

Culture for climate action in Jodhpur: reversing the trajectory from fragility to resilience

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Abstract

Purpose – This paper documents the outcomes of a year-long intervention designed to address climate challenges in Jodhpur, India. The intervention employed a phased approach that combined traditional knowledge, innovative communication strategies and youth engagement. The question guiding the interventions was: Can traditional knowledge, indigenous practices and place-based wisdom be used for risk-informed sustainable development?

Design/methodology/approach – The project utilised a mixed methods approach to achieve its goals. A documentary titled “Sanchay” was produced, capturing the perspectives of Jodhpur residents on climate risks. An architectural analysis of traditional houses was conducted to identify and understand their inherent climate-smart features. Immersive workshops engaged young minds in exploring climate change through creative expression, equipping them with the knowledge and skills to become agents of change.

Findings – “Sanchay” serves as a novel method for understanding risk through the lens of citizen narratives, offering a valuable complement to traditional top-down risk assessment methods. The architectural report provides evidence for integrating traditional knowledge into sustainable construction practices. The immersive workshops empowered young people to become agents of change within their communities. Finally, the capacity building initiatives strengthened the human resource base for future climate action efforts.

Originality/value – This project introduces a novel method for understanding risk through participatory storytelling, centred on the lived experiences of community members. It demonstrates the efficacy of combining traditional knowledge with science and technology for climate action.

Keywords Traditional knowledge, Vernacular architecture, Place-based wisdom, Capacity building, Heritage-based solutions, Climate action

Paper type Case study

Introduction

Located at the edge of the Thar Desert, Jodhpur, Rajasthan, paints a vibrant tableau of history, culture and resilience. Founded in 1459 by Rao Jodha, the great Rathore king, the city's identity is deeply connected to its strategic location and unique environmental challenges. The Mehrangarh Fort, perched on top of the hill, dominates the city, which was planned along the



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slopes and foothills in a network of narrow streets and lanes (Jain *et al.*, 2019a). These seemingly simple design elements reflect profound climatic wisdom. The narrow streets channel cool breezes and provide much-needed relief in the scorching desert heat. Houses are constructed using locally available materials like sandstone, creating passive cooling effects through thick walls and strategically placed ventilation (Jain *et al.*, 2019b).

Water scarcity is a constant reality in the desert landscape. Historically, rainwater was collected in a network of reservoirs and lakes (jheel and talaab), tanks (jhalara), stepwells (bavdi) and wells (kuan, beri and bera), interconnected by an intricate underground system (Meghal *et al.*, 2019). These over 100 water bodies were not merely functional entities; they were communal hubs, stimulating social interaction and shaping daily life (Sharad *et al.*, 2019). Food habits, festivals and even local deities reflected this reverence for water, a testament to the deep cultural adaptation to the desert environment (Jain *et al.*, 2019a, b).

As the city grew, newer, “modern” quarters developed and narrow streets and traditional houses, which gave way to wider roads and contemporary structures. The new city also witnessed a shift away from traditional water management practices to piped water supply, which led to the neglect of the historical water bodies. Even today, as local residents report, the issue of water unavailability has not been resolved; there are households which receive water only on alternate days. On the other hand, the lack of maintenance of the historical water bodies has led to a significant rise in the level of groundwater which, at times, causes severe waterlogging.

Jodhpur’s governance system also underwent significant transformations. Once the capital of the Marwar Kingdom ruled by the Rathore dynasty, the city now functions under the Municipal Corporation, as per the constitutional mandate of the country. Despite the abolition of the monarchy, the royal family continues to hold a revered position, with a certain “aura of kingship” still permeating the city’s social fabric. Understanding these historical and contemporary dynamics is crucial for navigating Jodhpur’s unique cultural landscape and its relationship with climate and sustainability.

Methodology

To assess the effects of climate change on Jodhpur, we focused on two key climate variables: temperature and precipitation:

Temperature projections till 2100: The projections offer a clear depiction of temperature trends across various months. February, March, April, May and November seem poised for temperature increases compared to historical records, with April emerging as the most significant rising trend. Conversely, the period spanning from June to October exhibits a consistent decrease in temperature, with September experiencing the most substantial negative trend. The analysis underscores the dynamic nature of temperature trends.

Precipitation variations from 1981–2021: Analysis of the data revealed distinct downward trends in January, February, April, July, October and November. Notably, the most substantial decrease occurred during July. Conversely, March, May, June, August, September and December exhibited upward trends. August had the highest positive trend with a change magnitude of 0.9201 mm.

Precipitation projections till 2100: Examining the data revealed notable shifts in the positive trend, particularly in August. Similarly, March, May, June, September and December exhibited positive trend changes. Conversely, certain months portrayed negative trend changes, including January, February, April, July, October and November.

The weather pattern has become, and will continue to be, erratic. The experiential outcome of this would be severe and frequent extreme temperature days, non-uniform rainfall distribution

and increased moisture content in the air (humidity). To understand the complex processes contributing to vulnerability in Jodhpur, we employed a layered approach adapted from the Forensic Investigation of Disasters (FORIN) framework (Smith *et al.*, 2016). We aimed to identify the root causes of vulnerability and unpack the interconnected nature of risks. This allows for proactive development of effective risk reduction and climate action strategies.

The layered approach involves:

Layer 1. Identifying the geo-climatic and physical changes.

Layer 2. Analysing demographic characteristics and their effects on the evolution and growth of the site to understand how the morphology of the site has changed.

Layer 3. Understanding place-specific knowledge including the social networks and the dynamics that have developed through different interactions to the context.

Layer 4. Understanding how the site functions economically including inequality, marginalisation, etc.

Layer 5. Tracking the growth and development of the site through different ways of governance.

Co-creating interventions with the Jodhpur community: Recognising the limitations of purely top-down or bottom-up interventions, the methodology employed a collaborative process that acknowledged the expertise of local communities as well as external experts. Over time, this facilitates increased engagement and capacity building, ultimately leading to co-created solutions and community ownership.

Our research identified the escalating threat of extreme heat in Jodhpur, as evidenced by our climate data analysis. To address this pressing challenge, we embarked on a collaborative journey with the Natural Resources Defense Council (NRDC), India, the Jodhpur Municipal Corporation (North), and the Mahila Housing Trust (MHT) to develop Jodhpur's first-ever heat action plan (HAP). An extensive engagement process enabled us to effectively advocate for the inclusion of culturally sensitive interventions within the HAP. This makes Jodhpur's HAP the first in India to officially recognise and utilise the potential of culture in mitigating extreme heat risks. The initiation of the HAP for Jodhpur was a predominantly top-down approach, necessitating the active involvement of the local government in policy adoption and implementation. This underscores the importance of local governance in climate policy execution (Marsden and Rye, 2010; Okereke *et al.*, 2009). Building a solid network with grassroots organisations, our team engaged with over 100 individuals in Jodhpur, particularly within the old city, ensuring diversity in gender, age and expertise. Two dedicated workshops were conducted: one with approximately 30 women, and the other was with about 50 children, aged between 12 and 21 years.

The culmination of our efforts resulted in the creation of a documentary titled "Sanchay" (GRRID Corps, 2023), which analyses Jodhpur's riskscape through the perspectives of both experts and locals. This innovative approach to communicating the riskscape through citizen voices aligns with the principles of participatory communication (Keeney and Winterfeldt, 1986).

The old city of Jodhpur is renowned for its distinctive traditional houses, believed by residents to maintain cooler indoor temperatures during scorching summers. Additionally, the city's vibrant blue-hued houses have encouraged the popular notion that the indigo colour itself possesses a cooling effect. We embarked on an investigation to discover the scientific basis behind these claims.

Initially, the indigo colour served as a social marker, specifically adopted by Brahmins (upper caste Hindus) in the Brahmapuri area to distinguish their dwellings. This preference

stemmed from the association of indigo with Hindu deities like Lord Shiva and Lord Krishna. Beyond its symbolic significance, eventually down the years, residents discovered the soothing and calming effect of the indigo paint, akin to a perceived cooling sensation. Additionally, the paint offered the benefit of repelling pests. These combined advantages led to the gradual adoption of the blue colour beyond the confines of Brahmapuri, transcending social boundaries.

To empirically verify the claims regarding the indoor temperature regulation in traditional houses, we devised a prototype named the “tiffin box” (Kanji, 2023). Equipped with temperature and humidity sensors and an atomic clock, this device recorded environmental data at regular intervals. By deploying the tiffin box within various houses, we observed a distinct drop in temperature and humidity as we moved deeper into the dwellings. This reduction of at least 3°C compared to outdoor temperatures provided concrete evidence, supporting the lived experiences of residents. Notably, the same experiment yielded less significant differences in newer, contemporary houses.

Recognising the potential of traditional architecture for mitigating the ill-effects of urban heat, we conducted a detailed architectural analysis of two selected old, traditional houses. The findings of this analysis, documented in a comprehensive report (Saha *et al.*, 2023), hold significant implications for contemporary architectural practices. By incorporating these insights into modern building design, we can potentially reduce the urban heat island effect and enhance energy efficiency in future constructions.

The city’s historical water culture holds immense potential for climate action and cultural revitalisation. These traditional water bodies, once central to Jodhpur’s identity and ecosystem, offer a sustainable solution for mitigating the impacts of climate change. Recognising this potential, we embarked on a collaborative initiative to revive Jodhpur’s water culture and empower the youth to become agents of change.

With the invaluable support of Maharaja Gaj Singh II of Jodhpur, the Living Waters Museum and the East India Dastangos, we conducted a four-day immersive workshop – Ripples of Heritage – for 30 students from local institutions. The workshop emphasised storytelling, narrative exploration and creative expression. During the first three days, students engaged in intergenerational dialogues, listening to stories and narratives about Jodhpur’s rich water culture and its connection to climate change. Guided by experienced facilitators, they then translated their understanding into various artistic mediums, including songs, music, dance and dramatic performances.

Multifaceted outcomes: Presenting the results of Net Zero in India. This paper has documented the multifaceted outcomes of a year-long intervention, aimed at addressing climate challenges in Jodhpur. The intervention employed a phased approach, generating valuable outputs that contribute to risk communication, sustainable construction practices, youth empowerment and capacity building.

Sanchay: unveiling the climate-culture story

This innovative film utilises the voices and perspectives of Jodhpur residents to unpack the city’s risk scape. By communicating risk through the lived experiences of citizens, Sanchay aims to inspire risk reduction behaviour and action more effectively than traditional top-down approaches.

Rejuvenating traditional wisdom for sustainable construction

A detailed architectural analysis of traditional Jodhpur houses was undertaken and served two crucial purposes. Firstly, it provides evidence that elements of traditional construction can be adapted to create climate-smart buildings in contemporary contexts, and secondly, it serves as a valuable resource for local authorities to inform development plans that mitigate urban heat island effects and promote energy-efficient buildings.

Empowering youth through experiential learning

The immersive workshop engaged young minds in exploring the connections between culture and climate action through innovative approaches. The workshop utilised traditional knowledge, place-based wisdom and modern science to advance capacity building among participants.

Building capacity for transformative change

Young architects gained valuable insights into traditional climate-smart construction, and a young cinematographer deepened their understanding of climate science. This enhanced capacity strengthens the team's ability to contribute to future climate action initiatives.

Conclusion

Our approach acknowledges that culture is not static but rather evolving. We emphasise the need to adopt older ways of life with a critical lens, adapting them to contemporary contexts and challenges. Long-term sustainability ultimately depends on the continued engagement and ownership of the Jodhpur community members.

In conclusion, the Jodhpur intervention serves as a valuable model for addressing climate challenges in a way that is both effective and culturally sensitive. By developing novel methods for understanding and communicating risk, balancing culture with science and technology, employing a blend of top-down and bottom-up strategies, recognising the evolving nature of culture and emphasising community ownership, this project offers valuable insights for building resilient and sustainable futures for communities around the world.

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