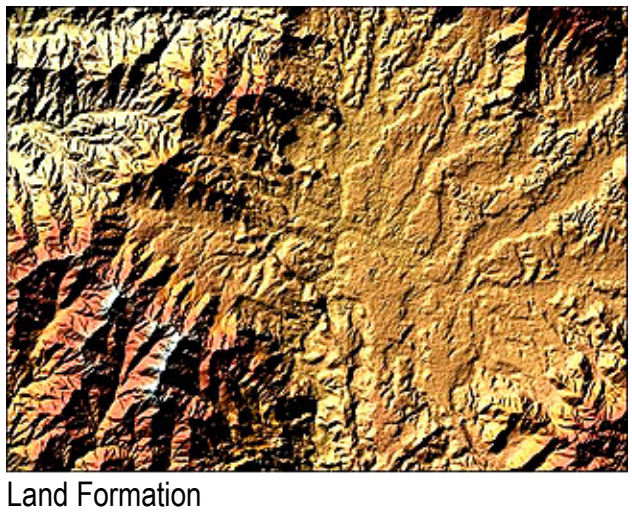
In a primordial introduction, visual projections in rich shades of stunning colour, of tropical prehistoric fauna and flora, engulf the spaces around the people present, as though an animation of a tropical jungle had arisen magically all around them. Models help visitors understand the scale at which the transformations have occurred. The scent of

Part Recreation of a Typical house in Kachchh

Diorama

View of a Street

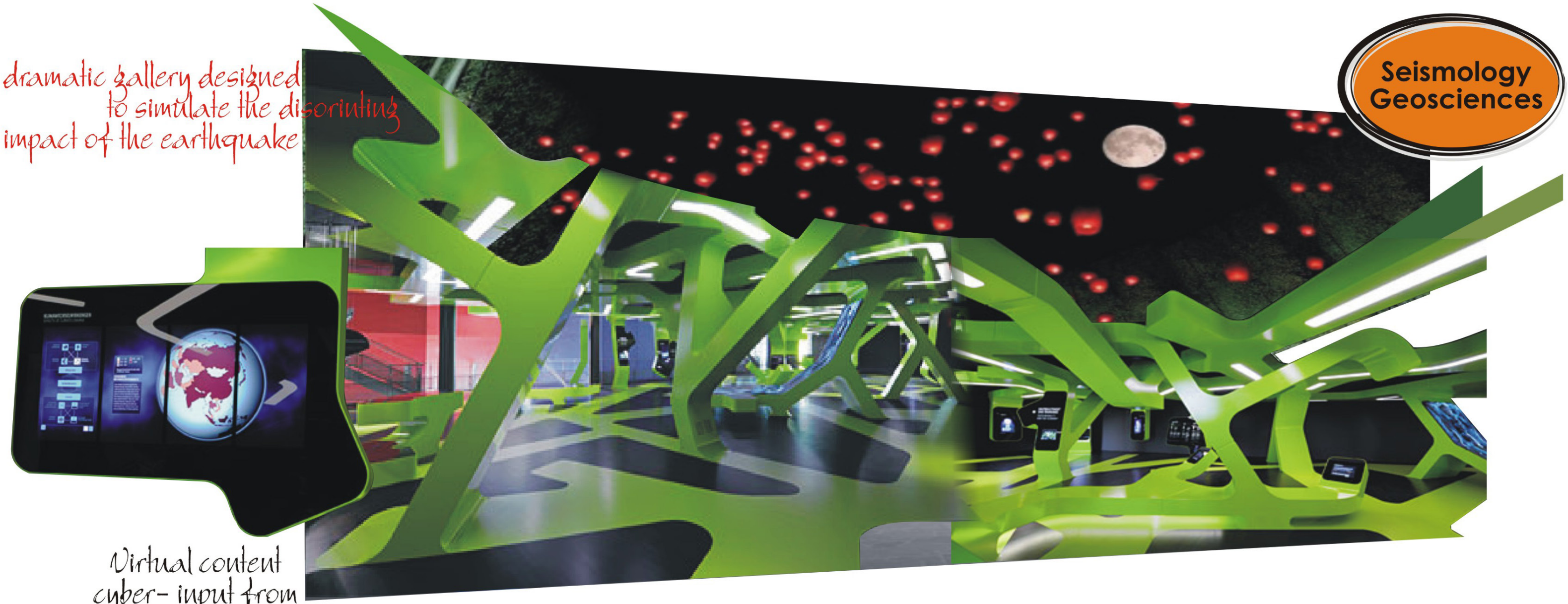
Shake table used to measure Earthquakes



Land Formation

dramatic gallery designed
to simulate the disorienting
impact of the earthquake

Seismology
Geosciences



Virtual content
cyber- input from
SETU centers

REFERENCE RENDERING/ IMPRESSION : EXHIBIT GALLERY ON EARTHQUAKE/AFTERMATH/ GEOSCIENCES

View of the Rann of Kachchh

The Coast of Kachchh

Pragmalji's rakhal

Computer Graphics recreated View of Dholavira

Scaled Model of the City

wet tropical earth fills the air, lights flash, the ground trembles, as the ridge forms ahead of one. The sharp sulphuric smell of molten lava slowly transitions to the smell of fresh earth and then grass, hear the bleak sound of a desert dust storm, and hear the sounds of the sea as the displays surrounding visitors presenting them with a narration of the creation of the distinct zones of Kachchh – The Rann, the Banni Grasslands and the Kachchh Coast, including its intertidal zone of mangroves as it is in the present.

From here, visitors may choose to explore any of the three zones. Alternatively, they may proceed to the next section on Kachchhi innovations to manage a primary resource – Water. All zones – The Rann, Banni Grasslands and Coastal Kachchh - eventually converge in the Innovation zone, through the Communities & Livelihoods sections bringing into focus innovations past and present that have enabled the people to manage the forces of both natural disasters and man-made ill-conceived interventions.

Innovations: Water: Aquifers and Water Harvesting

Emerging from the geological factors that inherently define the land of Kachchh, visitors are made aware of how these factors have affected the quality/salinity of the water of Kachchh. Through animated scale models and other visually explanatory displays, the visitor is introduced to the distribution and range of aquifers in Kachchh, unique as they are in terms of their distribution and number, discovering how their hydrology is intimately tied to human behaviour: these reservoirs decide where human beings will settle and give rise to the cultural innovations that people will develop in order to survive in times of water scarcity.
These displays show how, over the centuries, communities have evolved sophisticated methods of extracting, harvesting, and recharging these aquifers.

Dholavira:

Presented in the context of innovation to optimise resources, visitors enter a partial scaled simulation of the Bronze Age city of Dholavira. This settlement demonstrates the principles of water conservation and the political institutions that geo-hydrology and natural hardships have given rise to.

The display recounts how the location of the city, a hub of the Indus Valley Civilization four to five thousand years ago, was placed in-between two rivulets which were diverted and dammed to serve simultaneously as protection, irrigation, mechanisms of water storage and aquifer replenishment. A guide, dressed as an archaeologist in sola topee and khaki fatigues and grubby from the morning's dig, explains the layout of the city, and the artefacts strewn around the space.

Visitors walk through simulated portions of a cityscape which reveals the layout of drainage channels, kitchens and water tanks; they can feel the dry earth beneath them, feel the heat of the mid-morning, and watch a bricklayer firing a sample brick in a replica of an ancient corner kiln, as the sound of bronze-smelting, and shouts of Indus River boatmen, fills the air. Animated displays present insights on how 4,000-year-old innovations in building and ecologically strategic development

are still relevant in a modern disaster-prone region.

Trade exchanges are witnessed even at Dholavira which enjoyed historical links with empires westward across the Indus, thus demonstrating how Dholavira's legacy of cross-regional relations, economic and social, between empires lies in the more modern connection between Sindh and Kachchh.

Transition Space:
Flora and Fauna of The Rann: From an outcropping of rock, an assort ment of lizards warm themselves in the sun, peering down at a landscape of thorn forests (including the invasive Prosopis juliflora), cacti, and local species of guggar and gangani before them. Visitors see flocks of Great Indian bustard on the horizon. Against partial recreations of natural settings through which visitors walk, life-sized displays of several Kachchh species of animals have been positioned for them to touch and know about; at a dhand lake in the Rann, a flock of Dem oiselle cranes shares space with the Greater Flamingo; a chinkara gazelle and a pair of Wild Ass water tentatively, mindful of mugger crocodiles, the 'black-eared' caracal cat, and foxes. Meanwhile, birdsong fills the air, and visitors can push buttons to choose between sounds and pictures: larks, pipits, chats and the Lesser Florican bustard.

The Rann

A simulated ride through virtual space and time provides visitors with an immersive experience of the dramatic seasonal changes that transform the landscape of the Rann of Kachchh from a parched and bleak mud flat of perpetual mirages to a shallow, wet marsh, pink with flamingos. Visitors get to know the bets which provide occasional visual breaks in a barren vista and more importantly, a dry habitat in the monsoons for wildlife.

Several aspects of the Rann are presented in the next few sections which the visitor may navigate in any order they choose.

Ecological Challenges in the Rann:
Visitors may choose to learn through animated visuals about the threats to this fragile eco-region's habitat from cattle grazing, vehicular traffic, and cutting of trees to make charcoal besides the expansion of commercial salt extraction operations.

Salt Pans:
Visitors get to know the salt pan workers – Agarias - who spend most of the year in the Little Rann to make salt. Alongside learning about the hardships of the community, visitors are familiarised with the panning process through appropriately self-explanatory displays. History and culture of salt panning make connections to the significance of salt in both ancient and modern political India, referring to the Dandi March, and to post-liberalisation industrial problems and opportunities that confront the salt-pan workers.

Communities and Livelihoods of Banni & The Rann:
Displays and enactments recreate the anthropology of everyday life in typical settings among Banni communities such as the Rabari, Jat and Sama. Sound, recreated sections of living habitat, bring alive the


1:1 Model showing a Street View


Flora and Fauna of Kachchh


Greater Flamingos of Kachchh


Salt Pan, Kachchh


Scalled Recreation of Everyday Life setting in Kachchh


1:1 Model showing Life in the Community


Scaled recreation of Typical settlements


Part Recreation showing View of a street


Display of Aquatic Life


Underwater Overwater Diorama

social groups that traverse these two large expanses of land. Pastoralists, shepherds and cattle grazers of different communities would share their own unique traditions of agriculture and animal husbandry while crafts persons will make visitors aware of the symbology of their embroidery motifs and how styles can be linked to community identity. Through recounted stories, visitors will discover each community's unique ways of living, their rituals and traditions, their stories and myths, their music and art in interweaving narratives that encompass anthropology and economics and defines the interrelationships between all these social groups.

Transition Space:

Coastal Flora, Fauna and Aquatic Life: Visitors are led through the intertidal zone of mangroves into an aquatic ecosystem that surrounds them as if they were under water. Local sealife which runs the gamut of almost 300 local species of fish, prawn, phytoplankton and zooplankton moves around corals. Visitors see examples of mangrove species of flauna such as Avicinnia Marina, Avicinnia Officianalis and Rhizophera Mucronata. Visitors are introduced to the Starred Tortoise and fresh water turtle (Lissemus Puctata) in their habitats, as also local species of frog and toad.

Several aspects of the Coastal Kachchh are presented in the next few sections which the visitor may navigate in any order they choose.

Coastal Kachchh

Challenges to Coastal Ecology:

In this section, visitors will come to understand several challenges threatening the coast's ecology and the delicate interplay between development, industry and natural resource depletion. Major issues such as salinity ingress affecting the quality of soil and hence productivity; a decline in prawn catch due to scant rainfall; fresh water scarcity; and a rapid decrease in land used for agriculture now deployed by salt-manufacturing industries and wind farms owing to low agricultural productivity become issues for visitors to absorb.

Maritime History:

The sound of gulls, the smell of salty air and fish herald visitors into a space devoted to displays and objects which illustrate how Mandvi, Lakhpat and Mundra developed as fishing, overseas trade, and ship building centres of the region over the course of centuries, ending with post-Independence maritime and economic development initiatives. Computer graphics combined with display of actual parts/artefacts set against scaled recreations tell visitors of Kachchhi traditions of seafaring – their feats as navigators, sailors, ship and port builders from historical times to the present. Innate understanding of their coastal terrain, winds and currents and an adventurous spirit imbue the narratives with scientific knowledge, combined with cultural and economic insights.

Diaspora:

Despite a land ravaged by natural calamities, Kachchhis are a hardy and courageous people. Visitors hear through story-telling touch sensitive mannequins in appropriate costume about some of the out-migrat-

ing and outward-looking people of enterprise who today count as one of the world's most successful mercantile and business communities,

settled in countries from Canada to East Africa. Some of these are Mistris of Kachchh who took their expertise in architecture and building craft overseas and helped construct railways and cathedrals. They discover how in the 19th century, the government of Zanzibar was almost entirely Kachchhi. Legend has it that the intrepid sailor who brought Vasco da Gama across the Arabian Sea was not a European but a skilled navigator from Kachchh.


Scaled Models of Ships

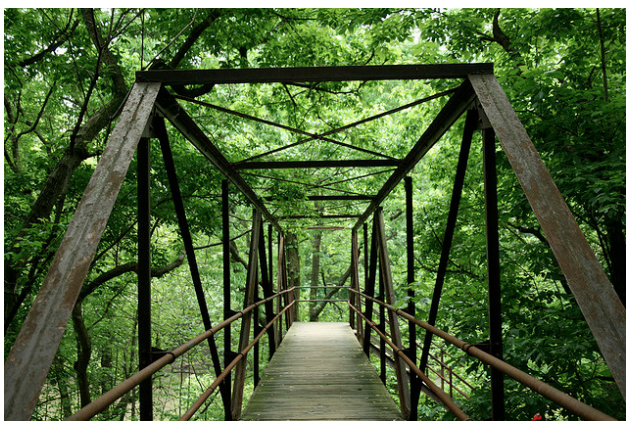
Coastal Communities and Livelihoods:

This section will illustrate different zones of human activity along the coast - from salt-panning and fishing (prawn, pagadiya fishing, mollusks) to multi-crop farming and animal husbandry. Visitors discover the craft traditions of the coast.


1:1 Recreation of the Ship Building Industry

Living Heritage

The exhibit experience come together in the light filled central space between the epicentres– the vulnerability and resilience of the people of Kachchh and their spirit of innovation and enterprise. The space brings into the museum experience a sense of life and continuity. Through audio-visuals means visitors will hear first person accounts of how lives and spaces were reconstruction post the 2001 earthquake and the lessons learnt in the process. In this section visitors will also be presented with the various challenges that face the region in the future and through interactive systems, be encouraged to add to the issues, provide their own perspectives and insights, thereby creating a pool of content which can periodically be debated by collectives who gather at Smriti Van for the purpose.


Forest of Gateways

Content Framework / Interpretive Research

Gateways to Kachchiyaat: kachchhdo bare maas*

The Smritivan Earthquake Memorial Museum will have a forest of gateways; each devoted to an aspect of Kachchhiyat. These gateways will be seamlessly woven on the themes of land, the people and the living tradition in a manner that enhances viewership. The Memorial itself will be organic and elemental in its conception, unlike any other that embodies the principle of "amoorta"- the formless force that takes on the shape of the vessel that holds it- akin to water in a container and the eternal soul in a transient body. The ensuing living museum space and exhibit design will transport the visitor to a calmer realm, enabling them to receive multi-layered communication and interact with non-linear immersive environments.


The Geodome

Exploration of Earthquake

While Kachchh has experienced over 90 major quakes since medieval times, the Smritivan experience is a memorial to the victims of the quake of January 26, 2001. The introductory space would simulate an environment that relives the seismic activity and the forces of destruction and its aftermath in an immersive exhibit experience. An Object-Theatre driven with visual media infusion inside the 12M dia GEODOME can help the visitor focus primarily on this catastrophic event, is human and material toll.


Interactive Displays for Disaster Risk Reduction

Interactive Displays for Disaster Risk Reduction


Shake table to monitor Siesmic Activity

A secondary exhibit experience would specifically be devoted to the role of GSDMA in Disaster Risk Reduction, details of the legislative and institutional arrangements, such as the Disaster Management Act 2003, plans for village and district-level disaster management plans, school safety, cyclone safety, the Incident Command System, information on the district level Emergency Operation Centres. This space will specifically try to enlighten the visitor that managing disasters is a multi-dimensional, multi-disciplinary and multi-sector activity while underlining the importance of proactive approach to earthquakes. This space will also clearly state the priorities as laid down in the 11th Five Year Plan and the Hyogo Framework of Action of 2005. Other aspects of disaster management on display would include, community based disaster risk reduction strategies, community capacity building on safe housing, contingency planning for disasters like earthquake, training on rescue acts and first aid in the time of disaster and risk transfers through insurance.

A tertiary exhibit experience would focus on the geological and seismological aspect of earthquake, early warning and detection systems, Richter-scale, satellite mapping and monitoring and global research and advances in this area. The exhibits would allow real-time monitoring of seismic activity in other parts of the world and trace the history of earthquakes and tectonic shifts along fault-lines.

- **The Land**

Gateway to the Geology

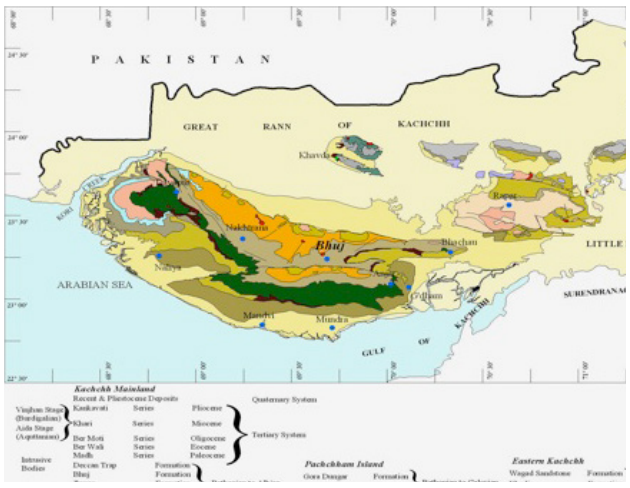
Resembling a tortoise on the map viewed upside down, the region of Kachchh was geologically formed before 18 million years. At that point in time the sea was on the surface and the land mass hidden underneath. With the progress of time, the internal geological changes like the volcanic movements and the movements of the earth's tectonic plates toward each other affected the land mass hidden underneath to rise above and the sea to gently slip off.

A continental collision began in the early cretaceous period some 70 million years ago along the line separating the Indo-Australian and the Eurasian plates, resulting into severe structural deformations of the earth's crust which led to the formation of the Himalaya. Parallel to the time of this occurrence the land of Kachchh began to surface from the sea. According to the evolution theory of the earth, this phase of transition is technically marked as the Mesozoic period. The remnants of sea animals like the Ammonites discovered in the region of Kachchh prove to be so. The fact that shells, intercalation of fine grain sandstone, the mounts of clayish soil and the intercalation of the mounts of limestone are processes undergone by the mounts lying underneath the sea, their findings on the hills of Kachchh suggest a prior existence of the sea in the region. Even today, the water found within the mounts of Kachchh constitutes a large quantity of salt and are known to be Inherently Saline.

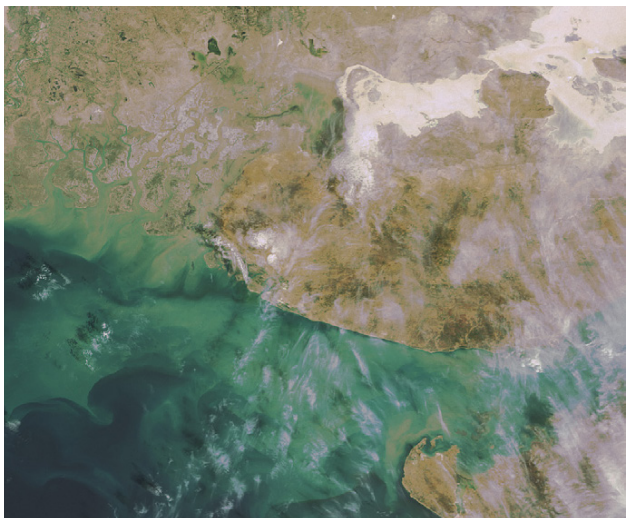
The mounts that were formed due to the volcanic eruptions and the flow of rivers after the Jurassic age, in the Cretaceous period and the Deccan Trap period, have negligible amount of salinity. The underground water found in the sandstone bed of Kachchh is supposedly a sweet water reserve that has been a collection of rains of approximately 10 crore years. Formed by the volcanic eruptions, the igneous rocks surfaced on the land and the effects of earth's environment transformed those beds into Laterite formations. This period marks the beginning of the Tertiary Age in Kachchh. Until this time, the western land of Kachchh was still under the domains of the sea.

Approximately 18 million years ago, the land known as Gujarat except that of the north-east region was under the sea. Nearly 2 million years ago the land of Saurashtra and the main-land of Kachchh surfaced from the sea. Within the last 20,000 to 5,000 years most of the land of Gujarat including the region of Saurashtra, the main-land of Kachh and a few islands rose above. And the form of land that we recognize today as Gujarat, Saurashtra and Kachchh is not more than 5,000 year old. With the to and fro movement of the sea on the surface and with the volcanic processes underneath, the land of Kachchh has become the land frequented by the earthquakes. It is recorded that a massive earthquake hit Kachchh on June 16, 1819. This partially changed the course of a section of the river Indus and caused a surface depression that became an inland sea known as "Allah Bandh". The process of growth of the vegetations in Kachchh began approximately before 7 to 8 crore years.

Indian Star Tortoise synonymous to the geology of Kachchh



Map of the Kachchh Region



Satellite Image showing Kachchh Underwater

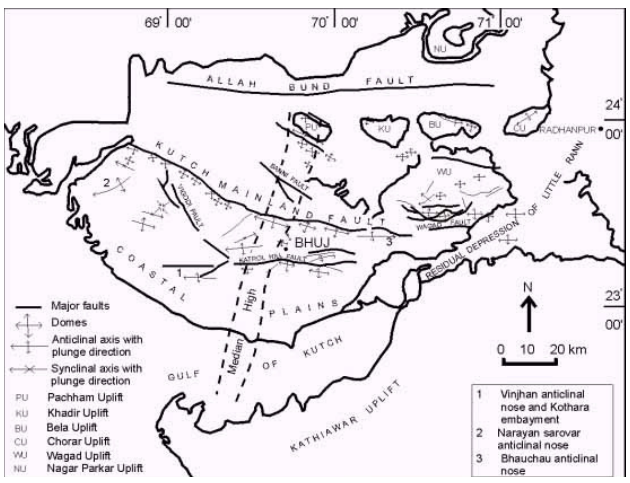


Diagram showing Fault Line

The Kachch Desert


the Rann of Kachchh


Grasslands of Banni


Land Formation


The Rann of Kachchh


The Coast of Kachchh

For the purpose of classification, the region of Kachchh has been geographically divided into diverse lands with respect to the mean sea level as:

- Desert region at 5 meter elevation
- Island region at 5 – 465 meter elevation
- Banni grasslands region at 5 – 10 meter elevation
- Central highland at 10 – 390 meter elevation
- Flat shores along the sea at 5 – 12 meter elevation

Geo-hydrology

Most of Kachchh that we see today was formed under the sea. The word 'Kachchh', meaning tortoise, received its name from its shape and morphology that was determined by a geological fold that brought the 'tortoise' out of the sea! The central ridge that runs from east to west, on which the town of Bhuj is situated forms the hump of the tortoise. These are largely fine sandstone and limestone sedimentary formations that are inherently saline, having been formed for centuries under the sea. This happened during the Jurassic Period. The central ridge created a gradient for the rivers to flow south and north into the sea. During the Cretaceous Period, these rivers washed the friable rocks to form coarse sandstone deposits along the ridge. This sandstone is the main source of deep ground water available in Kachchh.

Kachchh is also dotted by a series of hills along the northern flank of the Ridge. These were created by lava upsurges that pushed the sedimentary rocks upwards, sometimes breaking them open and letting the lava flow down the slopes. These have formed the fertile basalt rocks on which some of the best scrub forests stand today. During the same period further north in the shallow sea, the lava pushed up another chain of islands named Pachcham, Khadir, Bela and Chaupar.

In recent times, the alluvial deposits were formed along the coast by rivers, which have spawned vast mangrove forests in the intertidal zone. Similarly, the north flowing rivers deposited fine sweet fertile silt to form the famed Banni Grasslands. The Rann, the pervasive feature of northern Kachchh, formed fairly recently. For much of its geological history, this district was an island, but in the 12th century, had its northern sea border cut off by tectonic shifts, leaving the section of water to dry out and turn into what is today a vast white desert. Almost 17,000 square kilometers of the district are made up of this sodium-saturated area. Another theory is that the fine clay deposits of the Rann are formed by the delta of the ancient Sarasvati River.

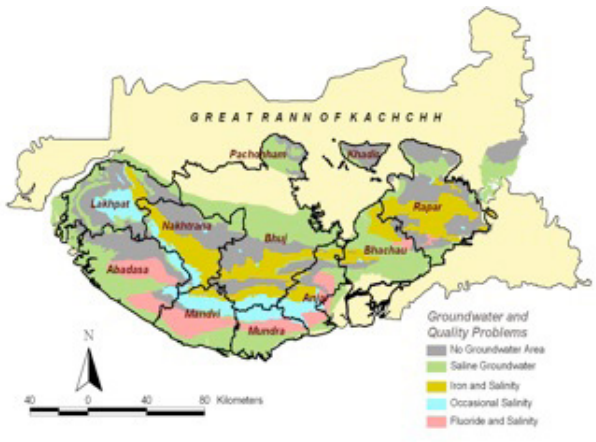
Three Types of Salinity

Emerging from these geological factors came three sources of salinity that affect the water of Kachchh. The first, an inherent salinity, stems from when Kachchh was underwater. As the bedrock formed, it took in much of the salt of the overlying ocean. Therefore, today, water flowing through channels cut through these rocks leech salt and silt. Salinity has also increased in the water of the region since the creation of the Rann. In the Great and Little Rann, seasonal tides ensure that much of the Rann remains perennially wet and marshy. As the locked waters

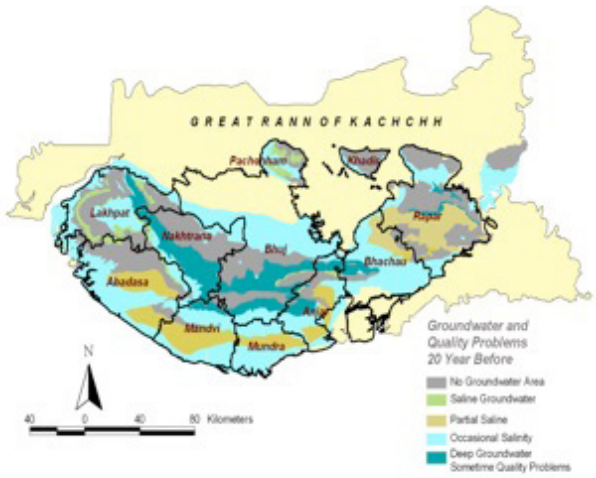
evaporate, they leave behind marine chemicals including salt. These often put pressure on adjoining landforms rendering them saline. Human action has also added a third source of salinity to the groundwater sources of Kachchh. On the coast, groundwater balance has shifted recently as freshwater is tapped through bore-wells for consumption, only to be replaced by ingress from seawater. This has made it increasingly difficult to replenish aquifers in the coastal zone causing the permanent loss of scarce sweet water aquifers in Kachchh.

4 Aquifers of Kachchh + 3 Water Harvesting Systems

Unlike most other regions in the country that have a few rock formations, Kachchh has eighteen. This is because Kachchh is placed at the confluence of the Gondwanas from the south, Aravalis from the North-east and another system from the North-west. Of the eighteen only four are sweet water aquifer systems. Most pervasive through Kachchh are sandstone aquifers. These are good providers of water, generally with relatively low salinity. This kind of aquifer is located along the Kachchh mainland, one of the reasons why Bhuj was located at its present position was because of the availability of this aquifer. The Laterite aquifers generally about the Gulf of Kachchh but yield low quantities of water. Alluvium aquifers provide sweet water, but dry quickly in drought conditions. Lastly, the natural basalt rocks hold water not in its pores as is the case of the earlier sedimentary rocks but holds water in its cracks. Communities here discovered these aquifers and named them based on the quality of water they yield. Over the years communities have evolved sophisticated methods of extracting, harvesting, and recharging these aquifers. For the animal herders and nomadic communities, water resources needed to be spread throughout the grazing land. This meant systematic excavating of zeels, and digging shallow wells in them, locally called virda. Often these were placed directly in the center of lakes, riverbeds and other water collection points so that even in the height of summer, the dried surface would have a well that dipped into hidden waters beneath. Tripartite lakes or talav systems were created, usually flowing from one to the other, thus segregating a drinking water talav from ones for washing and livestock. These sometimes would have deep wells at the bottom, often carving out the shape of a “w”, which would replenish lake waters with ground waters if needed, these step-wells were called Vav’s.



Map showing Groundwater and Quality Problems



Map showing Groundwater and Quality Problems 20 years before

Pragmalji’s rakhal

Earthen Check dam in bhuj


Computer Graphics recreated View of Dholavira


Reservoirs of Dholavira


View showing the City and Lake of Bhuj


The Coast of Kachchh


Domesticated Cattle

Dholavira

Some scholars believe that the first known dams were built right here in Dholavira, in northeast Kachchh. Dholavira, excavated in the 1960s, is a singular archeological find, symbolizing Kachchh's continued innovation in tapping into scarce and unreliable water sources and carefully establish an entire city in this arid climate. The location of the city, a hub of the Indus Valley Civilization four to five thousand years ago, was placed in between two rivulets which were diverted and dammed to serve simultaneously as protection, irrigation, mechanisms of water storage and aquifer replenishment. An ancestor of the ubiquitous moats that surrounded European castles, the system combined an intricate knowledge of stone masonry and set up a network of reservoirs all designed to hold sufficient water to escape unscathed from frequent seasonal droughts. Flood irrigation was used south of the city for agriculture, while grazing grounds were preserved to the north, ensuring both farming and livestock to flourish. The city had a drainage system connecting washing facilities and an underground water distribution system in the upper part of the town. A millennium before the vaunted reservoir system of the Roman Empire, the Indus Valley Civilization in this region could only survive through careful planning and rapid innovation.

Urban Planning for Water Resources

Building cities to house large populations that could be safe from consecutive droughts required water engineering with ingenuity. When the Maharaos decided to shift their capital to Bhuj in 1549, they interlinked three rivulets and eight large lakes to ensure water security for its citizens. The site for the city was carefully chosen on a 100 km2, 300 foot deep sandstone aquifer that could be recharged by four artificial lakes. When the lakes dried in the summers, the waters from another three lakes that were dammed in the nearby hills were released through sluice gates and travelled 2-5 km through diversion channels and tunnels to refill the lakes in the city. The recharged water was tapped through wells in each falia (hamlet) of the city. Designed to support the city on only 8 inches of rain a year, the planners stayed conservative by preparing for the worst of droughts and natural changes and in so doing, protected the population from the worst water shortages.

Gateway to Water in the Land of Extremes

The origin of the word Kachchh cannot be ascertained with clarity and is often attributed to the landscape of Kachchh, an aquatic reference and shows the importance of water for the land and to the flora, fauna, biodiversity and interdependence with the people of Kachchh. As the whole of Kachchh is surrounded by water and therefore, its ecology, economy, culture, rituals, social structure, festivals and struggle for survival is interlinked with water.

Kachchh can be described in a few words like Mindho mee, merman, madu, maal, Rann- Kachchh is the land of uncertain rain cycles.

Meraman means sea as opportunity, maal means domesticated cattle as a support for survival, madu maal means the people of Kachchh, often herders and nomads, who have adapted over centuries to with

stand harsh and extremes of the land and Rann means our unique area of vast arid saline muddy land which the colourful mirage of life in Kachchh.

Generally all over the world, the New Year celebration is always to thank nature after the harvesting season for the abundance of food grains and water which are the basic requirements of our society. But here in Kachchh, we celebrate our New Year before the start of the rainy season, the monsoon, hoping for the abundance of rainwater and food. That is why a Kachchhi saying; 'aavai ashadhi beej, ka-vadal, vaveet'. This means on the second day of the lunar month of Aashadh, which generally falls between June and July, we hope to see clouds or a bolt of lightning in anticipation of signs of good monsoon. In Kachchh, water is our life and that is why the Kachchhi believe in celebrating 'hope' for the monsoon season.

As we know that Kachchh is the land of uncertain rain and scarcity of water, it has its own unique flora, fauna, grasslands, swamps, shrubs and forest area. According to the documentation done between 1913 to 1926 by an eminent Kachchhi ethno-botanist and horticulturalist, Pandit Jaykrishna Indrajee Thackar, there are 511 plants of medicinal importance and he also recorded 402 garden and ornamental plants in Kachchh in his invaluable compilation, 'Plants of Kachchh and their Utilities'.

Droughts are the other reality of life in Kachchh, which is why the people in Kachchh always believed in conserving water as a religion and different water structures such as wells, lakes, stepwells, virdas, streams of water all are given the importance and status of temples or places of worship. One such example is the Hamirsar Lake – the heart of Bhuj city. Even today, with the first overflow of the lake in monsoon, the local government declares a holiday and all the citizens of Bhuj under the leadership of the Mayor of the city celebrate the occasion with sacred offerings as gratitude to the gods for the fresh waters in the lake.

Gateway to Agricultural Heritage

In Kachchh, the coefficient of variation in rain is as high as 40%, ie the reliability of showers falling at a particular time in the monsoon is only 40%. Therefore seed biodiversity, choice of crops and the practice of agriculture has been carefully evolved to ensure food security, simultaneously ensuring feed and fodder for the development of some of the most successful livestock for western India. It has also evolved to develop a symbiotic relationship where agriculture and animal husbandry support one another. 51% of the land of Kachchh is part of the Rann and a third of the remaining land is grassland; which leaves only 16% of the land for growing crops.

Bajra, a robust millet plays a central role in Kachchhi cuisine. Dry fodder Sorgum, for feeding the animals, are grown as opposed to most other regions that rely on green crops for their animals. Pulses that are the main source of protein and supply many nutrients while not needing rich soil to grow in are also a staple. These specifically consist of Green-gram and Moth-bean. Cluster-bean can be used in its entirety, including its seeds, stems and leaves, all ground up to feed cattle and

Monsoons in Kachchh

Sarcity of water

Hamirsar Lake

Agricultural Activities on Kachchh

Agricultural Produce - Cluster Bean, Moth Bean, etc.

Pulses

Collection of Harvested Crops

Rainfed Farms

Wide Range of Crops and Plants

Organic Fertilizers

buffalos. Cash crops are also specifically chosen that survive in the arid climate; the region around Bhachau-Rapar in east and southeast Kachchh provides soil where castor and Kala cotton can be grown in the extended Kharif season, providing oil and feed. Once primarily used for lamp oil, the plants have today many industrial uses.

Many traditional agricultural practices reflect the knowledge, generated and passed down over generations, intended to bring forth the greatest yield without exhausting soil and water resources. As some farmers put it, they need to maximize when there is water, to tide over the harmful effects of droughts. One common practice was mixed cropping; a bag was filled with seeds of millets, pulses and oil-seeds and the field was sown together. The plants would grow close together, but because millets have short roots, while pulses stretch deep into the ground, they would not compete for the same water and nutrients from each other. Additionally, millets require constant nitrogen which pulses add to the soil. Thus, they supported each other while not harming the long-term sustainability of the soil. Long maturing plants were preferred in order to tap into more nutrients and to provide more plant growth to be used for fodder along with grain. Families would focus their efforts on the crops doing well, seemingly ignoring flagging plants but knowing that the sooner successful plants could be harvested, the nearby stunted plants, like castor, would receive more nutrients, sunlight and water resources, which were then harvested in early winter. Lastly, to prevent the precious subsoil water from evaporating through capillaries, they were blocked with the practice of inter-cultivation. Agriculture only succeeded – and continues to succeed – as long as the water resources are well managed. In an arid district where 80% of farms are exclusively rain fed, it must be a carefully planned relationship between water and farming.

Biodiversity is a key tool in the sustainability of a Kachchhi farm. Planting a wide range of crops lessens and distributes risk ensuring some production based on the amount and timing of rain. When the rain arrives on time and in sufficient quantity farmers are able to harvest bajra, as their primary food crop, providing both grain and fodder. If the rain comes later in July, the bajra will still be harvested as fodder for livestock. An August arrival of rain means that sorgum will sprout on time and sustain the animals with its fodder. In this same way, planting seed varieties of the same crop, also distributes risk; for example three varieties of sesame, white, brown and black are planted together. White sesame is successful when the rains come on time, brown sesame if the rain is late and black for near drought conditions.

All these practices have also been evolved to avoid high costs of external inputs like fertilizers. Pests are rare as the heat prevents their spread. Thus their production is naturally organic; and its commercial benefits are beginning to be realized. As cultivation can only occur in the monsoon season, the fields are left fallow for at least the summer allowing nutrients to replenish naturally, without the help of chemical nitrous fertilizers. With high populations of livestock that benefit from the fodder of the fields, farmers have evolved several systems of recycling their dung as compost into their soils. Implementation of traditional knowledge leads to enhanced food security for the region, despite

farmers bearing the brunt of the arid climate. Since feeding livestock is paramount to livelihoods in the region, the drought-proof plants of sorgum, kala cotton and clusterbean prove essential. These are crops that also grow easily often with a single good shower. Sorgum will last until mid-August and therefore is rich in nutrients. Kala cotton provides oil rich with fats increasing the productivity of livestock. Clusterbeans, the most drought-resistant of all the crops in the region, grows to be a leafy palatable plant with many seeds. It grows even in the most exceptionally dry seasons. It is by planning around these plants that at the worst of times, livestock are fed and families are sustained.

As animal husbandry is such a large part of the livelihoods of Kachchh, there is also a intertwining of an agricultural and livestock practice. Rainfed farmers often could not solely rely on their crops to support them. Rain would not come some seasons or, if they did, the plants that could be raised were not enough sustenance to sustain their family. Therefore, farmers grew fodder plants and raised young bullocks, bred to be able to work in the difficult conditions of the region, strong and powerful. These in turn would be sold by the farmers to other parts of Gujarat, especially Saurashtra. Thus, the farms to this day have often a mixed focus of agriculture and animal husbandry to complement the rainfall in the region.

Drought-Proof PLants -Kala Cotton


Animal Husbandry and Livestock Practice


Storage of Water since its a Limited Resource


Banni Buffalo

Gateway to the Pastoral Life

The primary livelihood in arid regions is based on livestock; this is true for Kachchh, which is the only district in the country where the animal population is higher than the human population. Generally all over the world, arid regions with rainfall between 400-600 mm has mixed farming where rainfed agriculture is supported by livestock; however in regions like Kachchh, where rainfall is only a mere 200-400 mm, the region is predominantly based on pastoralism. In India, that is largely agrarian, regions like Kachchh have become breeding areas for the development of animals by pastoral communities for the specific needs of agriculturalists. Though water has always been a limiting factor, Maldharis developed their extensive system of livestock production here; therefore, livestock breeds have been adapted to scarce natural resources while producing food, fiber and energy. The rich livestock diversity of the district can be attributed to the unique bio-diversity of the district.

The Banni Buffalo is recognized as the most profitable animal in the country, ie with the least input costs, it provides the best profits for the milk it produces. This is because the Maldharis of Banni have carefully engineered genetic properties of drought resistance in the animal. In

Banni, the Banni Buffalo has been developed within the grassland ecosystem. This breed is well adapted to water stress conditions and to survive with saline water and saline grass species compared to other buffalo breeds of the country. The animals follow a unique semi-wild grazing practice carefully adapted to its ecosystem. For one, it grazes in the cool of the night, traversing an area of 10-15 km2. It also grazes without a herder and, in fact, the alpha male along with a herd of females and young ones marks its territory just as wild animals do. This keeps them not only healthy, but also performing better in production


Muslim Maldharis


Kankrej Bullock


Kachchhi Camel


Kachchhi Goats


Kachchhi-Sindhi Horse

and reproduction parameters. Before leaving for grazing, buffaloes are provided water from 'virdah', shallow wells constructed collectively by the Muslim Maldharis. This unique system of tapping the thin layer of sweet water in the subsoil has made the otherwise inhospitable grass-land accessible for a lucrative occupation in animal breeding.

The Kankrej cattle, considered as one of the most robust breeds in the country, too has its center of origin based on the arid ecology of Kachchh. Kankrej is a preferred homestead animal in many parts of India as it produces good milk, and due to its drought-resistant properties is hardy and can survive on little fodder. Bullocks of the Kankrej too have a high demand in Saurashtra as this breed performs better than any other breed in the agricultural field.

Kankrej bullock has the unique capacity of 'Savai Chal' which makes the animal faster in agricultural plowing and can also survive in water stress conditions. In the villages of Kachchh, cattle collect in a common place of the village locally called 'Vathan', where they are watered and a Gawala (herding boy) takes them out for grazing. The fame of this breed has also spread globally. In the late 19th century, the King of Bhavnagar, Maharaja Krishnakumar Sinhji, gifted a Kankrej pair to the King of Brazil. Today, Brazil has preserved this breed and it is named the Guzerá or Guzerat breed, based on the Portuguese spelling for Gujarat. The two breeds of Gir and Kankrej cattle, both imported from Gujarat have made Brazil self-sufficient in milk production.

In Kachchh district, the, Rabari, Jat, and Sama communities have produced two camel breeds, the Kachchhi camel that move very well in dry Rann with limited requirement of water. This breed helps our security guards to keep vigil on the border. The other camel breed, locally called 'Kharai Unt' survives by grazing on mangroves and saline plants and grasses on the coast. As an eco-tonal species, this unique breed is adapted to two adjoining ecosystems - dry scrub forest and coastal mangroves - for its survival. Kharai camels go for grazing on mangroves by swimming through the seawater in the creeks and come back to the mainland for watering. Ponds and Virdas are the main source of drinking water for camels. In Kachchh, large number of camels, sometimes more than 2000, graze on Salvadora and Suaeda species and breed around Chhari-Dhandh, a natural wetland which attracts many migratory birds. The owners of the Kharai unt are known to live mainly on a diet of camel milk.

Kachchh district has a population of more than 10 lakh of sheep and goats. Rabari, Bharwad communities maintain large migratory flocks. The Kachchhi goats yield a high amount of milk and can survive in semi-starvation conditions. This breed is well-adapted to inhospitable agro-climatic conditions, can subsist on a wide range of vegetation and water conditions and is suited to the hot arid region. These sheep and goat breeds are known to be excellent converters of degraded natural resources, transforming waste from harvested agricultural fields into food and fiber as well as subsequently supplying manure to the fields. Lastly, being rich in animal genetic resources, the district has produced the Kachchhi-Sindhi horse breed. With limited water and fodder, this breed performs better in harsh condition. More than 1500 such horses raised in the Banni region and another 2000 in other places of the dis

trict are recognized for its ‘Raval Chal’, a typical running style in which the rider can easily balance while riding.

Gateway to the Flora and Fauna

Flora

Many specimens of tree fossils that are millions of years old give an indication as to what kind of diversity and variety prevailed among the plants and trees grew in Kachchh. Examples of rare ocean life and remains of giant Dinosaur are also crucial aspects to be displayed in the museum. A detailed inventory can be made as to what kind of plant and tree life existed in Kachchh a hundred years ago on the basis of the work of Jaikrishna Indrajee Thakar. Forest Officer Raghuvir Singh Jadeja had found a fossil while lifting mud that had turned out to be 6 million years old as revealed by carbon dating. There are several fossil experts in Kachchh, among them are: Mohan Singh Sotha, Jugal Kishore Tiwari, Yogesh Jadeja. Their services can be taken to further identify examples of fossils of Kachchh. In Mata no Madh, interesting specimen of earth are available till this day which has a pleasant smell. Representation of Chakva Rakhal that is beautiful even today as it is covered with flora and fauna is important for the museum. Modern period may have representation of Linghodi, Lakhara, Velara Plantation and Social Forestry in Kachchh. Examples of extinct plants like ‘Raj gugal’ are absolutely necessary for the museum.

The state of Gujarat contains the second largest area designated as dry lands, following its northern neighbor Rajasthan for land grouped within arid and semi-arid climates. Due to its expanse in the west of the state, Kachchh is entirely comprised of dry lands, with a rich and diverse flora, befitting the many ecosystems of the district. Here in Kachchh, about 700 distinct plant species have been documented in recent years, including 20 that are endangered with one species, Helichrysum cutchicum endemic to Kachchh. Botanists have also discovered over 130 plants with medicinal properties. These plants, mostly xerophytic, are often unique for India in their ability to adapt to the high salinity of the soil, erratic availability of water and low soil nutrients. Despite recurring droughts in recent years the biodiversity continues to be exceptionally high for a dry land area even as there is sparse vegetation cover and low biomass productivity.

The thorn forests are the most abundant, mostly comprised of five thorny plants, the Acacia senegal (Gorad), the A. nilotica (Deshi bavar), the A. leucophloea (Harmo bavar), the Zizyphus mauritiana (Bor) and the Prosopis cineraria (Kandho). These plants have figured greatly into the traditional regional knowledge of water. It is said that wherever the native Prosopis cineraria is discovered, communities are sure that ground water of sufficient quantity and of good quality is present.

In recent history, the introduction of the invasive species Prosopis juliflora, locally called Gando baval, has had an incredible impact on every ecosystem in the region and in some ways constitutes its own ecosystem. Like its thorny native cousins, it is adapted to thrive on a low amount of rainfall and can survive in fairly high saline soils. It has shown a resilience unseen in other plants of this variety and an ability


Dinosaur Fossils

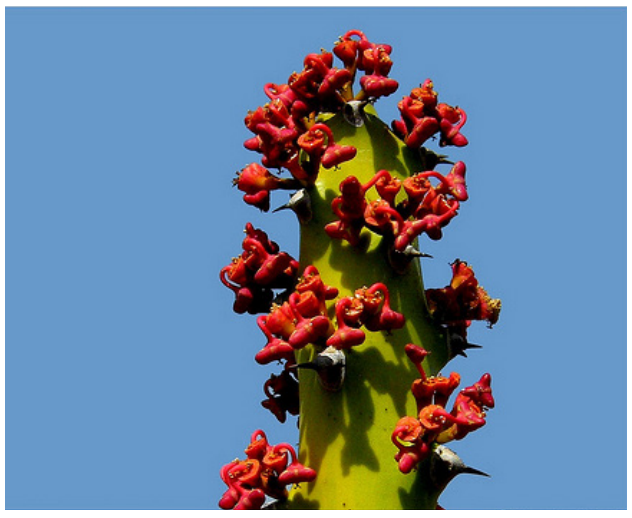

Display of Underwater Life


Mata no Madh


Acsia Senegalv


Acacia Nilotica


Leucophloea


Caducifolia Cacti


Capparis Decidua


Maytenus Emarginata


Suaeda Nudiflora

to spread all over the district.

In the hilly and rocky tracks that climb the highlands into the central section of Kachchh, tropical Euphorbia scrub pervades. Cacti and other desiccants do not need much water and are therefore able to survive where there is little soil and even less regular water sources. E. caducifolia- cacti (Thur), Capparis decidua (Ker), Commiphora wightii (Guggar), Grewia sps. (Gangani, Luska) and others from the Mimosaceae family dot this ecosystem. Amidst the white seemingly empty Rann crop up a series of islands, beth in the local language. Due to the mixing of sea water and fresh systems, these islands contain a rich and diverse floral ecosystem and attract a wide range of fauna to graze there. These saline thorny scrub systems function well in the shallow soil structure and are mostly stunted trees and bushes, like the A. senegal, Maytenus emarginata (Vikro) and the A. nilotica. They primarily rely on the relative lack of soil permeability to keep scarce water close to the surface.

The grasslands and wetlands of Banni offer a unique dual ecosystem that is rarely found elsewhere. Because of extreme seasonal change this region that forms the southern border of the Great Rann, the winter season from November to May serves as a marshy grassland, home to hundreds of thousands of migrating birds and overflowing with water. In the summer, this region dries out quickly, turning into savanna stocked with plants able to tolerate the shift from a wetland to dry grassland. The soil in Banni is made up of clayey and coarse textured soils and sprouts many grass species, both palatable and non-palatable. Suaeda nudiflora (Lano), Suaeda fruticosa (Unt morad), Cressa cretica (Oin) and Aeluropus lagopoides (Dolar) are the common saline tolerant plant species, which floral communities. An important, unusual plant endemic to Banni, locally known as lai, the Tamarix Aphylla, grows in this in-between stage as the ecosystem shifts from a wetland to a savanna. It spreads in the pockets of drying water, erupting in fluffy seeds that spread and cling to moisture on the ground and, as the moisture evaporates, the seed becomes planted firmly in its new location.

The mangroves of Kachchh comprise a unique coastal forest reflecting the fusion of an arid condition on the coast. Predominantly formed by a single species, Avicennia marina, the trees' adaptive significance is yet to be fully unraveled. Propagules (seeds) of Avicennia marina are endowed with characteristics that enable them to withstand and germinate in harsh environmental condition with high water salinity, reaching 50 parts soldium per thousand (ppt) and the high temperature of 50°C in the summer. It is this ability to live at the threshold of tolerance that enables A. marina to form extensive forest formations in an area where other forest systems find it difficult to grow. There are around 82 seasonal rivers and rivulets in Kachchh that discharge copious quantities of water and nutrients in the coastal zone only during rainy seasons. Despite the lack of good terrestrial vegetation, these rivulets enrich coastal waters of Kachchh with essential nutrients like nitrate and phosphate which enable proliferation of phyto and zooplankton, which in turn support a rich marine fauna. The mangroves also support the bird population with its seeds and leaves. The diversity and density of phytoplankton in Kachchh is comparable with any nutrient rich coastal

waters despite the high hinterland aridity. These trees also provide important fodder to animal herders, especially to camel breeders. It is believed that this fodder increases the fat content of milk produced by mangrove-fed animals.

As droughts have become more common and as Prosopis juliflora has spread rapidly, rare plants have been the worst affected with common plants taking over more land. Yet, in the past four years of greater than average rainfall, threatened plants have increased in number and natural seed banks have been strengthened. Anthropogenic and other biotic pressures have increased as the human population grows and spreads out and studies have yet to fully quantify the affects of development and increased water use on the flora population of Kachchh.

Prosopis Juliflora

Fauna

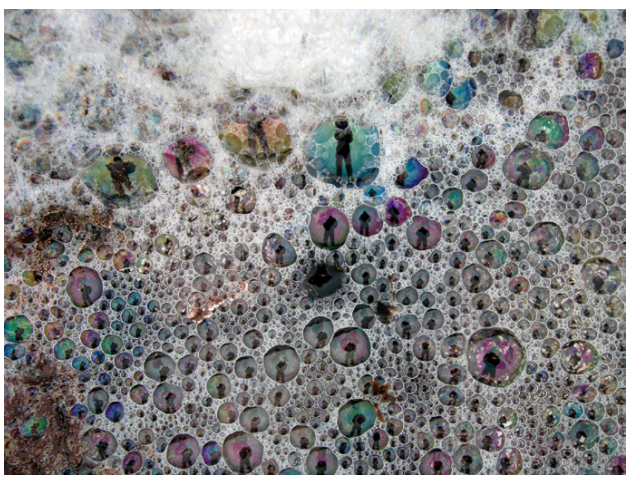
Kachchh serves as the gateway to many thousands of migratory waterfowl every year. Filling the sky every winter season, they come to feed, breed and nest in the multitude of wetlands throughout the district before heading on south into the Indian subcontinent. This role in an immense transcontinental system of migration is just one of the many ways that the fauna of Kachchh compliment the dry land water profile inherent here.

Mangroves of Kachchh

Weather in Kachchh is extreme and rainfall erratic averaging 340 mm a year. Low precipitation along with extreme temperatures of 10 to 45o C in winter and summer respectively,and a varied geo-morphology has developed the following ecosystems; tropical thorn forest, scrub savannah, grassland, the Great and Little Rann and mangrove coastal forests in this arid region. Rivers are seasonal and yet, both living in

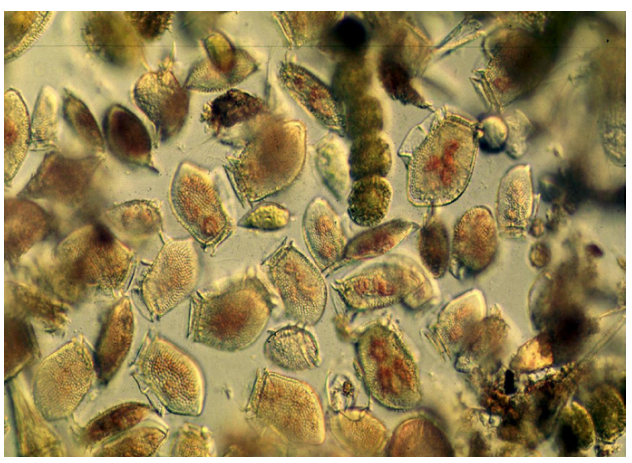
Greater Flamingos of Kachchh

those water sources and surviving because of them, vast and rich faunal biodiversity exists in Kachchh. This includes over 300 bird species, more than 250 of which are terrestrial, 50 mammal species, slightly less than 50 reptile species and a handful of amphibians (9 species) as well. Invertebrates have not been systematically surveyed, but hundreds of species abound and in the recesses of the waters of Kachchh, over 100 fish and prawn species have been noted.



Plankton creates Sea Foam

Winter brings a great deal of color to Kachchh and in the Great Rann to the north, pink shows up in the form of giant flocks of the Greater Flamingo. This vast white desert expanse is a natural wet-land and it serves as the only Asian breeding ground for the flamingo. In a year of good rainfall, the Rann becomes a vast confluence of salty water from the sea that mixes with the freshwater of the rivers and rain, creating brackish conditions for life to flourish. The plankton here becomes the prime source of food and consequently breeding grounds for more than 150,000 flamingos. The flamingos choose the location for their city by making a careful assessment of where the receding waters will have reached when their chicks are born and grow old enough to feed on the plankton in the waters. They build mounds of earth that come just above the waters on which they lay their eggs so that when the chicks are ready to hatch, the waters are shallow enough for them to wade and feed. The flamingos have also developed a ‘desalination system’ in their beaks so that they remove the salty concentrate through their eyes and drink only the sweet water.



Plankton

REFERENCE RENDERING/ IMPRESSION : EXHIBIT GALLERY ON KACHCHH REGION FLORA/FAUNA

Indian Mugger Corcodile fighting in Vanda

Spiny tailed Lizard

Desert Monitor lizard

Wild Ass

The Great Indian Bustard

For these one hundred odd migratory birds, the traditional water harvesting structures including ponds, wells, lakes, check dams, and virdas have an undeniable beneficial effect. Man-made wetlands are locations of rest, breeding and nourishment. Though the Rann and Dhands (natural shallow lakes) serves as massive natural wetlands, the 300 documented man-made fresh water structures are often equally important. Around 300 threatened Mugger crocodiles dwell in a few of these water bodies and form an isolated and remarkable population in the arid Kachchh. They have developed special hibernating holes and are known to migrate sometimes a few kilometers from one lake to another when lakes begin to dry up. Several species have adapted to the low water availability to take advantage of the large food reserves in arid Kachchh.

These man-made water habitats are shared by the locals and associated livestock, which forms the livelihoods for many communities. Over time, the increased need of human populations, frequent droughts, over-exploitation, and low maintenance of these wetlands has hampered the pervasive nature of these man-made landing areas. Protection and sustainable use of water resources of these wetland ecosystems are highly important for the survival of locals and associated diverse fauna. These so called satellite wetlands in rural areas lessen competitive pressures in the Rann and provide shelter for water fowls for a longer period. They dry out slower than the natural and shallow Rann and Dhands. This therefore allows for more varieties of birds to migrate to the area.

Fascinating and ecologically important fauna abound outside of the skies too. The one herbivore lizard, the spiny tailed lizard and the desert monitored lizard, a carnivore, found in Rajasthan and in the arid part of Gujarat, can be found in great numbers here in Kachchh. Another rock lizard, the Cyrtopodon katchensis is endemic only to this arid district. The flat saline terrain of the Rann also provides a unique home for the Wild Ass, only found here. Feeding on the shrubs and grasses sprouting from the bet, sandy islands of the two Rann ringing the edge of the great desert, the mammal can gallop and cover long distances and can survive without much shade or fresh water. The government has declared a sanctuary for the Wild Ass habitat in the Little Rann.

Another unique sanctuary has been declared for three bustard species; the Great Indian bustard, the Lesser florican and the Hubara or Macuueen's bustard, which are globally threatened species and inhabit grasslands and open scrub. Common and Demoiselle cranes are another migratory species that feed off the water bodies and grasslands all over Kachchh. More than 50,000 cranes converge on the Banni grassland and the rest of the district each year. Larks, pipits, chats fly around the grasslands as well and serve as prey for many types of raptors as well as desert cats, foxes and the endangered Caracal. The Chinkara, a gazelle species found in Kachchh depend on the thorny plant species of dry lands. It has the ability to live off the morning dew found on rocks and leaves for many days.

On the western Kachchh coast, an endemic prawn, Metapenaeus Kachchhensis can be found in great numbers and many other fish species are caught and sold by fisher folk in the area. This Jakhau coast

contains the second largest mangrove tract of the country. Some of these crustaceans are known to breed in the Little Rann and migrate through the Gulf of Kachchh before being caught as large lobsters near Jakhau. The sea life thrives amongst these trees, almost all of which are arid mangrove, which survive in the high salinity coastal zone.

- **The People**

Gateway to the Cities of Kachchh

The Indus Valley civilization was an urban civilization. There was an urban revival in north India at the end of what is described as the Vedic period. By the time of the Buddha, there were many cities of note, among them was Pataliputra described by Megasthenes in 300 BC. The Milindapanha, a treatise on cities, states that ' Just as the architect of a city, when he wants to build one, would first scratch out a pleasant spot of ground, with which no fault can be found, even, with no hills or gullies in it, free from rough ground, and rocks, not open to danger of attack. And then when he has made plain any rough places there may still be on it, he would clear it thoroughly of all stumps and stakes, and would proceed to build there a city fine and regular, measured out in quarters, with excavated moats and ramparts about it, with stout gate-houses and towers, with market places, cross-roads, street-corners, and public squares, with clean main roads, with regular lines of open shops, well provided with parks, gardens, lakes, lotus-ponds, and wells, adorned with many kinds of temples of the gods, free from every fault. And then, when the city stood there in all its glory, he would go away to some other land.' Cities continued appearing and disappearing and re-appearing on the Indian sub-continent in the ensuing centuries. The cities of Kachchh, during the historical period and after, are important identity elements of Kachchh as they reflect vital aspects of Kachchhiyaat. Today, more than 30% of one 1.5 million population of Kachchh in the area of 45,652 sq.km is urban.

Gateway to Bhuj : The Lighthouse of Kachchh

Bhujiyo Dungar - The Hill named Bhujiyo

From the viewpoint of the geological formation, Kachchh is an ancient region. The constitution of its geology dates back even before the Jurassic age i.e. approximately 18 crore years. The clevere of today's Kachchh was created from the remnants of the aquatic animals taxonomically sub-classified as the Ammonites. The land of Kachchh that surfaced from the sea due to the geographical influences as well as the sub-terrainian movements is divided among three regions namely, a) the main-land, b) the island within desert, and c) the desert.

The hills of Kachchh are called the Northern edge, the Central edge, and the Southern edge. The deposition of lava on the southern edge resulted into the formation of the Bhujiyo Dungar with the tallest peak at the altitude of 1500 ft.

The name of this historic hill and the city lying at its base is connected with the myth of Naga- the cult of snake worshippers. As with Taranga and Idar, the Bhujiyo Dungar standing nearby the out-skirts of Bhuj was a Naga station. Among the several legends of Kachchh, the love legend of Bheriyo Gaarudi and Sagai Sanghar of Sheshapattan is well

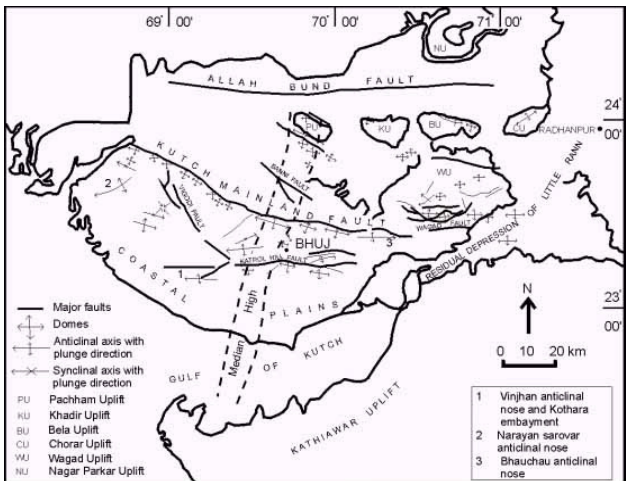


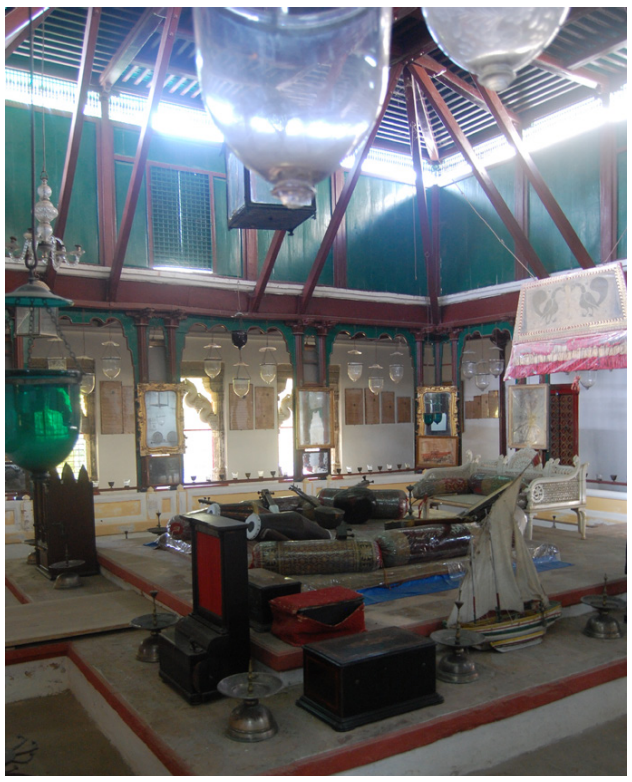
Diagram showing Fault Lines


Bhujangdev Temple


Bhujiyo Dungar


View of the City of Bhuj from the Bhujiyo Hill


Hamirsar Lake


Aina Mahal


Inner Courtyard of the Ranivas Palace


Darbargadh


Bhunga Houses

known in the regions of Kachchh, Saurashtra and Marwad. According to this legend, a prince named Bheriyo of the Bhati clan of Jaiselmer fell ardently in love with the valour and courage of a queen named Sagai of the Sanghar clan who ruled in the western region of Kachh known as Sheshapattan. Herself an expert conquerer of the Nagas, the queen as the condition of marriage demanded from Bheriyo the defeat of the Naga named Bhujang from Marwad. Informed of his arrival, Bhujang fled toward Kachchh. Gaarudi went after him, but was killed by the opponent. Learning of Bheriya's death, Sagai went to the hill where the battle had been fought and prepared a funeral pyre for herself. Thereafter, Bhujang resided on that hill and it came to be known as the Bhujiyo hill. And the city founded at the foot of this hill by Khengarji of Kachh in the samvat year of 1605 on the 5th day of the magshar month was named Bhuj after the Bhujiyo hill. In 1721 A.D., the conquest of Kachchh by a nawab named Kesarkhan, in order to collect tributes on behalf of the governor of Ahmedabad, defined the necessity of building an impregnable fortress. Soon the Khengar of Kachchh, for the purpose of defense, built a fort on the hill of Bhujiyo and Bhujiyo kilo derived its existence. The defense strategy of this construction was tested in 1730 A.D. when the governor of Ahmedabad named Sher Bulandkhan marched to conquer Bhuj in order to collect tributes, but was defeated with valor and courage by the 'Ra' of Bhuj. The glory achieved by this victory fills the hearts of the Kachchhi people, even today, with immortal pride.

To the people of Bhuj, this hill has turned to be more than just a geological formation; it has become their identity raised to a sacred dominion. Diverse castes living in the region of Bhuj still come to this Hill to perform the rites after marriage. The natural beauty of this place could not have been taken for granted, for anyone coming to this place would soon find himself mesmerized.

The city of Bhuj is the divadandi (light house) of Kachchh. A gateway to the urban past and present of Bhuj will contain the following:

- The settlement and topography - the physical context of Bhuj

How the position of the city may have been chosen while being established. What may have been the motivation of founding the city where it is? What was its relationship with the agricultural hinterland?

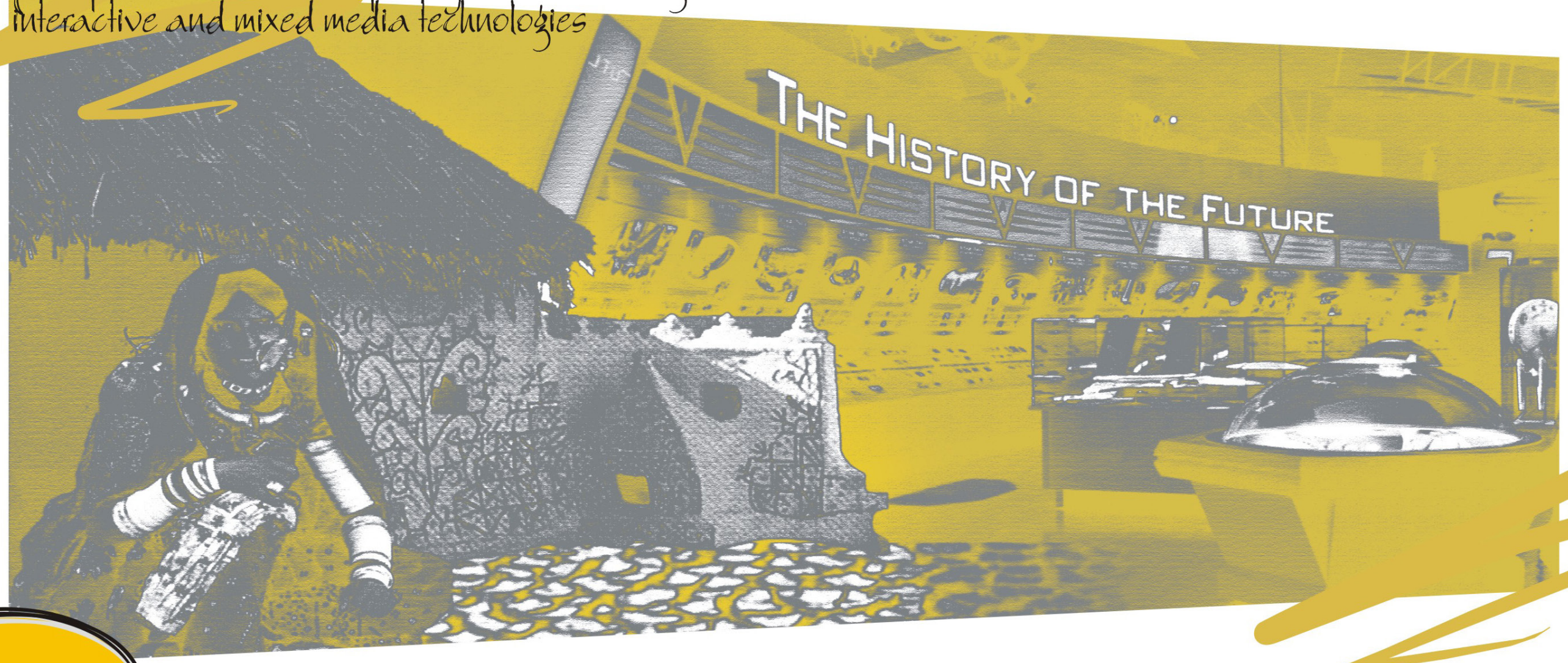
- The natural terrain and urban structure of Bhuj

How is the natural ground on which Bhuj stand? How does the town fit in the geographical structure of the Kachchh? What are the main features of the main streets as they may have existed during the time past? How did houses adjust and adapt to the terrain now and in the past? How were city squares or chowks formed by the streets?

- The architecture of Bhuj

Kalyaneshwar Mahadev Temple (1550 AD), Bhid Chabutara, Darbargadh, Prag Mahal, Aina Mahal, the fort walls of Bhuj as they existed once, the famous gates of Bhuj as they existed before, Sharad Bag Palace, Satyanarayan temple, Lakhpatjee Chatris as existed before and now, examples of the vernacular Kachchhi style, Rao Raydhanjee's chatri. The urban structure and character as reflected in Bhuj institutions like the palace (Aina Mahal and Prag Mahal), the public

the exhibit experience to use a combination of scenic back drop
juxtaposed with a contemporary aesthetic using
interactive and mixed media technologies



The People of Kachchh

REFERENCE RENDERING/ IMPRESSION : EXHIBIT GALLERY ON THE PEOPLE OF KACHCHH

spaces-the market (Rangoli chowk), the water bodies (Hamirsar Lake, Kalyaneshwar vav, Dedka vav) and places of worship. The Bhungas of Banni evolved post the 1819 earthquake as circular structures that could withstand lateral thrust of an earthquake, not allowing the building to collapse. Building cities like Dholavira, the part of towns of Lakhpat, Jakhau, Mandvi, Mundra, and in recent times Kandla; the Grasdhar capitals of Tera, Bhuj, Kotda and others have narratives that bring about an understanding of natural environment and adaptations of man-made structures.


Bhungas of Banni

Gateway to Dholavira and other Indus Valley sites of Kachchh

- **A Drifting Destiny: The Story of Lakhpat and Indus**

The story of Lakhpat drifts with the meandering fortunes of 'Sindhu' – the Indus; and its tributary Puran that passed through the region. Prosperous traders left the region and migrated out in waves, and this city slowly declined. Even today, the incredible moisture trapped in the sand radiates and creates the mirage of a vast water body. Travellers who made the journey before it became a forbidden zone came across remnants of the sea, boat-wrecks and trade half-buried in the sand, all reminders of a river which transformed into a desert. Shah Abdul Latif Bhitai's poetic lament at the changing landscape in the eighteenth century when the Indus changed course, and swung westward, is noteworthy.


Poet Shah Abdul Latif Bhitai

"Tell me the stories, oh thorn-brush,
Of the mighty merchants of the Indus,
Of the nights and the days of the prosperous times,
Are you in pain now, oh thorn-brush?
Because they have departed:
In protest, cease to flower.
Oh thorn-brush, how old were you
When the river was in full flood?
Have you seen any way-farers
Who could be a match of the Banjaras?
True, the river has gone dry,
And worthless plants have begun to flourish on the brink,
The elite merchants are on decline,
And the tax collectors have disappeared,
The river is littered with mud
And the banks grow only straws
The river has lost its old strength,
You big fish, you did not return
When the water had its flow
Now it's too late,
You will soon be caught
For fishermen have blocked up all the ways.
The white flake on the water:
Its days are on the wane."


Ruins of Dholavira


Rann of Kachchh

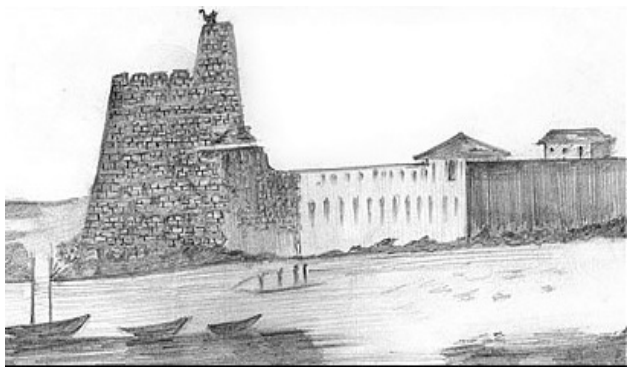

The great desert of Kachchh

- Translated by Prof. D. H. Butani (1913-1989) in "The Melody and Philosophy of Shah Latif"

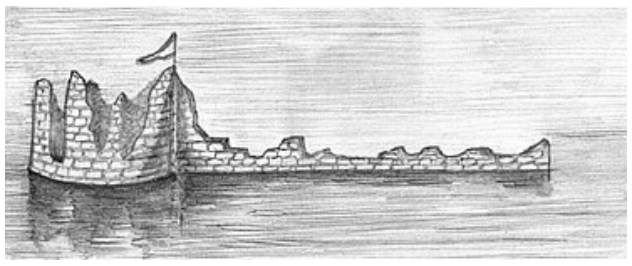
As I walk along the fort walls and look out onto the Great Rann of Kachchh, the desert which tells a thousand tales, I delve further into

Lakhpat

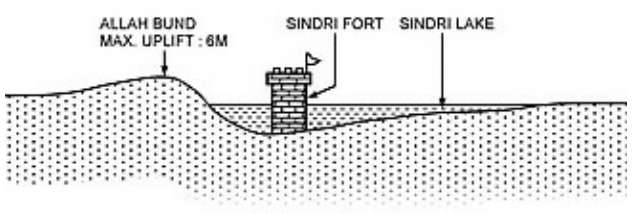
Gateway of Lakhpat



Fort of Sindhree



Fort of Sindhree submerged during Monsoons



Allha Bund

the story of Lakhpat. Up until the 12th century, this desert was still part of the ocean, and Kachchh was an island! Wondrously, I cut into a slim slice of time, and dip into the drama of the Indus that took place in only a hundred years! Come see

- 1750: The Kalhoras had begun to rule Sindh, and with their engineering acumen had built and repaired more than 700-900 canal systems of the Indus and its tributaries, bringing with it more than 22 lakh acres of land under irrigation upon which 30 lakh people flourished. Meanwhile the Puran continued to flow through lakhpat, as it had, for centuries before that, alongside fields of red rice.

- 1756-58: Indus began to shift westwards to its present position laying waste 10 lakh acres or 45% of the irrigated areas! Now, the Kalhoras had on hand a crisis with more than 15 lakh people left in hunger and penury.

- 1762-65: Ghulam Shah Kalhora decides to conquer new territories for his people and from 1762 to 65 made three foolhardy expeditions into Kachchh including the great battle of Jura in 1762 that he lost. During one such expedition, he captured several important towns, including Lakhpat, which were returned to the Maharao of Kachchh, later, as a compromise treaty. However, enraged and insulted at his loss, he dammed the Puran at Mora, and diverted part of its waters into canals for irrigation in Sindh, truncating the flow of the Sindhu.

- 1802: The successors of the Kalhoras, the Talpores, built the Ali Bandar that turned the fertile Sayra region above Lakhpat to waste, merging with the Rann for ever. The fort of Sindhree near Lakhpat filled up with mud and the sea took the place of Puran beyond Lakhpat.

- 1819: The final blow came with a huge earthquake that raised the river bed of the Indus, creating the 50 mile long ‘Allah Bund’ to the north of Sindhree, cutting the Puran completely. The earthquake submerged the land to the south of the Allah Bund, letting the seawaters flood the Sindree fort and creating a saline lake of 16 sq miles.

- 1826: Barely seven years after the catastrophic earthquake, and even as the people of Lakhpat pondered migration, a huge flood in the Indus broke all the dams, including the Allah Bund, to reclaim its original flow! The river danced again with boats over 100 tonnes not seen since 1762. Alexander Burns, chronicler of the death and rebirth of the Indus in this region, took a boat from Lakhpat to the Allha Bund in 1827, and says

“... I proceeded to ‘Allah Bund’ which I found to be composed of soft clay, shells elevated about ten feet from the surface of the waters, and cut through like a canal, with perpendicular banks on either side. The channel was about thirty-five yards broad and three fathoms deep; and a body of fresh water, a portion of the real Indus, rolled down it into the lake which I had traversed, below ‘Ullah Bund’.

Here the stream took on once more the appearance of a river, andIi found several boats laden with ‘ghee’ (clarified butter),…. and thus corroborated all which I had heard, that the bunds of the Indus had been burst, and the communication between the great river and its eastern and long forsaken branch was once more restored.”

• 1845-46, the region was ravaged by yet another earthquake, a small tsunami, and saw ground deformation around lakhpat. Soon after, the town began to empty, and Lakhpat's drifted into decline.
Gateway to the institution of Kingship of Kachchh

A Royal Marriage in Kachchh

Marital affairs of royalties always generate great public interest. In Kachchh, a royal marrieage created great interest in 1933, when Madansinh, a grandson of the ruler Rao Khengarjee was married to the princess of Kishangadh in Rajputana. Besides 4000 invitation cards for natives, 300 special cards were made for Europeans. Eleven parties, each headed by a high state official were dispatched to to personally invite the native princes for the ceremony at Bhuj. Later for eight days preceding marriage processions roamed in different areas of Bhuj town. These processions had a band party singing and nautch-girls as also horses and elephants. The processions were gifted by eight persons close to the Rao. The marriage party returned by a special train after two days of journey to a tumultuous welcome at the gates of Darbargadh by the Queen and Mr. and Mrs. Archer, the imperial representative besides may others on February 13, 1933. For three days, over 36000 people were fed in the palace and many of the poor outside. The bridegroom, whose reign was cut short by the integration of Kachchh with the Union of India, remained in London for the better part of his life.


Royal Marriage Setting


Royal Marriage in Kachchh


Darbargadh

Kavishri Dalpatram

• **The Living Tradition**

Gateway to the Kachchi Language and Literature

A well known connoisseur of poetry by the name Maharaoshri Lakhpatji founded a school in Kachchh for the learning of the Vraj language. The school remained active until the merger of the Kachchh state. From far and wide, poets came to this school for the purpose of learning the language. It is noted that Kavishri Dalpatram studied the art of prosody in this school. Kachchh saw the dawn of her poets from here. Maharaoshi Lakhpatji composed 'lakhpati shringar'(the aesthetics of lakhpati). After that poet Keshav and shri Jivram Ajramar in the poem-kaladhar udhijam written in gor poetry pondered about the essence of Kachchh in Gujarati language. Belonging to the tradition after that, the poet Niranjan in his poems 'matrubhumi ke naman'(salutations to the motherland) and 'tipe mein meraman' (Ocean in a drop) is seen reflecting the essence of motherland and his patriotism toward her. Inspired by the ideas of motherland, patriotism, nature, identity and the guts of Kachchhi speech, the contribution of Dulerai Karani remains a milestone in the poetic tradition of Kachchh. Working on the contemporary subjects of man's displacement in the society, society's fragmentation and cultural alienation, the poets like Makbul Kachhi, Abdulla Runja, Abd, Dr. Dhirendra Mehta, Ramnik Someshvar, Madhav Joshi 'ashq', Tejpal Dharshi 'tej', Madankumar Anjaria 'khwaab', Jayanti Joshi 'shabaab', Vraj Gajkanj, Pabu Gadhvi, Ravi Pethani 'timir' and 'vanchit' kukmavala; explored and reflected in their respective styles and genres old and new dimensions of the Kachcchi and Gujarati language.

The prose writers of Kachchh have made important contributions in


INDIAN SOCIOLOGIST

AN ORGAN OF FREEDOM AND OF POLITICAL, SOICIAL AND RELIGIOUS REFORM

LONDON, SEPTEMBER, 1908.

NOTICE.

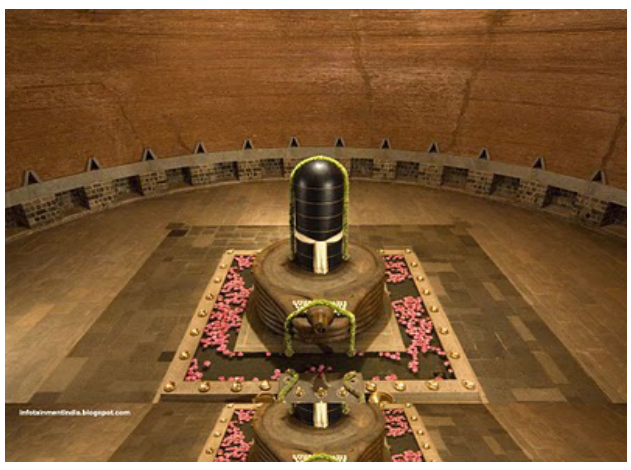
CHANGE OF ADDRESS.

THE ETHICS OF DYNAMITE AND BRITISH DESPOTISM IN INDIA.

SIMILIA SIMILIBUS CURANTUR—LIKE CURES LIKE.

Tabloid THe Indian Sociologist

Shyamji Krishna Verma



Shiva Temple

Shiva Temple

the development of the forms of essays, short stories and novels in the Kachchhi language. Working in conjuction to the poets, the writers like Bakulesh, Dr. Jayant Khatri, Dr. Dhirendra Mehta, Dr. Manubhai Pandhi, Vinu Keshvani, Jatubhai Paniya, Naran Damji, Umeeyashankar Ajaani, Pritamlal Kavi, Vinesh Antaani, Rajesh Antaani, Mavji Maheshwari, Nanalal Joshi, Niranjan Antaani, Indravadan Chhaya, Bipin Dholakia, Narmadshankar Mehta, Thakur Narayan Visanji, Gunvantrai Acharya, Rasiklal Joshi, Chandrashekar Buch, Gautam Sharma, Umashankar Ajaani, Jayant Sachde, Rajnikant Soni, L.J. Joshi, Prabodh Makde and the likes chose to reflect in their writings the ideas of motherland, indivuduals, society, history, sea and the culture of Kachchh.

Gateway to the communities of Kachchh

Kachchh and the Freedom Movement

Shyamji Krishna Verma was one of the three early freedom fighters of Gujarat, the other two being Madame Bhikhaji Cama and Sardarsinh of Limbdi. Shyamji was born in Mandvi in 1857 and was a brilliant student with a particular flair for Sanskrit. Shyamji taught at a university in England and while teaching he also earned a Degree in law from London and returned to India in 1884. He served as Diwan in some native states and realized that India's freedom movement could be better served staying in England. Returning to London, he founded the India House where the expatriate and visiting Indians discussed revolutionary plans. Verma started a tabloid called The Indian Sociologist in 1905 that inspired many political leaders and thinkers including Lala Hardayal and Veer Savarkar. The British government seized the offices of the tabloid and withdrew the Bar at Law Degree of Shyamji, compelling him to go live in Paris with his wife Bhanumati. Shyamji died in 1930, an unhappy man having been betrayed by his fellow countrymen on several occasions. His wife donated a large number of rare books to the Louvre Library in Paris and created a scholarship in the name of her late husband. The government of India honoured this great son of Kachchh with a Postage Stamp in 1988.

Perfect Religious Harmony of Kachchh

There is a 10th century Shiva temple and a Durgah of Ghulam Ali Shah at Kera, 20 kms from Bhuj. It is not generally known that a remarkable graveyard also exists side by side the durgah. The graveyard belongs to Ishnasari Khojas, a sect of Islam that is known for its tolerance. Here the graves are readymade in the form of otla ; the names inscribed are Vishram, Jetha, Ladak, Soniji etc. which are usually Hindu names. These names show that the forefathers of the present day Khojas were converted to Islam 200 years ago. Apparently, at times the newly converted had not adjusted to their new faith as can be seen from the epitaph of one Bhagat Ismailbhai Khalfan. It informs that the deceased returned to Shivdham instead of waiting for Quamat or doom's day on the fourth day of chaitra 1801 AD. Bhagat Ismailbhai was a devotee of Shiva and visited temples of Shiva daily. His footprints under a canopy are worshipped even today. Ismailbhai, belonging to Islam, had lived like a Hindu and was respected even among Hindus.

Bhujang Dev and the Temple Traditions

The Bhujangdev temple right at the top of the Bhujiyo is an ancient one, where, traditionally, the celestial serpent is worshipped by the Hindus to keep earthquakes away. Some of the seals found at the Indus Valley sites show snakes as figurines though their exact significance still eludes scholars. Noted Indian historian D.D. Kosambi has observed, 'what a widespread cult of the cobra is meant is beyond doubt. The Naga totem is still one of the principle Munda kilis. Naga tribes survive in Assam and Burma...The many hooded cobra was used as a rope at the churning of the ocean. He now accompanies both Shiva and Vishnu as guardian and is worshipped throughout the country with a particularly important festival day of his own-the Nag Panchmi. An alternative name for the Naga is Takshaka, which also means carpenter; the traditional Naga, a snake demon able to assume human form at will, is a superior craftsman. Taxila is derived from the same root taks, while innumerable local Naga cults survive to this day in Kashmir with antiquity duly attested by the Nilamata-Puarana, which shows that they were the original cults of the Kashmir valley.

The cobra Srikanth was the guardian of Thanesar (capital of the great Harsha)…the whole story of the great Mahabharatan war goes back to a lost non-Aryan or pre-Aryan nucleus, for the very capital Hastinapur (Delhi) is synonymous for 'City of Nagas', the word Naga also applied to the elephant (hastin) perhaps because of snake like trunk. Naga also means 'noble in character' in Buddhist tradition…The oldest naga tutelary demon subdued by any hero seems to be Kalia, at Mathura, whom Krasna wrestled down, but did not kill. Fa Hian reported that the Samkasya monastery had a special chamber for serving food ceremonially to the guardian naga. The Brahmins recovered from the first onset of Buddhism in Kashmir by taking over the local naga cults, which had withered under the doctrine of monks. The Navasahasanka-charita shows the predecessors of Bhoja at Dhara revering local patron nagas and marrying Naga princesses.'

The day especially devoted to worship the Nag Dev is the fifth day of the bright half of shravan (August). In some places in Gujarat, the likeness of a snake is engraved on a stone or copper plate and worshipped. Gujarat has many places with temples dedicated to the nag dev. Some of these temples have the following names: Ragatio Nag temple at Junagadh in Saurashtra, Charmalio Nag temple at Chuda, Vasuki Nag temple at Thangadh, Khambhadio Nag temple and Bhujia Nag at Bhuj. Also, every village in Gujarat was required to have an exorcist who also cured snakebites. The Smritivan could be linked to the August festival at the Bhujangdev temple marked by enactments of the Royal Procession, whose photographs survive in the Aina Mahel Museum, as a link to the living heritage. Similarly, other living traditions of all communities of Kachchh may be identified as part of the research and documentation activities.

Bhujangdev Temple

Nag Panchami Celebrations

Worship of the Nag Dev

Stone or Copper plate engraved with the Snake

Warriors of Jakhs

Gateway to the legends and folklore of Kachchh

Jakhs of Kachchh

Near the hillock of Bhujia stands a place of worship called Nana Jakh. It looks neither like a temple nor a mosque but an open room, perched

Temple of the Jakhs

Customs and Rituals of the Jakhs

Deities of the Jakhs

Horse Riding - Jakhs

Temple of the Jakhs

on raised ground and approachable by two stone staircases. There are 73 figures of horse riders installed as deities. They are worshipped by the Hindus and the Jains and are known for granting fertility to childless couples. The origin of Jakhs is shrouded in mystery. Jakh may be a corrupt form of Yakshas- heavenly beings. According to one story, the Jakhs belong to Iran. They were known to treat the poor with medicines they carried in a box. They also held a lantern while travelling in the night and this too is displayed in their temples. According to a legend, they arrived at Jakhau in Kachchh following a shipwreck some 600 years ago and hence known as Jakhs according to some. After landing, the Jakhs resumed their profession of travelling on horseback and treating the poor. During the period of the arrival of the Jakhs on the Kachchh scene, the Punara was the ruller. A legend has it that he was given an amulet by Lord Shiva as a boon, which would grant him immortality. Immediately wearing that amulet, Punara turned very cruel. He started exacting money from his subjects applying cruel methods. Those who could not pay were yoked to grind corn or to extract oil. The subjects approached the Jakhs for help in desperation. Apparently, the queen of Purana was childless and was also a devotee of the Jakhs. It was she who told the Jakhs that Purana took off the amulet only while bathing at a particular time each day. The Jakhs knew the use of gunpowder and attacked the dome of the bathroom where Punara was showering. The missile of the Jakhs destroyed the dome, a part of the structure instateneously killing Punara. Releived off the oppression, the people started worshipping the Jakhs as gods. Even today, the palace of Punara and an ornate Shiva temple stands at Manjal. The palace is known as Vadi Madi and is the only extant palace of the 13th century AD of Gujarat. People have erected a place of worship atop a nearby hill, on a terrace where the horse riders are installed. The Jakhs wore white clothes which is why every detail in this structure is done in white. This temple is the main shrine of the Jakh worship and is called ‘Mota Jakh’. Both nana and mota Jakh temples witness huge fairs each year in the month of Bhadrapada. These fairs are attended by a large tribal population of Kachchh each year. Those seeking a child, offer small wooden cradles to the temple deities and name their child ‘Jakhu’ after the Jakhs.

In the centre of Kachchh is a temple dedicated the gods called Jakhs. The custodians of the temple believe that centuries ago, seventy-one men and a single woman (together known as the Jakhs), emerged from sea to do wondrous things for the prosperity and safety of the local population. Speculation in the literature on the origin of these ‘fair-skinned foreigners’ attributes them to Anatolia or Syria (Kramrisch 1964: 55), or to Greece, Turkey or Central Asia (Rushbrook Williams 1958: 84–86). Their story seems to have been first recorded in English by Alexander Burnes in the 1820s, who, along with his more infamous brother James, was stationed in Bhuj. Burnes’ account of the Jakhs was probably copied with minor variations by the light-penned Marianne Postans in the 1830s. In her account, the Jakhs were shipwrecked and made their way inland on horseback to save the locals from the depredations of either a king called Punvro or a ‘demon’. They brought with them peace and a great knowledge of medicine. Some decades later, this version was reproduced in the fifth volume of the

Gazetteer of the Bombay Presidency in 1880. In this account (1880: 133, fn. 7), the Jakhs are described as a class of 'superhuman beings'. Legitimacy for this claim is drawn from Alexander Forbes' brief mention of 'Yukshas' (Jakhs) as celestial beings in his Ras mala, a florid, gothic, history of the region. The gazetteer briefly concedes, as if disguising an editorial controversy, the term probably referred to Musalmans, and, in Kachchh, specifically to a much older race of inhabitants.

In 1839, Postans had recorded that in the mists of time a troubled holy man had called his god 'Jakh' to his assistance: 'Jakh with his 71 brothers and a sister … came from Damascus and seated himself on a hill … the hill however unable to sustain so much purity began to sink ... and so moved on from hill to hill from the same necessity' (1839a: 156). One hundred and nineteen years later, in Rushbrook Williams' account, this had shifted only slightly to: '… the weight of their combined sanctities flattened the top of hill after hill' (1958: 84).

More recently, the gazetteer version was reproduced as part of the Census of India in 1961, which became the basis of Stella Kramrisch's (1964: 55–56) rendition of the story. In turn, Kramrisch's account became the principal source for Wendy Doniger's presidential address to the conference of the American Association of Asian Studies in Boston in 1999. Doniger argued that the Jakh myth is an 'inversion history', as the 'Muslim' invaders appear as heroes and the natives as villains. Furthermore, she suggested, it was probably in the interests of the early British, such as Burnes and Postans, to nurture this myth for it strengthened their own colonial interests, as a precedent for invasion to convey prestigious liberation. In this sense, the myth speaks of the assimilation of the values of the conquerors by natives, in which invasion has been transformed into a source of liberation and prestige. The myth and the legend have undergone evolving embellishments over the centuries

In the living tradition of the temple in the 1990s the Jakhs had become Hindu pastoral deities. Although they retained watery origins – they came from the sea into Kachchh – there was no question of them being 'Zorastrians' or 'Muslims', and they were certainly not regarded as 'foreign'. The deities were by now martial Rajputs. They are on horseback, and replete with moustache, turban, sword and a vermillion dash on their foreheads. The deities cared for by their custodians were most unequivocally Hindu. Jakhs were there to safeguard the fertility of Kachchh and its population. The Jakhs of the temple have been stripped of their foreign origins, domesticated. The 'native' is once again empowered to provide the source of liberation and prestige. The 'foreigner' becomes 'native', as the 'Muslim' or 'Parsi' becomes 'Hindu', and is empowered to protect the citadel from invaders from 'outside'. It might be fair to assume that the new myths of the Jakhs are once again a form of 'inversion history', where the airs and graces of local public temple culture have been re-imposed on the Jakhs in the post-colonial era.

Wall Paintings of Kutch

Wall Paintings of Kutch

Wall Paintings of Kutch

Gateway to Arts and Traditional Crafts

Wood carving, metal, silversmiths, textiles, weaving, knitting

Wall Painting Tradition of Kachchh

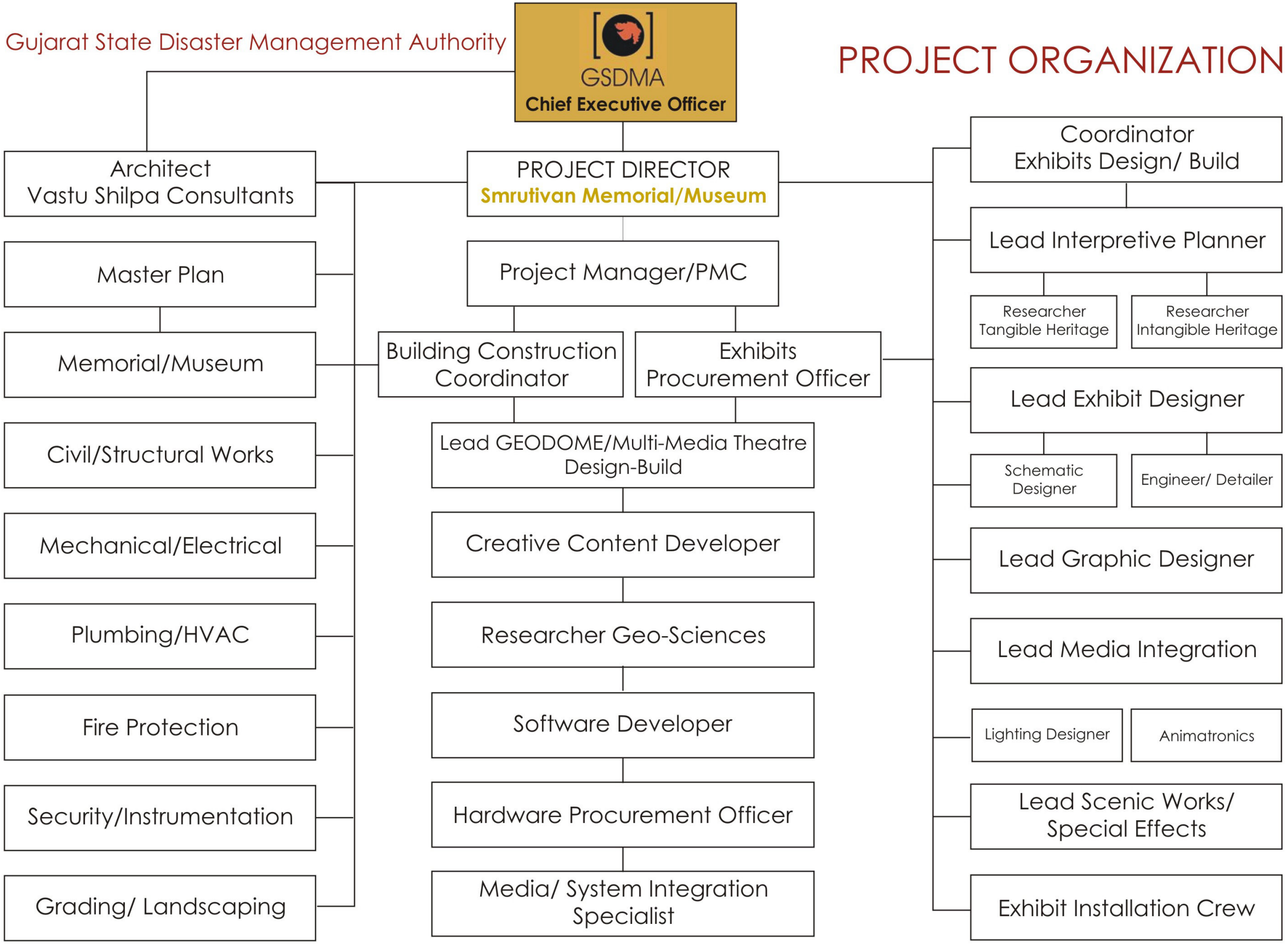
Kachchh had a rich tradition of wall painting in the local folk style called Kamangiri done by the Kamangars. Both Hindus and Muslims active as artists in this style of painting of Kachchh were called Kamangars. This style of painting, developed during the 18th century AD, reached its height during the middle of the 20th century after which it has been steadily deteriorating. The chief reason for this deterioration is the craze for converting old houses into new houses with new technology. A house with Kamangiri painting in Rayan village has been supplanted with an office building. At other places, walls are plastered erasing masterpieces. Kamangiri paintings always had religious themes and were meant to infuse the realm of the house with spiritual energy. Fortunately, Kamangiri paintings have survived in Captain Mc Murdo's house at Anjar. Captain Mc Murdo was the first British political agent of the British in Kachchh. In order to create an agreeable atmosphere in the newly conquered territory of Anjar, Captain Mc Murdo had commissioned painters of Kamangiri to paint the walls of his house with the scenes of the Ramayana and the Mahabharata which were the usual themes of the Kamangiri style. This bungalow at present is used as the offices of the Deputy Collector. This is a protected monument.

Section: 5

Project Organization and Implementation

- **Project Organization**
- **Implementation Stages**

PROJECT ORGANIZATION



Project Planning/Implementation

Interpretive Plan	Functional Plan	Architectural Design/Build	Exhibit Design/Build	Commissioning/Testing
▶ Research	▶ Institutional Program	▶ Visual Vocabulary	▶ Concept Design	▶ Exhibit Installation
▶ Collections/ Sourcing	▶ Storage	▶ Green Building Design	▶ Schematic Design	▶ Media Integration
▶ Literature Review	▶ Visitor Circulation	▶ FACD Integration	▶ Final Design	▶ Systems Integration
▶ Interpretive Narrative	▶ Amenities	▶ GeoTech./Seismic Criteria	▶ VSC Supervised TENDER NOTIFICATION	
▶ Methods of Expression	▶ Visitor Facilities/ Services	▶ Architectural Concept	▶ Exhibit Prototyping	
▶ Visual Interpretation	▶ Exhibits	▶ Site Design/ Integration	▶ Exhibit Engineering/ Production Drawings	
▶ Immersive Environment	▶ Adjacency/Access	▶ Civil Works/ Structural Design	▶ Graphic Design	
▶ Intangible Resources	▶ Freight/Parking	▶ Mechanical Design	▶ Graphic Production	
	▶ Traveling Exhibits	▶ Electrical/ Instrumentation	▶ Multi-media Integration	
	▶ Education/Classrooms	▶ Plumbing/ Sewerage Design	▶ Interactive Exhibits	
	▶ Administration/ Mntce	▶ HVAC/ Generator Systems	▶ Immersive Exhibits	▶ Unified Server Controls
	▶ Exhibit Studio	▶ Fire Protection	▶ Thematic Treatment on-site	▶ Mntce/Troubleshooting/Repairs
	▶ Museum Retail	▶ Security Criteria		▶ Staff Training
	▶ Café/Conference/Theatre	▶ Sustainability Criteria		▶ Upgrades/ Warranties

APPENDICES

- **Preliminary Estimates**
- **Credits**
- **Key Personnel and CV**
- **Definitions/References**
- **Architectural Drawings**

S.No	Activity	BUA
1	**Orientation Centre**	
	Reception	15
	Bag-in-Tag/Cloak Room	15
	Ticketing	15
	Audio Guide Kiosk	50
	Museum Shop	142
	Orientation Rooms	120
	Restroom (M)	35
	Restroom (F)	35
	Sub-Total	**427**
2	**Museum Administration**	
	Entrance Lounge with Front Desk	40
	Accounts Department	40
	Maintenance Department	20
	Chief Curator's Cabin	40
	Assistant Curator"s Cabin	40
	Foundation & Database of Victims & Families	30
	Board Room	50
	Restroom (M)	35
	Restroom (F)	35
	Storage	20
	Xerox	10
	Staff Pantry/Recreation	30
	Sub-Total	**390**
3	**Auditorium**	**700**
4	**Galleries**	
	The Land	966
	The Flora and Fauna	800
	The People	870
	Living Tradition	363
	Geo Dome	560
	Disaster Relief	450
	Geo Sciences	270
	Sub-Total	**4279**
5	**Café**	**338**
6	**Library**	**115**
7	**Temporary Exhibition Hall**	**807**
8	**Museum Shop**	**140**

S.No	Activity	BUA
9	**Freight Elevator**	**20**
10	**Children's Play Area**	**120**
11	**Graphic Production Studio**	**130**
12	**Collections Storage**	**120**
13	**Server Room/ IT and Exhibits**	**40**
14	**HVAC/Service Room**	**345**
15	**Security Control Room**	**50**
16	**Loading/Unloading Area**	**120**
17	**Central Spine Area**	**2359**
	TOTAL BUA	**10500**

Project Implementation Timeline*

PROJECT PHASE												36 MONTHS
Interpretive Plan	M3	M6	M9	M12	M15	M18	M21	M24	M27	M30	M33	M36
▶ Research ▶ Collections/ Sourcing ▶ Interpretive Narrative ▶ Methods of Expression												
Functional Plan ▶ Institutional Program ▶ Visitor Circulation ▶ Amenities ▶ Visitor Facilities/ Services												
Architectural Design/Build ▶ Visual Vocabulary ▶ Green Building Design ▶ FACD Integration ▶ GeoTech./Seismic Criteria ▶ Architectural Concept												
Exhibit Design/Build ▶ Concept Design ▶ Schematic Design ▶ Final Design ▶ Exhibit Prototyping												
Commissioning/Testing ▶ Exhibit Installation ▶ Media Integration ▶ Systems Integration ▶ Unified Server Controls												

*Preliminary timeline to be revised with detailed MS Project Schedule

Appendix: B.

- **Project Team**

A team of professional architects, researchers and museum planners has worked under the leadership of Vastu Shilpa Consultants' Principal Architect Rajeev Kathpalia to produce this final project report that sets the baseline for defining the scope of work.

As the project moves into the submission of the Final Report and commencement activities for the ensuing phases of detailed planning, design, project management, procurement, implementation construction, production and commissioning, more professionals will be brought on-board for meeting certain deliverables, quality assurance and standards.

This will ensure optimization of resources, adherence to project timelines, minimization the margin of errors stemming from fiscally non-viable experimental approaches, often the bane of inexperience.

Core Project Team: Key Personnel

Rajeev Kathpalia, Project Principal and Lead Architect: Smrutivan
A graduate of the College of Architecture, Chandigarh, 1979 and of Washington University at St. Louis, with a Masters degree in Architecture and Urban Design, Rajeev has worked in Delhi, Kuwait and St. Louis and currently practices in Ahmedabad. He is a Partner at Vastu Shilpa Consultants- a professional consultancy practice in architecture, urban planning and design. He is also a Trustee and Director of the Vastu Shilpa Foundation- a non profit research organization in environmental and habitat design. He is a Visiting Faculty at CEPT, Ahmedabad and has lectured extensively at Universities in India and abroad. He has served on the Jury of many professional organizations and is on the Advisory of many State and national level institutions. He is a recipient of several National Honours and Awards and his projects have been published in several journals all over the world.

Honours and Awards

2011 A+D Spectrum Foundation Winners Trophy, Institutional Archi tecture for FLAME University Campus, Pune

2008 World Architecture Award
2005 A+D Spectrum Foundation Award 2005 The Habitat Award for a Single Residence Design Winner's Trophy
2004 A+D Spectrum Foundation Recreational Architecture Award-2003
2004 Indian Architecture Awards AYA 2002, The Southern Gujarat Chamber of Commerce & Industry & IIA
2002 JK Cement Architect of the year award for Public Buildings -2003
2003 Prime Minister's National Award for innovative urban design for Restructuring the Historic core of Hyderabad
2002 A+D Spectrum Special mention award-2001
1998 First Prize, Urban Design Competition for Palm Marg, Sion Panvel Expressway and Mankhurd Panvel Rail Corridor
1995 JK Cement Architect of the Year Award-1993

1988 First Prize National Design Idea Competition, 1137 mixed in come housing Kalamboli, Navi Mumbai for CIDCO
1988 First Prize. Competition, Institute of Yoga and Conscious-ness, AP University, Vishakapatnam

Academic Appointments

2003 Core Faculty, VSF International Studio for students from
-2011 the Universities of Stuttgart, Technical University of Berlin, Technical Munich University of Darmstadt, Schools in In -dia and Curtins University, Australia
2009 Faculty for Sustainable Design workshop, IUAV, Venice, Italy
1999 Core Faculty, International Studio on Engaging the Peripher -ies' conducted by Vastu Shilpa Foundation and CEPT in collaboration with University of Washington, Seattle and University of Michigan, Ann Arbor.
1992 Summer Assisting Faculty, Masters Studio by Prof. BV Doshi, The Berlage Institute, Amsterdam, Netherlands.
1989 Visiting Faculty and dissertation guide, School of Archi
-2011 -tecture, School of Urban Design, CEPT
1987 Visiting Faculty, School of Planning and Architecture, New
-1989 Delhi
1986 Guest Critic, Graduate Design Studio, Washington University, U.S.A.

Book Review

2009 "Le Corbusier's Villa Shodhan"Editor,Manisha S. Basu: The Royal Danish Academy of Fine Arts School of Architecture.
Thematic Narrative

Hemang Desai
An author and journalist based in Ahmedabad, Hemang has written extensively for national and international mass circulating publications like the Times of India, The Indian Express, The Asian Age, The DNA, Divya Bhaskar and The Times (London). The more than 200 research based analytical articles and interviews published in English so far in the mainstream print media address a variety of topics, ranging from maternal deaths and museums to climate change and miniature paintings during last 15 years. He has been active in teaching at various institutions like CEPT, SPIPA, AMA, and NID for more than 18 semesters. He worked as the Writer, Translator and Researcher for the 2007 first French Biography of Mahatma Gandhi by Jacques Attali- "Gandhi ou L'Eveil des humiliés", published by Fayard, Paris. Writer, planner, editor for the book, "Architectural Treasures of Gujarat" published by the Tourism Corporation of Gujarat won a National Award for "Excellence in Publishing" by the Tourism Ministry, Government of India in 2009. This involved detailed coordination with the designers of the book and the printer. His book Annals of Reinvention: Discovering Ahmedabad served as the catalogue for Ahmedabad Municipal Corporation's 2009 Exhibition on the City of Ahmedabad in Spain, launched by the Euro India Forum in presence of Secretary, Urban Affairs, Government of India. His last book, Buddhist Treasures of Gujarat, with foreword by

the Chief Minister Mr. Narendra Modi, launched by H.H. Dalai Lama on January 15, 2010 in Vadodara.

Suranjana Satwalekar

A Partner at the Satwalekar Design Studio in Mumbai, Suranjana earned a BA from St. Stephen's College and a Diploma in Visual Communications from the National Institute of Design where she served as Faculty from 1985-2003. During her tenure at NID, she has taught exhibit design, headed the AV Studio and served as the Chairperson, Design Services & Research (NID's Client Service & Research activity) from 1995-2000.

Professional Experience :

Themed Environments/Museum/Exhibition/Set Design, Since July 2003

- Principal Design Consultant to Tech Connect, Delhi, Design of showcase R&D Labs, Genpact, Gurgaon
- Principal Design Consultant, TCS Customer Experience, Siruseri, Chennai, Tata Consultancy Services
- Principal Design Consultant, Concept Design - The TCS Experience Zone, Mumbai, Tata Consultancy Services
- Principal Design Consultant, Concept Design - Standardisation of Global Innovation Labs for customer briefing, Tata Consultancy Services
- Principal Design Consultant to Techlogique Consulting Group for design of theme-based/experiential,technology- driven, Executive Briefing Centres and branded environments. Clients include Tata ConsultancyServices Mumbai, Pune, Chennai, Thane, Bangalore; L&T Infotech, Bangalore; Cranes Software, Bangalore
- Exhibit Design Consultant, Wind Gallery (History & Evolution of Wind Energy), Suzlon Energy Ltd., Pune
- Consultant for Museum Design, Indian Museum, Kolkata - partnered with INTACH Mumbai for the pitch proposal for the Museum's modernisation along with Tasneem Mehta & Vikas Dilawari
- Advisor, Reserve Bank of India, Mumbai, for its Jubilee Year travelling exhibit on currency notes.
- Advisor, Shri Guru Gobind Singh Museum, Nanded
- Advisor, Living Heritage Centre, Surabhi Foundation, Mumbai. Articulated the proposal for a Cinema Heritage Centre
- Design Consultant, Sabarmati Ashram, Ahmedabad; Entry-point Visitor Facilitation, Library reorganisation &
- Exhibition Design - India of My Dreams & The Legacy of Gandhi (project abandoned by client due to lack of funds)

Upto 2003 as Design Faculty, National Institute of Design, Ahmedabad

- Project Head & Core Designer, Khalsa Heritage Museum, Anandpur Sahib, Anandpur Sahib Foundation,Chandigarh (completed Concept Design for the entire Museum in 2001)
- Project Head & Chief Designer, Reserve Bank of India Monetary Museum, Mumbai
- Articulated the first NID Project Proposal for the Master Plan for Modernisation of Victoria Memorial Hall,Kolkata
- Advisor, 'Chitra – An Exhibition of 18th Century Maps & Drawings

of India' from the Bibliothique Nationale,Paris; Embassy of France in India & National Museum, New Delhi
- Project Head, Set Design, Doordarshan News Channel (first launch), Prasar Bharti, New Delhi
- Design Consultant to the Tata Group, Tata Group Pavilion, International Engineering Trade Fair '98,Pragati Maidan, New Delhi
- Project Head & Designer, 4 exhibitions of traditional and contemporary tie-dyed textiles from all overthe world, International Shibori Symposium, NID, Ahmedabad
- Project Head & Designer, 'Destination India', a travelling exhibit, Dept. of Industrial Policy & Promotion,Ministry of Industry, New Delhi
- Project Head & Chief Designer, Concept Design Proposal for the exhibition, 'Bharat Ek Darshan', Secretariatof 50 Years of India's Independence, Department of Culture, New Delhi
- Project Head & Chief Designer, 'Rta Ritu – Cosmic Order & the Cycle of Seasons' Exhibition, IndiraGandhi National Centre for the Arts (IGNCA), New Delhi
- Chief Designer, 'Impact of the West' gallery, Discovery of India Exposition, Nehru Centre, Mumbai
- Project Head & Designer, NID Showroom, National Institute of Design, Ahmedabad

Audio Visual Design & Production, Since July 2003
- Creative Director, live action & animation films for Executive Briefing Centres for Tata Consultancy Services

Upto 2003 as Design Faculty, National Institute of Design, Ahmedabad
- Director & Co-scriptwriter, fund-raising video, 'Architecture & Design of the Khalsa Heritage Museum', Department of Culture, Government of Punjab.
- AV Director, 'A Day in the Life of India', 10-minute multi-screen AV, 'Hamara Bharat' Exhibition, BalBhavan Society of India, New Delhi
- AV Director, 'Rta – The Rhythms of the Cosmos', 8-minute multi-screen AV for 'Rta Ritu' Exhibition,Indira Gandhi National Centre for the Arts (IGNCA), New Delhi
- Co-director, 'Design for Communication', NID's presentation at Design Renaissance, International Design Congress (ICSID - ICOGRADA - IFI), Glasgow
- AV Director, 'Why Design?', 10-minute multi-screen AV for the Executive Committee of the Confederationof Indian Industry (CII), NID
- Coordinator, Audio Visuals, Discovery of India Exposition, Nehru Centre, Mumbai
- AV Director, 'India – The Environment', 12-minute multi-screen AV, Discovery of India Exposition,Nehru Centre, Mumbai
- Co-director, 'Kathak', 8-minute multi-image AV, Discovery of India Exposition, Nehru Centre, Mumbai
- AV Director, 'Passage of the Sun', 16-minute multi-image AV for the travelling 'My Land My People'exhibition, Festival of India in USSR
- Associate AV Director, multi-screen AV for Melbourne Art Directors'

Club Awards, MADC/ Graphic Design Department, Swinburne Institute of Technology, Melbourne
- Associate AV Director & Photographer, multi-screen corporate AV for the Graphic Design Department, Swinburne Institute of Technology, Melbourne

Miscellaneous, Since July 2003
- Invitee of the Government of Punjab to the Indo-US Technology Forum sponsored Museum Manangementseminar held in June 2006 with the Smithsonian Institute, for heritage sites in Punjab

Upto 2003 as Design Faculty, National Institute of Design, Ahmedabad
- Paper, 'Museums of the Future', presented at the National Museum, New Delhi for a workshop on the proposed post-graduate Museum Design Programme to be set up at National Museum Institute
- Core member of Content Team, Copywriter and Co-editor, NID-ITPO Showcase Design, Pragati Maidan, New Delhi
- Voice Over, 'Shubh Vivah', animated film on dowry directed by Nina Sabnani, produced by NID, telecaston Channel 4, UK
- Narration Script & Voice Over, 'One More TV', film produced by Development Education & Communication Unit (DECU), Indian Space Research Organisation (ISRO), Ahmedabad for NAMEDIA on the SITE experiment

Azhar Tyabji

With an M.Phil in Social Anthropology (Cambridge University), an MCP in Community Planning from the University of Maryland) and a BA in the History of Art from Cornell University, Azhar is a member of faculty at the Institute for Financial Management and Research (IFMR) Chennai, where he teaches courses in qualitative research methods and is shaping interdisciplinary action research on the monetary valuation of cultural assets. Tyabji has lectured internationally, consulted with advocacy groups and international development organizations in the US, Morocco, and India, and published articles on cultural education and craft. His book, Bhuj: Art, Architecture, History was nominated for the 2007 Henry Glassie Award of the Vernacular Architecture Forum.

Rahul R. Ranadive

Director of Frame of Mind Communications Private Limited, Rahul is a photographer, documentary-film maker, and teacher of visual media and communication. In his career, spanning over two decades, he has filmed the likes of Manmohan Singh, Atal Bihari Vajpayee, Rajiv Gandhi, V.P.Singh, the Dalai Lama, Edmund Hillary, Prince Charles and Lady Camellia, amongst others. He has worked on projects initiated by major international broadcasting corporations, i.e. BBC, Channel 4, Discovery, RAI, PBS .As a student of M.A. Mass Communications, his film "A Time to Heal" on the state of the river Yamuna was judged the best thesis film and telecast on the National Network. In 1986, Rahul was a part of the core team at TV Today that started the monthly video cassette NEWSTRACK. This was India's first attempt to challenge the government's monopoly on factual programming that led to the growth of private channels. Over the years, Frame of Mind Communications has worked towards empowering people from the margin by increas-

ing their access to media; and training. Along with the communication support provided in bringing about educational reforms in Ladakh, the photographic documentation of the region has been exhibited widely and was adjudged as Finalist for the Mother Jones International Award for Documentary Photography,1992, by the renowned Sebastian Salgado.

Sandeep Virmani

Sandeep moved to Kutch, a remote arid district, about twenty years ago, to make the place his adopted home and a place of learning. He naturally tends to look at situations from the disadvantaged point of view, and so gravitated towards finding his relevance as an architect in development. He enjoys probing into the complexities of nature and try to find decentralized and simple solutions that look at things holistically. Perhaps, that is why he has remained a generalist, though he is good at guiding and working with specialists. A conservationist at heart, he has explored its dimensions in the fields of water harvesting, organic agriculture, renewable energy, nomads and their habitats, the built environment, biodiversity, and industrialization and developed models of how we can have a more sustainable, equitable and gender sensitive society. To achieve this, he has also learnt how to set up and manage institutions. Over these years he has set up four organizations, Sahjeevan, that is an organization that helps incubate a topic as a knowledge centre for a period of time so that it may then be registered as an independent organization. Arid communities and technologies(ACT) was the first of these, which focuses on water in all its dimensions. Satvik: towards Ecological farming, networks the initiatives of the organic farmers of Kutch, and helps conserve important crop biodiversity of rainfed farmers. After the earthquake in 2001 in Gujarat, he got the opportunity to come back to building habitats along with his learning's in environment and participation. With like minded professionals he set up the Hunnarshala Foundation. In 1998 he set up the Kutch Navnirman Abhiyan (KNNA) that is a network of 30 NGO's working in Kutch. They focus on policy and capacity building of the district. His contributions in KNNA is in developing and up scaling the models developed by Sahjeevan in the areas of natural resource development and environment

George Jacob

India-born Canadian Museologist George Jacob has planned, designed and established museums and award-winning exhibit experiences spanning 11 countries in his 25 year museum career and is among the leading museum thinkers of our times. Former Smithsonian intern and Canadian Commonwealth Fellow, he specialized in Museum Studies, History and Leadership at the Birla Institute of Technology & Science, University of Toronto and Yale School of Management. With a track record of over $200 million in museum projects worldwide, he is the recipient of an unprecedented $19 million in US Federal and State grants and the author of the seminal books Museum Design: The FUTURE and the sequel Exhibit Design: The FUTURE with an Introduction by the American Association of Museums. Diverse museum projects cover a range of academic and popular pursuits including life sciences, astronomy, anthropology, cultural heritage, ethnology, archaeology, natural history, music, art and living traditions, to name a few. During these years, he has had the distinction of being the founding Director

of three museums including the $30 million NASA-Ames funded Astronomy & Cultural Centre, Vice President of the 21368 sq.m. OMSI, OMNIMAX facility, Chairman of numerous professional committees on museum ethics, policy, museum law, standards and curatorial practices. He was honoured to be the Project Director for the production of the Star Spangled Banner (the 1812 flag that inspired the American National Anthem) permanent exhibit at the Smithsonian in Washington DC dedicated to the nation by President George W. Bush. Soon thereafter, he was conferred the Outstanding Museum Professional status by the United States. He is regular OPED Columnist for leading Newspapers and Magazines and most recently, was a plenary Speaker at the ICOM/UNESCO sponsored 2010 World Conference on Inclusive Museums in Istanbul, Turkey.

Research

Dr. Pankaj Joshi

Dr. Pankaj Joshi has a Ph.D in Plant Science (Ecology, Taxonomy and Conservation) from Bhavnagar University, Gujarat and has 12 years research experience in the fields of plant taxonomy, rare and endangered plants, ethno-botany, grassland restoration, saline land reclamation, watershed development and Environment Impact Assessment. He has published 48 research articles in peer reviewed national journals of repute, chapters in books, workshop proceedings and local magazines. He has participated in several national and regional conferences/seminars. He has contributed in 31 technical reports published by GUIDE, Gujarat Institute for Desert Ecology, where he currently works. He is a registered member of IUCN – The World Conservation Union, Species Survival Commission Indian Subcontinent Plant Specialist Group (SSC-ISPSG) and Indian Association for Angiosperm Taxonomy (IAAT)

Dr. Sabyasachi Das

Sabyasachi's formative years at Visva-Bharati, in Shantiniketan motivated and shaped his thinking to work with NGOs helping communities thrive and protect their local environment. His doctoral work with the Van Gujjar, a pastoral community in Uttarakhand, helped illuminate issues facing pastoral communities, both nomadic and settled, in and around Rajaji National Park. Dr. Das has eight years of experience working on various issues in the development sector with a core focus in "Natural Resource Management". He has worked with farmers of the Vidarbha region to increase sustainability of their agriculture system in semi-arid climates and presently focuses his work at Sahjeevan on issues of livestock and decentralized drinking water systems in the arid region of Kachchh. This in turn has led him to be associated with the dairy movement in Kachchh, breed improvement efforts, and the revival of commons and pastoral rights. His work has contributed towards the recognition of the Banni Buffalo as the 11th registered buffalo breed in India, for which the institution was awarded by the Indian Society for Buffalo Development (set up by Central Institute for Research on Buffalo an institute of ICAR). Dr. Das is the Joint Secretary of Kachchh Nav Nirman Abhiyan and is involved with the Rainfed Livestock Network and Life Network.

Dr. Wesley Sunderraj
A wildlife ecologist Dr. Sunderraj holds an M.Sc., and Ph.D., in Wildlife Studies. Before joining GUIDE, the Gujarat Institute of Desert Ecology, he held a position with the Wildlife Institute of India, working on different research projects. His 26 years of research experience includes work on Habitat and Ecology of threatened species, biodiversity conservation, and restoration of Mining sites, Natural Resource Management and Action Plans and Regional Environmental Planning. He has also worked on Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) on development projects carried out in different states of the country. He has been specifically involved in 65 research and consultancy projects and publications including 40 scientific papers and 60 technical reports under his name.

Since 2001, Dr. Sunderraj has been involved in Sea turtle research and conservation and a member of IUCN/SSC Sea Turtle Specialist Group.

Dr. Yogendrasinh Jadeja
Working as a Director in Arid Communities and Technologies is working on water resource development and management aspects in Arid and Semi Arid regions of Gujarat since 1993. His contribution in water resource development and management is through decentralized water resource planning by bringing together traditional (local) geo-hydrological knowledge with advanced scientific knowledge. The organisation has trained more than 150 youth all over the country on comprehensive water resource Management.He has contributed significantly to the development of drinking water, developing a technical basis for ground-water legislation and Coastal Salinity remedies. His organisations services are used by several NGO's including Abhiyan, AKRSP, GIDR, BIAF, Arghyam, Seva Mandir across the country. He completed his graduation (B.Sc.) and postgraduate studies (M.Sc. and Ph.D.) in Geology from R.R. Lalan College and M.S. University respectively.

Appendix: C

- Definitions/ References

The Indian Constitution is clear in defining the value of preserving our heritage: "Any section of the citizens residing in the territory of India or any part thereof having a distinct language, script or culture of its own shall have the right to conserve the same" -Article 29 of the Constitution. "It shall be the duty of every citizen of India to value and preserve the rich heritage of our composite culture" -Article 51 A (F) of the Constitution

Appendix D

- Architectural Drawings

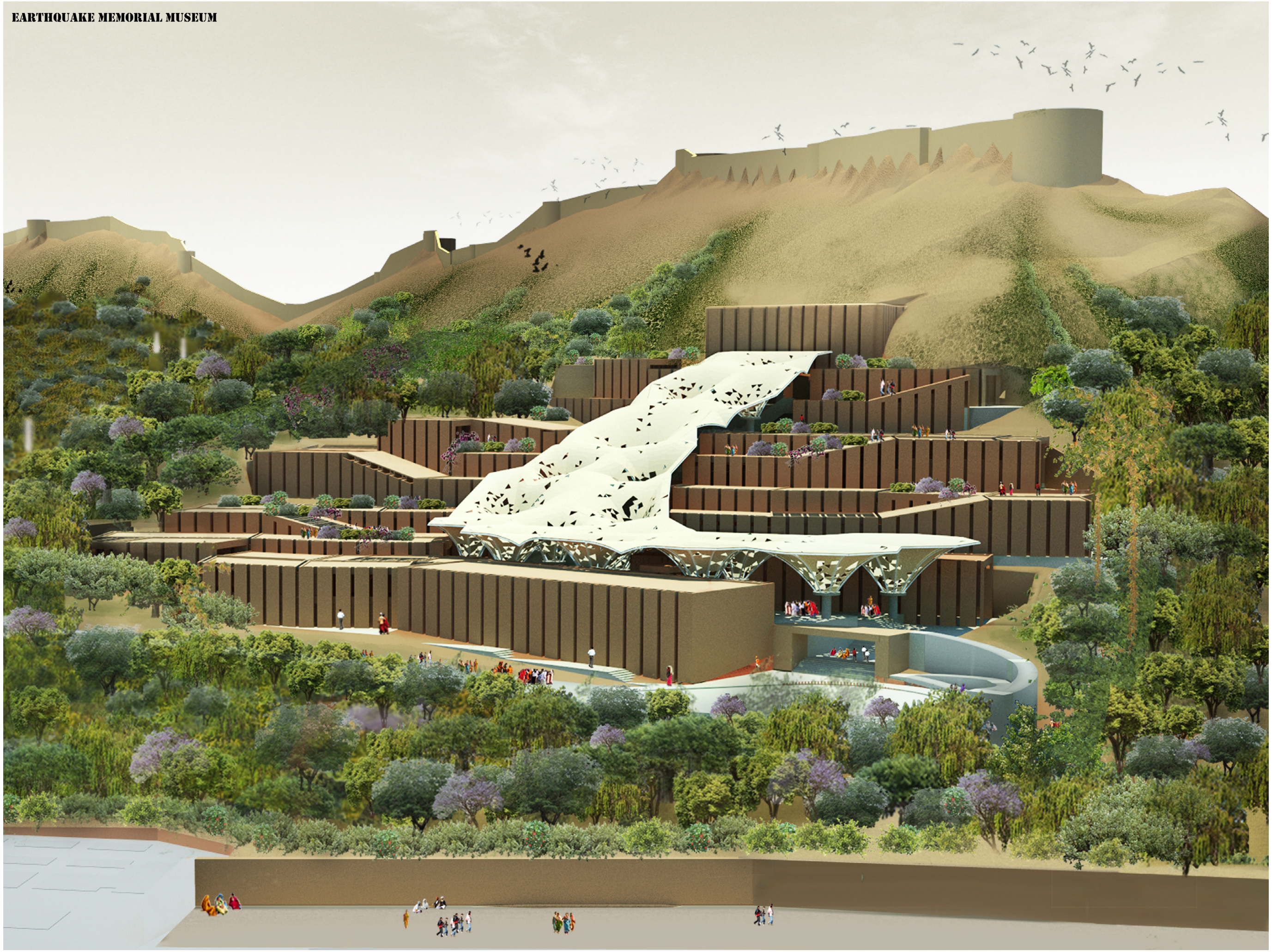
The Core Identity of the Smriti Van Memorial Museum will be in following vision statement:

'Tradition' in Hindi also translates into *'parampara'.*
The word tradition, unlike colloquially understood as 'rigid' actually means – *change;*
To be moving *'para*' or away from the *'param'*, the now.

Every region develops knowledge to cope with the Vulnerabilities' that the region presents such as to develop Resilience and develop sustainable civilizations. It is important for emerging generations to learn from the past such that their failings are not repeated instead traditional knowledge is added to and taken further. Core concerns of our future generations will be our disintegrating ecologies and depleting natural resource base. SVEMM will bring to the populations of the future the knowledge of the past so that the present is in focus and the future secure and sustainable. It will amalgamate the rigor of research by the west and the cultural communication tools of our heritage to engage in a reflective and constructive society.

'Those who cannot remember the past are condemned to repeat it'
(George Santayana, Life of Reasons, Reason in Common Sense, 1905)

Smriti Van Earthquake Memorial Museum



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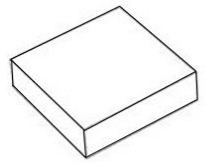
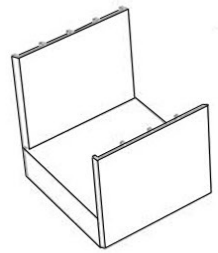
CONCEPT OF THE MUSEUM

Basic module

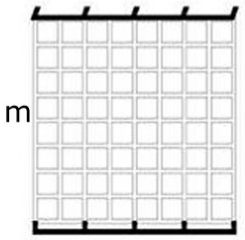
Independent cells which forms by repitition the entire museum.

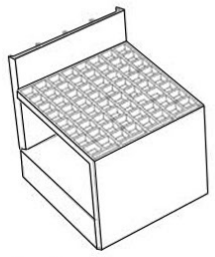


1. The land

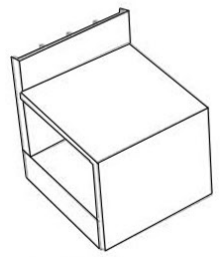


2. Retaining walls

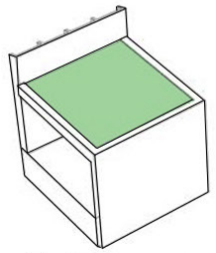




3. Beams



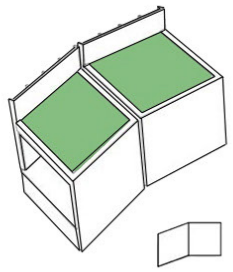
4. Slab



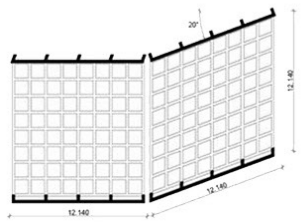
5. Parapet +
Roof garden

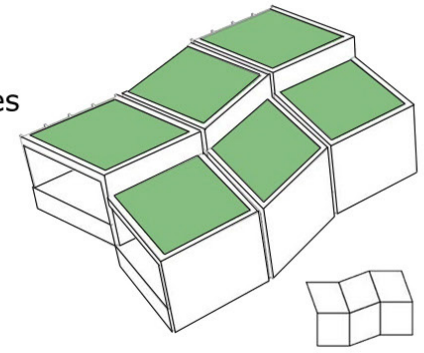
Agregation of Basic Module

Every second cell is rotated 20 degrees to make the retaining wall more stable to earth tension



6. Agregation to two modules

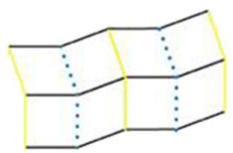


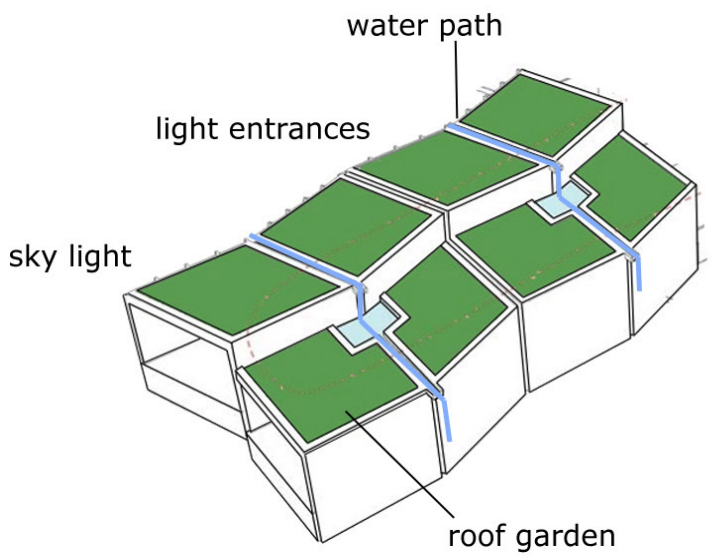


7. Agregation of 6 modules

Junction between the Modules

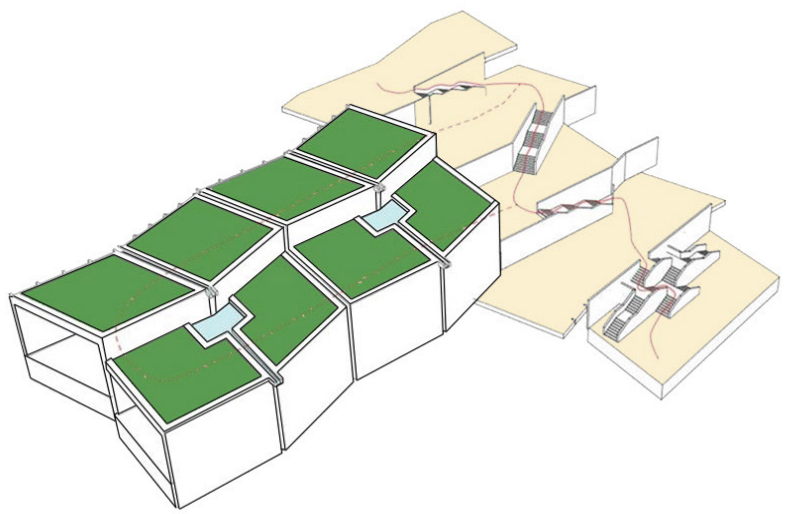
Space between the modules is used as light entrances or as water spouts





Short connections between the Galleries

There is a spine that connects all the galleries



1. Drop Off.
2. Entry.
3. Auditorium For 250.
4. Ticketing.
5. Temporary Gallery.
6. Loading/Unloading.
7. Library.
8. Children’s Play Area.
9. Gallery - The Land.
10. Gallery - Flora and Fauna.
11. Gallery - People.
12. Gallery - Living Tradition.
13. Gallery - Disaster Relief.
14. Gallery - Geo- Science.
15. Geo Dome.
16. Cafe.
17. Museum Shop
18. Central Spine

Museum Master Plan

Terrace Floor Plan

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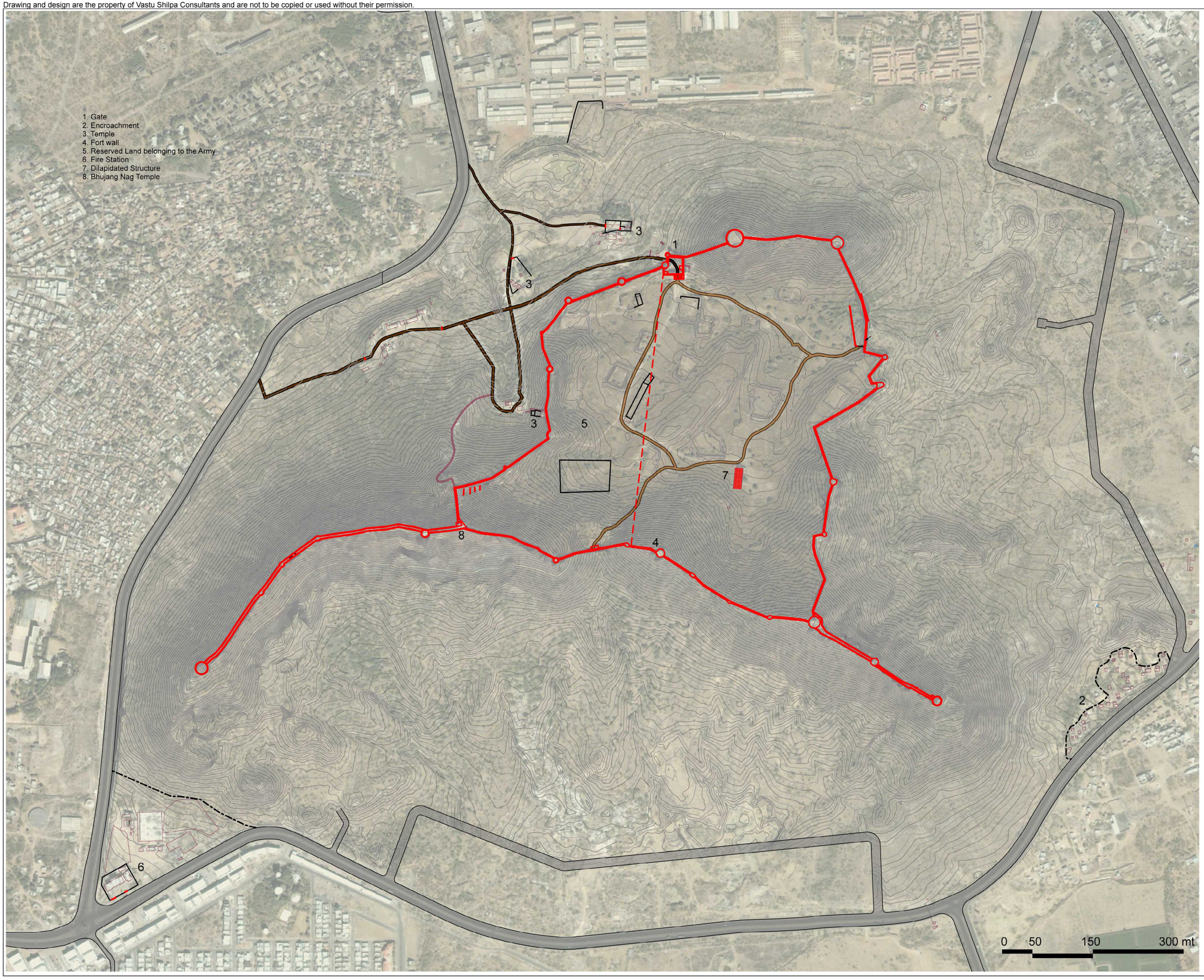

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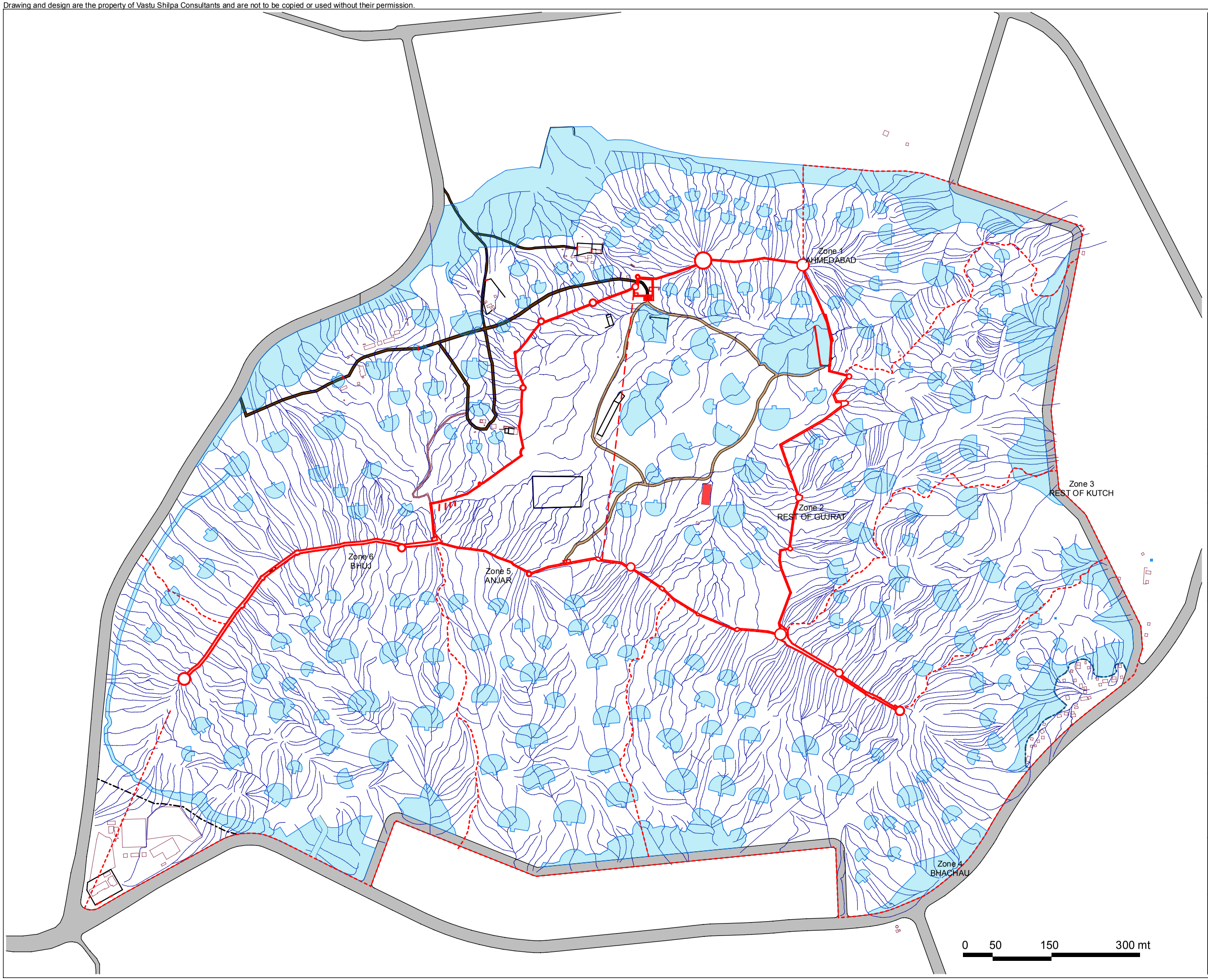

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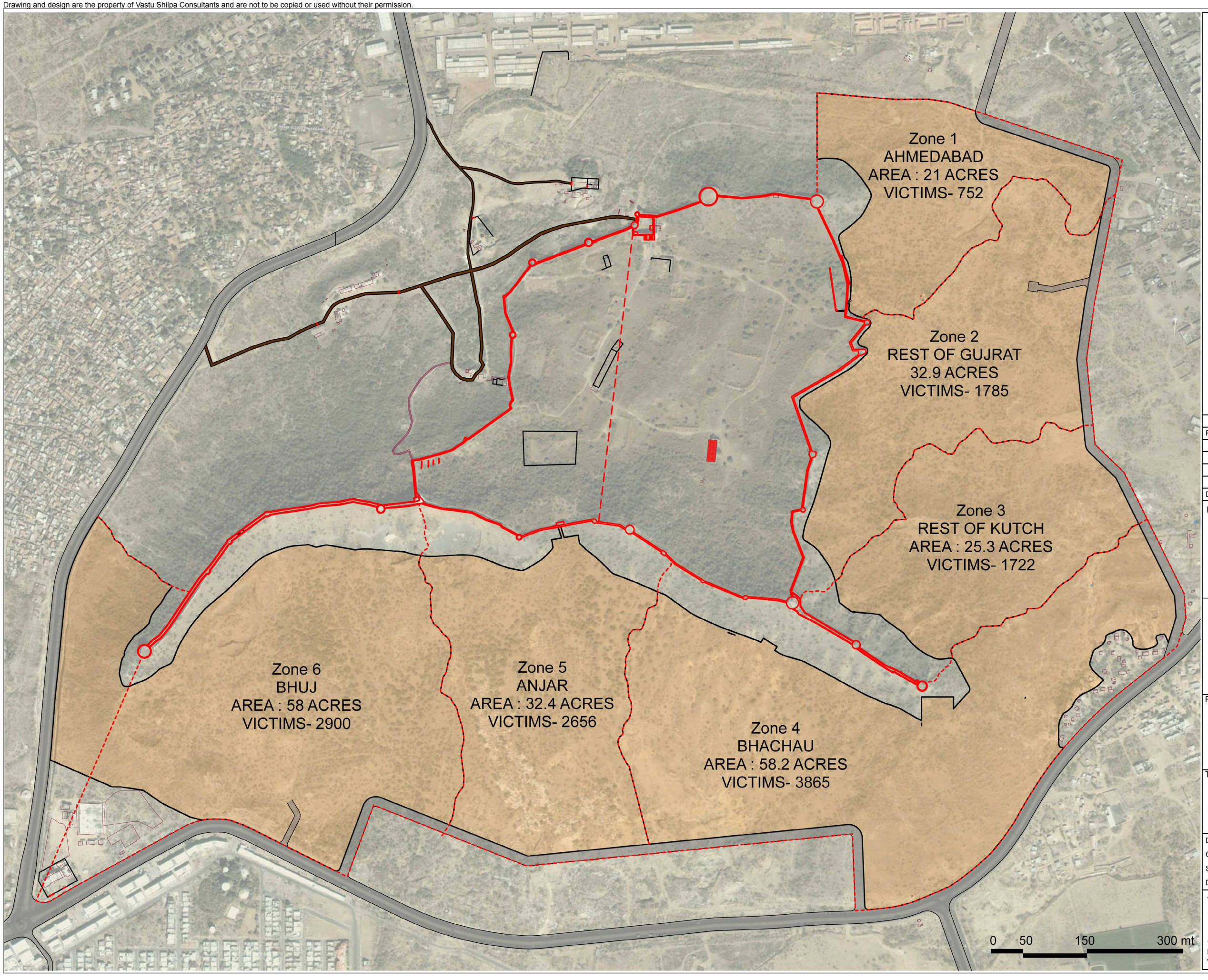

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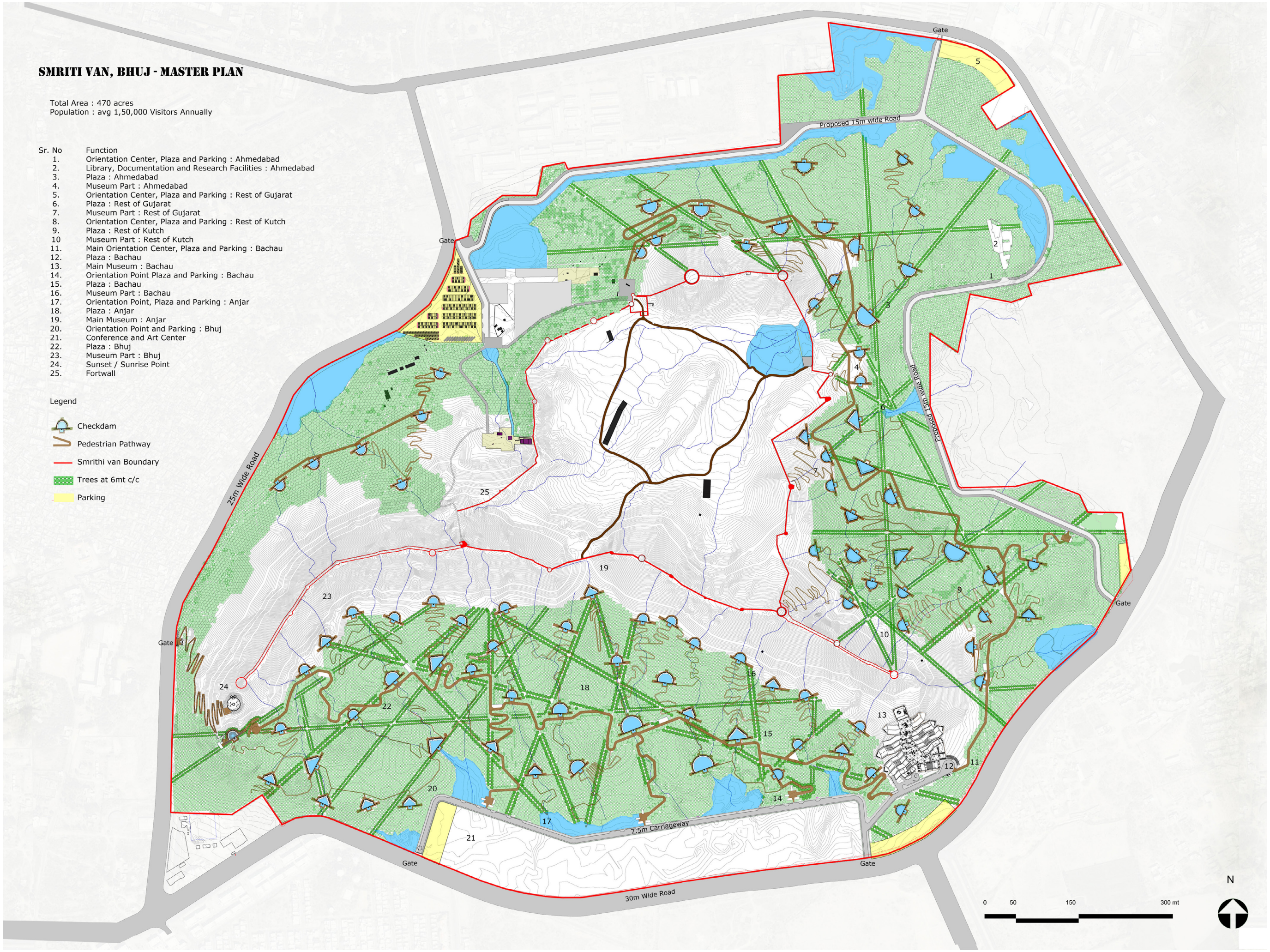
SMRITI VAN, BHUJ - MASTER PLAN

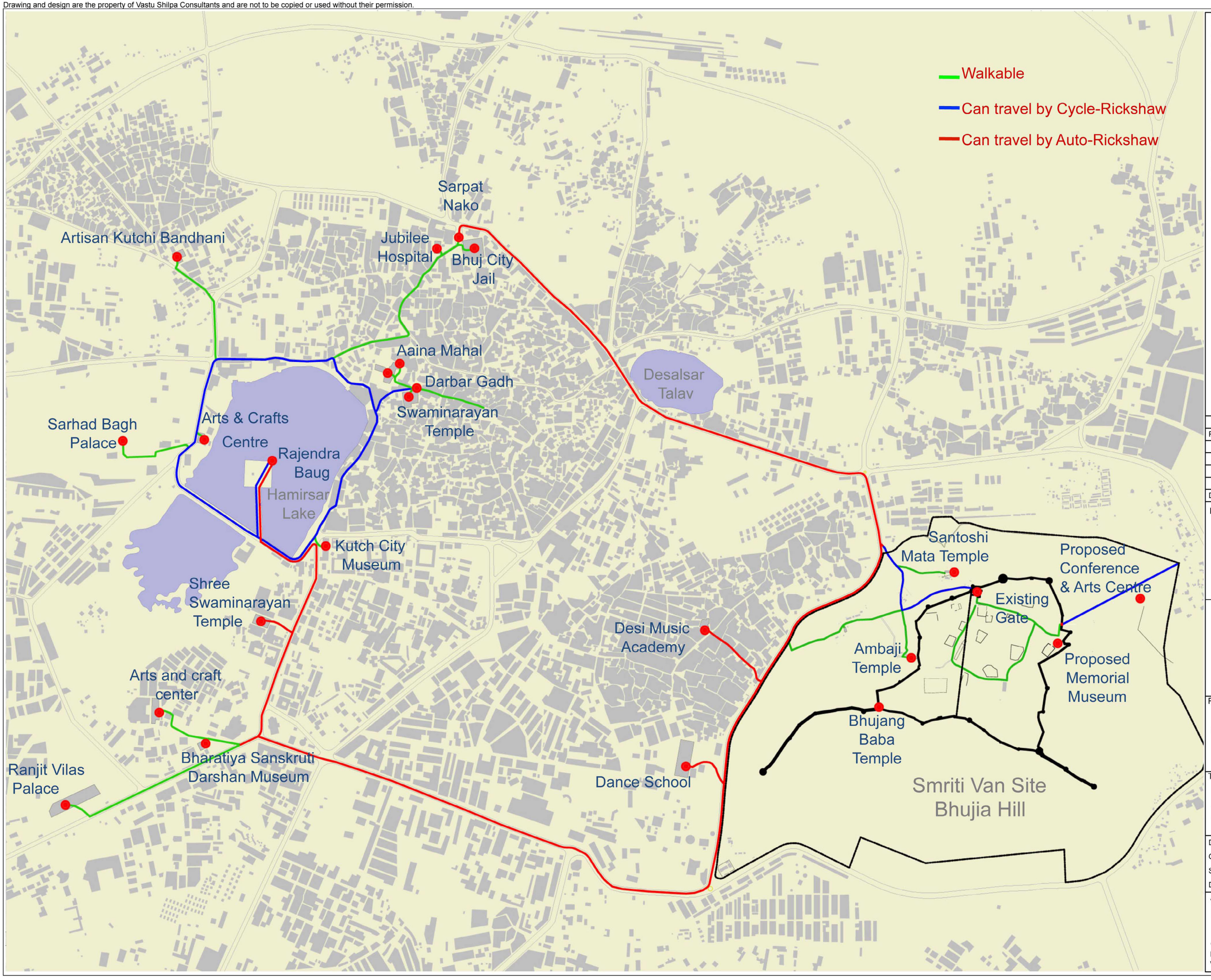
Total Area : 470 acres
Population : avg 1,50,000 Visitors Annually

Sr. No	Function
1.	Orientation Center, Plaza and Parking : Ahmedabad
2.	Library, Documentation and Research Facilities : Ahmedabad
3.	Plaza : Ahmedabad
4.	Museum Part : Ahmedabad
5.	Orientation Center, Plaza and Parking : Rest of Gujarat
6.	Plaza : Rest of Gujarat
7.	Museum Part : Rest of Gujarat
8.	Orientation Center, Plaza and Parking : Rest of Kutch
9.	Plaza : Rest of Kutch
10	Museum Part : Rest of Kutch
11.	Main Orientation Center, Plaza and Parking : Bachau
12.	Plaza : Bachau
13.	Main Museum : Bachau
14.	Orientation Point Plaza and Parking : Bachau
15.	Plaza : Bachau
16.	Museum Part : Bachau
17.	Orientation Point, Plaza and Parking : Anjar
18.	Plaza : Anjar
19.	Main Museum : Anjar
20.	Orientation Point and Parking : Bhuj
21.	Conference and Art Center
22.	Plaza : Bhuj
23.	Museum Part : Bhuj
24.	Sunset / Sunrise Point
25.	Fortwall

Legend

- Checkdam
- Pedestrian Pathway
- Smrithi van Boundary
- Trees at 6mt c/c
- Parking





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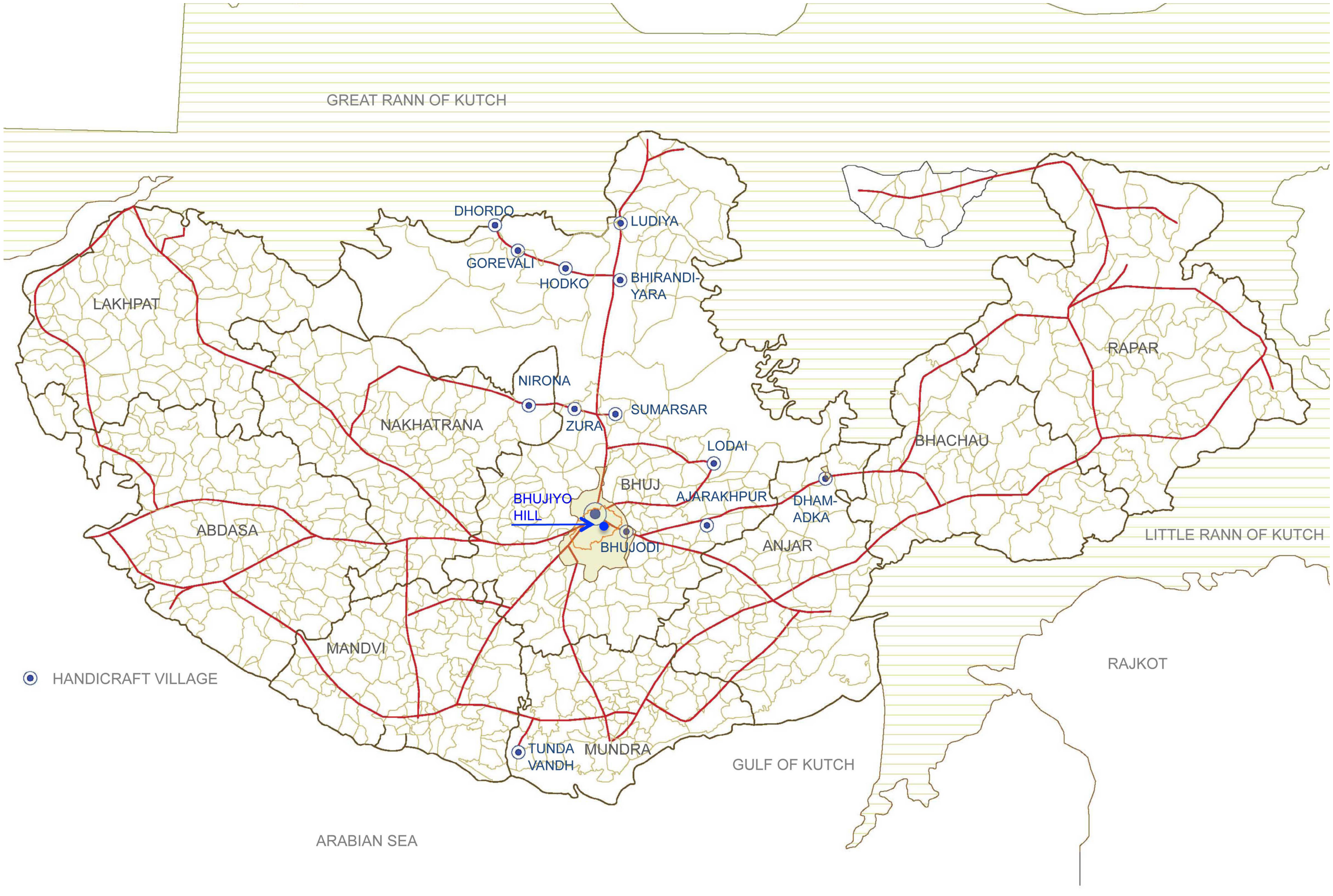

EXTENDING THE MEMORIAL MUSEUM ONTO KUTCH

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