Bikaner's Vanishing Façade: Heritage-preservation through Havelies

Nupoor Jha & Dushyant Dave

Abstract

Bikaner is regarded as the "City of 1000 Havelies," and is home to various business dynasties including as Daga, Rampuriya, Kothari, and others. Havelies of Bikaner, which have been a source of pride for the Indian mercantile community, i.e. Marwaris, since the 16th century, are on the verge of extinction. Haveli architecture is influenced by social, cultural, climatic, and artistic factors. The intricate artistry on the stone exterior jaalis, jharokas, wood doors, ceilings, and iron gates appears to be on display in a gallery. The Aala gilla work on the walls by Chungar society artisans were not only beautiful, but also provided some relief from the heat. To protect against the harsh city climate, the Haveli had passive features such as a courtyard, jharokha, and chattri. However, it is difficult to envisage them being demolished because the majority of the owners have left and there is barely any maintenance. Havelies' special art, such as stone carvings and woodwork details, are offered in chunks at premium rates in the market. Population, transportation, energy, and water demand are all key drivers. Havelies are on the verge of becoming extinct. In brief, Bikaner needs an effective conservation policy as well as a tourism strategy to restore the city's lost magnificence while conserving local climate-responsive architecture.

Keywords: Climate responsive Architecture; Congestion; Concern & Policy; Conserving heritage; Energy demand.
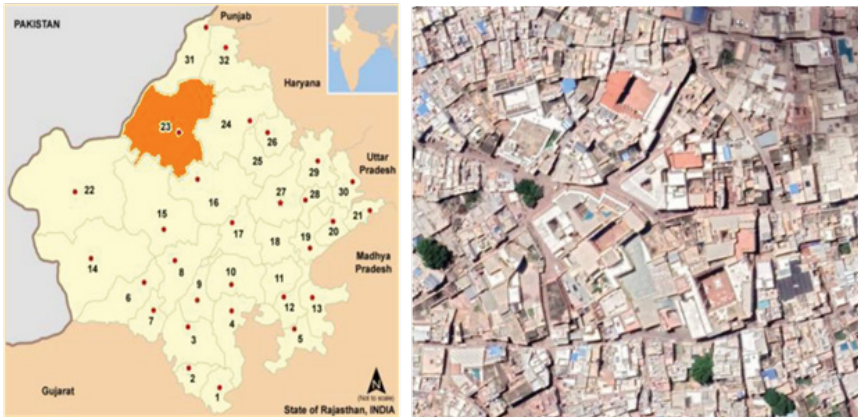
1. Introduction

The human settlement has played significant role in the development of society. The journey of mankind from nomadic life to today's urban settlement expands upto thousand of years. The early humans lived nomadic life, moving as hunters from one place to another in search of food, security

and shelters. Eventually the agriculture revolution led to the settlements. The period witnessed the rise of farming communities, construction of homes and the early villages. The practice of agriculture, domesticating animals and human settlements resulted in the growth of cities, states and civilization. The expansion of trades and other commercial activities led to the development of related infrastructure and opportunities for people. The industrial revolution brought massive changes transforming cities as the economical, cultural and social centers. The development of cities is related directly to the human progress. Even the India has seen emergence and decline of such urban centers. The emergence of various trade and commercial activities contributed to the success of these centers by enriching them with wealth, resources and stability. The kingdoms provided security, governance, infrastructure for both commercial, and defense often fortified or walled for protection from external threats.

These walled cities were located strategically on trade roots or river valleys[1]. From ancient to medieval era India has rich history of walled cities like Old Delhi, Jaipur, Jaisalmer, Agra, Ahmadabad, Gwalior, Bikaner and many more. This paper will discuss about the vanishing facades of walled city of Bikaner.

 A nation's identity is rooted in its heritage. It brings together art, architecture and culture. Bikaner is the city of joy, food and havelies. It has historic importance, rich cultural heritage, artistic and architectural contribution[2]. Though being in hot & dry region the impact can be seen in planning and design. Living in desert and semi arid environment is a challenge. Also dust and sand storms are frequent[3]. The climatic influence has resulted in responsible and eco friendly design in architectural style . Additionally, there are more than a thousand Havelies in the city. Bikaner city was established on 3rd April 1488 AD by Rao Bikaji. It is located at Latitude and longitude of 28.027138, 73.302155. The total area of city is 30247.90 sq.ft. This western part of Rajasthan has Sandy Plains and hot arid climate[4].

Fig.1 Map of Bikaner in Rajasthan   **Fig.2 City plan of Bikaner**
(Source: https://www.rajasthan.gov.in)

The havelies are known for its well carved stone façade, jharokha, jaalis, wooden door and frescoes. The Havelies are 100 to 400 year old. Housed in walled (Parkotayukt) city narrow streets, projected jharokhas, stepped floors all create a mesmerizing and climate responsive architecture. The walled city is a reflection of the polygamous society and culture of Bikaner. However, the upheaval has also had an impact on this lovely city. Change is fueled by human behavior, habits, lifestyle, energy demand, transportation, and urbanization[5]. Even yet, it is imperative to protect our architectural legacy. This paper is an attempt to raise the concern regarding our vanishing heritage.

2. Relevance of Heritage

For the city, these Havelies were more than just a display of craftsmanship; during famine, the Marwari's decided to use their money to fund these spectacular constructions for social causes. The Bikaner Marwari traveled to other towns and around the world establishing solid economy. While Bikaner was a desert city with terrible weather. People's lives were made tough by the sandstorm and harsh climate. Agriculture and greenery was non-existent. The main reason was the lack of rain. As a result of all people were suffering from starvation and unemployment. The Marwari then began to build four to five-story havelies during 16th century to create employment. The art using stone, usta, fresco, & wood all excelled.Hence Havelies represents human concern during the difficult time of famine in Bikaner[5].

3. The Walled city

In Rati ghati Rao Bika made his first fort were at present Laxminath ji and Ganesh ji temple is established[6]. Since 530 years the walled city has survived the changes in culture, social, economical and climatic while retaining its heritage and tradition. Being located in arid region of Rajasthan the impact on planning is quiet evident. The city layout reflects the deeper awareness of environmental condition and how effectively climate challenges can be addressed. The overall form reflects compact planning to minimize exposure to sunlight and effect of dust storms. The streets are narrow that provide shades.Traditional passive cooling features were utilized like courtyard, jaalis,thick walls, high ceilings, building orientaion to maintain comfort in hot climate[7]. The walled city is located on the slope that curbs the issue related to drainage and water logging. It includes water tanks and wells for water conservation and management. All these characters displays the achievements and its impact on modern society.

Figure 3a :The compact form of Bikaner city

Source : Author & www.dreamstime.com

The PARKOTA was created by Raja Rai Singh in 1645 for the security of city. The wall is 4 and half mile long with a varying height of 15 to 30 feet and 3 to 6 feet wide. It is made out of stone, rodon , mitti and lime. The wall has five main gates and 8 small gates called "bariyaan" in hindi. The gates are Kote gate, Goga gate, Shitla gate, nathusar gate, jasoosar gate, and the badiyaan are Benisar baadi, Ustaan baadi, Hamaloon ki baadi, bidasar baadi, paboon baadi, kasaion ki baadi, idgaah baadi, and jail ki baadi. Though other gates has been created as per current requirement of city. The city's design takes the tough climate into account. The slope, as well

as the unequal skyline for shading houses and roadways, are all features of responsive architecture. Though havelies in walled cities were not built to a set size and plan. The Havelies appear little and narrow from the outside, yet they are enormous on the inside. City has 76 colonies (mohalla), chowck or guwad. Of which 2h Chowck are of Oswal Jains, 14 pushkarna Brahmin, 11 maheshwari, and 7 chowck of other Brahmin castes. Rest mohalla and guwad are of other working communities like sunaar ki guwad (jewelers), darziyon ki guwad, chungaraan mohalla and others. The slope of the city provides natural removal of water during rain. While in new city the regular problem of water logging persists[6].

Figure 4a:PARKOTA of Walled city in a critical condition

Figure 4b:PARKOTA of Walled city, Bikaner

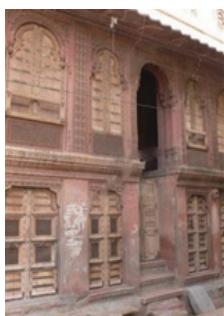Source : Author & www.dreamstime.com

Figure 5a: Nathusar Gate

Figure 5b:Kote Gate

Source : https://samacharseva.in/kotgate-gogagate-nathusar-gate com

4. The Havelies

Originated from Persian word "Hawalli" meaning partition or private space. These are traditional courtyard house used as residence for business community or influential family during the age. The Haveli symbol-

izes the status of the families. The city still holds the magnificent edifices with intricately carved jharokha. The courtyard surrounded with rooms were well ventilated and planned to enhance the the indoor thermal quality. The jharokha, small openings were incorporated to reduce the impact of dust storm and harsh sunlight; also it helped in enhancing privacy. Huge heavily decorated halls (Dewan-khana), narrow stairs, carved columns, big terraces, cellars (ghumarias) all created a mesmerizing impact. The city of Havelies made out of Dulmera stone, lime and bricks create a mesmerizing story in between desert. Stone jharokhas, carved wooden doors, projected balcony with carved windows, courtyards, wooden ceiling, frescoes and all other elements create delightful impact. These Havelies are 100 to 400 years old. Some of the famous names are Rampuria haveli, Kothari ji Ki haveli, Daga ki haveli and many more.These Havelies were constructed by Marwaris during the famine in Bikaner for the employment of locals resulting in development of skilled ustaads,kaarigar and artists[5].

| Figure 6a: Mohta ki Haveli | Figure 6b:Kothari Building | Figure 6c: Rampuria Haveli |

Source : Author

4.1 Few elements of Haveli

4.1.1. Courtyard

It is the central space of house surrounded by rooms and partly open area. This space is utilized for various purposes   from daily household activities to rituals, ceremony, gatherings and more. It provides sunlight, ventilation, proper flow of air for all other spaces[8]. In hot place like Bikaner circulation of air is one of the prominent aspects in creating thermal comfort. As per Vastu courtyard is like lungs for the house. It follows the

vastu concept that all spaces emerge from a central point. While other activities spread around the center. The Havelies have courtyard and other fully-partial open spaces that maintain indoor temperature. The size and number of courtyards depends on type of haveli[9].

Figure 7a:Courtyard of Rampuria Haveli)

Figure 7b:Courtyard of Agrawal Haveli inAshaniyon ka Chk.)

Source : Author

4.1.2. Jharokha

Heavily carved window protects resident from the harsh sunlight. Generally of 3'x6' with stone at   the bottom supported by beautifully carved brackets. The designs are floral, leaves and scrolls. Lattice work can also be seen. The jharokhs provided privacy to the family and women. It allows to see outside without being seen from open space and streets[10].

Figure 8a,b & c: Projected Jharokha with Chajwal & deep carving provides shade to the street

Source: Author

4.1.3. Façade

The front of the Bikaner havelies are deeply carved is an exquisite example of architecture. Floral carvings, jharokha, projected balconies providing private seating space all are the components of façade. The increased textured surface minimizes the surface heat gain. Doors and windows made of finest woods with intricate carvings.

Figure 9 Intricately carved Façade

4.1.4. Lime work

The lime was used to bind walls, create , floor, ceiling, etc. For cooling lime was used to make floors and walls[11]. Even jharokhas in certain cases were made out of lime from moulds. Chungar community artists came to Bikaner around 250-300 years back. They use to do decorative work by "Kalam" and make flooring, ceiling by "Meetha Chuna" as well. The kalam work can be divided in Mughal and Aala Gila work. Chungar artists learned Mughal art from Iranian workers called to work in Karan Mahal during reign of Mahraja Dungar Singh. While Ala gila work or fresco was developed by these artist and executed on facades and halls of Havelies[12] .
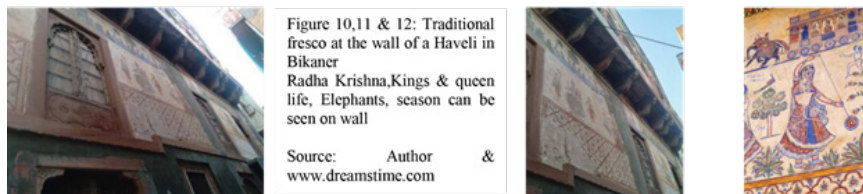

4.1.5. Shaded streets

The streets are narrow to protect buildings from direct sunlight. The ratio of street to building heights creates shadow during the day hours. It also restricts the movement of sand storms. The direction of streets is at right angle to the movement of dust storm[13].
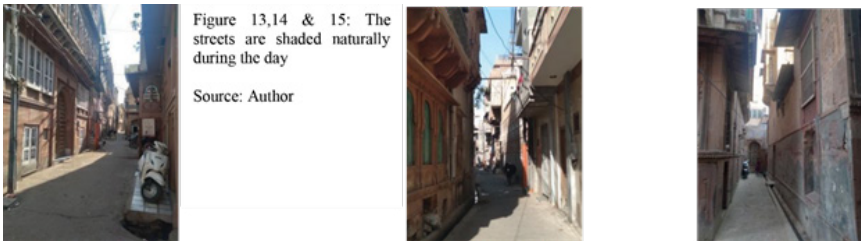
Figure 13,14 & 15: The streets are shaded naturally during the day

Source: Author

5. Changing need and its impact

The built heritage of the city has changed gradually eroding its historic identity due to urbanization. The valuable memories of the towns that has been passed for generations were torned relentlessly. Urbanization has strained the historical characters that has deeper relation with surroundings[14].The change in lifestyle, rising population is transforming the fabric of the heritage cities. In the year 1951, five cities were having population of more than one million that increased to 53 cities in 2011 and it is expected to reach to 70 by 2031[15]. Long Term Urban Transport Policy. Centre for Policy Research, Urban Workshop organized on May 29th. Bikaner is one of the fastest growing city of Rajasthan since last 50 years. This increase has influenced the walled city drastically.

The economical changes, energy requirements, transportation all have changed in recent years the impact of which is evident in walled city. The factors like increase in population due to urbanization, residential energy and water demand, commercialization, high maintenance cost, transportation, shifting of owners has resulted in damaging facades, streets and heritage[16].

5.1. Urbanization

It is a process of transformation of society which is rural in character, life style, culture and economy in comparison to urban that is engaged in service sector and industry. As per UN report 2014 nearly 50% of world population will shift to cities by 2050. Factors like employment, industries, education, and tourism are responsible for this high growth. as per census of India 2011 - Rajasthan - district census handbook, Bikaner in 2001 73.28% of total population was urban while in 2011 it is 72.07%. the industrialization has boosted the process of urbanization affecting the economic development. In Rajasthan historical and cultural factor along with tourism contributes to 8% share of state GDP. The rising economy and migration to the city increases the need for infrastructure[17]. Bikaner has great attraction for tourist which in turn impacting the character of city.

5.2. Congestion

Congestion is one of the most common physical concerns in historical places. Congestion refers to inadequate housing facilities, inadequate neighborhoods infrastructure, and a lack of circulation space. According to numerous research, the most prevalent perceived concern is congestion rather than density. Congestion arises when physical infrastructure cannot keep up with the density of an area[18]. The narrow streets of the city now contribute to this problem. The change in living, transportation, building use, laying of new sewerage lines, densely packed houses plays significant role in worsening the situation[19].

S.No.	Years	Bikaner			
		Male	Female	Population	Growth (%)
1	1951	60,536	56,577	1,17,113	48.06
2	1961	79,954	70,680	1,50,634	28.62
3	1971	1,01,439	87.079	1,88,518	25.15
4	1981	1,36,975	1,16,199	2,53,174	34.30
5	1991	2,23,764	1,92,525	4,16,289	64.43
6	2001	2,80,450	2,46,557	5,29,007	17.92
7	2011	3,38,442	3,05,964	6,44,406	17.27

Table No:2 Population of Bikaner and its growth during 1951-2011(in Lakh)
Source: Census of India, Bikaner Office

5.3. Damaging of Façade

Unfortunately, many mansions have become victims of air pollution, with deadly smoke containing lead particles and sulphur oxides. The primary causes are the numerous auto-rickshaws that travel the tiny streets throughout the day. These trucks run on diesel fuel and generate black smoke from their exhaust, causing respiratory difficulties for inhabitants and visitors. I'm not sure if there is a policy in place to manage air pollution in the city, or if the district administration is aware of the issue by regulating the types of vehicles and fuel that may be used in the city[14]. The district administration could consider implementing innovative modes of transportation for passengers, such as battery-powered mini-vehicles. The harmful gases emitted from diesel-powered vehicles combine with the small amount of moisture already present in the atmosphere and are transformed into sulfuric and nitric acids and then come in contact with the finely carved red sandstone. It reacts with the stone and gradually corrodes the surface of the stone, spoiling the appearance of the stone. Within a few years the red sandstone layer on the building deteriorates and becomes weak. Therefore, it is extremely important to control the amount of harmful gases along with the level of suspended particles in the air as a necessary measure to preserve the architectural heritage of Bikaner[20].

Figure 17a,b, & c: The frescoes of the walls were damaged due to pollution Source: Author

5.4. Transformation of Haveli

Another aspect is the changed building use like conversion in various outlets like jewellary showrooms, clothing stores, food products and other small outlets for rent as well as hotels[14] . Havelies are low rise and ground floors are converted into As mentioned above tourism is an important aspect in growth of city economy. Many of the Havelies in walled city is now a heritage hotel or guest house. Even tourist prefers to stay in city to

get the actual feel of this historical site. These Havelies has been renovated as per current requirement. While during this process the character of historical structures are ignored that can be identified in fig.

Figure 18 & 19: The outlets at G.Fl. does not gave organized signage, parking or maintenance

Figure 20 & 21:Conversion into hotel needed change as per requirement. A beautiful school building in use but need maintenance.

5.5. Commercialization

Other than various building use the unorganized vegetables market and extended shops can dilute the cultural and historical identity of heritage city. Increased foot traffic from locals and tourists deteriorates the infrastructure. Old residential neighborhoods have been extensively transformed into commercial zones as a result of the introduction of new formal economic order into the already-existing informal economy. Due to the lack of available land and the growing population, the value of land has increased significantly in these regions that provide higher financial returns on land used for business purposes. figure 25 & 26.

Figure 22,23 & 24: Small outlet and spice store in old city. Unorganized shops has damaged the façade (www.dreamstime.com)

5.6. Ownership change

In certain cases the division of property into smaller segments results in decline. Sometimes multiple families are residing together in Havelies which once was owned by a single family.

5.7. Changing lifestyle

The recent change in our lifestyle has increased the electricity and water demands for household. The inclusion of washrooms with water and sewage facility, power supply, Air conditioning, etc. are the basic requirements but it seems unorganized and inappropriately placed in context of city. The desire to have modern construction has adverse effect visible in fig.31.

Figure 25,26: In front of a Haveli new construction can be seen Figure In this image the alternate Havelies are being converted into modern houses (these constructions does not follow the surroundings)

Figure 27 & 28: Unorganized Electric pole and wires can be seen

Figure 29: Fixing of AC, Coolers disturbs façade though required

5.8. High Maintenance cost

The havelies are loaded with intricate work, delicate designs and exclusive material. All of them need maintenance. The carved stone work, wooden doors, panel and ceiling, frescoes, exclusive Usta as well as all other work demands skilled artisans. These are expansive to maintain and in certain cases even the work is lost like Aarish lime plaster, frescoes, Usta. The outcome is many of these intricate works and material has been sold on exclusive rates in market.

5.9. Abandoned Havelies

Many of the owners have shifted to other town leaving them on the responsibility of care takers. The building does not receive the attention and maintenance required. Due to negligence the frescoes, intricate carvings have fa llen into disrepair.

Figure 30: The dismantled haveli at Daga Chowck

Figure 31: Garbage along the strect

Figure 32: A huge haveli in debries

Source: Author

IV. Conclusions

Built heritage represents culture, social and architectural language of a city. The journey of establishment expresses the human ability to understand, relate and create in coordination with nature. It can be seen in walled city through the structure, streets, materials. While the increasing population and demands are resulting in congestion and damage to walled city of Bikaner. The city needs planning for energy, water demand, solid waste management, transportation, parking, etc. This is affecting the character and quality of our traditional buildings. Therefore It needs the attention of government and people. Serious policy framework is required for the preservation. Change is inescapable, but careful planning that takes into account all conceivable circumstances has the potential to safeguard our legacy and build a more inclusive environment. Instead, research and planning for climate-responsive structures should be supported. Even today, conventional building behavior in terms of thermal comfort, air quality, and vernacular architecture is a great example. The hot and arid atmosphere of India necessitates the inclusion of courtyard and passive features in the architecture. All stakeholders must collaborate on a single platform to create a long-term mechanism. Otherwise, apathy may cause irreversible harm.

V. Glossary:

Aala Gila or Araish work: An indigenous Indian technique of wall painting by lime plaster also called wet fresco

Bariyaan - Small gates

Chungar – A community of artists works with lime (chuna)

Dewan-khana- Decorated living halls

Ghumarias- Cellars

Guwad- Chowck

Jharokha- Heavily carved window

Projected Jharokha with Chajwal & deep carving provides shade to the street

Mohalla- Colonies

Usta- Gold meenakari on camel leather

Works Cited:

Ansary, R. (2013). Pattern of Urbanization Migration and Economic Development in Rajasthan:A District Level Analysis. Indian Sreams Research Journals. VII(XII).

Bansal, S.C. (2010). Urban Geography. Meenakshi Prakashan, Meerut.

Bhalla, L.R. (2023). Rajasthan Ka Bhoogol. Kuldeep Publishing House. 204-205.

Bhattacharya, D. (2021). Rajasthan ka Puratatvaawam Itihas-Vol.II by James Todd. Rajasthani Granthagar Jodhpur, 488.

Bikaner town of a thousands splendid Havelies https://blogvirasate-hind-wordpress-com.translate.goog/2018/02/27/bikaner-town-of-a-thousand-splendid-mansions

Borie, A., Catalaa, F., Papillault, R. (2020). Jaipur A planned city of Rajasthan. Altrim Publishers, Catalonia.

Carran, D., Hughes, J., Leslie, A., Kennedy, C. (2012). A short history of the use of lime as a building material beyond Europe and North America. International Journal of Architectural Heritage. 6. 117-146.

Goetz, H. (1950). The Art and Architecture of Bikaner State, Bruno Cassier Publication Oxford, 17-18.

Joshi, R. (2018). पाठा परंपरा एवं परिवर्तन. Pustak Mandir, Bikaner. 25-27.

Kiruthiga, K., Thirumaran, K. (2019). Effects of urbanization on historical heritage buildings in Kumbakonam, Tamilnadu, India. Frontiers of Architectural Research. 8(1). 94-105

Kochar, U., Kadri, Z.U.H. (2005). Hazaar haveliyon ka Shahar,Rajasthan.

Koenigsberger, H.O., Ingersol, G.T., Mayhew, A., Szokolay, V.S. (2022). Manual of Tropical Housing and Building: Climate Design. Universities Press, Hyderabad. 23-30.

Kumari, S. (2020). Historic Cities in India-An Overview. SPAV-International Journal of Planning and Architectural Science. 1(1).

Naidu, R. (1990). Old cities, new predicaments: a study of Hyderabad. New Delhi: Sage Publications.

Prakash,S. & Rawat, N.S. (1961). Chemical study of ancient plasters found at Kausambi. Viynana Parishad Anusandhan Patrika. 4, 23-30.

Ramchandran, R. (1989). Urbanization and Urban System In India, Oxford, New Delhi.

Saraswat, S. (2011). Understanding Courtyard Design through Havelies of Rajasthan, Insite 09/11, 18-21.

Samuel, L., Dharmasastha. K., Shiva N.,Maiya, M.P. (2017). Thermal Comfort in traditional buildings-I. International Journal of Sustainable Built Environment, Gulf Organization for Research and Development.

Tillotson, S. (1998). Indian Mansions: A Social History of the Haveli. Orient Longman Limited, New Delhi.

Upadhyaya, V. (2017). Transformation in Traditional Havelies: A case of walled city. Imperial Journal of Interdisciplinary Research (IJIR). 3(2).

Web pages:

https://www.rajasthan.gov.in/

www.dreamstime.com