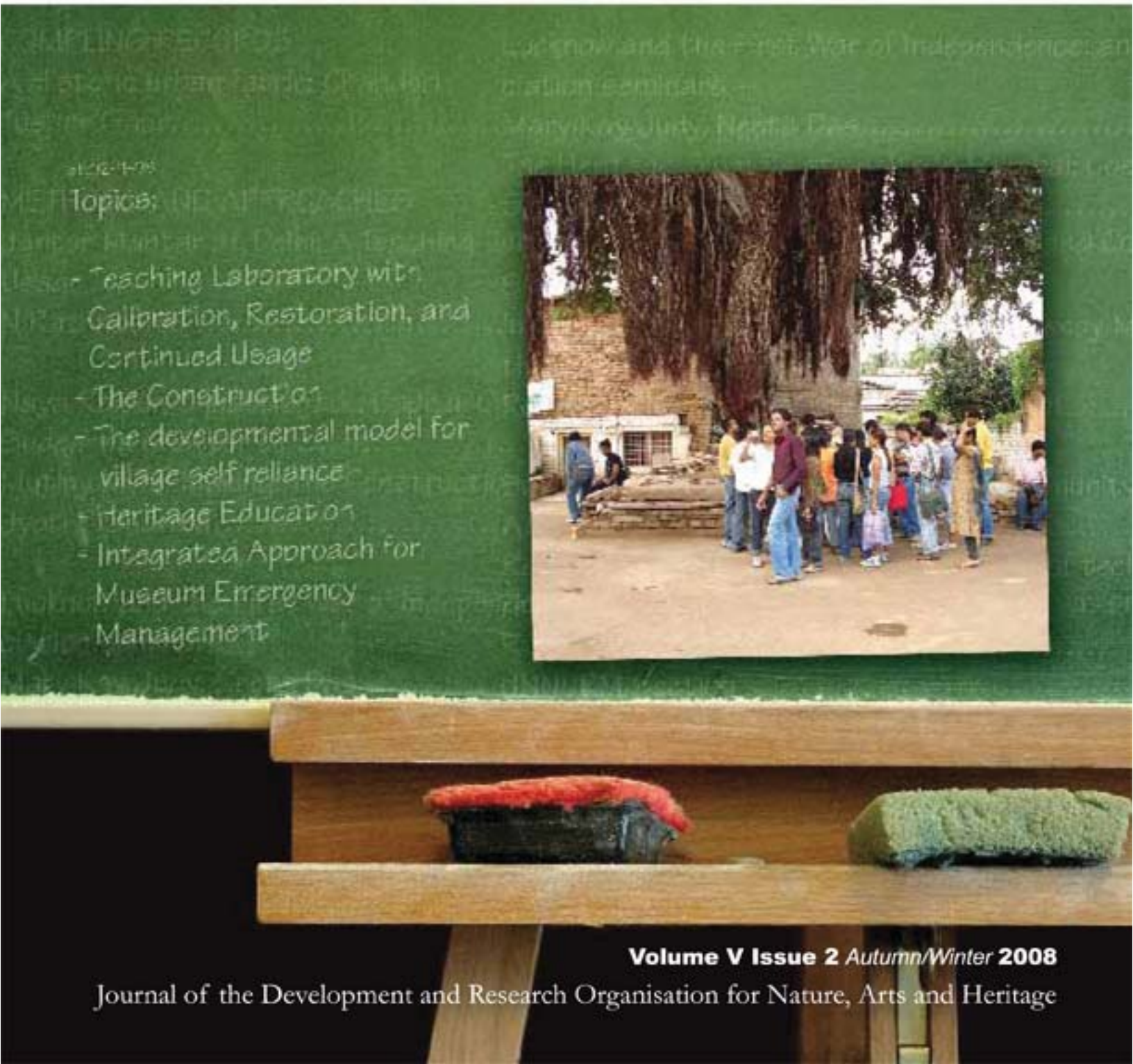
Context

Built, Living and Natural



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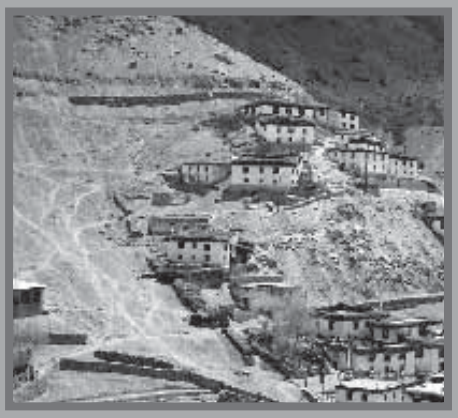

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About the Volume

Heritage awareness and education is probably the key to long-term sustenance of our cultural heritage. Conservation remains a challenge in a country like India, where masses continue to struggle with day to day needs of food and infrastructure, cultural beliefs advocate constant renewal of sites and development is associated with new materials and technology. The solution lies in instigating a deeper understanding of the use and significance of this heritage amongst the people, supplemented with a parallel comprehension of the ground realities by the professionals in the field.

The issue brings forth few such examples that present interesting approaches towards an understanding of history and heritage. The documentation and analysis of transformations of Kucha Ghasi Ram depict the impact of urban growth and changing society on the built fabric. On the theme of the First War of Independence of 1857, the two articles on Delhi and Lucknow showcase two different perspectives. While 'Mutiny Myth Making' addresses glorification of the British who participated in the war and the creation of a social and physical phenomenon, 'Lucknow, the First War of Independence' studies the impact of the war on the built fabric and explores means to document and interpret the same today.

The Jantar Mantar experience provides an innovative reuse of our astronomical heritage that complements the restoration works undertaken for the site. The case of Jogeshwari caves in Mumbai enumerates the existing social conflict with practiced conservation guidelines, a situation faced in hundreds of similar sites across the country. 'Museum Emergency Management' calls for an integrated approach, addressing new avenues for our cultural heritage sites in the wake of recent events and catastrophes.

Sustainable solutions section covers both the urban and the rural landscape. The design of Naya Raipur as a new capital city aims to integrate environmental and social aspects in planning while the success story of a village panchayat at Odanthurai presents the use of latest technology to create a self reliant responsive administration.

We continue to provide analytical articles on urban development works under the JNNURM section. This issue features an assessment of the ground reality vis-a-vis the objectives of the JNNURM mission for the city of Chennai. 'Engendered Perspectives' highlights the need for and lack of gender sensitivity in the objectives under this mission.

For heritage to play a meaningful role in the present context and the future, generating awareness amongst children is essential, an aspect that is covered under the collective book review.

Shikha Jain

Compiling Records

Somya Johri is an architect from Vastu Kala Academy, Indra Prastha University, New Delhi. Currently pursuing Masters in Architectural Conservation at the School of Planning and Architecture, New Delhi.

Gateway to Kucha Ghasi Ram

A semi public open space as a part of the residence

Kucha Ghasi Ram: A heritage street

SOMYA JOHRI

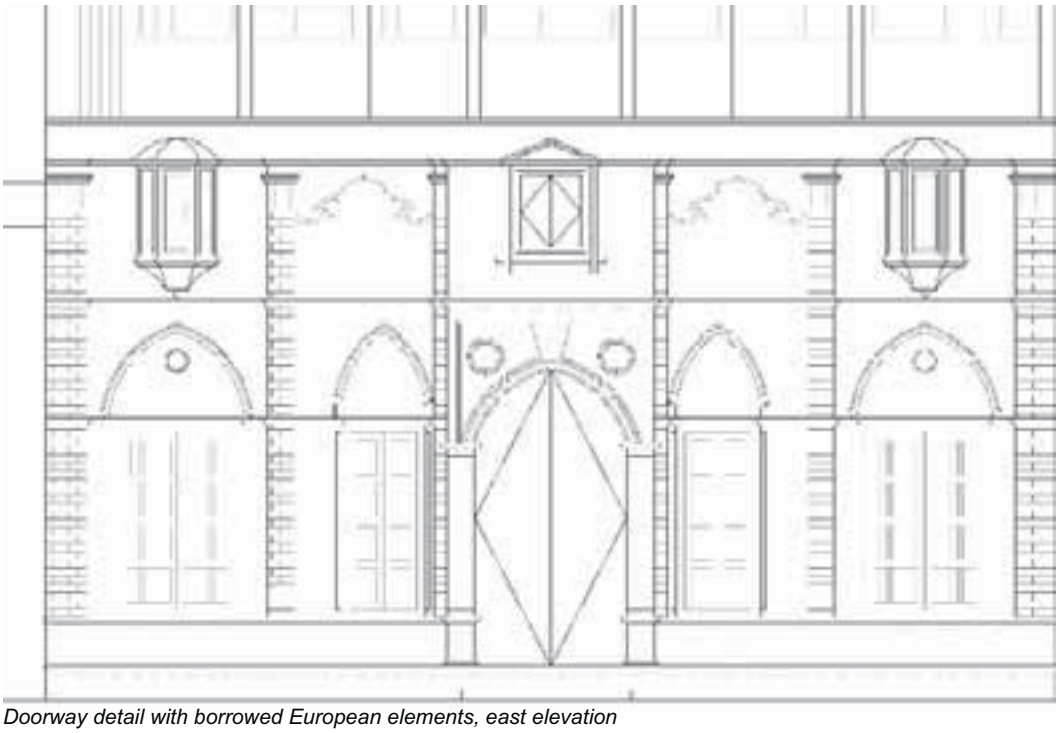
INTRODUCTION

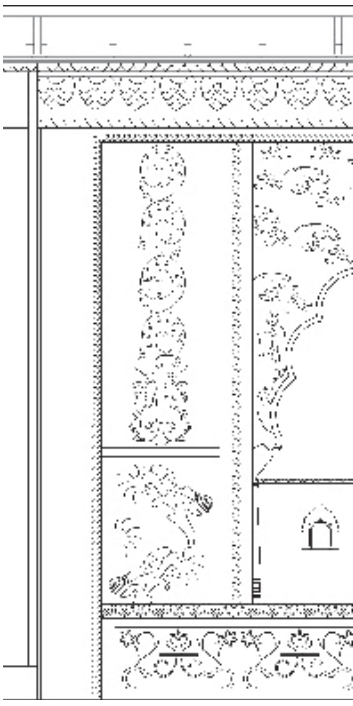
Kucha Ghasi Ram is a street within Shahjahanabad, Old Delhi. The historic planned city was built by Shah Jahan and served as the capital city during the Mughal period. The main components of the designed infrastructure were the mosques, bazaars, water system, gardens and city wall. Rest of the area was left for individual development.

The land around the court was given to important courtiers. There were few structures existent on the site which were incorporated in the planning of the area like the Kalan Masjid and Turkman's grave. Red Fort was the focus on the banks of Yamuna river, and Chandni Chowk was the main axis leading to it. Jama Masjid was placed at the highest point of the site.

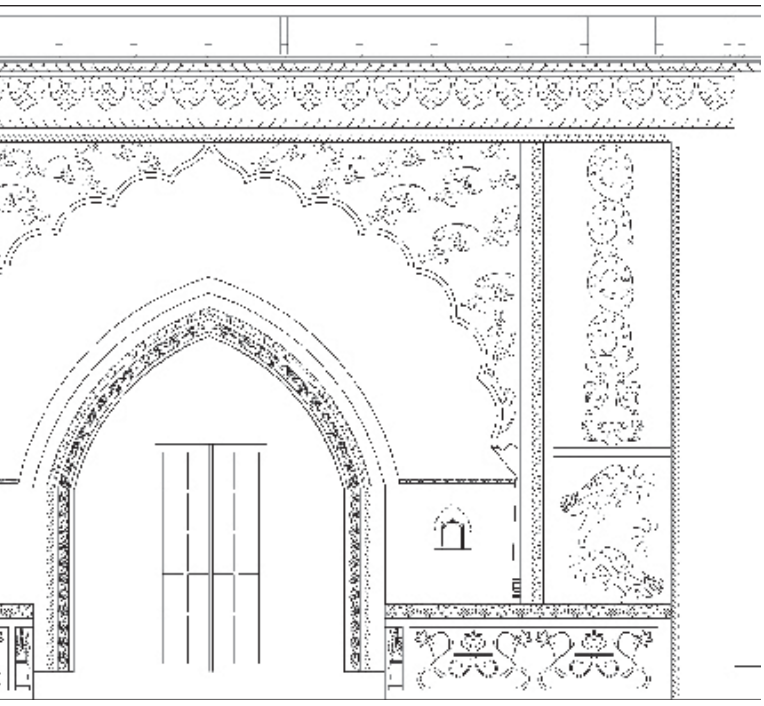
West elevation

East elevation

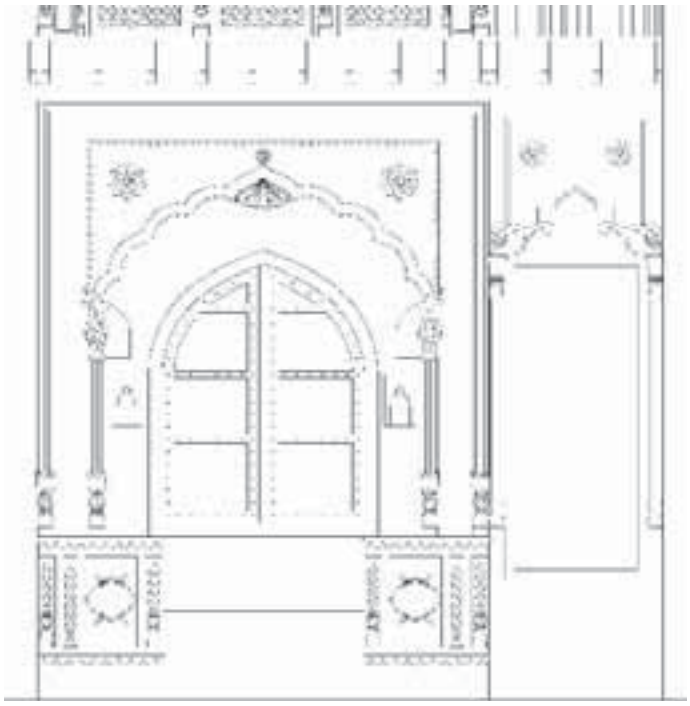




Doorway detail with borrowed European elements, east elevation



Ornamented doorway detail 1, west elevation



Ornamented doorway detail 2, west elevation

Ornamentation on wall surfaces, especially the entrance doorways

The zoning was done in distinct social groups based on the occupation of the people. The zones were defined by the *katras* and *kuchas*. A *kucha*, in Mughal times, was a cluster of houses with a common landmark or a common mode of occupation, for example Malliwara and Ballimaran; the gardeners', and the oars-men's neighbourhood respectively. Kucha Ghasi Ram, located adjacent to Katra Neel, near the Fatehpuri Mosque is one such cluster in the city of Shahjahanabad.

ANALYSIS

Kucha Ghasi Ram was originally a mansion of Ghasi Ram, an astrologer in the court of the Mughal emperor

Street fabric in 1850

Street fabric in 1911

Old property lines

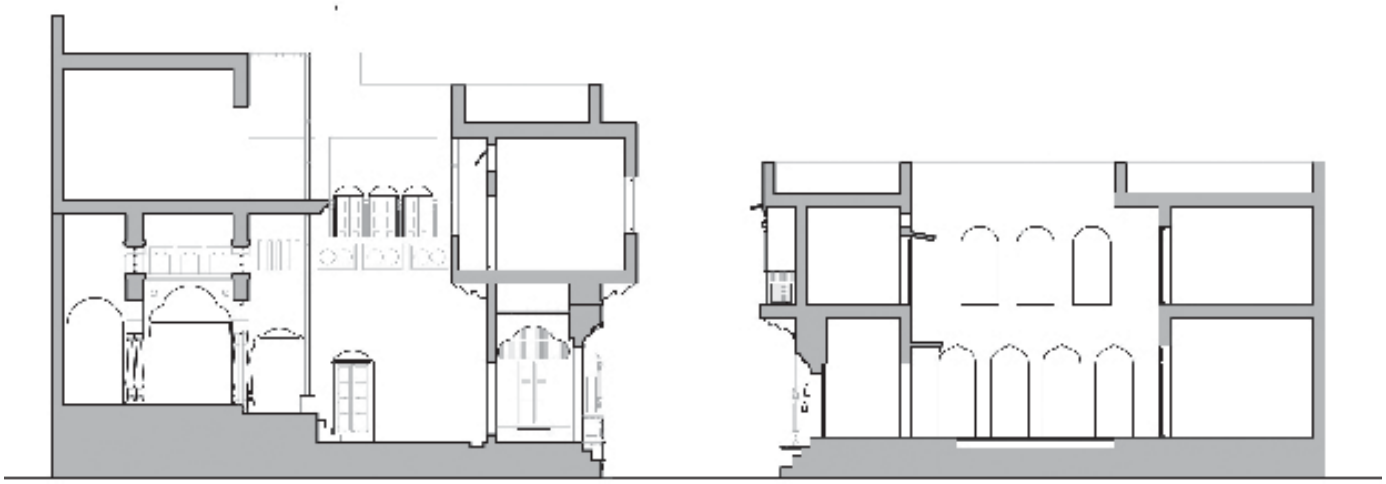
A haveli in Kucha Ghasi Ram that has retained its character

Shah Jahan, built in 1650. After 1731, the area was occupied by other important people and divided into six plot boundaries. In 1850, the gateway of the Kucha was opened up to a court which led to the street. After 1911, the entire street was divided into nine plots which were individually owned, and the area developed as a wholesale market for cloth. Presently, the original single mansion has been fragmented in to 21 plots, with most of the properties on the ground floor being used for commercial purposes.

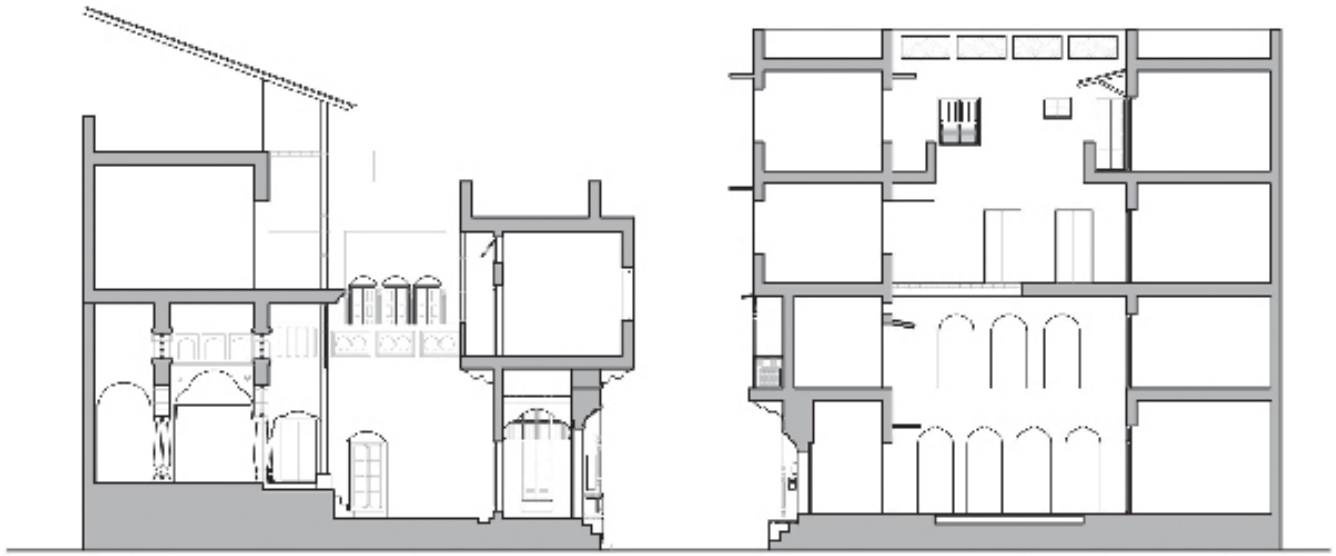
The ownership pattern and changing use pattern is seen to have a direct impact on the condition of the structures. The owner residents had involvement and association with the property, which is reflected in the retention of heritage value in self owned and occupied units, even today. The rented out units on the other hand suffer from either lack of maintenance due to financial constraints or lack of sensitivity in carrying out repairs, alterations and additions to the built structure, such that the original design is adversely affected. While most of the original

Changing skyline and plot boundaries in western elevation

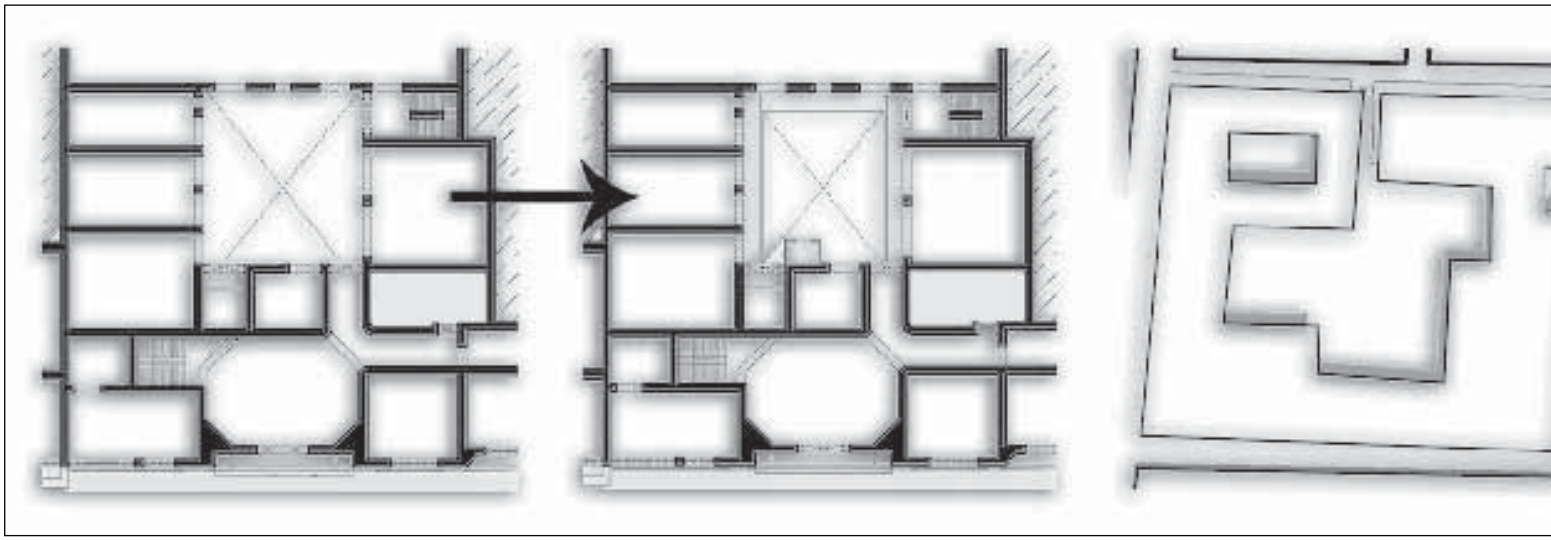
Changing skyline in eastern elevation



Street sections - reconstruction of original form

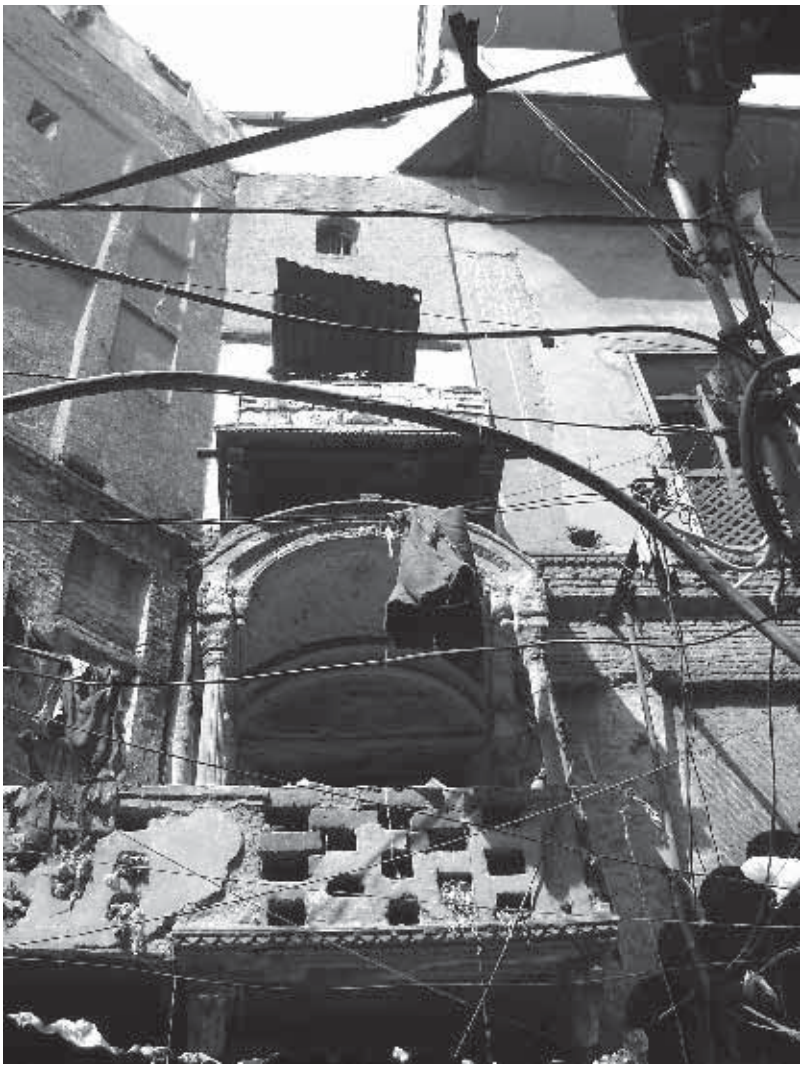


Transformations recorded in 2007

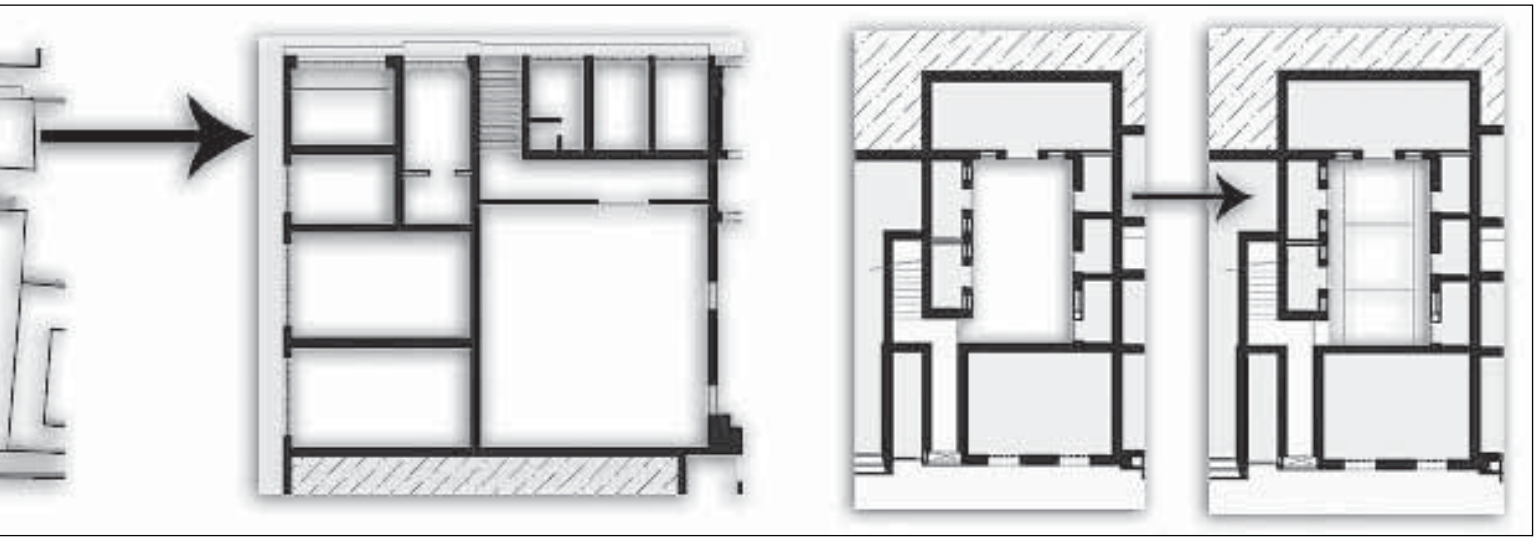


residents opted to move out of the area due to commercialisation of the street and the resultant decrease in quality of life, the sub divided units were rented out to a migrant population that the commercial activity attracted, mainly labour to support the new use. This resulted in an increase in demand for infrastructure and unsympathetic additions and alterations.

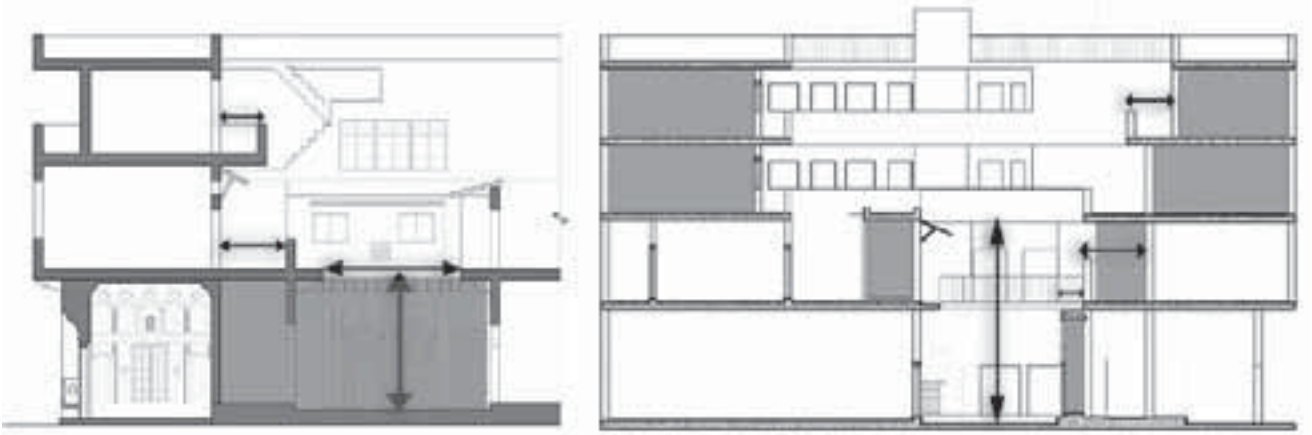
New floors have been added, that bear no reference to the original street character and project onto the street leading to reduced light and ventilation. The courtyards have been encroached with built form, disturbing the scale of the open area within the built structure, with the original ratio of the width of the courtyard to the height of the floor of 1:1 or 1:2 now being changed to 1:3 or 1:4, thus affecting the quality of light and ventilation. The courtyard that formed a significant focal point in the spatial planning of a *haveli* is now partly or completely transformed. The individual spaces within the structure have been



Condition of jharokhas on facade



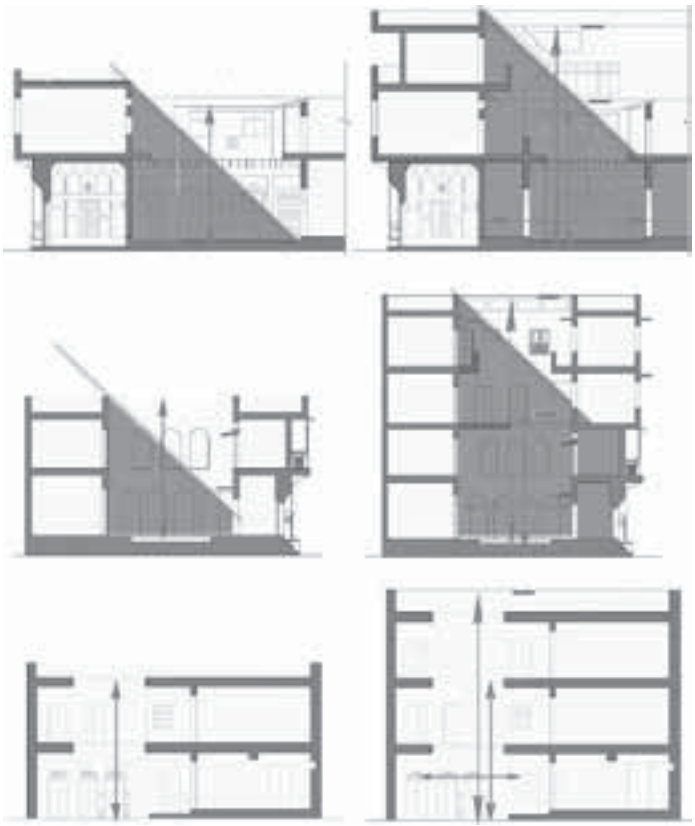
Addition and alterations



Addition and alterations

fragmented and openings have been altered. Hence, the open and built spaces are losing their character and heritage significance, in the absence of any guidelines to govern the alterations and additions to the heritage fabric.

To prolong the life of the heritage structure, it is important to put it to an appropriate use. Few such examples of adaptive reuse are visible in this area. One of the buildings in the area is an old *haveli* which is now serving as a primary school. The open courtyard acts a breathing space for the surrounding class rooms. The area in front of the building is used for temporary shops after the school hours. So it is not only the built structure that is of heritage significance but also the character of the street and the activities that integrate with the structure to serve the every day needs of the people at present.



Before addition of floors

After addition of floors

Deterioration in the character of courtyards by addition of floors

Adaptive reuse of a haveli as MCD school

CONCLUSION

After the study of the street of Kucha Ghasi Ram, it can be clearly stated that the architectural heritage of the street is largely intact but is loosing its significance at a very fast rate. It is important to take actions immediately so that there is no further deterioration of the fabric. For this, it is essential to determine the thresholds for interventions. There is a need to formulate strict guidelines for additions and alterations to be undertaken in the future. Also, it is important to address the social character of the street today along with its historical and architectural significance, to enable integration of heritage conservation with social and economic regeneration of the area with an inclusive approach.

Acknowledgements

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- The project is a part of studio at the School of Planning and Architecture under Priyaleen Singh.

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Methods and Approaches

Mutiny Myth Making

The construction of John Nicholson as the 'Hero of Delhi'

JYOTI P SHARMA

ABSTRACT

The Indian Mutiny of 1857 came to symbolise an act of British valour and its representation unfailingly eulogised the victorious British and berated the routed indigenous rebels. The indigenous uprising that came to be called the Indian Mutiny was one of the most significant political events in British colonial history. Indeed, the Mutiny made heroes of military officers of the East India Company as they engaged with the indigenous rebels in battle. Hailed as heroes, these men and their exploits were immortalised in the British collective consciousness giving rise to numerous Mutiny myths.

The case of the Hero of Delhi, Brigadier-General John Nicholson, who was venerated as a Mutiny hero both in colonial India and in Britain is described. Nicholson's memorialisation comprised an array of modes of representation ranging from the literary in the form of memoirs, official records, to cartography and photography and finally to the fashioning of an entire memorial landscape where architecture and horticulture came together to commemorate the hero of Delhi. Even as post-colonial India forgot Nicholson, he continued to live in the Irish national consciousness as a great hero epitomising Irish identity.

Jyoti P Sharma specialises in issues pertaining to built heritage, particularly of the Islamic and Colonial periods of India. Her doctoral work at DeMontfort University, Leicester, UK, examined the transformation of the urban form of Shahjahanabad/Old Delhi following colonial intervention in its varied dimensions.

INTRODUCTION

From a military perspective, the 19th century had been a most eventful one for Britain with the country engaged in the Crimean War, Persian and Chinese conflicts, yet nothing captured the imagination of Britons as the events of 1857 in north and central Indian Subcontinent. The indigenous uprising that came to be called the Indian Mutiny was one of the most significant political events in British colonial history. As 19th century Britain celebrated the idea of nationhood, its colonial military campaigns produced a fair share of heroes, namely military officers engaged in battle or discharging administrative duties. Against the backdrop of the events of 1857, the case of one such officer, Brigadier-General John Nicholson is described, who was serving in India. Architectural interventions, among other means, became tools of Mutiny myth making. Nicholson was immortalised in the collective British consciousness as the 'Hero of Delhi'. His deification was part of the British strategy to cement the memory of their victory in public consciousness. Nicholson's exploits were recorded in various accounts of the Mutiny for posterity and a memorial landscape was fashioned in his honour thus vigorously contributing to a steadily increasing corpus of Mutiny myths for public consumption both in the Subcontinent and in Britain.

Portrait of Late General Sir John Nicholson, Delhi 1939-40, vol.14, 1315, DGASI Collection, ASI Photo-Archives.
Source: Archaeological Survey of India

THE CONTEXT

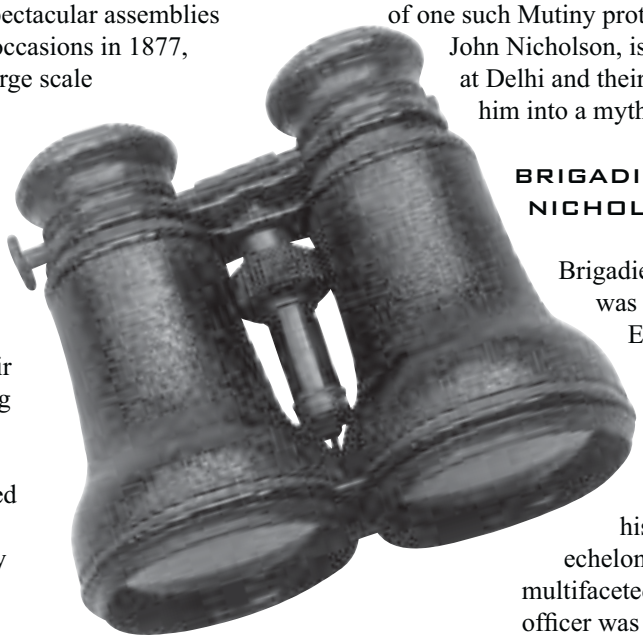
Just as the attack and seizure of Delhi by the indigenous rebels in May 1857 was read as a grave threat to British authority, likewise the British victory over those rebels in Delhi in September 1857 was seen as the waning of the uprising. The hard fought victory reinforced the need to stake a strong claim for legitimacy of British rule. Among the measures adopted to drive home the message of British invincibility, was the act of Mutiny veneration that resorted to rhetoric to portray the British as intrepid heroes and the Indians as vanquished villains. This outpouring of the hero worship sentiment was a 19th century cultural product aided by cerebral deliberations notably Thomas Carlyle's lecture series (1861) constructing the idea of a hero[1]. Carlyle envisioned the hero as a man of great courage, sincerity and compassion who was incorruptible and charismatic, transcending the times he lived in. His hero could be easily transported to the Indian Subcontinent where the British Company officials were expected to espouse the same virtues. Indeed, the events of 1857 did throw up many men including the subject of this study, Brigadier-General John Nicholson, whose exploits made them fit candidates for hero worship and concomitant Mutiny myth making.

REPRESENTING THE MUTINY

The Mutiny found representation in several formats ranging from written and spoken accounts, starting with rituals and ceremonies to visual records. The written and spoken accounts dealt with histories, memoirs, travelogues, official reports, lectures, parliamentary debates, sermons, political speeches, cartoons, fiction and poetry. Journals such as the Blackwood's Edinburgh Magazine and the Westminster Review critically analysed the events while maintaining the undercurrent of British heroism. Magazines such as the Punch carried cartoons valorising the British as valiant lions who routed the Indian Tiger. In a similar vein, fictional accounts based on the events of 1857 imparted to their British protagonists a larger than life persona that subverted all other characters in the plot. In the Indian subcontinent, those who witnessed the events at first hand wrote memoirs redolent with admiration for British exploits on and off the battlefield as they

fought both the 'enemy' and disease. Further, tourist guidebooks on cities that had been centres of the revolt devoted complete sections to 'Localities of the Siege' urging the reader to undertake a tour of Mutiny sites. HG Keene (1882, pp. 67-68) wrote that the British victory surpassed the 'performance of Alexander and Xenophon' and went on to suggest a tourist itinerary of Mutiny sites. Another mode devised to memorialise the Mutiny was through observance of rituals and ceremonies. In Britain religious preachers sermonised the Mutiny expounding on themes of collective sins and chastisement. Britain celebrated the Mutiny golden jubilee in 1907 by hosting the surviving veterans to a banquet in Albert Hall at London, reliving the glorious moments of British valour. In the Indian subcontinent, the British victory was commemorated via ceremonial durbars of which the most spectacular assemblies were held in Delhi on three occasions in 1877, 1903 and 1911. Through a large scale orchestration of cardboard architecture, the British effectively sent across the message of their authority. The tour of Mutiny sites in places like Delhi, Kanpur and Lucknow was ritualised into a pilgrimage and by excluding it from their itinerary, visitors risked being seen as unpatriotic.

The Mutiny was also recorded visually via drawing, cartography and photography often by those involved in the action namely the troops and officers of the British army. Cartographers unfailingly continued to mark Mutiny sites associated with the British on maps made long after 1857 to keep alive the memory of the event. Commemoration of the Mutiny also relied on photography as photographers like John Murray and Felice Beato recorded the sites for posterity at Agra, Delhi and Lucknow following the events of 1857.[2] The objective of such missions was to draw attention to the courageous British at the threshold of victory, to the suffering of hapless women and children at the hands of the indigenous rebels or to the routing of the rebels. Even as the subject of representation was an architectural creation, the role of architecture was to provide the backdrop against which the Mutiny events unfolded. Beato's image of the tomb of Emperor Humayun in Delhi was transformed from a popular tourist attraction into a Mutiny site where the incumbent Mughal King, Bahadur Shah II, was captured by the British. Likewise, Lucknow's Sikandar Bagh Palace provided the perfect dramatic backdrop in whose foregrounds were scattered skeletal remains of the 'rebel sepoys' who had been slain by the valiant British forces. Interestingly this photograph was taken by Beato in 1858 months after the city had been won over by the British. This exaggerated recreation of the event by the photographer was an important force in the making of Mutiny myths creating an indelible impression of British invincibility. All forms of Mutiny representation consistently kept alive the events long after their occurrence with the valiant British hailed as heroes and the rebels portrayed as villainous. The role of one such Mutiny protagonist, Brigadier-General John Nicholson, is mentioned whose exploits at Delhi and their representation transformed him into a mythical figure.



Field Glasses used by General Sir John Nicholson, Delhi Museum 1934-37, vol.6, 6396, DGASI Collection, ASI Photo-Archives.
Source: Archaeological Survey of India

BRIGADIER-GENERAL JOHN NICHOLSON

Brigadier General John Nicholson was an Irish officer in British East India Company's army. He began his military career as a cadet in the Bengal Infantry at the age of sixteen and then assiduously worked his way up the military echelons. In keeping with the multifaceted roles that a military officer was entrusted within British colonies, Nicholson proved to be an adept administrator and soldier[3]. His administrative abilities came to the fore in his handling of the affairs of the North West Frontier Province while his prowess as a soldier was displayed during military campaigns notably the Afghan revolt (1841) the Anglo-Sikh Wars (1845 and 1848) and the siege of Delhi (1857). Nicholson was the archetype Company officer driven by a strong sense of purpose and absolutely convinced about the superiority of his own cultural milieu. Not among those who shared camaraderie with the indigenous elite, Nicholson's methods did not always meet his superiors' approval who thought him to be too high handed. He was infamous for his temper just as much as he was praised for his sense of parity. His

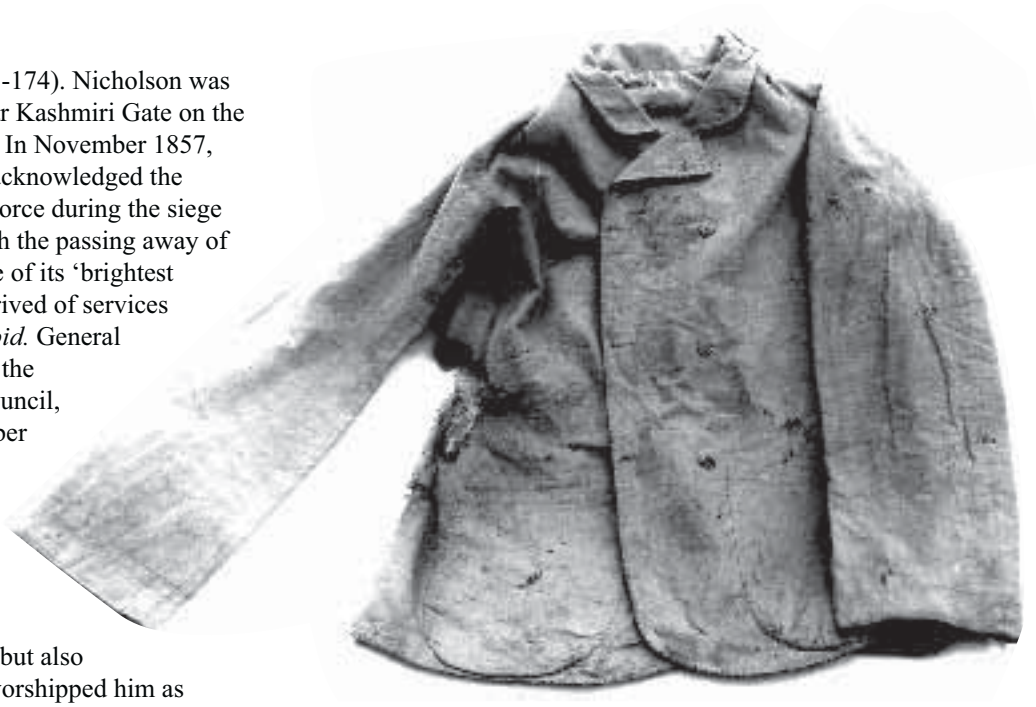
charismatic persona won him a band of dedicated indigenous followers comprising tribesmen from the North West Frontier Province who called him 'Nikal Seyne'. Despite his displeasure for glorification, his admirers were unfailing in their admiration for him. Nicholson was a frequent subject of remark by his contemporaries. Indeed, with his ability to handle a crisis established, it would hardly be incorrect to aver that Nicholson epitomised the 19th century Victorian hero as envisioned by Carlyle.

THE SIEGE OF DELHI

In May 1857 when the Mutiny broke out, Nicholson was the Deputy Commissioner of Peshawar. In June 1857 he was elevated to the rank of Brigadier General. Realising the importance of wresting back Delhi from the insurgents and the role that Nicholson could play in its realisation, he was sent to Delhi to bolster the efforts of the British camping on the Ridge to end the insurgents' siege of the city (Norman & Young 1902). Nicholson's arrival in the British camp was a morale booster for the troops, demoralised as they were by both the enemy and disease. His first victory over the rebels was at Najafgarh when the latter attempted to capture the siege train advancing towards the Ridge. A telegraphic message sent from the British camp to Ambala stated that 'Brigadier-General Nicholson attacked the enemy's force at Nujufghurh yesterday evening (25th) and completely routed them, capturing all their guns, twelve in number'(*ibid.* Telegram from Camp before Delhi to EC Barnes, Umballa, August 26, p. 242). This victory reinforced Nicholson's image as a hero. He then coerced General Wilson, in charge of the operations at Delhi, to launch an attack on the walled city. Nicholson was given the charge of leading his men to breach the Kashmir Bastion to enter into the city. The assault was launched on September 20, 1857 and with guns pounding the city wall, the Kashmiri Gate and Bastion was breached followed by the Mori Gate and Bastion and Kabul Gate. Nicholson headed a group of troops advancing towards Lahori Gate to secure its release to let in British troops. As they made their way through the narrow street, Nicholson was shot in the back near Burn Bastion. His condition being described as 'dangerously wounded', he was carried to safety to be treated at the field hospital. Nicholson held onto life to hear that the city had been decisively won on September 21. On September 23, he breathed his last. An eyewitness lamented that Nicholson's death 'which it is not too much to say has dimmed the lustre of even this victory - as it has deprived the country of one of the ablest men and most gallant soldiers that England anywhere numbers among our

The Memorial of General Nicholson, Photograph by HA Mirza & Sons, Delhi, Postcard printed in Saxony, i16020, Private Collection. Source: Ratish Nanda

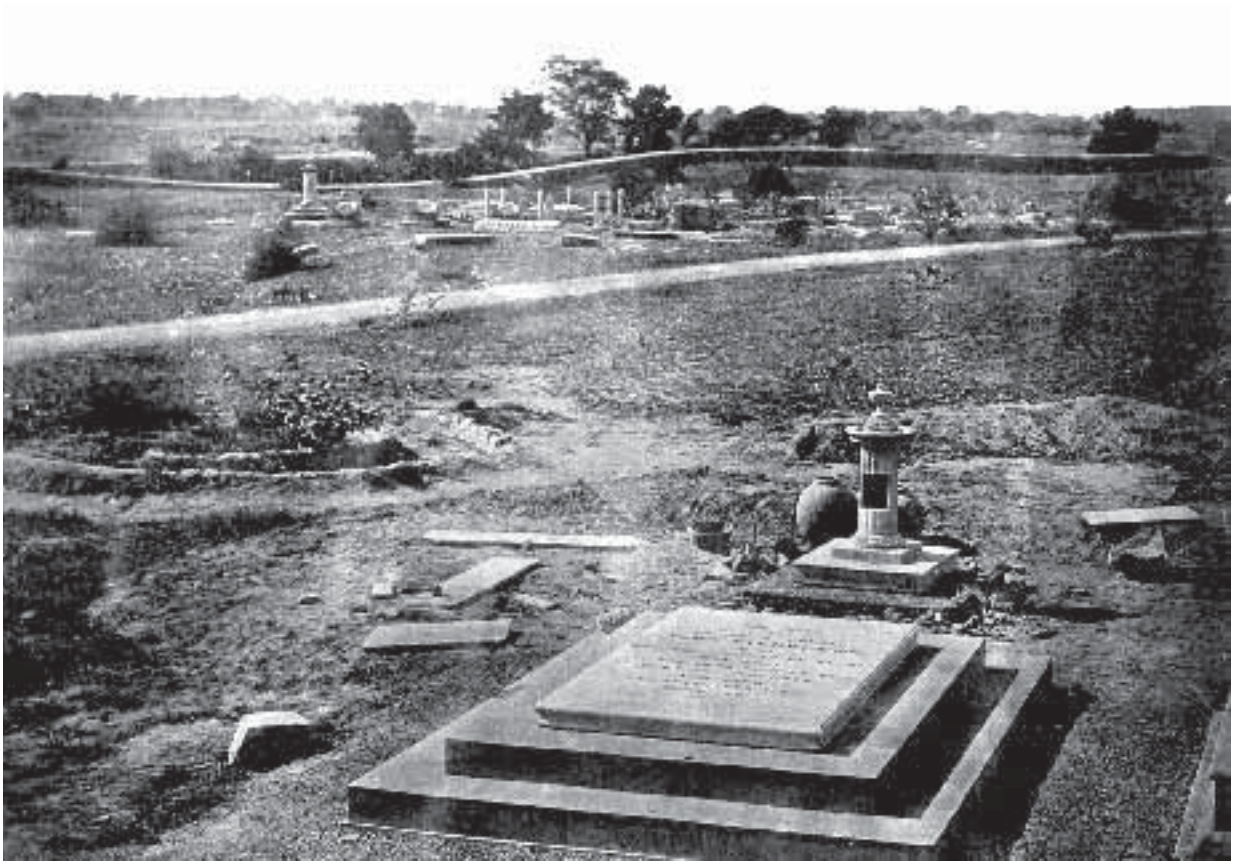
ranks'[4] (Fanshawe 1902, pp. 173-174). Nicholson was interred in the new cemetery near Kashmiri Gate on the morning of September 24, 1857. In November 1857, the Governor General formally acknowledged the contribution of the Delhi Field Force during the siege operations and mourned that with the passing away of Nicholson, the army had lost one of its 'brightest ornaments, and … the State deprived of services which it can ill afford to lose' (*ibid.* General Orders by the Right Honourable the Governor General of India in Council, No. 1383, Fort William, November 5, 1857, p. 218).



An old Coat of General Sir John Nicholson Delhi 1939-40, vol.14, 1316, DGASI Collection, ASI Photo-Archives. Source: Archaeological Survey of India

REMEMBERING NICHOLSON

Nicholson's demise was deeply mourned not only by the British but also his staunch followers who had worshipped him as 'Nikal Seyne'. There is an apocryphal account of one of his followers having killed himself on hearing of Nicholson's death, claiming that there was no point in living if his beloved 'Nikal Seyne' had departed from this world. Indeed, Nicholson had become the 'Hero of Delhi'. The making of the myth called Nicholson, assumed large proportions as he became part of Mutiny folklore. He was immortalised through written and spoken accounts, visual records and a specially created memorial landscape. The Gazetteer of Delhi (1883-84, pp. 199-200) devoted a detailed section to 'The Mutiny' and described Nicholson's military exploits during the siege, calling him the 'life and soul of the assault '. Delhi tourist guidebooks such as Keene's (1882, pp. 24, 73) described Nicholson as 'a great soldier, and a great man in every sense of the word' who 'achieved immortality in dying at the age of 35.' Nicholson was referenced in literary works like Kipling's Kim and was the subject of books and poetry.[5] Praise for Nicholson continued long after 1857. HC Fanshawe, of the Bengal Civil Services who was also the Commissioner of the Delhi Division, in his account of Delhi written in 1902 provided a detailed account of the Mutiny while stating that a monument to Nicholson and his men was likely to be raised in front of Kashmiri Gate. Nicholson was also memorialised via cartography and photography. Post-Mutiny maps marked the spots associated with him like the spot near Burn Bastion as where 'General Nicholson was shot', the site where he was interred as 'Grave of General Nicholson' and the memorial landscape that came up in his honour.[6] Beato's two volume photographic documentation of post-Mutiny Delhi also paid ode to Nicholson.[7] The first volume contained images of Mutiny sites including among others those associated with Nicholson namely 'Grand Breach-Kashmir Bastion', 'Main Breach and Gate', 'Kashmiri Gate' and 'Mori Bastion' (Numbers 20, 21, 22-23, 24 respectively). The second volume ended with the image titled 'New Burial Ground in Delhi with General Nicholson's Tomb' (Number 28). The conclusion of Beato's compilation with this image reaffirmed the perceived significance of Nicholson's contribution to the events of 1857 and secured his place as a Mutiny hero in British consciousness. By the early 20th century, picture post cards became a popular source of remembrance and among those in circulation was a series on Delhi that included one titled, 'No. 13. The Memorial General Nicholson, Delhi (India)'[8]. This post card provided the arm chair traveller the opportunity to partake of the memorial landscape honouring the Victorian Hero of Delhi. Commemoration also entailed museumisation of Mutiny memorabilia. The Delhi Fort Archaeological Museum (set up in the Mumtaz Mahal in the Fort during the 1911-12 Delhi Durbar celebrations) displayed among its collection, copies of Beato's images of Mutiny sites, a portrait of Nicholson and two objects of his personal use namely his field glasses and an old coat, both otherwise banal items of utility but sanctified by their association with the great soldier.[9] These modes of representation were



Tomb of Brigadier-General Nicholson, Delhi, 1931-35, vol. 13, 5941, DG, ASI Collection, ASI Photo-Archives.
Source: Archaeological Survey of India

joined by architectural interventions made in the built environment that further bolstered Nicholson's legendary heroism.

DEVISING A MEMORIAL LANDSCAPE

It was in Delhi, where Nicholson displayed exemplary courage in battle, that a memorial landscape was fashioned in his honour. The landscape would further cement Nicholson's memory through its physical engagement with the public. The memorial landscape befittingly came up in close vicinity to Kashmiri Gate, associated with Nicholson during the action of September 14, 1857. It comprised a public park named Nicholson Garden and the Kashmiri Gate Cemetery where his mortal remains were interred. The public park, by its very nature, abetted interaction with the public, while the cemetery was a place of solemn contemplation. Nicholson Garden was laid on an open tract of land, north of walled Delhi, along Alipur Road that linked the city to the British Civil Lines. Cartographic data suggests that the Garden was laid out in the 1860s, in all likelihood, by the newly constituted Delhi Municipality entrusted to provide open spaces for the use of the city's Europeans. The Garden was formally named, Nicholson Garden, when his memorial was installed in 1906.[10] The Delhi Gazetteer (1912, p. 219) listed the Garden among the 'Places of Interest' in Delhi city describing it as an 'ornamental plot surrounding the statue of the fallen hero, whose grave is in the cemetery across the road.' Indeed, the pride of place of the Garden was Nicholson's statue set on a pedestal raised on a triangular plinth with provision for lighting. As for the enveloping Garden, its layout subscribed to the prevalent English landscaping fashion that the Municipality had zealously adopted to lay out public parks in post-Mutiny Delhi[11] (Sharma 2007). Three straight pathways, flanked by Royal Palms for vista creation, led from each corner of the wedge shaped plot to the statue. Winding paths led to different parts of the Garden landscaped with a fountain, plants including shrubs and flower beds, light poles and the ubiquitous lawn as ground cover. As for the Cemetery, it came up north of the Nicholson Garden separated from it by Qudsiya Road for the interment of soldiers who died in the action of 1857. Following Nicholson's interment, it was called Nicholson's Cemetery. Nicholson's grave was marked by a white marble tablet with the epitaph.

Indeed, the Garden and the Cemetery formed an integral part of Delhi's Mutiny landscape. This landscape was created through architectural and horticultural interventions on sites predominantly the Ridge that had a strong association with the British during the siege. Guidebooks like Keene's listed Nicholson Cemetery as part of the Mutiny itinerary that had been sanctified into a pilgrimage. Other sites associated with Nicholson were also marked in his honour. The narrow road parallel to the city wall through which Nicholson led his men towards Lahori Gate was named Nicholson Road. The spot near Burn Bastion where he was wounded was marked by a marble tablet inscribed in the city wall.

> 'This tablet marks the spot where Brigadier-General John Nicholson was mortally wounded during this assault on the 14th September 1857.'[13]

The Mutiny Memorial, a tower of Gothic conception, was erected in 1863 and carried plaques with names of officers and soldiers killed in 1857, foremost being that of Nicholson, 'Commanding Fourth Infantry Brigade'. Nicholson's heroism was also remembered in his homeland with poetic tributes and memorials in his honour at his birthplace, Lisburn in Ireland.

CONCLUSION

The Mutiny made heroes and villains of men depending on whose side one was. Post-independence India saw heroism in the acts of the indigenous rebels and saw men like Nicolson as oppressive rulers. This reversal of perception was reason enough for sites associated with colonial heroes to be neglected and Nicholson was no exception. Nicholson's memorial landscape was altered with Nicholson Garden being amalgamated into a larger green area named Tilak Park after the Indian nationalist, Lokmanya Tilak and Nicholson's statue removed. Subsequently the original Nicholson Garden was renamed Maharaja Agrasen Park with an equestrian statue of the King replacing Nicholson's statue. Nicholson's Cemetery deteriorated owing to neglect. While Nicholson Road survived with its name unchanged, the tablet marking the spot where Nicholson was wounded was lost once the city wall was demolished. The commemorative plaques on the Mutiny Memorial got an addition in 1972 that eulogised the indigenous rebels 'who fought bravely against the repressive colonial rule in the First War of Indian Independence in 1857.' Nicholson's homeland however, continued to cherish him. On the occasion of the Mutiny centenary, some Irish groups parleyed with the Indian government to have Nicholson's statue (that once stood in Nicholson Garden) shipped to Ireland. In 1960 the statue was mounted in the forecourt of the Royal School at Dungannon (Nicholson had attended the school as a child), becoming an emblem of Irish identity. Maharaja Agrasen Park owned by the Municipal Corporation of Delhi remains unprotected thereby negating the site's historic worthiness. The Cemetery was accorded protection by the Delhi State Department of Archaeology. The inventory of Delhi's built heritage compiled by Indian National Trust for Art, Culture and Heritage (INTACH) in 1999, listed the Garden and Cemetery recording 'serious deterioration' in both. Of late, the Cemetery has been conserved, following a grant by the British High Commission in India, but the Garden remains deprived of any conservation intervention. That the two sites together once signified a colonial memorial landscape is a fact lost in the folds of time. The tale of Nicholson is one among many that make up the larger tale of Delhi and it is only fair that each tale be cherished or else the story of Delhi will remain partly untold.

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Notes

1 For a detailed discussion, see Carlyle (1861).

2 For a detailed discussion, see Pelizzari (2004).

3 For a detailed discussion, see Pearson (1939).

4 Lieutenant HW Norman's Narrative in Fanshawe (reprint 1991, pp. 173-174).

5 Among the books written on Nicholson were: Trotter (1898) and Pearson (1939).

6 Data drawn from the following post-Mutiny maps: Cantonment, Civil Station, City and Environs of Delhi 1867-68 IOR X/1666/1-4 British Library, Oriental and India Office Collection, London; Delhi & Environs by JG Bartholomew, *Imperial Gazetteer Atlas of India*, PLATE 55; and Delhi Survey 1910-11-12, Surveyed under the order of the Municipal Committee, Delhi by AJ Wilson of the Survey of India, Town and Country Planning Office Collection, Delhi, Sheet Nos. 63; 64; 75; 76.

7 The following data has been drawn from reproductions of Beato's Album that was the subject of scholarship in Masselos and Gupta (2000).

8 The Postcard image was taken by HA Mirza and Sons, Delhi and it was published in Saxony. It forms part of a private collection that was generously shared with the author and for which the author remains grateful.

9 Data drawn from Archaeological Survey of India's Photo Archives, DGASI Collection from the following Delhi Albums: Delhi, Volume-13, 1931-35; Delhi Museum, Volume-6, 1934-37; Delhi, Volume-12, 1931-32; and Delhi, Volume-14, 1935-41.

10 The following description of Nicholson Garden has been inferred from Delhi Survey 1910 to 1912, Surveyed under the order of the Municipal Committee, Delhi by AJ Wilson of the Survey of India, Town and Country Planning Office Collection, Delhi, Sheet Numbers 63, 64, 75, 76.

11 For a detailed discussion on the British treatment of Delhi's Public Parks, see Sharma (2007, pp. 210-228)

12 Recorded on site.

13 Fanshawe (reprint 1991, p. 92).

Lucknow, the First War of Independence

An exploration through conservation appreciation seminars

NEETA DAS AND MARY KAY JUDY

ABSTRACT

The city of Lucknow was marked by the First War of Indian Independence, 1857, not only by the historical associations that it gained but also from the abrupt transformations that the built fabric saw. As a result of these transformations, the city lost important parts of its historic fabric, which lack interpretation on site. Two seminars were organised for architecture students in the years 2006 and 2007 in honour of the 150th year anniversary of the First War of Indian Independence, aimed towards awareness generation and teaching conservation skills to the students. The article elaborates the process and achievements of the seminars that can act as means of encouraging interest in the historic events and associated transformations in built fabric of the city and its interpretation for the present and future generations.

INTRODUCTION

In honour of the 150th year anniversary of the First War of Indian Independence, two Conservation Appreciation Seminars were conducted

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Mary Kay Judy is a conservation architect and international cultural heritage consultant based in New York City. She received her Masters in Historic Preservation from Columbia University and undergraduate degree in Art History from the University of Cincinnati.

Pre- 1857 map of Lucknow showing the Machchi Bhawan fort dense city.
Source: State Museum, Lucknow

by the authors within the architecture department at the Babu Banarasi Das School of Management and Technology.[1] The seminars organised over two consecutive years were focused years on raising awareness about the local monuments and city planning that survive today as the a legacy of the war and its aftermath. In March 2006, the subject was 'Landmarks of the First War of Independence, 1857' followed by 'The 1858 Aftermath: the Destruction of Nawabi, Lucknow' in March 2007.

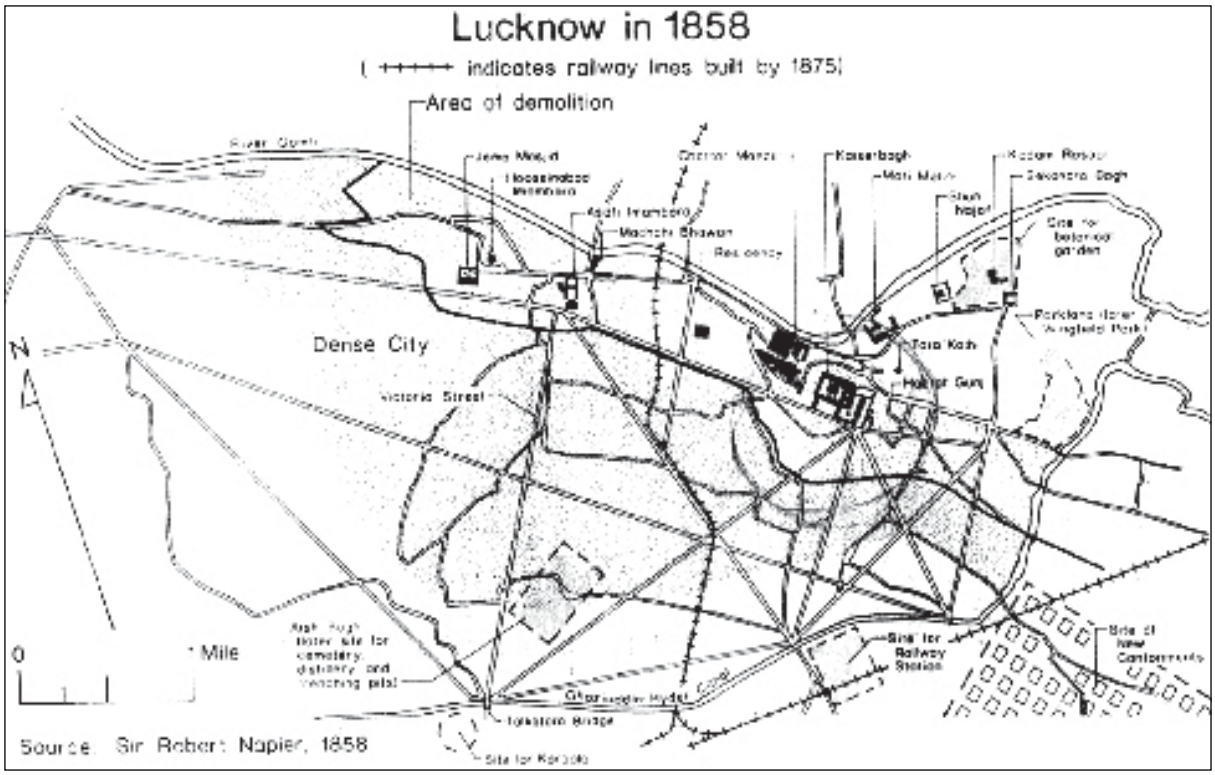
Key to both seminars, 'Landmarks' and 'Aftermath', was the student's utilisation of historical archival material and the component of the students being actively engaged in urban exploration of the sites and surrounding city. The aspect of urban exploration allowed students to gain a greater understanding of the events of the war and its impact on the local built environment. In addition, as part of the 'Conservation Appreciation Seminar' series, the curriculum was designed to introduce the basic concepts of conservation in evaluating the buildings and sites associated with the war. The first war of independence brought about two major issues which are of interest to architects: firstly, the destruction of medieval cities and secondly, their reconstruction with a colonial mindset.

HISTORICAL BACKGROUND OF LUCKNOW

The British had been living in India since the 17th century. They came as traders and slowly gained in power as rulers. They started acquiring small kingdoms and consequently developed an army which had a large number of Indians. The British had a symbiotic relationship with the Indians in which both the parties stood to gain. They had never experienced any revolt against them, of the magnitude of 1857, since their arrival in India in the 17th century. However, after the revolt by the Indians, and its suppression by the British, this equation changed. British for the first time experienced two emotions; fear and triumph. Fear after they witnessed the brutal killings of their countrymen by the locals; and triumph because they could perceive themselves as the rulers of India after the Mughals. These two emotions changed the face of cities in India after 1858.

The medieval cities were dense with labyrinthine streets and dark alleys. From the point of view of the new rulers, the city had to be 'safe' where the troops could move easily in case of a mutiny. Any place considered as a threat for the British was demolished. This happened in many pre-colonial cities like Delhi, Lucknow, Meerut, Jhansi, Bareilly, and Moradabad. It led to the large scale demolition of cities, important forts and palaces of the Indian rulers, and building of wide streets through the city to facilitate easy movement of British troops and artillery. For example, in Delhi, after the war, the area between the Red Fort and the Jama Masjid was cleared. This clearing displaced the old market area that existed there. Much of the architectural heritage was lost as a result of this demolition drive.

The next stage was that of reconstruction, under which, major urban planning campaigns took place in several major Indian cities to prevent the likelihood



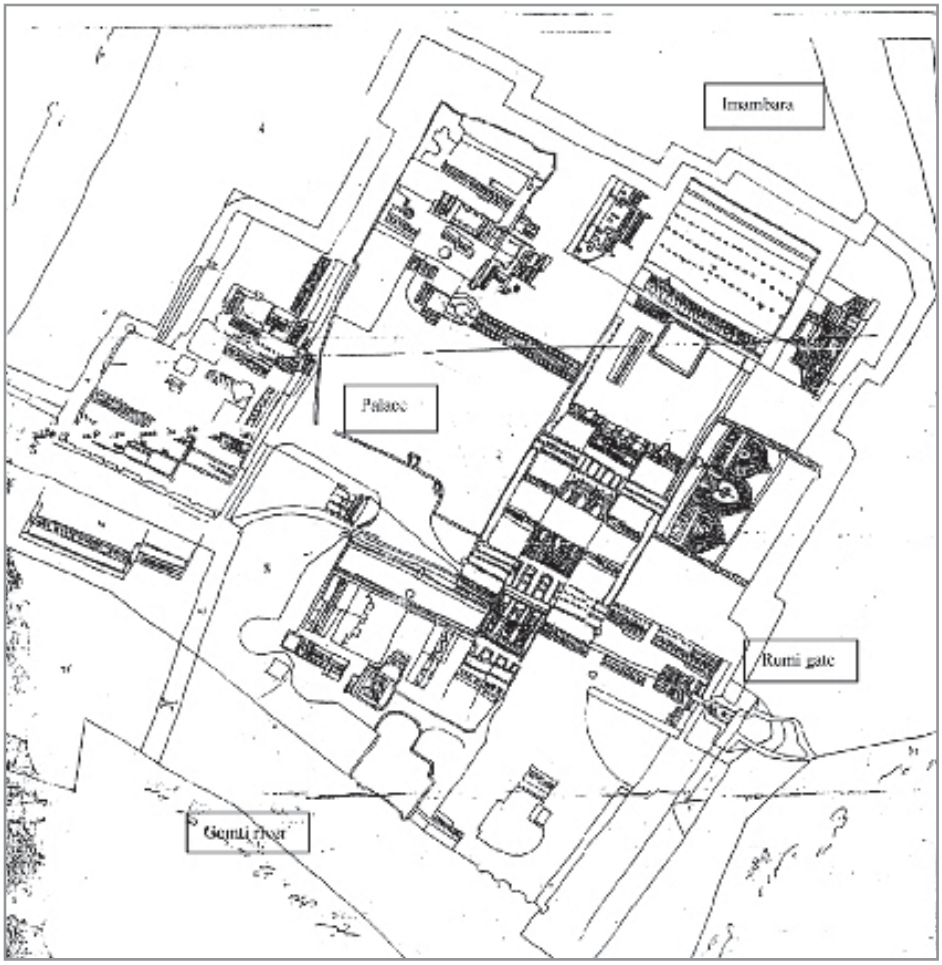
Plan by Sir Robert Napier showing the areas of demolition and layout of the new roads.
Source: Veena Oldenburg, The Making of Colonial Lucknow

of another uprising. Also, now that the British were the rulers, they needed the necessary infrastructure. Safety from the 'mutineers' and an obsession for sanitation prompted them to develop large areas for exclusive use of the Europeans known as the Civil lines and Cantonments (Oldenburg 1989). Centralised administration gave rise to several buildings like courts and secretariats. Equally important was the need of Indians who could support the British. Introduction of western education, especially the knowledge of English, saw the construction of schools and colleges doling out this foreign education system. Thus, colonial buildings made after the mutiny were meant for public use which also included railway stations, hospitals, education and administrative buildings, precedents of which did not exist in pre-mutiny India.

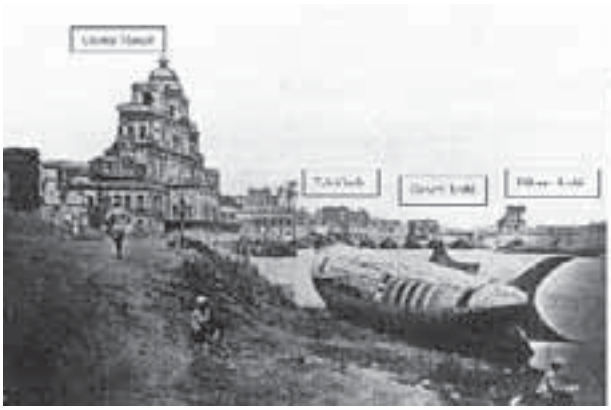
The city of pre-1857, Lucknow had many large forts and palace complexes like the Macchi Bhawan, Chattar Manzil, and Kaiserbagh. Around the Macchi Bhawan fort was the dense city of Chowk. After the war, the fort was blown up and the King George's Medical College stands in its place today. The British were threatened by the density and maze like streets of the Chowk area, so the wide Victoria Street was made cutting through the dense fabric.

This allowed the British troops to move quickly when needed. Chattar Manzil and Kaiserbagh were the strongholds of Begum Hazrat Mahal, an active participant in the war. The palace complexes were destroyed by dissecting these with wide streets. Both the palaces that were built around a court were mutilated. Most of the other complexes that were also considered as a threat to the British, were partially or totally destroyed (Das 2003).

After the war, the city was redesigned by western town planners, Robert Napier in 1858 and much later by Patrick Geddes in 1916. Many new schools and colleges like the Lucknow University were built in the prevalent Indo-Saracenic style. The Secretariat building and the Charbagh railway station were constructed in the same style. The new cantonment was designed with wide streets and sprawling colonial bungalows. The British took over Hyatt Baksh, an old Nawabi kothi, and greatly improved and dressed it in the Indo-Saracenic style, to serve as the Governor house. Today, these buildings stand alongside the mutilated Nawabi complexes as examples of colonisation by the British, fallout of the first war of independence. All these areas with wide streets and large colonial buildings are presently referred to as 'new' Lucknow, which is in



1863 Board of revenue pictorial map of the Machchi Bhawan fort. All was demolished only the Imambara exists.
Source: Board of Revenue, Lucknow



View of Chattar Manzil palace from the river.
Source: State Museum, Lucknow

The Chatter Manzil palace court during the 1857 war.
Source: State Museum, Lucknow

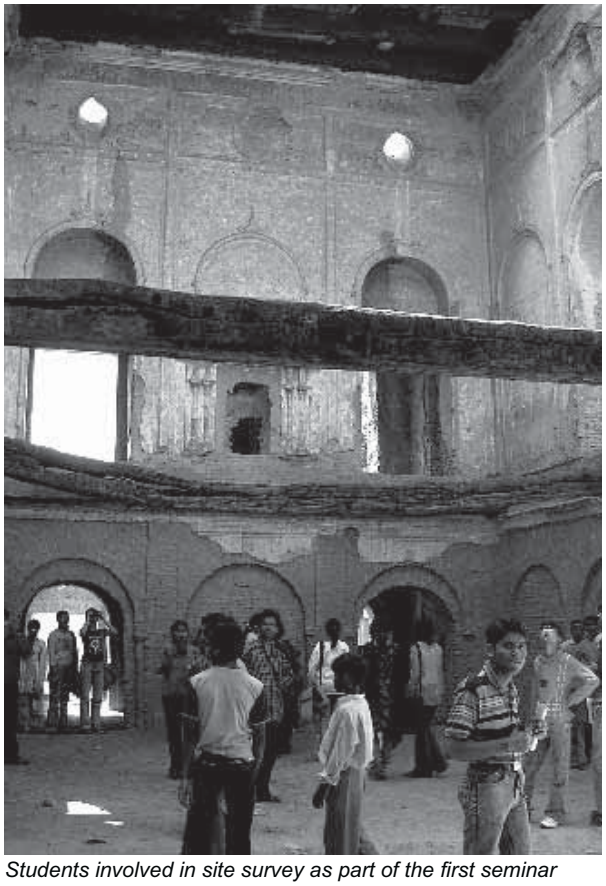
stark contrast to the 'old' Lucknow with its medieval planning and Nawabi structures. It is common for people today to associate these newer parts of the city, better suited for the car and today's lifestyle, as the outcome of 'modern' India (Das 1998).

THE SEMINARS: PROCESS AND ACHIEVEMENTS

Landmarks of the First War of Independence, 1857

In 2006, the 'Landmarks of the First War of Independence' seminar concentrated on the local buildings, sites and strategic locations, while retracing the British movement through the city. The seminar participants were the first year architecture students. Prior to fieldwork, the students were given a lecture of the overall history of the war starting with the Indian infantry revolting at Marion Cantonment to the British suppression in March 1858. Each step in the progressive development of the war was highlighted by associating it with the local buildings and sites where the events took place. Students were then given historic maps and different historic travel accounts which described the events of the war and the buildings where pivotal events took place. Fieldwork began by taking the students to the area of the city where Marion Cantonment was located on historic maps. Today, clues to its existence have been obscured by history and new development has made its evidence very elusive to the contemporary visitor. Despite this fact, students were encouraged to be resourceful in their field investigation while combing through the area and looking for signs of historic construction, such as *lakhauri* bricks, historic plaques or monuments, as well as interviewing the local residents and shopkeepers to yield more clues.

The students' resourcefulness was rewarded in finding several building fragments, forgotten memorials and a British graveyard, all of which were hidden by later construction or unmarked. All these features contributed to establishing the area as the historic location of the Cantonment where the infantry revolt sparked the onset of the war. The students' subsequent enthusiasm was a direct result of the phenomenon that they had discovered the historic evidence of the Cantonment themselves. It is also important to note that prior to the seminar, students were not aware of the significance of the Marion Cantonment or its



Students involved in site survey as part of the first seminar

Generation of maps and analysis as a part of the Landmarks of the First War of Independence, 1857 seminar

Discovery of a British graveyard by the students in the Cantonment area

location within Lucknow. After the morning of urban exploration around the Cantonment area, students boarded a bus to follow the historic trail of British troops moving through the city. Visits were then made to the strategic points of the war on the trail including Alambagh, Dilkusha, La Martiniere and the Residency. At each site, students performed a conservation condition survey noting construction technique, status of heritage protection, any deterioration and its causes, while documenting the condition photographically.

The final part of the seminar comprised of the students working in groups to create their own travel journals with accompanying photographs and map illustrations following the same route as described in the historic travel account they were assigned. Included in the students' contemporary journals were comparisons of 'then and now', observing changes in the urban environment over time.

The 1858 Aftermath: Destruction of Nawabi Lucknow

The main forts, palace complexes and Chowk of Lucknow were destroyed by the forced introduction of wide, bisecting Victorian style avenues. As such, for the contemporary visitor or student it is difficult, if not impossible, to imagine that these were once grand,

Students exploring the fabric on site, guided by historic maps, as part of the second seminar

Comparison of historic maps with Google Earth images in the classroom

Students involved in site survey as part of the second seminar

Discovering the historic fabric through identification of lakhauri brick construction

sprawling palace complexes complete with picturesque gardens and gateways. In March 2007, through the seminar 'The 1858 Aftermath: the Destruction of Nawabi Lucknow' the profound effects the war had on the architecture and planning of the city of Lucknow, were studied. The students, who had participated in the first seminar, now in the second year of architecture, analysed changes in the urban fabric at the hands of British planners following the War of 1857.

The goal of the seminar was for students to discover themselves how the complexes were conceived and laid out before 1857. The discovery process allowed them to find the physical clues and evidence during the urban exploration as guided by the historic maps dating from before the war and subsequent changes.
The three areas most affected by the British policy of 1858 were chosen for the seminar fieldwork and included Macchi Bhawan and surrounding chowk, Chattar Manzil complex and the Kaiserbagh Palace. The first day of the seminar took the students immediately to the field where the historic maps of the three subject areas were distributed for the walking tours that would be taken together as a group. Students were instructed to follow the route on the historic map, exploring the remains of the palaces and chowk, as

well as the post 1857 avenues of the contemporary landscape. The students also completed architectural documentation forms and condition surveys with accompanying photographs of each one of the sites examined.

Following the discovery process, documentation and condition surveys, the students returned to the classroom for the final step of their assignment. To fully impress upon the students how dramatically the landscape had changed after the War, back in the classroom students located the Macchi Bhawan and Chowk, Chattar Manzil complex and Kaiserbagh Palace in Google Earth aerial images. The Google Earth image was placed side by side with the historic maps to create a 'then and now' comparison to fully understand how the landscape had changed after the First War of Independence of 1857.

CONCLUSION

The seminars were an attempt to teach practical preservation skills and promote a greater awareness among future professionals, as well as the public, influencing the built environment. The condition assessment and architectural documentation carried out were oriented towards the teaching of means of practical conservation skills. The study and analysis enabled the students to understand the city of Lucknow in a completely new light on the basis of their own, hands-on observation of historic architectural remains and comparisons with the historic maps. Hence, the seminars achieved the aim of generating awareness and interest in heritage amongst the students who participated in these and those around them, which could in turn affect the attitude of the professionals and the general public towards the built heritage and its associations in the future.

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Notes

[1] Both the seminars were conducted as part of the 'Conservation Appreciation Seminar' series created by Mary Kay Judy. The 'Seminar' series is a programme of the Cultural Heritage Educational Initiative, founded in 2002 to promote cultural heritage and conservation education and has been generously supported by the Asian Cultural Council in New York City. To date, nine different seminars have been successfully completed with the participation of over two hundred students and faculty.

Community Open Spaces

Evolving a user friendly landscape

ABHIJIT NATU

ABSTRACT

The National Building Code of India (1983 and 2005) has enforced the reservation of minimum open spaces in residential developments for the benefit of a contiguous community. A methodical research was carried out in Pune, aimed at exploring the users' appreciation of the open spaces to determine what they 'liked' or 'disliked' about these. The study is significant, because such spaces are the principal venues in towns and cities in developing countries for day to day recreation of residents. Concluding results indicated that vegetation was the most liked landscape element. Users valued the spaces for openness and as social meeting places. Lack of maintenance and cleanliness of the various recreational facilities and lack of control to prohibit certain uses were the factors that affected the users' experience. Knowledge of these aspects can help designers and policy makers to evolve user friendly landscapes which can make the users' experience a pleasant one.

INTRODUCTION

Well defined community open spaces were integral part of eastern cities (Rewal 1992) and these created a strong sense of community (Thapar 1992). The spaces occurred in traditional settlements in forms such as *kataras* of the walled city of Delhi, *vadas* of Pune (Joglekar 1992) or

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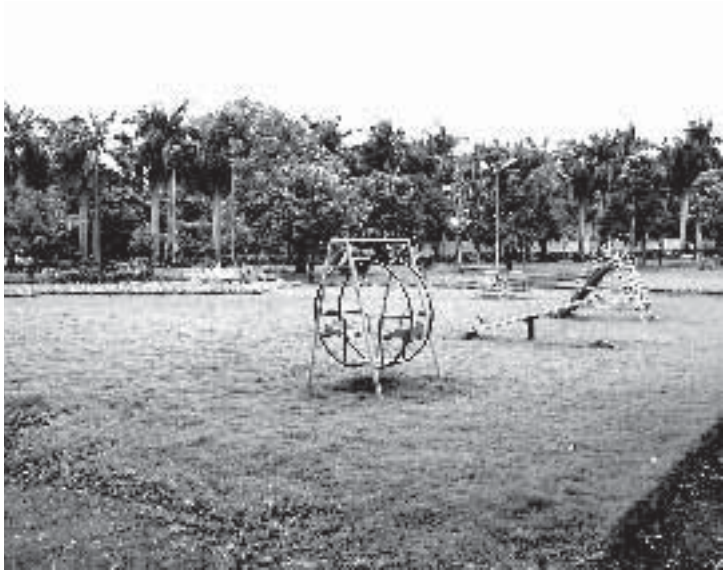

Park space

Play ground space

pols of Ahmedabad (Vastu Shilpa Foundation 1988). However, with the advent of industrial age and growing congestion in urban areas, it became necessary to enforce by legislation the mandate of formal open spaces so as to create better living environs. Provision of nearby open spaces or neighbourhood parks for recreation in residential areas is an important part of urban planning and these open spaces contribute to individual well being (UNPF 2007) apart from serving as lungs of the city. The National Building Code of India (1983 and 2005) made it mandatory to formally reserve certain minimum open space in residential developments for the use of the contiguous community that it calls as the 'community open spaces'. These outdoor open spaces are potentially the prime resources to meet the day-to-day outdoor recreational needs of the residents (Joardar 1989). But very little is known about how people across densely populated third world cities respond to these spaces in their day to day living milieu (Yuen 1996). Designers have a control on the physical characteristics of the open spaces (Hull & Harvey 1989) and the design of spaces can encourage or inhibit user participation (Berleant 1988). Knowledge of users' preferences can enable designers to make the spaces likable and therefore usable, through physical design. A methodical research[1] was undertaken to understand the users' perception and use of the formal community open spaces in urban residential developments in India, the findings of which are explained here.

RESEARCH DESIGN

This research aimed at exploring use and user's perception of open spaces. For understanding the use of open spaces, 'activity mapping' was employed, while for understanding user perceptions, 'interviewing' was used. The research focused only on the users of the open spaces hence this study was limited and the non-users were kept out side the scope of the study. The research was carried out in Pune, an important city in Western India, ranking eighth in the country in terms of population (Census of India 2001). Pune has a climate conducive for open space use and the citizens do use the open spaces. The study focused on the 'formal' community open spaces in residential developments.

Pune Municipal Corporation (PMC) has listed the neighbourhood parks developed by it but a list of formal community open spaces in various residential developments is not available. Owing to this limitation, a multi-stage sampling strategy using systematic area cluster sampling (Kothari 2005) was employed. Considering the extensive time required for the observation tactic of activity mapping, there was a limitation on the number of sites which could be studied. The criterion for selection of open spaces was to have maximum diversity sampling (Patton 1980) to ensure open spaces with diverse physical characteristics.

In all, 17 open spaces were selected from different residential developments across the city. The random sampling procedure ensured diversity of the spaces in terms of the socio-economic context of contiguous residential communities. Within the sample of spaces chosen, three broad categories could be made based upon the nature of the dominant landscape characteristic. Spaces which contained lawn and

Table A
Aspects liked by the users of the open spaces

	Aspects liked by the Users	Responses		Percent of Cases
		N	Percent	
	Vegetation			
1	Lawn	29.00	9.48	18.24
2	Trees	34.00	11.11	21.38
3	Greenery	35.00	11.44	22.01
4	Fresh wet smell of lawn, leaves and flowers	1.00	0.33	0.63
	Sub-Total	99.00	**32.35**	**62.26**
	Other Landscape Elements / facilities			
5	Mound	6.00	1.96	3.77
6	Sitting Spaces	4.00	1.31	2.52
7	Play space for sports	14.00	4.58	8.81
8	Play equipment	4.00	1.31	2.52
9	Temple	4.00	1.31	2.52
10	Sounds of Birds	3.00	0.98	1.89
11	Jogging Facility	1.00	0.33	0.63
12	Fountain	5.00	1.63	3.14
	Sub-Total	41.00	**13.40**	**25.79**
	Openness and other Spatial Qualities			
13	Nearness to home	14.00	4.58	8.81
14	Openness	21.00	6.86	13.21
15	Fresh air	29.00	9.48	18.24
16	Peacefulness	13.00	4.25	8.18
17	Less crowded	4.00	1.31	2.52
18	Away from traffic	8.00	2.61	5.03
19	Safe	8.00	2.61	5.03
20	Spaciousness	8.00	2.61	5.03
21	Free from pollution	10.00	3.27	6.29
22	Nearness to river	8.00	2.61	5.03
23	Naturalness	4.00	1.31	2.52
	Sub-Total	127.00	**41.50**	**79.87**
	Other People and Activities taking place in the space			
24	Meet people	12.00	3.92	7.55
25	See children play	1.00	0.33	0.63
26	Decent people in park	3.00	0.98	1.89
27	Prohibition on eating in the park	1.00	0.33	0.63
28	See activity happening	2.00	0.65	1.26
	Sub-Total	19.00	**6.21**	**11.95**
29	**Cannot say**	8.00	**2.61**	**5.03**
30	**Everything**	4.00	**1.31**	**2.52**
31	**Nothing**	8.00	**2.61**	**5.03**
	Grand Total	**306.00**	**100.00**	**192.45**

Table B
Aspects liked by the users of the park spaces and playground spaces

Sr.No.	What people liked in open spaces?	% of users giving the response	
		Park like spaces	**Grounds**
01	Vegetation	81.90	26.00
02	Other Landscape Elements / Facilities	17.14	46.00
03	**Openness**	**85.71**	**72.00**
04	Other people / activities taking place	17.14	8.00
05	Cannot say	5.71	4.00
06	Everything	3.81	0.00
07	Nothing	0.95	8.00

tended landscape, are called as 'park like spaces', spaces which had barren ground are called as 'grounds' and spaces which had wild scrub growth are called as 'unkempt settings'. Further, the park like spaces generally had higher level of maintenance while the unkempt settings were completely unattended in terms of maintenance. The sample contained eight park like spaces, seven grounds and two unkempt settings.

NATURE OF DATA AND METHOD OF ANALYSIS

Open-ended questions seeking users' likes and dislikes resulted into descriptive qualitative data. The responses were analysed and coded to form categories. Since a user had more than one response to the questions, the responses were analysed using the 'Multiple Response Analysis' method. It was noted that, many users gave more than one response or mentioned more than one aspect they liked or disliked. Hence, the total number of responses received, exceeded the total number of interviewees and thus the total of percentages for different responses is more than 100. The qualitative approach of this study allowed the users to freely express their opinions in their own words. Hence, though a particular aspect/opinion was mentioned by only one user, it was equally important as it was a non-directed response elicited through the actual experience of the users.

FINDINGS

The answers of the users were in response to landscapes of the open spaces they were using. The answers given by the users were also analysed with reference to the landscape characteristics of the spaces (park like spaces or grounds) to which the users belonged. Users mentioned more than one aspect in response to the question 'what do you like in/about the space'. Number of responses received from the users varied from one to four. Hence, the number of total responses increased, there were 159 users and the numbers of

responses were 306. The responses were inductively divided into four categories which were as following:

- Vegetation
- Other landscape elements/facilities in the space
- Openness and other spatial qualities
- Other people and activities happening in the space.

According to the salient findings almost 63% of the users mentioned that they liked the spaces because of the various environmental qualities of the spaces such as openness (13%), fresh air (18%), away from pollution (6.3%), traffic (5%), spaciousness (5%), less crowded (5%) and peace (8%). It was noted that irrespective of whether a space was park like (85%) or ground (72%), the users liked the spaces for their 'openness'. Though only few users mentioned aspects such as 'near to home' (5%) and 'safe' (5%), these responses signify the value of open spaces for being 'close to home havens'. Next to spatial qualities, ranked 'vegetation' in terms of number of users (62.26%) stating that they liked trees or lawn or greenery in general. Liking of lawn was of course mentioned by the users of park like spaces. The users liked to see activity happening and meeting other people in the open space bringing forth the significance of community open spaces as 'social spaces'.

'Liking a temple' in an open space is very unique to the Indian context. The number of people making a mention of it may be very small (as a temple was present in only two sites) but it is an indicator that people may actually like the presence of a religious structure in their open spaces. It was noted during the site visits, that residents of three colonies had constructed 'shrines' underneath the Ficus trees (*Ficus infectoria* and *Ficus bengalensis*). These trees carry religious value in Indian communities.

'Sounds of Birds' and 'Fresh wet smell of lawn, leaves and flowers' though mentioned by very few users, are important responses as they reflect the sensitivity of the users to the multi-sensory stimuli in the landscape.

Table C
Aspects disliked by the users of the open spaces

	Aspects disliked by the Users	Responses		Percent of Cases
		N	Percent	
	Lack of Vegetation			
1	Lack of Lawn	2.00	0.91	1.26
2	Lack of shade trees	4.00	1.82	2.52
3	Lack of greenery	3.00	1.36	1.89
4	Lack of flowering plants	1.00	0.45	0.63
	Sub-total	10.00	**4.55**	**6.29**
	Other landscape elements / facilities			
5	Lack of clear free space for sports	4.00	1.82	2.52
6	Play ground surface	8.00	3.64	5.03
7	Garbage bin	9.00	4.09	5.66
8	Dust	9.00	4.09	5.66
9	Walk way paving	10.00	4.55	6.29
10	Mud of walking track	14.00	6.36	8.81
11	Less area of the space	4.00	1.82	2.52
12	Odd shape of the space	1.00	0.45	0.63
13	Quality of play equipment	2.00	0.91	1.26
14	Less seating spaces	1.00	0.45	0.63
15	Drinking water facility	1.00	0.45	0.63
16	Space is secluded from the buildings	1.00	0.45	0.63
17	Poor lighting	1.00	0.45	0.63
18	Rain water stagnates	3.00	1.36	1.89
19	Too many levels and divisions in space	3.00	1.36	1.89
	Sub-Total	71.00	**32.27**	**44.65**

Unkempt setting

	Aspects disliked by the Users	Responses		Percent of Cases
		N	Percent	
	Other Uses / Users			
20	Unknown people, strangers	2.00	0.91	1.26
21	Dogs / Dog defecation	7.00	3.18	4.40
22	Nuisance due to cricket	6.00	2.73	3.77
23	Drinking activity	3.00	1.36	1.89
24	Romancing activity	5.00	2.27	3.14
25	Nearby residents who object for playing	2.00	0.91	1.26
26	Noise due to play	2.00	0.91	1.26
27	Non-colony users	2.00	0.91	1.26
28	Some users passing urine in the space	1.00	0.45	0.63
29	Crowding	3.00	1.36	1.89
30	Noise of laughing club / group activity	1.00	0.45	0.63
31	People talking too loud while walking	2.00	0.91	1.26
32	Watchman's behavior	2.00	0.91	1.26
33	Users walking on lawn with shoes	1.00	0.45	0.63
34	People throwing litter	5.00	2.27	3.14
35	Children from slums	2.00	0.91	1.26
36	Users kicking mud	1.00	0.45	0.63
37	Smell of adjoining cowshed	1.00	0.45	0.63
38	Users plucking flowers	1.00	0.45	0.63
	Sub-Total	49.00	**22.27**	**30.82**
	Management and Maintenance Issues			
39	Use restrictions	2.00	0.91	1.26
40	Lack of maintenance	7.00	3.18	4.40
41	Time restrictions	1.00	0.45	0.63
42	Mosquitoes	6.00	2.73	3.77
43	Lack of cleanliness	19.00	8.64	11.95
44	Non-maintained toilets	1.00	0.45	0.63
	Sub-total	36.00	**16.36**	**22.64**
45	**Can not say**	31.00	**14.09**	**19.50**
46	**Nothing**	22.00	**10.00**	**13.84**
47	**Everything**	1.00	**0.45**	**0.63**
		220.00	**100.00**	**138.36**

Table D
Dislikes of the Users of the 'Park like spaces' and 'Grounds'

Sr.No.	What people disliked in open spaces	% of users giving the response	
		Park Like spaces	**Grounds**
01	Lack of Vegetation	9.52	4.00
02	Other Landscape Elements / Facilities	35.24	54.00
03	Other uses / users	26.67	38.00
04	Maintenance and Management of the space	18.10	26.00
05	Can not say	20.95	18.00
06	Nothing	**18.10**	6.00
07	Everything	0.00	2.00

Almost 60% of the users of a park in old city area, along the river Mutha mentioned that 'nearness to river' was an important aspect that they liked about that park. This implies, that view and proximity of a larger open space or natural feature is valued by the people. This response elucidates the idea of 'borrowed landscape' (Jelicoe & Jelicoe 1991) that is, view of an offsite feature enjoyed from the site.

ASPECTS DISLIKED BY THE USERS

Users also mentioned more than one aspect in response to the question 'what do you dislike in/about the open space'. Number of responses from the users varied from one to four. Hence, the number of responses received from the 159 users was 220.

The responses were inductively categorised into four categories which were as following:

- Vegetation
- Lack of Vegetation
- Other landscape elements/facilities in the space
- Other users/uses
- Maintenance and management of the space.

Table C enumerates the detailed responses in each category.

Quality and maintenance of various surfaces was a reason for dislike among the users. Responses about disliking 'play ground surface', 'mud of walkway', 'walkway paving', 'rain water stagnates' are important from the point of view of choice of materials for the base plane, as the base plane surface is the functional floor of a landscape (Motloch 2001). 'Lack of clear space for sports' or 'too many levels in a space' indicate the spatial limitations which affected use of the space for sports activities. Almost 30% of the users disliked the behaviour of certain users in a space. Control over 'strangers', 'non-colony residents', 'slum children',

Tree shrine

'drinking liquor', lies in the ambit of management and security of the spaces. Disliking 'playing of cricket' by some users and disliking the 'users who objected to play' by the cricket players, brings forth the conflict between the two groups. This points out at the larger issue of provision of play grounds for the adolescent age groups, which has to be addressed at the planning stage of the residential developments.

Disliking the lack of maintenance and lack of cleanliness of spaces was mentioned by almost 20% of users. Almost 19% of the users of the park like spaces mentioned that they did not dislike anything. Though this cannot be conclusive evidence, but can be considered as an indicator of general satisfaction of these users in their spaces, as against the ones using grounds. This also points towards the users' preference for tended settings with more greenery.

CONCLUSION

The intention to include open ended enquiry was to explore the 'likes and dislikes' of the users. Though there are diverse and site specific responses, the responses throw light upon several aspects of the open spaces and they do suggest some approaches for improving the quality of community open spaces.

Given the importance of vegetation (lawn and trees), it would be appropriate to give attention towards the provision of right amount of lawn and trees. The finding is also, in agreement with the 'preference for natural and tended settings for recreational activities' inferred by Simonic (2006) or Phanisree (2004). Next to vegetation, maintenance and cleanliness of the spaces were important for the users. Elements such as dusty ground surface, mud walk way were mentioned as nuisance causing elements by the users, which reflect the importance of selection of appropriate materials for various surfaces based on the usage. People complained about lack of fencing and manned control on the spaces which led to 'misuse' of spaces for activities such as drinking liquor, throwing garbage, etc. Hence, spatial and manned control over the open spaces in residential developments has to be given a thought while planning and managing the spaces.

Along with the visual characteristics of the landscape, responses of users, though few, about the tactile (feel of grass, water), auditory (sound of birds) and olfactory (smell of grass and leaves) aspects of the landscapes indicated the multi-sensory perception of landscape elements. The study alike earlier studies by Burgess et al. (1988) or Yuen (1996) offered insights into the multivalent environment of these near to home spaces. Apart from the responses pertaining to the landscape elements, the users liked the spaces for their openness, fresh air, and away from traffic locations.

The importance of open spaces as 'lungs of the cities' (National Commission on Urbanisation 1988) and their significance for being 'open' (Lynch 1991) have been explored earlier. The findings based upon the users' opinions, strengthen the planners' intent of providing these spaces.

The third important aspect affecting the users' experience of open space is the presence of other

Play equipment : generators of social interaction

people and activities. Users' valued these spaces for meeting other people, to see children play and see other activities happening. This brings forth the value of these open spaces in facilitating social ties. Elements such as play equipment and temples can create opportunities for social interaction along with the primary activities of play and worship, respectively. Users' dislike for 'laughter club noise', points towards need of spatial articulation to separate out group activity areas to retain calm in the park, for peace loving users. The findings of the qualitative inquiry to understand 'what the users of open spaces liked or disliked in their spaces', are significant as they are non-directed responses of the users coming out of their own experience of the spaces. Using these findings to address the needs and preferences of the users can help in evolving user friendly places in the open spaces.

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Notes

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Museum Emergency Management
An integrated approach

ROHIT JIGYASU

ABSTRACT

Natural and man made disasters are a threat to cultural property, exaggerated by several issues in the field of cultural heritage disaster management. The public policy for addressing the needs of heritage and management during disaster situations is ineffective and there is lack of proactive initiatives towards disaster reduction and mitigation. Museum emergency management faces further challenges, as the movable collections are not seen in relation to their context in case of catastrophic events, emphasising on the need for an integrated approach with focus on a preventive mode. The Museum Emergency Programme, initiated by the International Council of Museums, through its education component, 'Teamwork for Integrated Emergency Management'(TIEM) that took place during 2005-06, focused on the risk assessment, emergency preparedness and response and other basic principles of integrated emergency management for museums. An important positive step in the field, the inferences and achievements of the programme need to be carried forward through extensive initiatives for mainstreaming heritage concerns in ongoing efforts towards disaster reduction and sustainable development.

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INTRODUCTION

There has been an increasing frequency and intensity of both natural and man made disasters in the recent past, causing widespread loss of life and property, as seen through the devastation caused by the South Asia earthquake, hurricane Katrina and the Indian Ocean tsunami. Museums are an invaluable repository of the cultural past and with rapid development and modernisation, their relevance is ever increasing. However, natural hazards such as earthquakes, floods, cyclones and tsunami put these at high risk besides slow and progressive factors such as urbanisation, underdevelopment and poverty, which in fact increase the vulnerability to such catastrophic events.

Several international efforts for cultural heritage disaster risk management[1] have taken place during the last few decades; still this area faces a number of critical challenges. Lack of awareness on the importance of protecting cultural heritage from disasters is the first one of them. This is also linked to the fact that proactive role of cultural heritage in its tangible and intangible manifestations for sustainable disaster reduction and recovery is not recognised and in most cases, still seen as the last thing on the priority list of disaster managers. Another important challenge is the lack of education and training of heritage managers as well as disaster management agencies on ways and means of protecting heritage from disasters and addressing them during response and recovery phases. There is ineffective public policy for addressing the needs of heritage and management during disaster situations. Moreover, the predominant approach is reactive, focused primarily on the post disaster activities of immediate rescue and relief operations followed by rehabilitation. Proactive initiatives towards disaster reduction and mitigation are still lacking to a great extent.

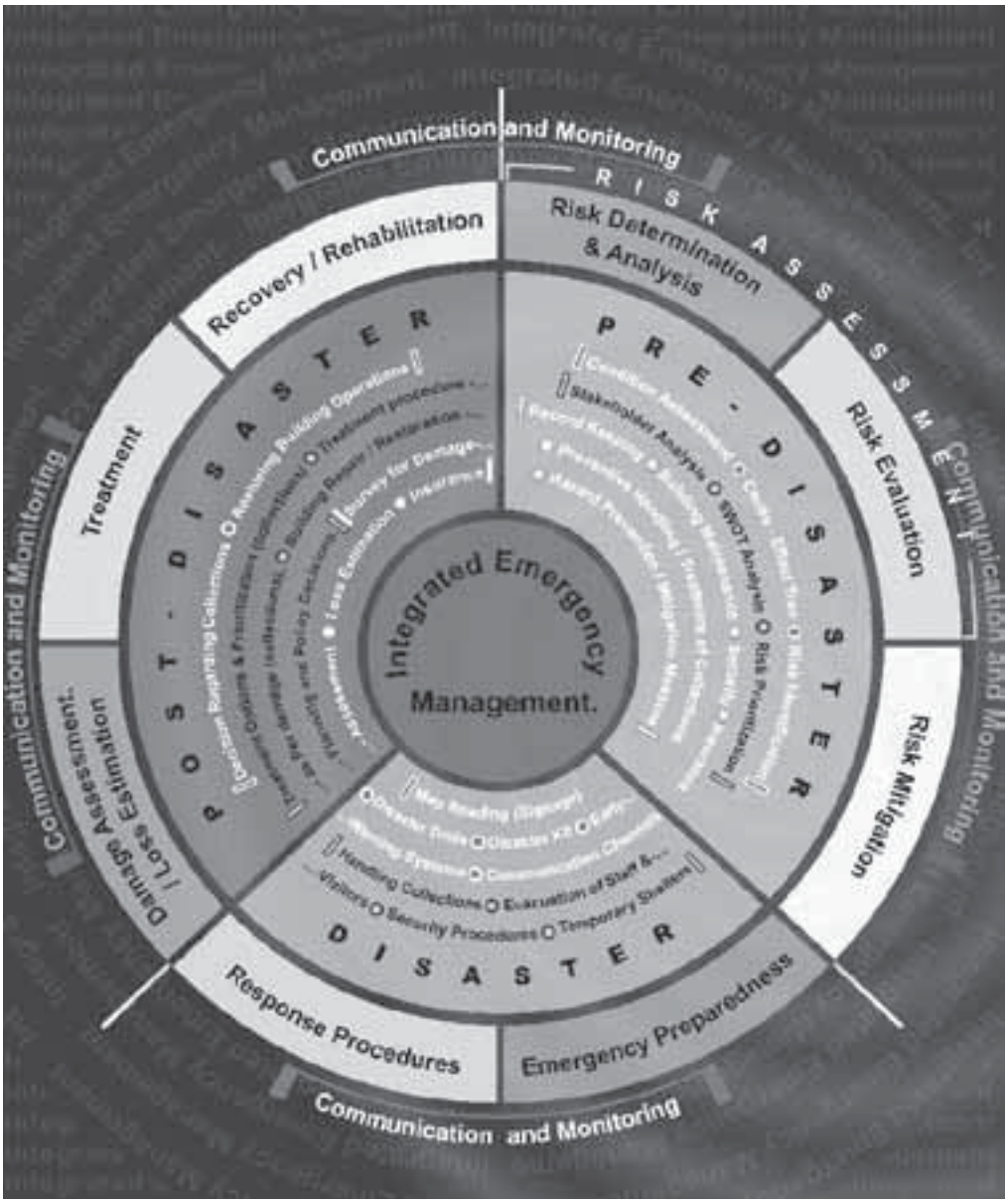
The historic palace in Bhuj housing significant collections was severely damaged due to the devastating Gujarat Earthquake in 2001

In most instances, the main approach for disaster reduction is hazard-centric, focused on the major hazard event such as earthquakes, while overlooking the slow and progressive risks such as termite infestation or leakage of roof, which may create vulnerability conditions to these catastrophic events. The multifaceted tangible and intangible dimensions of a given cultural resource and its setting/context are not understood and recognised. In the case of museums, while the focus is on movable collections, their context is often overlooked. In many cases, there are inherent conflicts between the values of buildings and those of collections in which they are housed or between the needs of local people and those of tangible heritage.

PRINCIPLES FOR INTEGRATED EMERGENCY MANAGEMENT

Considering these challenges, an integrated approach for emergency management of museums is indeed the need of the hour. Collections are the main focus of museums since these are primarily what they are meant for. However, one cannot overlook other dimensions that make the museum an integrated whole. These include the building/buildings in which these collections are housed, the people including staff, visitors and local community as well as the immediate setting in which the museum is located. This approach becomes all the more important in those cases, where collections are housed in the religious/historic structures located in culturally significant settings, which may also have 'living' association with the local community because of their role/meaning in their cultural practices. The 'living' aspect of museums has two main dimensions. The first, dealing with those museum buildings and/or their collections, which are still living[2] and the second dealing with the contemporary museums, which exist in a living environment[3] (Jigyasu 2003). It is important to make this distinction explicit right from the beginning, as each of these dimensions has its own specific characteristics and associated risks. The former dimension is certainly one of the most important aspects of cultural heritage in many cultures of Asia and Africa. Such an approach emphasises the role of local knowledge and capacity in reducing disaster vulnerability rather than merely the weaknesses by over-emphasising the vulnerability situation.[4]

Craftswomen from Kutch region undertaking traditional decoration work on the walls of the Crafts Museum in New Delhi to demonstrate their skills. This work becomes part of the museum display along with other movable collections that are created by the artists during their visits to the museum around the year



Integrated Emergency Management Cycle for Museums demonstrating various activities to be undertaken before, during and after the disasters

In most of the perspectives that are being offered[5], disaster is generally defined as linear objective reality, with a precise starting and an ending point and various phases in relation to disaster are categorised as pre emergency and post disaster phases and consequently various risk mitigation measures are devised, considering these phases to be strictly exclusive. In fact, disaster has no precise starting and ending points. Rather, disaster situations need to be seen in a continuum, because actions taken during various phases have an impact on each other. This means that the need is to establish backward and forward linkages while deciding various actions and interventions at various stages (Jigyasu 2003).

It is also important to understand the term 'disaster' and articulate its relationship to 'risk'. In fact, disasters are a direct result of risks, the latter being primarily responsible for transforming emergencies into disasters. Therefore it is important to draw links between the actions undertaken for disaster management and various risk management activities. At the outset, it is clear from the above discussion that there are complex factors, which puts a museum at risk in a particular

context. These risks may emanate from within the museum or from its surrounding context. This factor is significant in case of those museums, which are located in dense urban fabric, putting tremendous challenges for emergency evacuation and response. On one hand, these risks may emanate from the inherent and/or external problems in the building housing the collections that may result from its location, material and construction system. On the other hand, these may be the result of inherent nature of collections and the internal environment of the galleries and storage (temperature, humidity as well as light conditions), which in many cases are also dictated by the design and location of the building. Moreover, the physical vulnerability of a museum is also related to the social, political and economic context of the region in which it is located.

Therefore, museum emergency management is not a simplistic proposition that can be merely reduced to taking some measures for expected emergency situations; rather, addressing this subject requires consideration of multiple sources of momentary as well as slow and progressive risks to the collections and their impact on each other, which create vulnerability conditions for the disaster. This would demand a much deeper thinking both for the underlying causes, which put the museum at risk and their long-term implications. Last but not the least, emergency risk management for museums is very much in tune with the general paradigm shift that is already taking place in conservation and management practice; from a reactive curatorial mode to a preventive mode aimed at protecting the present of 'the past' by anticipating the risks in future.

TEAMWORK FOR INTEGRATED EMERGENCY MANAGEMENT (TIEM)

Museum Emergency Programme (MEP), initiated by the International Council of Museums (ICOM), is a significant initiative to address the critical risks confronting museums from natural as well as man-made disasters[6]. An important component of MEP is the training and preparation of museum personnel in various aspects of risk assessment, emergency preparedness and response following the basic principles of integrated emergency management. TIEM is the education component of MEP. This eight month pilot course that took place during 2005-06, focused on the risk assessment, emergency preparedness and response and other basic principles of integrated emergency management for museums It was undertaken through a partnership of the Getty Conservation Institute (GCI), International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) and International Council of Museums (ICOM). The course was offered for museum personnel from seven Asian countries, namely Cambodia, India, Japan, Korea, Sri Lanka, Thailand and Vietnam.

The First Phase of the project concluded with a two-week workshop (August 15-26, 2005) held in Bangkok, Thailand. This was followed by the second phase called the distance mentoring phase that lasted over a seven-month period during which participants, working in their own institutions, followed a programme of practical work that took them through the process of museum risk assessment and the basic steps of an emergency plan. The final phase of the course involved a meeting of all the participating institutions in Seoul during June 2006 for sharing the experiences of the Teamwork process. The course outline and teaching strategies included the Integrated Emergency Management (IEM) cycle, the use of case study approach and a field exercise; these have been elaborated later.

THE IEM CYCLE

The relationship between disasters and risks has been articulated in IEM Cycle, especially developed for this

TIEM participants undertaking risk assessment of the building and collections of the MEP Museum during the introductory workshop in Bangkok

course. The cycle attempts to establish an interface between disaster and risk management through various activities that follow a logical sequence and draws multiple inter-relationships between these activities. In fact, this cycle dictated the structuring of the introductory workshop into various modules and topics.

USE OF CASE STUDY APPROACH

Case studies are effective learning tools as they facilitate understanding of 'real' situations and experiences. These not only help in knowing 'What' but also 'Why' and 'How' of the particular case in consideration. In this process, they substantiate the challenges as well as the achievements in a particular context. This way case studies effectively link the participants to their own situations through mutual sharing of experiences and in this process facilitate relevant dialogue and discussions. Such an approach was successfully adopted in the introductory workshop along with the conventional classroom teaching. The instructors not only used secondary case studies to substantiate their lessons but also encouraged the participants to present their own cases.

'MEP MUSEUM' AS THE PLAYGROUND FOR LEARNING

Field exercises are vital to comprehend and test the knowledge gained in the classroom. Moreover, they enable gathering first hand experience, being face to face with the real life situations. One of the buildings in the National Museum Bangkok was designated as 'MEP Museum' for the sake of carrying out two major exercises, namely integrated risk assessment[7] and emergency response during a flood scenario.

CONCLUSION

The seven month long mentoring phase of the unique TIEM pilot project, culminating with a detailed introspection during the workshop in Seoul during June 2006, resulted in the following achievements and challenges:

- There is heightened awareness of all the staff of the participating museums about the hazards, vulnerabilities and consequent risks through integrated assessment of the museum building and its collections. Some museums developed tools such as risk registers and checklists to carry out risk assessment tailored to their own context and needs.
- There is an increased participant awareness of the 'big picture' and the need to work in a cooperative manner not only with the internal museum stakeholders but also the broader community especially critical partners that can assist in routine and emergency situations.
- Another significant achievement has been a general shift in the understanding of the nature and scope of emergency risk management. At the beginning, most participants could only think of large scale potential hazards such as floods and earthquakes. However as the course progressed, the significance of addressing slow and progressive risks creating vulnerability of collections to various kinds of natural and human-induced hazards was clearly understood. As a result, several activities were undertaken by each museum to improve general maintenance and management of the building and its collections in storage as well as display areas.
- True to its name, the TIEM initiative has indeed succeeded in inculcating a spirit of teamwork among the museum staff. Most museums have formed emergency planning committees among their staff. As a result, the interdepartmental dialogue has improved and several meetings have been organised to discuss various issues related to emergency planning and management. Moreover many museums have succeeded in establishing coordination with other agencies such as the fire office, police and the municipality.
- Last but not the least, the participants of the TIEM educational initiative have indeed served as catalysts for disseminating the knowledge gained through this experience at the national and even sub-regional levels. Workshops and echo-seminars have been organised by various museums to disseminate their knowledge and experience within the museum staff as well as with other museums.

Success of this unique pilot training project can be gauged not just by measuring it against the main objectives set within but also through the success of tangible activities that it facilitated through its unique conceptualisation, programming and pedagogy, which succeeded in bringing together the theory and the practice. In order to take this initiative further, a regional network for Integrated Emergency Management of Museums in Asia needs to be created. The network could help maintain a momentum for organising regular training programmes on emergency management of museums. This can also be used for sharing the training materials on collections management; building maintenance and preventive care topics. Such a network can play an important role in making contacts and generating resources

for equipment needed in emergency planning and management. Similar training programmes could be organised at sub-regional level, for example Africa, Middle East, South America, South Asia, South East Asia, and the South West Pacific. An advanced level of TIEM can be developed to include specific techniques and methodologies for assessing, preventing, mitigating and recovering collections and the buildings from various natural and human induced hazards.

Lastly, there is an urgent need to enhance the dialogue among professionals to further the cause of museum emergency preparedness. At one level, this dialogue needs to be encouraged amongst conservation professionals from sites as well as collections so as to facilitate integrated risk management of museums.

At another level, there is a greater need to foster communication between the conservation fraternity and the wider community of professionals in the field of disaster management. This is indeed crucial for mainstreaming heritage concerns in ongoing efforts towards disaster reduction and sustainable development.

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Notes

[1] One of the first efforts to recognise the need for protection of cultural and natural heritage from natural disasters was the UNESCO convention concerning the protection of the World Cultural and Natural Heritage in 1972. The Blue Shield movement for risk preparedness of cultural heritage, which started in 1996 and Kobe Tokyo Declaration in 1997 were important steps towards development of this initiative. The initiative has gained significant momentum over last few years with the organisation of the International Symposium on Cultural Heritage Disaster Preparedness and Response organised in Hyderabad, India by ICOM in 2003. It was followed by the recommendations on cultural heritage risk management adopted as part of the Second UN World Conference on Disaster Reduction in Kobe, Japan in 2005. Recently, a special session entitled 'Integrating traditional knowledge systems and concern for

cultural and natural heritage into risk management strategies' was organised by ICCROM and UNESCO World Heritage Committee as part of the International Disaster Reduction Conference (IDRC), Davos, Switzerland 2006.

[2] The living aspects of heritage deals with rituals and practices, skills and crafts, performing arts, vernacular building systems, ecological systems characterising the way of life of local people, which have evolved over time and are still surviving in similar or modified form. This dimension includes both tangible and intangible aspect of heritage and tends to seek the interrelationships that contribute to their living nature.

[3] 'Heritage components in a living environment' implies dealing with their present context. Here, the primary issues are concerned with protection and management of those significant components of heritage, which still survive in the present in totality or in parts, although as mute testimony to the past. However they find themselves in an entirely different context. The challenge for their protection and management is especially seen in those communities, which are very dynamic and are witnessing rapid social and economic transformation processes, by choice or compulsion.

[4] This aspect was investigated by the author in his doctoral research titled 'Reducing Disaster Vulnerability through Local Knowledge and Capacity - the Case of Earthquake-prone Rural Communities in India and Nepal' (1999-2002). The research sought the potential role of local knowledge, skills and resources for planning and mitigation measures to reduce vulnerability of rural communities against earthquakes in India and Nepal.

[5] Gilbert (1998) has classified numerous theoretical approaches to disasters into three main paradigms. The first is disaster as a duplication of war (catastrophe can be imputed to an external agent, human communities are entities that react globally against aggression). The second is disaster as an expression of social vulnerabilities (disaster is the result of underlying community logic, of an inward and social process). The third is disaster as an entrance into a state of uncertainty.

[6] It is multi-faceted, multi-year project that aims to advance the 'understanding and awareness of the nature of disaster phenomena and how to limit and contain damage by using preventive conservation measures in order to save cultural heritage and avoid the development of a crisis'. MEP includes public awareness, as well as the gathering and dissemination of information. These particular aspects of MEP will be carried out by ICOM working through its national and international committees. For more information about MEP, see http://icom.museum/mep.html.

[7] Risk assessment is an inherent part of integrated emergency management of museums. Through systematic methodology, all the risks confronting the museum (building, collections as well as people) were identified based on site observations and subsequently analysed as causes and effects, vertically as well as laterally. Various risk scenarios were created and further evaluated based on various indicators such as frequency/ probability, consequence/severity of impact and loss of values that determined various risk levels. Finally risks were prioritised based on locally available resources as well as constraints and analysis of various actors. Worksheets and checklists were developed and provided to the participants as tools for conducting risk assessment of 'the MEP Museum'.

Jantar Mantar, Delhi

A teaching laboratory with continued use

N RATHNASREE

ABSTRACT

The historic Jantar Mantar observatories built by Sawai Jai Singh in the 18th century need not be mere monuments today. They have immense potential to be used as a teaching laboratory for positional astronomy. There is continuous engagement of astronomy educators, students and amateur astronomers in the observatory. As a case example, it has been demonstrated by a group of volunteer observers from the Nehru Planetarium and the Amateur Astronomers Association at New Delhi, that the Samrat Yantra of the Delhi observatory, even in its current state of disrepair, is capable of measuring time with an accuracy of one second. This demonstration was made possible through a careful placing of temporary calibration markings for every minute on the quadrants of the Samrat Yantra. The calibration markings were then followed up, through public observations and collection of a public database of time measurements to demonstrate the achievable practical accuracies.

There is an increasing need for such awareness and calibration activities to facilitate the impetus to the ongoing restoration process. This process is essential for sustainable conservation of these observatories and long term measures for such activities needs to be planned.

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A view of the Samrat Yantra and the instruments to the south of it, at the Jantar Mantar observatory, Delhi

INTRODUCTION

The initial reaction of any Indian astronomer to the Jantar Mantar masonry observatories built by Sawai Jai Singh II, is that they are so poignantly anachronistic! Gigantic masonry instruments built early in the 18th century for accurate measurements of ephemeral elements of celestial objects, at a time when such accurate measurements had become possible through instrumental innovations in telescopes seems a bit debatable. However, from another perspective, Sawai Jai Singh was possibly way ahead of his times. He was attempting innovations in masonry instruments at a time when their utility was getting limited as compared to the accuracy achievable with telescope related instrumentation. Sawai Jai Singh had another utility in mind for these magnificent instruments. He deliberately set out to build something that would serve not just as an observatory for his own measurements needed towards a compilation of an ephemeris, but, would also serve as a teaching laboratory. He clearly stated this intended utility of his observatories in the preface to the 'Zij-e-Muhammadshahi', which was a compilation of all his astronomical endeavours. Sawai Jai Singh's intention was to popularise astronomy and bring serious astronomical activities within the reach of the *aam admi* or the common man. The effectiveness of his efforts towards popularisation of astronomy could perhaps be glimpsed from the coherent usage of his observed instruments for the calculations of *panchang* (Hindu calendar) in Rajasthan till date. The depiction of a solar eclipse, by the painter in a Ragamala painting series from Bundi (middle 18th century) also reflects the way Sawai Jai Singh's interest in astronomy may have influenced the artisans of that period. Otherwise, astronomical representations were not too common in medieval art from India.

Jantar Mantar observatories of Sawai Jai Singh can possibly be accepted as poignant heritage, anachronistic as well as ahead of time. All astronomers in India should have a keen interest in ensuring that this heritage is kept alive, through careful maintenance and continued usage of these instruments by school and college students, for astronomical observations. The instruments could have an enormous use to explain concepts of positional astronomy. They could be used for specific observational projects by students or by general public for special astronomy event observations.

CALIBRATION AND AWARENESS ACTIVITIES

Nehru Planetarium, with help from the Amateur Astronomer's Association, is contributing towards awareness and calibration activities, as a voluntary support towards the efforts of the Archaeological Survey of India to restore the markings on the instruments. The need of the hour is to ensure that

Patamanjari Ragini – from a ragamala series of paintings (Bundi 1750s) depicting a Solar eclipse, corona during total Solar eclipse, visibility of stars at totality, and the disturbance created amongst the birds, from the unusual darkening. Source: Splendour of Rajasthani Painting by Jai SIngh Neeraj, Abhinav Publications

this restoration process remains sensitive to heritage as well as true to astronomy. Modern day accuracies of observations are not possible with these masonry instruments, and they are not expected either. At the same time, practical accuracies are achievable, even when absolute beginners try their hands at observing with these instruments.

When one first works with these instruments, it is difficult to believe that such diffuse shadows can be characterised with the minuteness required to achieve the desired accuracies. The gigantic size of the instruments are a help here, allowing higher accuracy even when the shadows are pinpointed with just the intuitive feel that comes with continued observations. These achievable accuracies, also allow students to develop a respect for numbers hidden in nature. They come to the observatory, measure some lengths to the positions of shadows, learn to convert these lengths into altitude and azimuth of the Sun or time, compare their obtained results with theoretical values or calibrated clock time and are extremely thrilled to see the emerging accuracies in their own measurements! There is a whole paradigm shift in a student's understanding of positional astronomy concepts while walking through the spherical trigonometry that forms the construction of the Jantar Mantar instruments. It is this same spherical trigonometry which is somewhat difficult for them to grasp through the two dimensional pages of a text book. Walking through this spherical trigonometry definitely makes the concepts more accessible.

It is indeed sad that such a unique astronomical heritage has been lying waste for most of the 300 years since the time of the construction of this observatory, as is the case with other observatories in India, built around the same time. Once the observatory fell into disuse after Sawai Jai Singh's death, there has been no record of its use, even in periods following desultory renovation attempts for the Delhi observatory instruments. Though the pundits in Jantar Mantar continued to take readings but these were limited to a few knowledgeable persons only. Foreign travellers such as, Tiffentahler from Austria (1747), William Hunter (about 1790), William Franklin (1793), Major William Thorn (1803), Fanny Parks (sometime between 1822-45), Leopold Von Orlich (1845), Garcin de Tassy (1860), Carr Stephen (1876) and HC Fanshawe (1902), have written about the use of these instruments.

The Delhi observatory was renovated in 1852, when the Samrat Yantra was repaired, and again, in 1909-1910 when major renovation of the observatory was undertaken. A detailed engineering report by G Kaye (1918) was presented on the status and use of all the instruments of the observatory. The Niyat Chakra instrument of the Misra Yantra was renovated in 1951, which was the last major renovation work done for the observatory instruments. In recent times, there have been reports by Indian astronomers, on the status of the instruments and the need for a restoration and the use of the observatory at Delhi, for teaching positional astronomy (Babu & Venugopal 1993). The most comprehensive study of the status of the instruments of all the Jantar Mantar observatories of Sawai Jai Singh is presented by VN Sharma (1997).

Most of the existing literature about Jantar Mantar, Delhi, treats these as historical instruments that are presently not in a usable condition on account of their state of disrepair. The existing literature also limits

Amateur astronomers helping visitors compare the angle inside the triangular gnomon of the Samrat Yantra, with the latitude of Delhi, during the Spring Equinox 2005

Students of Sanskriti school measuring the Altitude and Azimuth of the Sun, using the Jai Prakash

itself to a theoretical understanding of the possible usage of the instruments. But, there are no observations taken by astronomers that can actually characterise the properties and vagaries of each instrument. The situation changed in March 2004, when the Nehru Planetarium conducted public observations for the first time using the Ram Yantra and the Sawai Jai Prakash Yantra to measure the co-ordinates of the Sun and Venus as part of the 'Transit of Venus' educational activities. The aim was to measure the maximum elongation of Venus from the Sun, preparatory to using the actual observations of the transit of Venus across the face of the Sun on June 8, 2004 for measuring the Earth Sun distance.

Many school/college students and visitors to Jantar Mantar, enthusiastically participated in taking these observations in March-April 2004. Once the methods of observing with the instruments are clearly understood, their use was appreciated through this exercise. The observations and activities conducted in March 2004 were reported in November 2004 issues of Resonance (Rathnasree 1984). During these observations, the altitude and azimuth of the Sun and Venus were measured independently, which were later used to determine the angular separation between the Sun and Venus. The Ram Yantra and the Jai Prakash were used for these measurements for the first time since the observatory fell into disuse.

The Ram Yantra is built as two complimentary cylindrical instruments, ideally designed for an easy measurement of the altitude and azimuth of celestial objects. Altitude is the angular height from the horizon, of a celestial object. One could drop a perpendicular from the object on to the horizon, and mark this point as 'P'. Starting from the direction North, the angle made by sweeping towards the East, until the point 'P' is reached, is the azimuth of a celestial object. Each of the cylindrical instruments consists of a circular wall and a gnomon at the centre. The height of the walls and the gnomon, have been designed to be exactly equal to the inside radius of the building measured from the outer circumference of the thick gnomon, that is, the height of the gnomon is exactly equal to the length of the floor of the instrument measured from the outer circumference of the gnomon to the inner circumference of the wall. The requirement is to observe the shadow of the gnomon, determine its centre and mark it on the floor or the walls of the instrument, wherever it falls.

The floor is divided into thirty sectors and thirty gaps of the same dimension as the sectors. Each of the sectors is thus spanning six degrees of azimuth and they are further subdivided into six degree markings. Thus, angles of one degree each can just be read from the azimuth markings. Finer graduations seem to be missing from the Delhi instrument, in its present condition but temporary calibrations for finer accuracy can always be achieved using tape measure placed parallel to azimuth circles or measured along the radial direction. The gaps are for facilitating the movement of observers to read the markings and hence, the complimentary instrument is designed in such a way that, the shadow falls on a sector of one of the instruments, if it falls in the gap for the other instrument. The walls of the instrument are also graduated similar to the floor, each of the markings representing one degree in azimuth and one degree in altitude.

Readings were taken by visitors to the observatory on March 29, 2004 (refer table); after some initial

Altitude and Azimuth readings for the Sun (March 29, 2004)

Observers	Time	Altitude		Azimuth	
	(IST)	(Obs.(in degrees)Th.)		(Obs.(in degrees)Th.)	
Sanskriti School	12:18	65	64 .82	174	175.37
Sanskriti School	12:25	64	64.90	180	179.48
Samridhi/Sneh	13:00	63.53	63.88	199	199.67
Lady Irwin College students	14:30	51.35	51.45	235.75	235.67
DPS Noida students	14:53	47	47.00	240	241.22
Sarvodaya Vidyalaya students	15:00	44.1	45.78	243	243.06
Usha Menon	15:30	39.77	39.75	249	249.12
Cheena/Dolcy	16:00	32	33.49	254	254.24
KDA/Hansraj/Jindal	16:30	22	27.09	258	258.71
SKV students	17:10(?)	16	18 .38	252	263.95

explanation was given to them for observing, by the staff of Nehru Planetarium. This was their first exposure to observing with the Ram Yantra and considering this, the accuracies obtained by such casual observers is commendable.

Since March 2004, the Jantar Mantar observatory has been in use for collecting a database of astronomical observations and also for teaching of basic positional astronomy by teams of observers from the Nehru Planetarium, Amateur Astronomers Association, Delhi, and the NGO Science Popularisation Association of Communicators and Educators (SPACE), through voluntary work. This work has emphasised that notwithstanding the state of disrepair of the instruments, they are in a condition to be used for astronomical observations and teaching of astronomy. This usage could proceed, in spite of the fact that most of the markings on the instruments are missing and the instrument surfaces have patchy layers. In the absence of markings on the instruments, such usage would need to make measurements of the entire dimensions of the instruments, and then measure the position of Sun's shadow or the reflection of a night time celestial object, in the instrument, for every data point collected. Why would there be an interest in the collection of such a large data-base of observations using the Jantar Mantar instruments, while being well aware that these are not unknown numbers being pulled out from nature? The interest comes from the fact that such a large data-base collection of known celestial quantities, would allow us to characterise the unknown masonary parameters and small errors in the actual conversion of spherical trigonometry into masonary that went into the construction of the instruments of the Jantar

Amateur astronomers helping to measure the dimensions of each individual segment of the Ram Yantra, helping with the efforts of the Nehru Planetarium, New Delhi, to obtain a complete calibration of all the Jantar Mantar instruments of the Delhi observatory

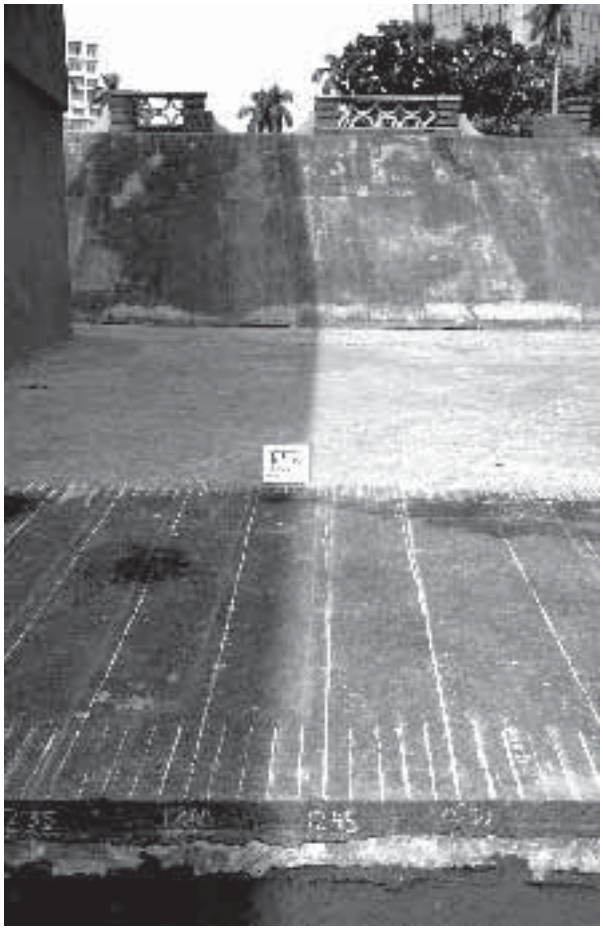
The twin Ram Yantra instruments of the Delhi observatory

Mantar early in the 18th century. There is an existing ongoing process for the functional restoration of the Jantar Mantar observatory instruments, in which, the Nehru Planetarium, is participating with the required astronomy inputs. One aspect that has been of primary importance while looking into the restoration of the observatory instruments has been the recognition that the exact status of the instruments in their present state be recorded completely. This recording has taken the form of measured and survey drawings for the Misra Yantra that was conducted at the initiative of the Apeejay Park Hotel. Detailed photographic recordings of all the aspects of the instruments that form part of the Misra Yantra is also ongoing under this endeavour.

There is another way in which a complete recording of the present status of the instruments could be obtained, before proceeding with the restoration process of the instruments. This would be through a compilation of a large database of positional astronomy observations, using the instruments in their present condition. If such a database is collected ensuring a wide spread in the times of the day and year, when the data has been obtained, it will create a reasonably representative picture of the actual astronomical condition of the observatory instruments, in their present state. The observers from the Nehru Planetarium are involved in obtaining such a large database of astronomy observations using each and every instrument of the observatory, which can be utilised to completely characterise the state of the instruments in their present condition. The actual process of restoration could take place after such a systematic recording is completed, for every instrument segment, though this is a formidable task. As of now, it is only for the quadrants of the Misra Yantra and for the Karka Rasi Valaya, the instrument on the back wall of the Misra Yantra, that such a data-base has been collected by observers associated with the Planetarium. This activity has been a purely voluntary work undertaken by the staff of the Nehru Planetarium and the Amateur Astronomers Association with no formal funding or support. Completion of the envisaged database collection, would however, need a more formal support structure. Observations using the gnomons and the quadrants of the Misra Yantra have been completed by the Nehru Planetarium by January 2007. The quadrant segments of the instrument were also tested with temporary templates that were prepared by observers from the Planetarium in March 2007.

CALIBRATION OF THE SAMRAT YANTRA

Major calibration work for the quadrants of the Samrat Yantra was attempted and completed with very interesting results during September - December 2006. This calibration work showed, for the first time, that a practical accuracy of one second in measuring time is feasible with the Samrat Yantra. The Samrat Yantra at the Delhi Jantar Mantar observatory has a strange history. It seems to have had a problem of water seepage at the base of the instrument in the last few decades. To overcome this problem, at some time, part of the excavated pit around the central gnomon of the instrument was filled up. This resulted in the loss of a segment of the quadrant of the instrument on either side of the central gnomon. On account of these missing segments of the quadrants, all existing literature treats the Samrat Yantra as an instrument that is no longer usable. Near the central gnomon of the Samrat Yantra, a horizontal cemented platform is present that seems to

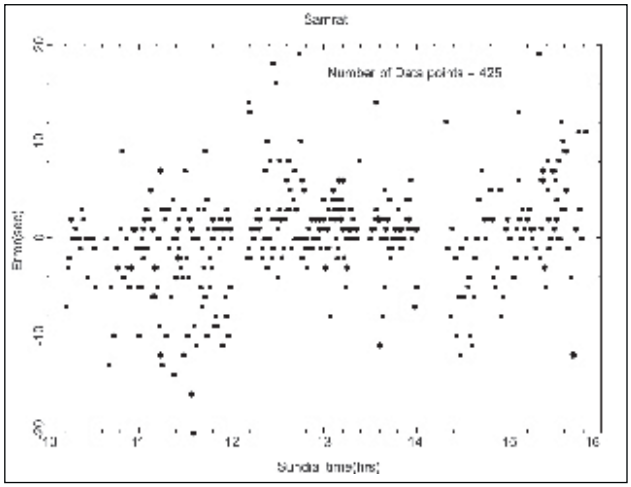


Chalk calibration markings made on the Samrat Yantra quadrant

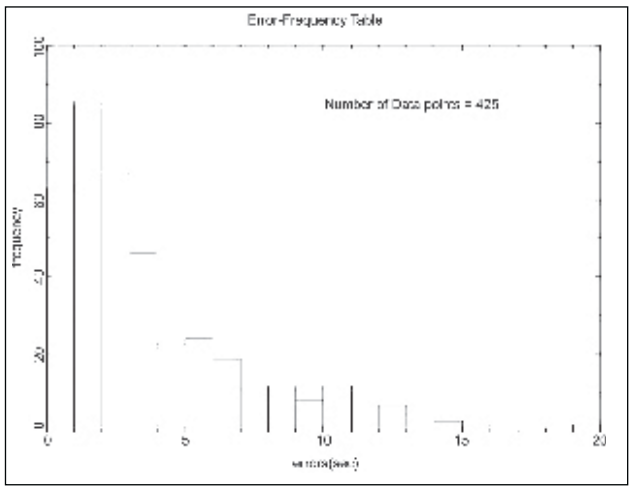
be a continuation of the quadrant. The instrument can be used as an Equinoctial sundial, using the original calibration of Sawai Jai Singh's astronomers on the intact segments of the Samrat Yantra and a calibration analogous to a European sundial on the horizontal platform where the quadrants are missing. In its current state, if the markings are redone on the instrument, the Samrat Yantra will be a unique sundial in the whole world, on account of its chequered history. It will be an Equinoctial sundial with an oriental design for its quadrants for the morning and evening hours, and more like a European sundial close to noon hours.

A completely theoretical calibration of the instrument in its present condition, would require an accurate measurement of the length of the quadrant that is presently above the level of the surrounding ground as well as the length of the horizontal platform that is the continuation of the quadrant would be required. On account of the many masonry irregularities that are now present on the instrument, it is very difficult to get accurate measures of these lengths. An observational calibration of the instrument was attempted, to get a preliminary idea of the possible accuracies with this instrument. When markings are present on any sundial, one reads the sundial time and applies the appropriate corrections to obtain the standard time. The constant correction due to longitude difference between the Samrat Yantra (latitude 280 37' 36", longitude 770 12' 59", as measured using a commercial GPS) and the standard meridian for the Indian Standard Time (IST), is an addition of 20 minutes and eight seconds to the sundial time. The equation of time correction also has to be added or subtracted appropriately to this.

While doing an observational calibration this process was reversed. The shadow position was marked for every minute of sundial time, by applying the appropriate correction to Indian Standard Time. The clock used to make this calibration was set to one second accuracy with kind help from the Timing and Frequency Division owf the National Physical Laboratories. This clock synchronisation was repeated every few days while the calibration work was in progress. A calibration marking made on any given day was tested out repeatedly on subsequent days, using the appropriate equation of time for that day. In some cases, accuracy was achieved iteratively, while many markings made for the first time did turn out to be accurate to one/two seconds at the first attempt; proving that this kind of accuracy is possible on account of the immense dimensions of the instrument.



Errors (in seconds) obtained by students and amateur astronomers, reading time using temporary calibration markings made in chalk, for the Samrat Yantra of the Delhi Jantar Mantar Observatory, in December 2006



A histogram of the errors in time (in seconds) obtained by students and amateur astronomers, using the temporary calibration markings made for the Samrat Yantra of the Delhi Jantar Mantar Observatory, in December 2006

CONCLUSION

An enormous amount of work needs to be carried out to complete the database collection for every instrument of the observatory, before restoration work is undertaken for that instrument. Such work is only feasible with engagement of educational institutions. An inclusion of the positional astronomy aspects of the Jantar Mantar instruments in the senior school/BSc (Physics) syllabus would go a long way towards ensuring such a student presence. The MSc Astrophysics course at the Delhi University already has few lectures devoted to basic positional astronomy concepts related to horizon co-ordinate system and the

Equatorial co-ordinate system. Considering that it is precisely these co-ordinate system measurements that are brought alive by the Jantar Mantar instruments, a formal inclusion of a practical laboratory session for these sessions at the Jantar Mantar observatory, would ensure an interested student use of the observatory.

While Jantar Mantar serves as an educational resource, a strong support structure is essential for work to be done by educators and students, particularly at this stage when database collection is required. Hence, the process of restoration of the observatory requires a continous collaboration between astronomers, conservation architects and engineers over an extended period of time. This functional restoration is to be done in tandem with conservation ethics by retaining the historical and archaeological integrity of the Jantar Mantar observatory.

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Heritage-Slum Relationship in Mumbai

Coexistence and conflict

SHEELA PATEL AND MALVIKA AGARWAL

ABSTRACT

Heritage conservation is not just concerned with physical objects and structures under the scrutiny of the historian or conservationist. More often, it is about the relationship that different groups of people have with heritage, and about finding a solution for the complex issues that arise from these overlapping, conflicting interests. These conflicts are acutely highlighted in cases where heritage resources become the centre of battles for conservation, land use, and people's rights to the spaces they use, a scenario common to urban India today.

This article focuses on the case of the rock cut temples in Mumbai, their occupation by the city's burgeoning slum population and their eventual reclamation by the agencies officially in charge of their protection. While conservation and preservation is the prime agenda of official agencies, people who have built relationships with the sites over the years; as living, recreational and religious spaces, are also an important part of the development process. Solutions, therefore, need to be found to create an integrative system, one that acknowledges the diverse relationships that exist at heritage sites and works to reconcile them with the elite, official conservationist concern that often holds no meaning at the grass root level.

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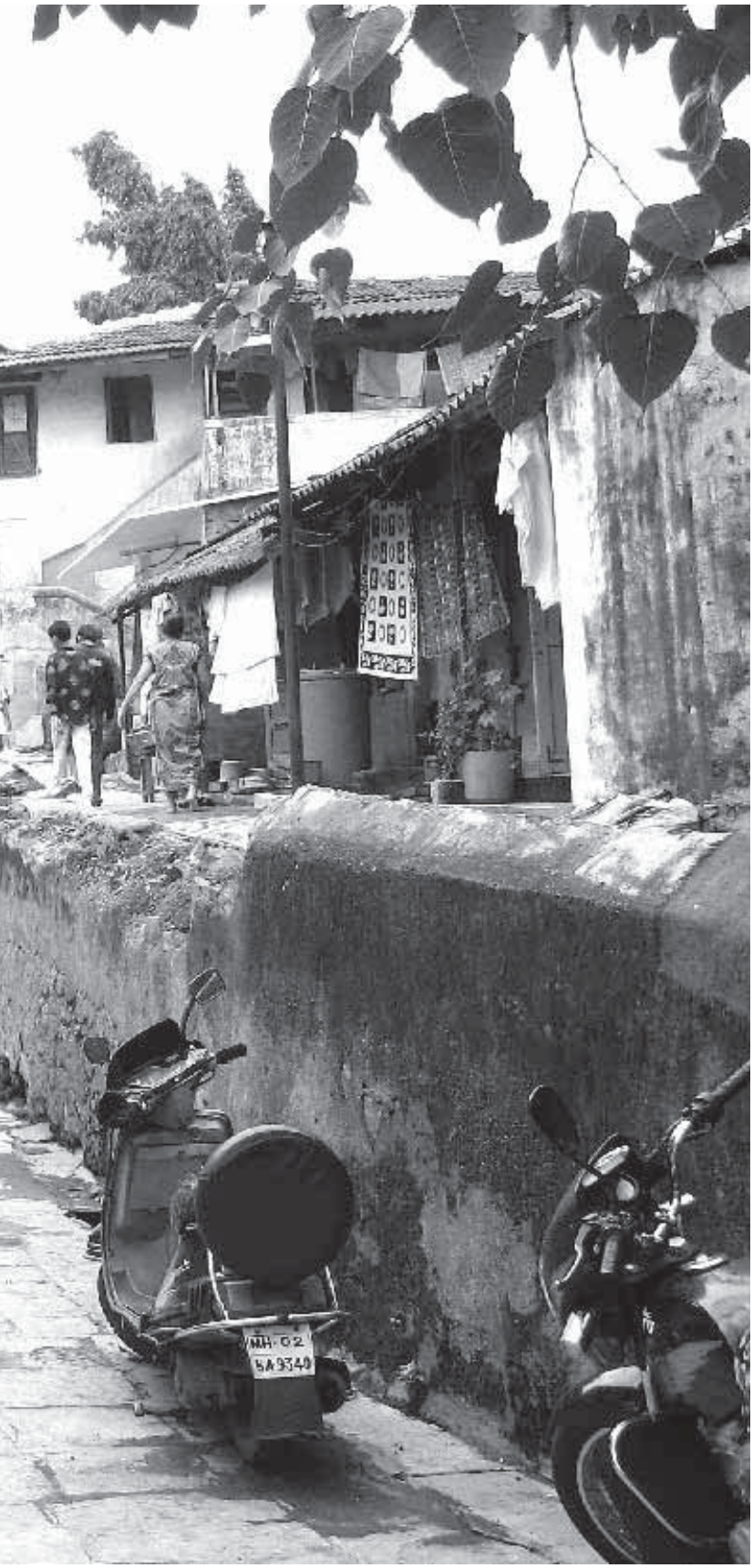
Malvika Agarwal is a freelance heritage consultant, currently working in conjunction with SPARC, towards developing a sustainable and symbiotic developmental solution for heritage sites and slum communities in Mumbai.

Entrance to the Jogeshwari caves



INTRODUCTION

Heritage conservation and development in India is a complex, long-drawn process involving governmental agencies, funding priorities, bureaucratic obstacles, and, increasingly, private sector organisations that have been taken into the fold. The focus of official (and several unofficial agencies) in charge of heritage in India largely remains on conservation, preservation and maintaining structural integrity. Conservation is further complicated in the urban centres of the country, with space constraints, population pressures and higher amounts of pollution contributing to faster decay. People are seen as the major cause of damage to sites – through deliberate destruction, pollution, damage through construction activities, or 'inappropriate' usage of sites. People, therefore, tend to be fenced out, access being given only to the tourist who can afford to visit sites, or the intellectual who 'appreciates' their value.

Heritage conservation thus remains in the realm of the elite even though, ironically, it is the common man that lives near or uses the site and has the greatest direct influence on it. While the protectors of heritage tend to have a negative attitude towards resident communities, the communities themselves have a mixed outlook towards ancient sites and monuments, the term 'heritage' being something of an alien concept. While these sites are used as residential, occupational, recreational and even religious spaces, their ascribed status as historical spaces, important primarily because they are old, is not a concept that is accepted easily. For people who struggle for basic amenities and living space, the thought of spending precious resources on keeping old buildings maintained is not one that can be understood or respected.

This conflict of perspectives is the cause of most of the contention around the conservation versus community debate. Internationally, heritage stands at the centre of a battleground of ownership; legal, intellectual and emotional (Graham, Ashworth & Tunbridge 2000). The need of the hour is for a realisation that heritage preservation and development of communities are not mutually exclusive areas of concern, and can in fact coexist in a symbiotic relationship.

Mumbai, the financial capital of India, and the city with over 55% households living in slums, has to

The ancient Jogeshwari caves were located in an isolated semi-forested area much to the north of the later developed city of Bombay (Now Mumbai). With urban growth from south to north, the caves are now part of a three decade old densely populated slum settlement called Pratap Nagar Basti.

deal with conflicts between slums which although deemed illegal, are a response to demand of habitat that arises from lack of planned provisioning. The potential of balanced arbitration as the way forward is explored through a case study of the Jogeshwari Caves of Mumbai that face extreme circumstances today.

BACKGROUND

Mumbai's structural heritage, although not as profuse as other cities in the country, comprises of sites of great significance. Some of the earliest Buddhist and Hindu rock cut temple complexes exist in the densely populated north of the city, dating between the first century BC and the fifth century AD (Rowland 1970). The Jogeshwari caves are one of these ancient temple complexes. Considered the oldest surviving example of Hindu rock cut architecture in the world (Patel 2007) as well as the architectural and stylistic precursor to the Elephanta Caves, they are also part of the Pratap Nagar Basti, a three decade old slum settlement that has completely engulfed the structure.

Originally a Shiva temple dating back to the fifth century, the Jogeshwari caves were abandoned over time. Even though the site was officially listed by the Archaeological Survey of India (ASI) as a monument of national importance as far back as 1907, there was no supervision or security provided to it, and it is only recently that a fence was installed at the site. The site stood isolated in a semi-forested, hilly outcrop in the north, infested by bats. However, as the city expanded from south to north, the area around the caves soon started attracting the poor who settled near and eventually around the caves. The density grew to the point that people even built houses on top of the rocky outcrop within which the caves had been cut. While on one hand the ASI ignored the worsening condition of the site (the only ASI office for Maharashtra at the time being located in Aurangabad), on the other hand, the Municipal Corporation of Greater Mumbai (MCGM) and the Government of Maharashtra, ignored the obvious lack of housing availability for the poor and let the slum grow unchecked. By the 1990s, the caves were inaccessible to outsiders, not only because of their location in the middle of a densely populated slum, but also because of the stench and filth inside, as there were no sanitation facilities, drainage or sewer networks. However, the site is a home to the people that live there. Religious activities have been restarted (five different shrines currently exist, hundreds of people throng to the caves for the festival of Mahashivratri), children use the peace and quiet of the caves to study in, or the open spaces to play and adults go there for afternoon siestas. Some of the smaller caves were also used as toilets due to inadequate provision of sanitation within the settlement.

CURRENT CONDITION

Structurally, the site has degenerated through years of neglect. Sewage, waste and water seepage, coupled with the weight of the hutments on top, has damaged delicate sculpture and created dangerous cracks in some parts of the complex. The slums, although the most obvious problem, are definitely not the only perpetrators. The MCGM has also laid down drainage lines near by, and given permission to construction projects very close to the structure, this despite having the caves marked out on their Development Plans for the area, and in contradiction to the *Ancient Monuments and Archaeological Sites and Remains Act 1958* (Government of India) which does not permit any development within 100 metres of a listed site, with additional regulations on a further 200 metres.

In reality, however, apart from several multistorey buildings in the area, two major roads also have breached the law in this regard.

In 2005, a Public Interest Litigation (PIL) was filed against all the official agencies involved in the protection of the ancient cave temples of Mumbai in an attempt to improve their conditions, following a series of articles in a local newspaper decrying the condition of the caves. While the Mumbai High Court asked for explanations from all the official agencies, the first step it ordered was to demolish the structures that were on top or immediately adjacent to the site. No communication was established with the slum dwellers before the demolition was executed. At the same time, the MCGM sought to complete construction work in the area that had been stopped because of the PIL, while the ASI put up a wire fence around the top of the site to keep people out. The police absolved itself of responsibility by saying that location prevented constant monitoring, while the MCGM stated that the caves were not their jurisdiction.

In its final judgment in August 2007, the High Court ordered appropriate rehabilitation of the slums under the Slum Rehabilitation Authority guidelines, as the first step towards developing the site. Since then, a survey has identified 750 structures within the prohibited 100 metre zone around the caves, and some basic repair work has been undertaken, but no further negotiations have taken place. The ASI is to draw up and submit an immediate plan of action for the caves, which will ostensibly be ready in the coming months.

The official agencies' attitude is further slowing down the process, as they view the slum dwellers as no more than encroachers. Their relationship with the site as a place of worship, recreation and daily activity has not been considered in this process of removal. The plan submitted to the High Court by an appointed committee has asked for the site to be conserved, beautified and opened up to tourists, disregarding the future of the hundreds of people who live there. A parallel can be drawn here with other sites in the city that have had similar issues; railway and airport land, road expansions. In the past such need for the space that the poor needed led to evictions where households just had to 'disappear' which meant they went and encroached some other place. More recently after much activism, there are rehabilitation policies in place that require the state to provide alternatives to the households so affected, but the struggle to ensure participation and ongoing rehabilitation after relocation still continues.

The situation at the caves is presently a grid-lock, due to lack of communication and coordination between the ASI and various other institutions in the city that need to be involved. None of the agencies have sufficient infrastructure or resources to deal with this very complex situation single-handedly. Aiming for mere 'beautification' can not result in an economically sustainable solution for the site, and the short term solutions would result in a direct opening for the urban poor to come back and settle at the site.

A POSSIBLE SOLUTION

The first and most important aspect of the strategy towards a solution lies in embracing the heritage of the entire region as a whole. This metropolitan region has a large number of such caves, many that are not encroached, but in a terrible state as well. They all need to be seen as one project whose vision for development has to go beyond conservation, and bring them into the region's present engagement, for children from schools and citizens to seek and explore this heritage, for tourists to come and link this ancient treasure to the present day. Looking at heritage as a field in itself continues to isolate it by the monopoly of the official agencies. Especially in the urban environment, the least feasible solution is for a faceless agency to put up a fence around the site, spruce the structure up, lay out a garden, and expect it to stay that way. Yet this archaic solution is the one that is implemented over and over again. Heritage management by the ASI needs many partnerships to make this change take place. In Mumbai for instance, the Mumbai Metropolitan Region Development Authority (MMRDA), has both resources and capacity to bring all the stakeholders together to design a solution. Viewed through the lens of partnerships, the issue of conservation and beautification, which is one aspect of the management process, can be made more participatory and negotiable. The focus, while undertaking all these processes, has to be on balancing heritage conservation with slum rehabilitation, land rejuvenation, economic upliftment of the area, awareness generation and tourism.

The starting point is to locate leadership which can arbitrate between the conflicting interests that prevent development, through combining the needs for development as well of heritage conservation; creating capacities for communication between agencies, private sector organisations, affected communities and other groups that play a significant role in what happens to the sites during and after the planning and execution

View of a porch at Jogeshwari caves

(Hall & McArthur 1996). Moving on from the linear process of first drawing up a conservation plan and then expecting everyone else to fall in line, the approach has to be based on two-sided awareness: conservationists and heritage planners addressing the communities' significance, as much as they expect communities to be aware of the significance of heritage sites.

For the urban environment, lessons can be learnt in how other areas of development have started functioning, vis-à-vis slums and other agencies. For many decades eviction of slums was undertaken to proceed with undertaking public and private projects in cities. Increasingly, this approach has failed to produce outcomes, while dialogue and negotiation with communities facing such eviction and providing them with alternatives for relocation has emerged as a successful means in completing large infrastructure projects. The heritage development process is similar to other urban development processes, whether they are for road widening or creating more land for the airport, as all require a change in attitude towards communities and residents to produce sustainable solutions for the cities. This means a change in approach from an absolutely object-centric to a more inclusive perspective that recognises that the rest of the world does and will have an effect on the site; it cannot be isolated and protected forever, especially not in an overcrowded urban context.

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Sustainable Solutions

Naya Raipur, Chhattisgarh
A sustainable urban design perspective

SUDESHNA CHATTERJEE

ABSTRACT

The journey for creating a new capital city for Chhattisgarh began in 2001 and survived changes in administration led by different political parties. Despite the criticism often leveled against making new cities, and in particular capital cities, a new capital city in the fast urbanising and globalising context of India today provides a unique opportunity to develop land and infrastructure keeping in mind the intensifying discourses around identity, growth, equity and environmental sustainability.

The main objective of Urban Design of the new capital city of Chhattisgarh, Naya Raipur, is to visualise a new medium density, medium rise city on an 80 square kilometre greenfield site for a population of 5,00,000. The overall goal is to create a capital city for Chhattisgarh in which regional identity of the state and the democratic ideals of the nation are upheld, and the future aspirations of the new city to play a vital role in the global economy nurtured. To reinforce the role of Naya Raipur as a new 21st century capital city, planning and design of the city promotes sustainable urbanism by combining the creation and enhancement of transit-served, pedestrian and diverse places integrated with high performance, energy efficient infrastructure and buildings.

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BACKGROUND

Chhattisgarh became the 10th largest state of India when the 16 Chhattisgarhi speaking south-eastern districts of Madhya Pradesh gained statehood on November 1, 2000. For the last seven years, the Secretariat for the new state has been functioning from an old hospital building in Raipur city (the administrative headquarters of Raipur district), which was assigned the role of the capital city of Chhattisgarh till a new, more appropriate capital city was planned. In 2001, the first Congress government of Chhattisgarh, led by Ajit Jogi, promoted the idea for developing a new capital city on a greenfield site based on the model of Chandigarh and Gandhinagar. The present capital, Raipur, spreads over 188 square kilometres and is the largest urban agglomeration in the state with a population of 6,70,042 (2001). Currently, Raipur is experiencing growth rates higher than the state with the population projected to touch the 1.5 million mark by 2021. This has resulted in congestion. Further, the inefficiencies due to lack of appropriate infrastructure as a legacy of mostly unplanned growth has compounded the urban problems of Raipur. Already stretched to its limits, Raipur is unable to deal with the added pressure of capital city growth. In 2001, the government invited several planning firms to help with the selection of the site for the new capital city within a 50 square kilometre radius of existing Raipur. An international competition was organised to choose the planning and design team for creating the new capital city of Chhattisgarh. The Delhi based firm Consulting Engineering Services (CES), won the competition and was appointed in August 2002 to undertake the job. The site for the new city spreads over 80 square kilometres and is bound on the north and south by two existing railway lines, on the north and south-west by two national highways, and on the west by the Raipur airport.

The 20th century is the century of capital cities. In 1900, barely 40 nations had capital cities. By 2000, there were more than 200 capital cities across the globe (Gordon 2006). Creating new capital cities, especially national capitals, is seen to be problematic for reasons of cost, disruption and political unrest. The situation has, however changed, as the urgent need for new capitals for newly formed states in the developing world is felt, at the important historical moment of the new millennium where such states are poised to create new identities for themselves at regional, national and global levels. Moreover, a new capital city provides a unique opportunity to develop land and infrastructure keeping in mind the intensifying discourses around environmental sustainability and its role in combating climate change. The progress made in the fields of environmental design, informational revolution, high-speed mass transportation, and the imperatives of social development in planning, has better equipped planners to deal with the traditional tripartite struggle over balancing growth, equity and environmental issues (Campbell 1996).

In 2006, CES created a good concept master plan for Naya Raipur by establishing an innovative transportation network that was integrated with the land use pattern for the city. This laid the blueprint for the essential structure for this new greenfield development. To take this planned structure beyond the abstraction of land-use patterns required a 'total urban design' approach to articulate the grain of the city right down to the tertiary street level within neighbourhoods and with special focus on the public realm and the buildings that frame it (Lang 2005). This meant involving a team of people, essentially urban designers and landscape architects, who visualised the total development and devise strategies for controlling it.

SHAPING A NEW IDENTITY THROUGH SUSTAINABLE URBANISM

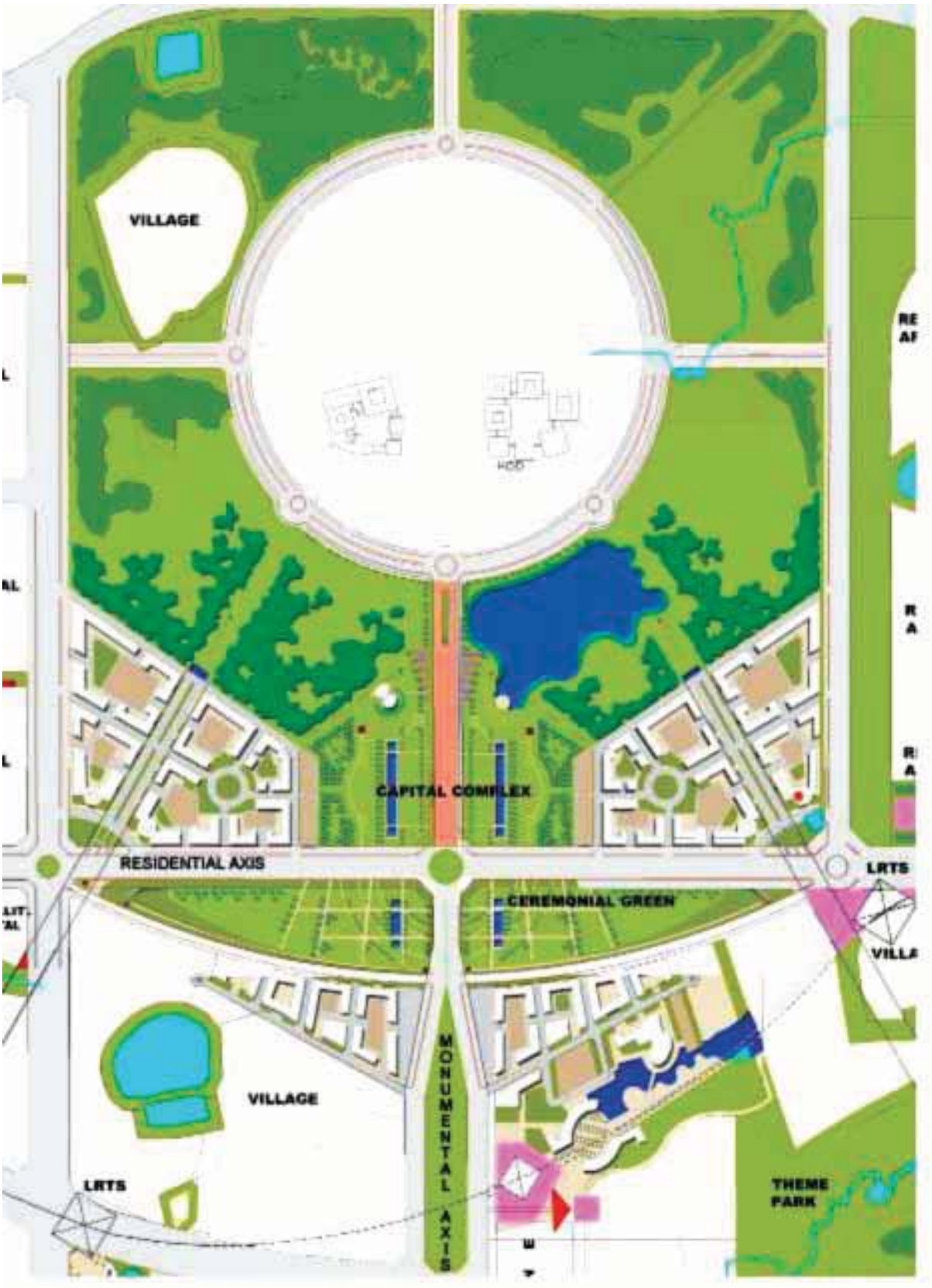
The main objective of Urban Design of the new capital city of Chhattisgarh, Naya Raipur, was to visualise a new city on an 80 square kilometre greenfield site for a population of 5,00,000. Naya Raipur is planned as a compact linear city with a mass transit system, namely Light Rail Transit System (LRTS) running along the long North-South axis of the city that connects the two railway stations at the two ends. One of the most remarkable features of the Naya Raipur plan is the use of this long North-South spine of the city as the amenity spine with spaces for work, including small scale work spaces for professionals; recreation, education and health services (larger than those provided at the neighbourhood scale) within walking distance of all neighbourhoods. All residential neighbourhoods, on either side of the amenity spine, are pedestrianised along with cycle tracks connecting the mass transit system. The LRTS is only two kilometres from the farthest end of the residential areas on either side of the long North-South axis of the city. All work areas in the city are connected to the LRTS and the bus system. On either side of this axis, the city space is structured by imposing a street grid which divides the city into several different sectors with diverse environmental conditions. The typical sector is 800 metre x 800 metre and the inter-sectoral roads

Urban Design Master Plan

Typical residential neighbourhood

intersect at street roundabouts. This transportation network grid is similar to the planning of celebrated British New Town Milton Keynes and the iconic plan of Chandigarh though the scale of grids in Naya Raipur, in embracing walking distances as a guiding principle, is smaller than both these cities. Buses will ply on all arterial streets and facilitate integration of all land uses with the public transportation system.

The grid planning that broadly outlines the city sectors was not carried inside the sectors to leave room for design flexibility based on environmental, behavioral and cultural considerations. Each residential sector of the city is envisioned as a sustainable community with diverse housing types that cater to the needs of a heterogeneous Indian society, with provision of everyday needs within five minute walking distance in the neighbourhood. A car free central, multi-nodal open space within each neighbourhood allows residents to walk end to end in all four directions without encountering major roads. Such a place also allows different user groups marked by age and gender to simultaneously claim space in the heart of the neighbourhood by appropriating the many diverse outdoor settings. Near the entry to each neighbourhood, space has been allocated for informal sector including weekly markets. The open space system also houses the diverse social infrastructure of the neighbourhood as strategic landmarks at the end of residential streets to create interesting vistas and to enhance visual connectivity. The highest point in the city is on the eastern edge, and by a happy accident is approximately in the center of the long mass transit axis. This high area is demarcated as the site for the capital complex



Part of monumental core showing capital complex precinct

Car free central plaza of Naya Raipur CBD

Multi-modal transport hub as a gateway to the city

Sustainable Urbanism

Sustainable Urbanism represents a new paradigm for designing and developing human settlements in the 21st century as discourses on climate change intensify around the world. Douglas Farr (2008) in his book, 'Sustainable Urbanism: Urban design with Nature' proposes an integration of human and natural systems by combining the learning from three movements—smart growth, new urbanism and green building, to define an approach to design and development truly capable of producing an urbanism that is sustainable.

The green building and smart growth initiatives by themselves are half measures, as under these paradigms a high-performance building can be certified green even if such a building is located in a completely automobile-dependent context. Similarly walkable neighbourhoods by themselves are not sustainable if they do not incorporate green building practices.

Farr defines Sustainable Urbanism as 'walkable and transit-served urbanism integrated with high-performance buildings and high-performance infrastructure'. The key ideas that underpin Farr's definition of Sustainable Urbanism are:

- Increasing density as higher density developments consume less land, protect water quality, make it easy to attract and retain public transit riders and create a reliable market for walkable communities near transit service.
- Creating sustainable corridors to integrate transit and open spaces for conserving biodiversity across the developable land and region.
- Creating sustainable neighbourhoods where the overall size is suitable for walking and transit service; weekly shopping needs are available at a walkable distance; different housing types cater to the diverse population needs; special sites are reserved for civic purposes; and a network of streets allow pedestrians, cyclists and motorists to move safely and comfortably through the neighbourhood.
- Promoting bio-philia by connecting with nature through parks, greenways, bio-retention systems for run-offs; better design of external lighting to eliminate glare, over-lighting and light trespass; and local food production.
- Promoting high performance buildings and infrastructure through design to meet energy consumption performance standards and carbon-neutrality in buildings and developments; incorporation of core best management practice (BMPs) in infrastructure projects; and advocacy for incentives and actions to ensure all buildings and developments meet these targets.

that comprises of the Vidhan Sabha, government headquarters and the Secretariat. These buildings were confined to an inner circle within an extensively landscaped precinct. The design of the capital complex within the inner circle was left out of the scope of urban design.

A study of 20th century capital cities by Vale (2006) reveals certain time tested patterns that define the urban design of capital cities: government functions were typically separated from the rest of the city through strict control of land uses; strong spatial ordering dictated what was important to the prevailing political ideology and the identity of the state; and strong axial planning was complimented by grand public architecture. In Naya Raipur, the middle part of the city, along its short axis, starting with the capital complex and ending with a major work area bordering the airport land, form the monumental core of the city. The government or state power dominates its eastern landscape, and economic functions including a central business district, a software park, cultural district, convention centers, and hotels command the western or lower end of the axis. The residential areas are on either side of this East-West oriented short monumental core, along the long North-South people's axis of the city. Naya Raipur offers valuable public space in the most prominent nodes and locations as sites for display that showcase tribal and emerging contemporary works to solidify a cultural identity rooted in a tribal past. These public spaces are also created for beholding important public buildings as well as for promoting interesting, multi-purpose environments in themselves for diverse civic and recreational activities.

The health and environmental benefits of connecting human beings to nature is promoted through creation of mandatory open spaces along sensitive natural features such as drainage channels, wooded areas, parklands and lakes to protect and enhance ecological systems as a citywide strategy. All public areas of the city are designed according to principles of universal design so that people with different abilities will have access to the city. Issues of equitable development are further addressed in promoting two residential sectors, at opposite ends of the city near the two railway stations, as sites for affordable housing in addition to the pockets earmarked for Economically Weaker Sections (EWS) within each residential sector. These two sectors are chosen for affordable housing because they contain two large villages, Reiko and Upparwara, that will inevitably expand and provide housing to migrant labour entering the city. It is in the best interests of all to provide low-cost housing with secure tenure in these locations to preemptively address the inevitable haphazard growth of informal housing. The design of Naya Raipur is mindful of the complex needs of growth, equity and environment in the process of development of the new city.

THE MONUMENTAL AXIS AND THE RESIDENTIAL AXIS

One of the key features of the Naya Raipur Capital City Plan is two intersecting axes, one to celebrate power, the monumental axis, and the other to embrace everyday life, the residential axis. This is another time-tested urban design structuring move in capital cities-the power axis of 'Rajpath' and people's way of 'Janpath' in New Delhi, the short 'monumental axis' and curved 'residential road axis' of Brasilia, are some examples. In Naya Raipur, the monumental axis is the short axis and is of course a center of power, but also a cultural hub (similar to the Mall in Washington DC) and a major work district for the city. The East-West monumental axis emanates from the capital complex on the highest point on the eastern edge of the city. But soon after the beautifully landscaped capital complex precinct, the monumental axis is intersected by the North-South residential axis which runs along the entire length of the city and structures the residential districts and all other uses outside the small monumental core. The point of intersection of the two axes are celebrated by a large semicircular plaza that serves as an active recreational hub as well as a site of display of significant art installations and a space for beholding the capital complex and other grand public buildings all around this intersection. This plaza is a pedestrian environment with integrated cycle tracks. It provides smooth passage to both pedestrians and cyclists via subways in all directions.

To the west of the plaza, the monumental axis becomes a divided carriageway with a 100 metre wide central verge which serves as a major recreational space in the city. The central verge offers an expansive cultural landscape with possibilities for open air exhibits, active and passive recreation, and a gradually emerging view of the capital complex towards the east. This central verge and the monumental axis end in a semicircular people's plaza in the western end of the axis beyond which is a site for a major software park. The public plaza is earmarked for an iconic art installation commemorating the people who fought for statehood of Chhattisgarh.

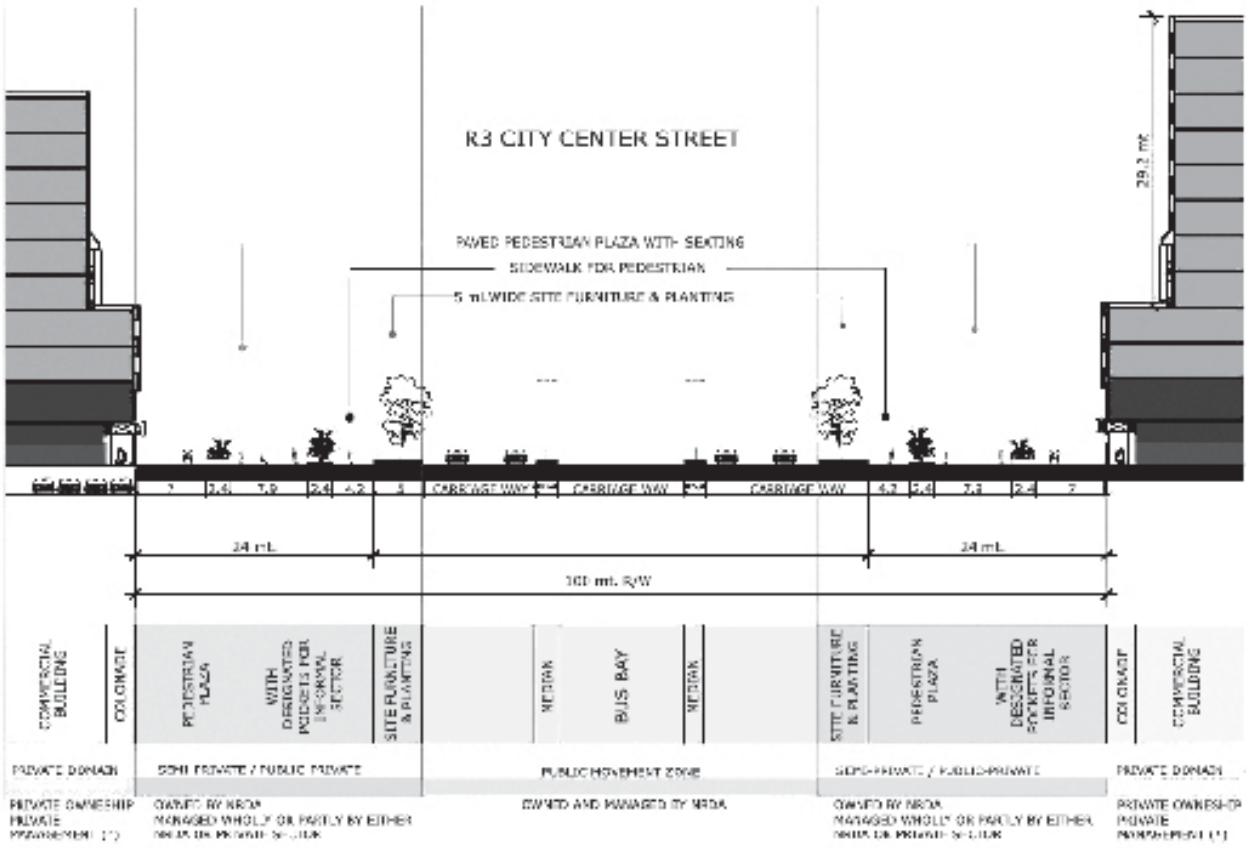
The central verge is intersected by the LRTS line towards its eastern end below the point of intersection of the two axes. The character of the monumental core changes after this intersection with the LRTS system from being a seat of power to a more cultural space for the city with sprawling low-rise institutional and cultural buildings lining its northern edge and a landscaped cultural edge on the south beyond which is the large central park of the city. The residential axis, as discussed earlier, runs from north to south along the heart of the city connecting the two railway stations. This axis accommodates the LRTS corridor, the amenity spine of the city and a continuous landscaped walking and cycling environment that connects the city end to end. As the residential sectors are only 800 metres deep and there are only two sectors on either side of the residential axis, the amenity spine is walkable from all neighbourhoods in the city. The spine also contains high speed buses with stops in the centre of the outside edge of each neighbourhood. In addition to the two main axes, the design includes two visual axes that culminate in the capital complex from the most western peripheral road that will bring most people to the city. The visual axes contain pedestrian and cycle network though landscape greens cutting across several different sectors and provide gradually emerging views of the capital complex. The mandatory no-build zones of the visual corridors further create a safe human movement network through the city toward the monumental core.

HUMAN-FRIENDLY MOVEMENT NETWORK

All city roads above 24 metre right of way are fitted with cycle tracks and pedestrian sidewalks, which if successfully implemented, will make Naya Raipur the first Indian city to have pedestrian and cyclist friendly infrastructure along the length and breadth of the city. In addition, the residential neighbourhoods are further designed to maximise the length of the vehicular route taken by private cars, and minimise the distance for pedestrians and cyclists by allocating them the shortest routes through the heart of the sectors. At every point where there is a level change necessitated for mode separation, there are ramps to ensure that pedestrians with different abilities have access everywhere. Basic details have been developed for ensuring universal access in the sidewalk through curb ramps, change of materials etc. This new capital city has the possibility of establishing a benchmark for human friendly connectivity through public transport modes as well as through walking and cycling.

DESIGN CODE

Urban design has been used as a strategic tool to integrate environmental and human issues, and connect nature and culture in every aspect of city design in Naya Raipur. Cities typically address the key issues



Regulating code for CBD city center street

of natural resources, environmental protection, high quality public places, housing quality and diversity, job economy, access, quality and equity in services and governance in their strategic plans (such as in Sydney) to achieve sustainable development (Newman 2006). Most of these themes, barring a few, maybe directly promoted through urban design. Some of these ideas are codified in the Design Code for the city. The Urban Design Code for Naya Raipur is thematically divided into six broad sections, namely, environmental protection, natural resources, access, places of high quality, quality and diversity of housing and quality work places. Each of these sections promotes key sustainability criteria through urban design and landscape. In an age where every significant new global development and event (such as Beijing Olympics, London Olympics) is being promoted as an opportunity for showcasing sustainability and energy efficiency to fight climate change, the new capital city of Naya Raipur cannot but embrace these principles and leave a lasting legacy for the state and region and also for urban design and planning practice in India.

The Design Code provides a set of rules and ideas that will govern development across the new city. For example when an important public building with a strong place-making potential at an important location in the city such as the Central Business District (CBD) is being designed, designers should refer to code sections on 'Natural Resources' to understand the basic approach to energy-efficient development; 'Places of High Quality' to understand the intentions for public places through open space design, and public building design; 'Quality Work Places' to understand the design intent and exact controls set out in the CBD Regulating Code for that plot and its development. If the plot in question has any sensitive ecological features, then developers should refer to the section on 'Environmental Protection' in the Design Code. Natural features and sensitive areas including water features (lakes, ponds, and active drainage channels), thickly wooded areas and stands of mature trees, existing rural settlements, sites of archaeological interest, significant view corridors such as to the capital complex and natural or geological hazard areas or soil conditions, are protected as a citywide strategy to minimise the impact of development on the environment. This has helped to create more contextually distinctive neighbourhoods and public spaces. These strategies will foster distinctive, attractive places with strong sense of place, a quality integral to the notion of sustainable urbanism. The planning of Naya Raipur has preserved all the

villages except one (Rakhi village, which has been relocated within one kilometre to make space for the capital complex) in the designated site of the new city, and in doing so has made a clear attempt to promote village-based socialism. This has been further strengthened by urban design and landscape strategies in the Design Code to not only maintain these villages but also upgrade infrastructure and provide quality amenities to them. The CBD is the only priority area of the city which has a detailed regulating code that while using standard urban design vocabulary of street types, height zones, building uses and development controls of each plot, is much more detailed than the standards and design guidelines for other priority areas. It defines the public realm of the CBD in a precise and legible manner to reduce the scope for haphazard development by different developers across many plots. The main intent of the regulating code is to ensure quality human experience across the public realm transcending individual plot boundaries (Sternberg 2000). This experience is not only enhanced through design but also by the nature of maintenance. The regulating code also specifies who should control and be responsible for maintenance and upkeep for each portion of the public realm. It was important to establish a detailed regulating code for the CBD, which will be built by several developers, to ensure creation of a strong pedestrian core that connect large public plazas with several opportunities for organising informal sector within the predominantly mid-rise CBD. The Design Code uses urban design and landscape as a strategic tool to integrate environmental and human issues, and connect nature and culture in every aspect of city design and development in Naya Raipur.

PRIORITY AREAS

Several priority areas were identified for special urban design attention following the Design Code. These were - the capital complex precinct, the monumental axis, the CBD, the transport hub as a major gateway to the city and the typical residential neighbourhood. For all these areas, the urban design structuring was based on understanding and creating an efficient movement system with minimum conflict of vehicular and pedestrian traffic. Streetscapes for the different street types within each of these districts were defined keeping the nature of the street and the needs of the different users of the street in mind. Diverse open space typologies were created along with parking areas and service areas for the precincts. At the building level, the different building typologies were defined based on the functional uses and frontage on major streetscapes. Mass and scale of each building type were established for each precinct. Only in the case of the CBD, elevation controls were specified for streetscapes along the most pedestrian heavy routes.

CONCLUSIONS

Naya Raipur is envisaged as a medium density, medium rise city. The urban design of Naya Raipur has maximised pedestrian scale in the most prominent locations and along the most important routes besides promoting universal access, facilities for walking and cycling are provided in this new compact city. The rich landscape of the city will always make the experience at the eye level interesting as several different vistas have been opened up along the pedestrian routes to important public buildings and places. This integration of visual connections to physical landmarks will not only make the city legible but also make the experience of moving through the city memorable and varied in different seasons when the trees, ground cover and flowering shrubs in open areas change form and color. To implement this vision of a 21st century sustainable capital city will require leadership and effective communication between different stakeholders. Design and planning alone cannot ensure the quality of environment and life, without appropriate institutional support from the local government who must be responsible for review, monitoring and implementation of plans especially in the most prominent areas of the city.

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Odanthurai Experience

A developmental model for village self-reliance

R SHANMUGAM

ABSTRACT

The village panchayat of Odanthurai in Tamil Nadu is a model in achieving self reliance through responsive governance and innovative approaches supported by a participative local community. Local self governance in Odanthurai has succeeded in devising of progressive and sustainable solutions for indigenous issues with transfer of latest technology and use of renewable sources of energy over the last decade. The panchayat has demonstrated achievements in the areas of infrastructure, education, health and sanitation, human resource development and social welfare; identifying issues at the grass root level and finding solutions and implementing them with belief in public trusteeship. This article narrates the achievements of the panchayat which helped in getting the basic necesseties in order and raising the aspirations of the community towards a better standard of living.

R Shanmugam is the former president of the Odanthurai village panchayat, Tamil Nadu. He took up the position of the president of the panchayat consisting of 11 villages with a total population of 5,000, ten years ago.

INTRODUCTION

Odanthurai panchayat was established in the year 1961. This panchayat has a large number of people belonging to scheduled and backward communities (SC/ST& MBC/BC). Moreover a vast majority were living

Philosophy

The Odanthurai Panchayat has a strong belief in Gandhian principles of Public Trusteeship. 'A responsive system must be elected by the people to fulfill the felt needs by democratic means and ways.'

Our Principle to function as Representative Institution
Panchayat President is a person elected by people to serve the people. He shall not be selfish person. He shall work towards the betterment of the people.

Our Views on Gram Swaraj
Gram Swaraj can be attained only by the self reliant local self-government at Panchayat level which contributes towards making the country a developed one in the year 2020, as envisioned by the former President of India, APJ Abdul Kalam.

Below Poverty Line (BPL). The panchayat lacked basic amenities and infrastructure even after 50 years of independence. However, all these facilities were provided within a record time of nine years just because of responsive governance and innovative approaches supported by a participative local community under the new Panchayati Raj system. Odanthurai panchayat believes that to make a village self-reliant, it must have a responsive administration. The basic tenet of a responsive administration is that it must be able to fulfill the needs of the public, particularly those such as housing, roads, drinking water, toilet facilities, schools, and hospitals. Being a responsive administration Odanthurai panchayat achieved the following goals within a period of nine years:

Objectives	Achievements
100% protected water supply	Achieved through the Swajaldara Scheme.
100% housing for houseless ST people.	400 houses constructed through Innovative Scheme
100% individual toilets in BPL households	950 toilets added through the Total Sanitation Campaign (TSC)
Renewable energy generation	Use of biomass gasifier, solar lights, night soil based biogas and wind energy.
Education for all	In action under SSA enrolment and regular stream
Public distribution	Perfected
Establishing common television at panchayat	Eight such TV rooms added
Women empowerment	Initiatives through 54 Self Help Groups

Odanthurai panchayat has succeeded in its initiatives towards a responsive administration at grass roots level. It has achieved success in almost all the relevant spheres of rural development and also brought fruitful results in transferring latest technology from market to the field in the areas such as renewable energy and water treatment.

APPROACHES AND MODEL

Participatory Implementation
Odanthurai panchayat involved the general public in identification of available schemes (based on community and local needs); programme planning, and scheme implementation.


Gram Sabha

Transparency in Administration
All the schemes and programmes were implemented in a transparent manner. Before and during the implementation of the schemes, the public was consulted through Gram Sabha meetings where all accounts and relevant documents were kept open to public for audit. Further, a copy of Form No. 30 (a form used to furnish current month's income and expenditures) were publicly displayed for reference.

Rapport Building
As mentioned earlier, the panchayat was a backward one for decades. To bring in development, it was felt that a good relationship between elected body and district administration/state and central governments was inevitable. Hence, good rapport building was encouraged between aforesaid institutions. It helped to represent the problems of the panchayat and its people and the need for implementation of various

developmental schemes. These efforts helped the panchayat to get a number of special projects in housing, drinking water and renewable energy.

Grass Roots Level Democracy

Odhanthurai panchayat used the mechanism of local self governance by convening Gram Sabha meetings on stipulated dates apart from conducting special Gram Sabha Meetings as and when required. While other panchayats conducted only four or five Gram Sabha meetings, Odanthurai conducted at least seven to ten meetings every year. The Gram Sabha was used to discuss all relevant matters connected with beneficiary identification, scheme implementation, programme monitoring and financial matters.

Innovative Approaches

Odanthurai panchayat tried out innovative methods for over all development. Various schemes like concrete houses for tribal people, concrete roads in tribal hamlets, renewable energy for street lights and drinking water supply, and office automation were initiated.

RESPONSIVE ADMINISTRATION

Odanthurai panchayat registered a record growth during past nine years. Of the growth and development attained over the past 57 years, about 85% of the same was made only during the period 1996-2005. Various forums such as Gram Sabha, hamlet level meetings and SHG forums were used to engage the local people. Schemes and programmes were selected and implemented based on the needs felt by the public. A series of special projects were given to the panchayat as a result of the special initiatives taken by the panchayat.

Infrastructure Development

In ensuring sustainable community development, basic and fundamental infrastructure was required to be developed. As such, the following infrastructure development was carried out over a period of nine years under different departmental schemes of Government of India and Government of Tamil Nadu.

- *Housing*: Within a record period of four years, 299 houses were constructed apart from up-gradation of 85 *kutcha* houses with a total budget of Rs. 104.05 lakhs.
- *Drinking water*: A project under Rajiv Gandhi National Drinking Water Mission was sanctioned for Odanthurai panchayat with a total budget of Rs. 48 lakhs which included Rs. 6.2 lakhs public contribution. Under this special project the entire village population (over 6000) was provided with protected water, fully treated water and 100% bacteria free and de-infected water. Moreover, a salient feature of the water treatment plant was that it was designed to run using biomass gasifier.
- *Connectivity Roads*: In the history of Odanthurai panchayat, mud roads were the only way out for about 50 years since Independence, whereas now all the connecting roads within the panchayat have been converted into bitumen and concrete roads (a total length of 13 kilometres. About Rs 1.5 lakhs was donated by the public for road development.

Samathuva Puram kutcha houses - before

Samathuva Puram kutcha houses - after

Housing provisions in the years 2001 – 2004

S. No.	Scheme Name	Funds Allotted (Rs. In lakhs)	Total houses constructed
1.	Scheduled Tribe Development Programme (New Houses)	40.20	119
2.	Indira Awas Yojana (New Houses)	12.15	45
3.	IAY (New Houses)	8.50	85
4.	Innovative Housing Scheme	43.20	135
	Total	**104.05**	**384**

Public Buildings Constructed

S. No.	Public Buildings Constructed	Expenditure (Rs. in lakhs)
1.	Panchayat building	3.00
2.	9 School buildings (different schemes)	27.00
3.	1 new School building (Sarv Shiksha Abhiyan)	3.00
4.	6 Public television rooms	3.00
5.	2 Community halls	3.00
6.	1 SHG shopping complex	4.00
7.	1 PDS shop	1.50
8.	1 Library building	1.00
9.	3 Anganwadi buildings	3.75
10.	2 Check dams	.50
	Total	**49.75**

First community participation scheme under Rajiv Gandhi National Drinking Water and Sanitation Mission

- *Public Buildings*: A number of public buildings were constructed with people's contribution. These included school buildings, public television rooms, community halls, Anganwadi (government scheme for social welfare of women and children) buildings, check dams, a library, a panchayat building, a shop and a shopping complex.

Human Resource Development

As a part of human resource development drive, the people, particularly those who belonged to socially under privileged sections were organised, and sensitised about various ongoing developmental programmes and motivated to join hands in the form of SHGs. A total of 54 women SHG were formed which included five ST groups, four SC groups and 45 BC groups. Entrepreneurship and trade specific and employment oriented training programmes were also conducted in coordination with DRDA, Women Development Corporation (Ma Thi) and Community Polytechnic of Sri Ramakrishna Mission Vidyalaya.

Child Labour Elimination and Education for All

Odanthurai panchayat was declared a child labour free panchayat. In this panchayat, all the children below age of 14 were ensured to attend schools. Community participation was ensured in 100% enrolment drive and awareness generation for various stakeholders like parents, school teachers, village elders and the youth.

Health and Sanitation

In ensuring healthy living and prevention of disease the activities conducted aimed towards prenatal and postnatal care, supply of nutritional food for children, eradication of malnutrition, attainment of 100% vaccination, HIV/AIDS awareness generation, ensuring sale of iodised salt, distribution of iron tablets for adolescent girls; conducting health camps such as general health, dental and eye camps. Under clean village campaign and Total Sanitation campaign, 100% result was attained. More than 750 households were provided with two buckets each for waste segregation at source.

Further, the panchayat had engaged three waste collection vehicles to ensure proper management and disposal of domestic waste. One compost yard was also developed at a budget of Rs. 20 thousand. Odanthurai panchayat banned the use of and dumping of hazardous and chemical substances that pollute the environment. To enhance the environmental status, a number of tree plantation drives were conducted with the support from forest department and NGOs. This helped to retain and improve the green cover and also increased the rainfall.

Social Security and Welfare

Various social security measures were taken by the panchayat, which included:

- Measures for ultra poor: Four elderly people were identified as ultra poor living without any means for livelihood and support. An old school building was

Wind turbine in Odanthurai Panchayat

converted as their shelter home with basic amenities for their stay. Three SHGs undertook responsibility to feed these ultra poor persons and helped them live a dignified life.

- Protection for widows, destitute and ailing aged: Arrangements were made for old age pension for about 75 old age and destitute persons who were in dire need for external support. About 12 destitutes were linked with SHGs to create a livelihood for them.
- Welfare for Handicapped: Eight disabled persons were identified through a survey and were linked with International Human Resource Development Centre (IHRDC) which formed a SHG uniting these disabled members.

TECHNOLOGY TRANSFER

It was felt that transfer of latest technology to rural areas was a must for balanced economic growth. Further, technology know-how was the solution for generating additional employment avenues and income generation. Odanthurai introduced latest technology in the following fields:

Computerisation and Office Automation

In Odanthurai panchayat, a computer was installed at the cost of Rs. 50 thousand. The instruments include Pentium IV based system, telephone with internal modem, and colour printer. Office automation, customised email communication and website creation especially for Odanthurai panchayat were initiated to make the process a success.

Water Treatment

Odanthurai has a population of over six thousand. The daily water need for domestic and drinking water purposes exceed 2.00 lakh litres per day. Considering the emerging situations, Odanthurai panchayat installed, on the banks of River Bhavani, a water pumping and water treatment plant with a capacity to pump and treat 2.25 lakhs litres of water per day at a cost of Rs. 48.00 lakhs with 10% public contribution.

The salient features of this plant were two basic filters, sand filter and ceramic filter, and a de-infection unit using silver ionised technology.

Renewable Energy Technologies

Rural India's energy requirements are equivalently growing as in the case of urban India. However, a fact is that rural India possesses some of the natural and renewable energy sources in abundance. Odanthurai installed the following renewable energy plants with innovative purposes:

- *Wind Energy:* Complete energy self sufficiency was achieved by the year 2006, by erection of a wind turbine with 350 kilowatt capacity. Currently, the panchayat has a power surplus.
- *Biomass Gasifier Energy:* A biomass gasifier unit was installed at a cost of Rs. 3.10 lakhs. This biomass based energy is being used to pump and treat drinking water.
- *Solar energy:* In Odanthurai, 65 street lights were installed in two hamlets namely Kallar Pudur ST colony (25) and Vinobaji Nagar hamlet (40) at a cost of Rs. 7.00 lakhs. Further, solar lights facility


Concrete road at Vinobaji Nagar


Middle school building

S. No.	Particulars	Progress during the past 35 years	Progress during the past 10 years
1	Drinking water supply schemes	-	A special project (RGNDWM) at a cost of Rs. 48.00 lakhs especially for Odanthurai panchayat
2	*Roads* - Metal - Tar - Concrete	 15 kms - -	 - 15 kms. 2 kms.
3	Street Lights	69 street lights	280 street lights
4	*Group Houses* Concrete Roof Tiled Roof	 - -	 320 + 51 = 370 155 + 60 = 215
5	*School* Primary School High School School Building	 1 0 1	 2 1 8
6	Household Toilets	7	950
7	Public Television	-	8
8	Renewable Energy Generation Scheme	-	Bio Mass Gasifier Plant – 1 (Rs. 3.5 Lakhs), Solar Street Lights – 60 Nos. (Rs. 11 lakhs), 350 kilowatt Windmill (Rs. 1.55 crores)
9	Multipurpose building for Women SHGs	-	3
10	Habitation	4 (existed)	9 (newly created 5)
11	Women Employment Federations	-	1

at panchayat was also arranged so as to reduce electricity bills.

- *Night Soil Linked Community Cooking Biogas Plant:* Two Night Soil Linked Community Biogas Plants have been installed with a capacity of 10 cubic metres each. These plants were linked with individual household toilets in tribal group houses. The biogas produced from these plants was distributed to households on rotation basis. This immensely helped reduce their hardships of fuel wood collection for cooking.
- *Low Cost Technology for Women SHGs:* To ensure sustainable livelihoods for the families of SHG women members, who belonged to BPL families, various special initiatives and measures were taken. Trades based on simple manufacturing technology, such as foot wear manufacturing and foot mat production from waste cotton were introduced. A packaged drinking water plant has been set up, resulting in more livelihood opportunities for SHG members involved. Also, Training and Development programmes for Technology Transfer through tie ups with leading NGOs/professional institutions like IHRDC have been carried out.

CONCLUSION

The table demonstrates a comparative statement showing achievements of the past nine years against preceding 48 years by Odanthurai panchayat, Karamadai Block, Coimbatore District, Tamil Nadu.

Odanthurai has won the President's Nirmal Gram Pushkar Award for the year 2004-2005. Odhanthurai acts as a model panchayat for others on many counts namely:

- Odanthurai is the first panchayat at national level to have a comprehensive community water supply scheme under Rajiv Gandhi National Drinking Water Mission. The Project was first launched in this panchayat. It has water pumping, and advanced water treatment plants, hence attaining 100% bacteria free drinking water (sand and silver iodised filters)
- First panchayat in the country to have installed biomass gasifier (waste wood based renewable energy) and used it to establish the entire water supply scheme
- First panchayat to have Group Housing for Entire Tribal population with complete infrastructure and to have achieved the status of 'hutless or huts-free' in 2006
- Child dropout free status
- Its own social protection system protecting four deserted persons in community run care home.
- First panchayat to have a wind turbine that is owned by a local body (350 kilowatt capacity, at the cost of Rs. 1.55 crores), first local body to become energy self sufficient by getting grid connectivity for use and supply of power produced by the wind turbine.

The Odanthurai panchayat has created a history of achieving its goals with success in the last decade. The long term goals towards which the panchayat is striving aim at raising the living standards of the residents by ensuring employment for all, education for all, and 100% household water supply through pipelines; turning the 11 villages under it in to a self sustaining, progressive conglomerate, setting an example in sustainable solutions.

JNNURM Section

Status of JNNURM in Chennai

G DATTATRI

ABSTRACT

The progress report of Government of India on the funding of JNNURM as of 31st March 2008 mentions that the total sanctioned cost of projects for all cities covered under the programme is Rs. 57,764 crores and the central assistance committed is Rs. 31,240 crores. However, in respect of Chennai 16 projects at an approved cost of Rs. 1305 crores were under implementation in the Chennai Metropolitan Area and the amount released by Government of India was Rs. 144.22 crores during the same period. The percentage of utilisation in most schemes are marginal or nil. The implementation of the project has been very slow in respect of infrastructure of development and in respect of basic services for the urban poor. Citizen participation in monitoring of projects is completely absent and no mechanisms have been set up by the implementing agencies. Public awareness on the projects is nil and there has been no serious effort by the implementing agencies to disseminate the progress of the scheme. It is hoped that the participatory review of CDP for Chennai and the studies on the waterways rehabilitation and solid waste management proposed under a CDIA project of Asian Development Bank slated to commence shortly will rectify the anomalies and provide a framework for effective formulation and speedy implementation of projects under JNNURM in Chennai.

G Dattatri has a Post Graduate Diploma in Town and Country Planning from School of Planning and Architecture, New Delhi and a Degree in Civil Engineering from University of Mysore. Former Chief Urban Planner, Chennai Metropolitan Development Authority (CMDA), currently, he is a Trustee of Citizens Alliance for Sustainable Living (SUSTAIN) and Advisor, UN-HABITAT.

FINANCES RELEASED BY JNNURM

A full page advertisement in the national newspaper *The Hindu* (June 6, 2008, p. 9), published from Chennai, released by Government of India claimed that the mission had made considerable progress since its launching by Prime Minister in December 2005. It talked about the components of the two submissions *viz*. Urban Infrastructure and Governance (UIG) and Basic Services for the Urban Poor (BSUP) and gave figures of finances released to the states and Union Territories for implementing the projects. This information is summarised in table A.

THE CASE OF CHENNAI

Central officials and the Government of Tamil Nadu had come to a consensus that the JNNURM Scheme will extend to the entire Chennai Metropolitan Area including the local bodies outside the Chennai Municipal Corporation. The CDP proposed an investment of Rs. 45,000 crores in the Chennai city and adjoining local bodies during the mission period. The formulation of a City Development Plan incorporating vision as well as long term plans for the metropolis was a prerequisite for submitting detailed project reports for financing. The preparation of such a document had to be done through wide public participation and in a transparent manner. However, the CDP for Chennai was prepared hurriedly without public participation. Perhaps the government thought that this process would delay submission and approval of CDP to draw funds from the mission. In fact, none of the residents or civil society sector groups had any inkling that a CDP was prepared and sent for approval. There was absolutely no citizen participation in the process which was considered essential in the formulating of JNNURM Scheme. Some of the civil society organisations organised a workshop with NGOs, urban experts and public stakeholders, where high profile officers of the central and state governments also participated. The participants expressed their deep concern that an important instrument like the CDP which would be the basis for infrastructure investments was not properly prepared before sending it to the Government of India.

The workshop recommended to the authorities that:

- CDPs and DPRs should take into account the Chennai Master Plan contents and requirements and must optimise opportunities for enhancement of resources.
- Facilitate and promote participatory planning process in the preparation of CDP.
- Clarify on funding, financial resources for operational and maintenance of assets created under the programme.
- Address issues relating to urban poverty, water and sanitation and complexity in local economy in the development and management of urban areas.
- Promote Public Private Partnership covering infrastructure development and service delivery.
- Establish a system to share information in a transparent manner with the stakeholders.

Recommendation for enabling citizens to:

- Support participatory planning process for CDP through sensitisation of their roles and responsibilities.
- Establish a civil society monitoring mechanism for measuring efficiency of delivery of services particularly for the poor and measurement of livable quality on a regular basis.

Consumer Action Group (CAG), an NGO participant in the workshop presented a memorandum to the Ministry at the conclusion of the workshop. It was signed by a number of individuals and organisations, bringing out and highlighting the deficiencies in the preparation of the CDP, particularly the lack of public participation and transparency. The memorandum also requested

Table A

JNNURM Status Updated as on 31st March 2008 ***Rs. in Crores***

Components	Projects Approved	States Covered	Sanctioned Cost (Rs.)	Central Assistance Committed (Rs.)
UIG	324	26	30135	14612
BSUP	274	30	17421	8760
Total	**598**	**-**	**47556**	**23372**
UIDSSMT	649	25	6198	4997
IHSDP	422	29	4010	2871
Total	**1071**	**-**	**10208**	**7868**
Grand Total	**1669**		**57764**	**31240**

UIDSSMT – Urban Infrastructure Development Scheme for Small and Medium Towns, IHSDP – Integrated Housing and Slum Development Programme, **Coverage:** UIG and BSUP cover 63 identified cities. Other cities are eligible for assistance under UIDSSMT and IHSDP
Source: The Hindu, June 6, 2008, p. 9

the Ministry not to approve the CDP in its present form.

PROJECTS IN CHENNAI METROPOLIS: URBAN INFRASTRUCTURE

However, despite this public initiative, several schemes for financing under the JNNURM have been approved for implementation based on the CDP submitted for Chennai. The projects that have been approved by the Ministry for which initial funds have been released are indicated in table B and C.

FINANCIAL PROGRESS

According to the Government of India, Ministry of Housing and Urban Poverty Alleviation's quarterly progress report in March 2008, the only project amongst these where significant amount of expenditure has been utilised, is the Desalination of Sea Water Project at Minjur, that is 41.75% of the approved cost of the project. It is followed by the IT Corridor Infrastructure Project where 19.65% of the project cost has been expended. In all the other projects the percentage of expenditure is nil or negligible. The percentage of expenditure to approved cost upto March 2008, for projects under Urban Infrastructure and Governance are indicated in table D.

PHYSICAL PROGRESS

Even where some progress has been made in terms of expenditure, there is no available record of the physical progress on ground. Neither the date of physical completion nor the date of commissioning of the projects have been indicated in the quarterly project report. The expenditures made so far indicate that there will be serious financial and time overruns and benefits of the project will be delayed. Till March 2008, the achievement under Submission I, in terms of financial expenditure is only Rs. 144 crores which amounts to a little more than 10% of the approved project cost of Rs. 1,306 crores.

Table B
Project Details – Chennai City Rs. In Crores

	Implementing Agency & Date of Approval	Approved Cost	Release of funds by Govt
A. CHENNAI CITY			
Water and Sewerage	**Metrowater**		
1. Improvement to water supply	002/Nov. 2006	322.00	47.01
2. Water Supply and Sewerage to IT Corridor	003/Dec. 2006	41.77	10.22
3. 54 MLD STP at Perungudi	011/Feb. 2007	31.48	2.99
4. Sea Water Desalination at Minjur	012/Feb. 2007	87.80	21.95
Road related works	**Municipal Corporation**		
1. Road over and under bridges (6 Nos.)	007/March 2007	44.41	5.55
2. Flyover at Perambur	008/March 2007	32.88	4.11
3. High Level Bridge on Alandur Road	009/March 2007	5.48	0.68
Solid Waste Management	**Municipal Corporation**		
1. Perungudi & Kodungaiyur	004/Feb. 2007	255.32	31.91
Total		**821.14**	**124.42**

Source: GOI Quarterly Progress Report, March 2008

Table C
Projects – Chennai Outer Local Bodies Rs. In Crores

B. CHENNAI OUTER LOCAL BODIES	Implementing Agency & Date of Approval	Approved Cost	Release of funds by Govt
Water and Sewerage	**Metrowater**		
1. Water Supply for Porur	014/May 2007	12.36	1.54
2. Sewerage Scheme at Ullagaram-Puzhithivakkam	015/Oct. 2007	103.84	-
3. Water Supply for Maduravoyal	017/July 2007	23.30	2.91
4. Water Supply at Ullagaram-Puzhithivakkam	020/Dec. 2007	28.08	-
5. Comprehensive Sewerage at Avadi	021/Jan-Feb 2008	158.05	2.77
6. Water Supply at Nerkundram	022/Nov. 2007	19.17	-
7. Sump, Pump house at Poondi	018/Aug. 2007	9.11	1.13
8. Sewerage facilities for Ambattur Phase-III	Not Available	130.91	11.45
Total		**484.82**	**19.80**
Total Chennai Metropolis		**1305.96**	**144.22**

Source: GOI Quarterly Progress Report, March 2008
The Chennai related projects were approved between November 2006 and March 2007 and the outer local body related projects have been approved between May 2007 and February 2008

Table D
Utilisation of Funds under JNNURM

Project Code	Sector	% Utilisation
CHE 002	Water Supply	6.49
CHE 003	Water Supply	19.65
CHE 005	Water Supply	-
CHE 012	Water Supply	41.75
CHE 018	Water Supply	0.33
CHE 014, 017, 019, 020, 022	Water Supply	-
CHE 011	Sewerage	0.15
CHE 015, 021	Sewerage	-
CHE 004	Solid Waste Management	-
CHE 007	Roads and Flyovers	3.60
CHE 008, 009	Roads and Flyovers	-

Source: GOI Quarterly Progress Report, March 2008

BASIC SERVICES FOR URBAN POOR

There are three categories of projects proposed for implementation for Tamil Nadu including Chennai; dwelling unit construction by the Slum Clearance Board, house construction or upgrading by individuals and improvements to basic services in slums. The implementing authorities are the Slum Clearance Board, Corporation of Chennai and Local Bodies. The Commissioner of Municipal Administration acts as the nodal agency for local body projects. According to the Government of Tamil Nadu Policy Notes on Municipal Administration & Water Supply Department and the Housing & Urban Development Department, the Government of India has sanctioned five projects at an estimated cost of Rs. 1,303 crores and released Rs. 125.23 crores for four projects of which three are for the city of Chennai (942.29 crores). These include two projects by Slum Clearance Board at a cost of Rs. 814.85 crores and one project by Chennai Corporation at a cost of Rs. 127.44 crores.

The Government of India has also approved nine projects for local bodies. A sum of Rs. 82.99 crores has been released by Government of India. Along with Rs. 78.66 crores released by State Government, Rs. 161.85 crores have been released to nine local bodies. The local bodies (municipalities) covered within the Chennai metropolis are Alandur, Ambattur, Kathivakkam, Madhavaram and Tiruvottiyur. It is also reported that the Tamil Nadu Slum Clearance Board (TNSCB) has drawn up an ambitious programme to rehouse/resettle all the remaining slum families living in objectionable and unobjectionable locations in Chennai, Coimbatore and Madurai in self contained tenements with required infrastructure. The state Housing and Slum Clearance Minister has mentioned that the government will implement a massive housing scheme at an estimated cost of Rs. 3,000 crores under JNNURM to make Chennai, Coimbatore and Madurai slum free cities. It was also mentioned that 1.12 lakh tenements will be built in Chennai; 60,257 in Madurai and 12,730 in Coimbatore.

As part of this programme, the Slum Clearance Board has proposed to construct 35,270 tenements as 'integrated townships' in Chennai, Madurai and Coimbatore at a total cost of Rs. 1,206.55 crores in the following locations in Chennai:

Name of the Schemes	No. of Tenements	Amount (Rs. in Crores)
Chennai, Ezhil Nagar	9,936	257.54
Chennai, Perumbakkam I	10,452	440.61
Chennai, Perumbakkam II	9,476	374.24

Source: Housing and Urban Development Department, GTN Policy Note 2008

It is not clear whether the above schemes have been cleared by the Ministry under JNNURM funding. The Administrative Staff College, Hyderabad, an institution designated for the appraisal of Chennai CDP had made some important points for inclusion of these schemes in the CDP in its Appraisal Report 3:

- The focus appears to be mostly on Chennai city. There is need to present the situation in the metro area other than the Chennai city, for each local body separately wherever possible as each local body is an independent entity.
- It covers only slum related aspects and, not poverty in its totality. It should focus both on slums as well as basic services to the poor.
- There is need to discuss urban poverty in all its dimensions – infrastructure including water, sewerage, sanitation, roads, lights; housing, social and economic development status and issues like education, health, vulnerability, livelihoods.
- The report needs to be incorporated and integrated with the CDP for Chennai Metropolitan Area and cannot be seen independently as slum improvement project proposed by TNSCB.

However, the Policy Note states that the construction of the proposed tenements by TNSCB will be commenced during 2008-2009. Most of the above information has been culled out from the policy notes and other documents posted by Government of Tamil Nadu on the net. From this it is difficult to get a correct picture of the projects being implemented by TNSCB, Chennai Corporation and the local bodies and the progress being made either in financial or physical terms.
The scheme of construction of houses, upgradation

by individual owners and improvements to basic infrastructure in slums, carried out through the Commissioner of Municipal Administration, has progressed very slowly. According to a report in *Times of India* (July 28, 2008),

> A two member team from the Union Ministry of Housing and Poverty Alleviation along with the state government officials and local body representatives inspected a few houses of beneficiaries of the centrally sponsored basic services for the urban poor in Alandur…… Most of the beneficiaries and local body representatives pointed out that the insistence on a *patta* from the recipients is a major hurdle. Out of a total 827 housing units the local body is yet to issue work orders for 317 units because the beneficiaries do not have *pattas* to prove that they own the land. This has restricted beneficiaries from availing the benefits of the scheme. The scheme has progressed slowly since 2006-7 when Alandur Municipality was selected. Over the last two years the local body has completed only 30 new houses out of a total of 261.

GOVERNANCE

The JNNURM was conceived as a reform driven mechanism for improving quality of life in cities. Although Tamil Nadu has been in the forefront in urban reforms there has been no great progress in devolving powers effectively to local government and streamlining administrative procedures. There are several important reforms both in the mandatory list as well as in the optional list which have yet to be initiated. Unless these reforms are instituted immediately, it is not possible for the local bodies to keep pace with the rapid growth of population and provide for housing and basic services for the poor and infrastructure to make the cities livable.

According to the Policy Note mentioned earlier, the following reforms have been taken or initiated by the Government:

Areas of Reform	Status
Repeal of Land Ceiling Act	Done
Rent Control Act for 52 properties	Steps taken to repeal the Act
Stamp Duty reduction	Reduced from 13% to 8%
74th Constitutional Amendment	17 out of 18 functions transferred to ULBs
Community Participation Law	Under preparation

PUBLIC KNOWLEDGE OF PROJECTS AND THEIR IMPLEMENTATION

There is very little information disseminated by the implementing agencies at the local level on the schemes proposed or schemes under implementation and their present status either through departmental bulletins or through media reports. There is not much information available through the local press also. Thus, the citizens generally do not have any inkling as to what JNNURM is achieving.

Proposals made some time in early 2007 for setting up of Citizens Technical Advisory Group (CTAG) and Citizens Voluntary Technical Core (CVTC) as envisaged by Technical Advisory Group to JNNURM to assist and monitor the projects under implementation is yet to materialise. In the absence of these mechanisms it will not be possible for citizens to take part in the development of their cities. These facts underline the urgent need in the identification, preparation and implementation of projects under

CDIA – Mission and Services

Cities Development Initiatives for Asia (CDIA) has been established by Asian Development Bank with cooperation from Federal Ministry of Economic Cooperation and Development, Germany, GTZ, KFW, Invent and SIDA.

The mission of CDIA is to assist cities in providing better urban services for their citizens. It can provide technical assistance to help to formulate and finance policies and projects. It can link to other cities worldwide which have solved similar problems. And it can help to find companies to build and/or operate the infrastructure.

The services are to move from strategic master plans to concrete policies and infrastructure projects ready to present to financiers and project developers, cities need access to international expertise and advice in areas such as:

- Early-stage project preparation assessment and structuring
- Project financial structuring and packaging
- Project finance and refinancing
- Upgrading of implementing city administrations
- Institutionalisation of respective policies
- Training of decision makers and administrative staff

CDIA enables cities to find and use this expertise to implement city development strategies, come up with bankable infrastructure projects and to build local capacity in these areas.

JNNURM in Chennai. They also emphasise the need for capacity building at the level of local bodies as well as at the level of citizens and civil society if JNNURM is to succeed.

INITIATIVE OF ASIAN DEVELOPMENT BANK

It is a good augury that at this point of time the Chennai Municipal Corporation has entered into an agreement with the Cities Development Initiatives for Asia (CDIA) established by the Asian Development Bank for undertaking a comprehensive participatory review of the City Development Plan including a programme of institutional development linked to the CDP process, infrastructure planning and programming, the preparation of a marketing and communications strategy/plan for the investment programme. This initiative will also examine the waterways rehabilitation and solid waste management programmes with necessary feasibility reports which could be posed for funding and implementation. The Second Master Plan for Chennai after a thorough dialogue with civil society and citizens is also ready and is expected to be approved by the Government any time now. The CDP review can now be built upon the policies and strategies enunciated in the Master Plan. The civil society and corporate sector in Chennai are now more than at anytime keen to engage themselves in the urban development process and become partners in achieving long term sustainability in upgrading the quality of life for all the citizens. Thus, the present time appears to be an opportune moment to move ahead systematically not only in the utilisation of funds under JNNURM but to engage in comprehensive, equitable, inclusive and sustainable development of Chennai. The CDIA initiative in Chennai can also assist other cities to benefit from this experience.

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Engendered Perspectives
An analysis of the JNNURM

KANAK TIWARI AND JULIE THEKKUDAN

ABSTRACT

Every project that does not make the attempt of social inclusion is a lost opportunity for achieving 'an equitable distribution of the fruits of economic growth' to all. JNNURM is turning out to be one such lost opportunity with reference to gender inclusive urban development. Highlighting the gender neutrality of JNNURM, this paper suggests that a gender informed basis for any such scheme would lead to better and more holistic alternatives of development. In order to enquire the present gender quotient of the Mission, it also examines the rationale, objectives and agenda of reforms besides, briefly looking at the City Development Plans (CDPs) of six mega-cities.

INTRODUCTION

Urban development the world over, has for a long time not taken into account the specific needs of those sections of citizens who were not considered the 'working population' of a city, namely women, children, aged, the differently-abled and the poor. The reinforcement of these stereotypical definitions of what constituted productive roles and citizens in society in the context of city planning and urban projects has been a major stumbling block in promoting inclusive citizenship.

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When these definitions are further examined from a gendered perspective, we find that women are doubly marginalised and excluded because of the conventional perceptions of a citizen as well as the sex of that citizen. If old people face constraints then old women are doubly constrained, if children are at a disadvantage, then young girls are at a further disadvantage and so the list continues irrespective of whether the citizens are disabled, migrants, casual labourers or night shift workers for instance. These people being denied active and complete participation in the public life of the cities become repeatedly marginalised.

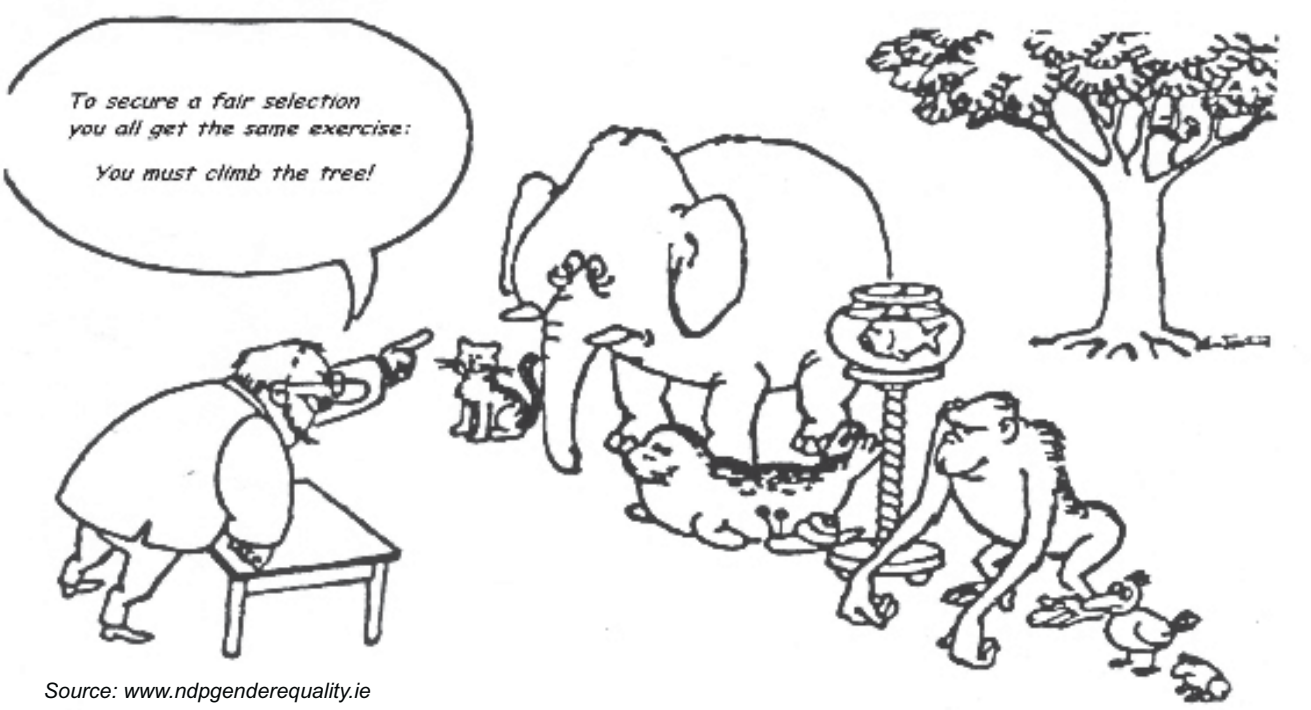
Today's reality is that half the population of any city comprises of women, their contribution to the GDP is also close to half and they are as productive in relation to any male citizen. Yet, their mobility in the city and access to urban services continues to be restricted physically as well as socially. Despite the fact that conventional families with a homemaking wife, a breadwinning husband, and children constitute decreasing proportions of the population today; housing and all other sectors of urban development, are still designed to accommodate this conventional household type (Ahrentzen, cited in Sarkar 2008).

A commensurate inclusion of the excluded sections, especially women, in urban planning and infrastructure development is still lacking. At the same time, urban development today has moved beyond the needs of the working population. Many of the urban services within a city should ideally be accessible and equally utilised by all citizens without any discrimination.[1] Studies on 'gendered spaces' and 'safe cities for women' have led to studies like 'children in cities' and 'how safe cities are for the differently-abled' (Desai 2007). Thus, gender provides a launch pad towards safer, inclusive and more humane cities for all (Tiwari 2006). 'What works for women and children works for society. If women and children cutting across class and religion feel safe in cities, then those cities are safe' (Patel 1998). When this statement is further analysed, what is being stated is, that if plans are developed around women's needs they will include the needs of men but the vice versa is not necessarily true.

Large projects of urban development become the vehicles for inclusion of social groups, which have been denied access to urban services as per their specific needs. Every such project that does not make the attempt of social inclusion is a lost opportunity for achieving 'an equitable distribution of the fruits of economic growth' to all (Olson, cited in Delhi Human Development Report 2007). JNNURM is turning out to be one such lost opportunity. Due to its magnitude and reach, JNNURM has been touted as the biggest ever intervention in urban India. It has kick-started, and in places accelerated, reform at both State and Urban Local Bodies (ULBs) levels. Some of these reforms are absolutely essential to take forward the goals of the 74th Constitutional Amendment Act that forms the basis of citizen participation in Urban Governance.

JNNURM comprises of a number of sectors under its two sub-missions, namely Urban Infrastructure and Governance and Basic Services for Urban Poor. Although inclusion of marginalised sections such as the poor forms the core of JNNURM, there are still questions regarding the depth and the real extent of this inclusion. Though this paper's recommendations aim at creating a channel through which benefits flow to a larger section of the city population, its main content is limited to addressing the specific needs of women within the larger purview of Urban Development and further focusing on aspects of the JNNURM. The basic premise of this paper is that gender sensitive urban development will bring about greater social inclusion.

This paper comprises of three sections. The first looks at gender neutrality in urban development projects/schemes like JNNURM and reiterates that in the present context gender sensitivity would lead to more holistic development than gender neutrality. It will point out the fact that gender neutral inputs can only yield gender neutral outputs and outcomes. The second section highlights the reasons why gender mainstreaming should be an important agenda of urban development in the current times. This is done by picking up two admissible components from each Sub-mission of the JNNURM. In Submission I (Urban Infrastructure and Governance), the emphasis is on urban transport, parking spaces and street lighting, whereas in Submission II (Basic Services for Urban Poor), the focus is on water supply and sanitation. Here it is aimed to bring forth linkages between present status of urban development and its disadvantages to women, thus reiterating that a pro-women tone of the Mission would have resulted in ripple effects in every direction to the level of even the smallest projects. The third section looks at City Development Plans (CDPs) through a gender lens. It is concluded on a positive note, that government policies and schemes related to urban planning and development for greater social inclusion are achievable.



Source: www.ndpgenderequality.ie

GENDER NEUTRALITY[2] OF URBAN DEVELOPMENT SCHEMES

Citizens in a developing country like India look up to the State as a guarantor and provider that would take into account their varied needs. State policies and schemes are seen as mechanisms for fulfilling the aspirations of the common people. Since Independence, there have been many government projects that have had the intention of catering to the needs of the poor and other marginalised groups. Yet, six decades down the line, the physical reality is that poverty has increased and exclusion on different accounts has deepened. What remains to be addressed in these policies, schemes and projects are the concrete steps to deal with specific needs of those excluded instead of considering the citizens as a homogenous group as indicated in the figure below.

JNNURM is stated to be the largest and grandest schemes of urban development launched by Government of India (GoI) with a budgetary provision of Rs. 50 thousand crores for a period of seven years. Whether it becomes an overwhelming success or a grand failure as claimed by some critics, there is no denying the fact that JNNURM remains a powerful catalyst to bring about a new kind of urbanisation that will give a global image to Indian cities. In the whole process of JNNURM, 63 chosen cities are to embrace the suggested reforms and have CDPs, which are like a road map for further development and upgradation of existing urban services. An important component of every CDP is the City Investment Plan that puts forth sector-wise projects with respective budgetary requirements which in turn gives rise to Detailed Project Reports (DPRs) for every sector.

In its current form, the Mission is essentially a gender neutral scheme, which is problematic. The contention with gender neutrality is the acceptance of status quo, not taking into account those excluded and therefore, their specific needs. In JNNURM, a focus on equity, with reference to the needs of women, is obvious by its absence. An inclusion of gender needs could have been possible in various components of the Mission as illustrated below:

- *Rationale and Objectives of the Mission:* It would be unfair to state that JNNURM has not resorted to equity measures to address issues of inclusion. For example, the rationale of JNNURM talks of commitment to National Common Minimum Programme and to the achievement of the Millennium Development Goals (MDGs), but a nominal portion of the two has taken concrete shape either in the reform agenda or the objectives of the Mission. Six of the eight MDGs specifically target women and India is lagging behind in achieving any of these; the Mission takes into consideration only one related to poverty. If JNNURM is to really contribute towards fulfilment of the MDGs, this

commitment has to be translated from intent to measurable components of action.

- *Reforms under the Mission*: Under JNNURM, there are two kinds of reforms that ULBs and the states have to adopt, some that are mandatory and others optional. Under mandatory reforms, there is specific mention of basic services to urban poor including security of tenure at affordable prices. Optional reforms include revision of building byelaws; byelaws for the use of recycled water; adoption of other water conservation methods; and, earmarking of 20-25 percent of land in all housing projects for economically weaker sections (EWS) and low income group (LIG) category.[3] Out of these 13 mandatory and 10 optional reforms under the Mission, there is none that even mentions women, thus completely negating facts like increasing number of women headed households, especially in slums or the role of women in water conservation; the larger adverse impact of inadequate basic services on women and the existing building byelaws that have resulted in a male dominated built environment.[4] The reform agenda of JNNURM is one of its strongest components as assistance to State governments and ULBs are linked to these reforms. This is a reason why a pro-women connotation to these reforms would have been ideal.
- *Stakeholder Consultation*: JNNURM emphasises on CDPs that are based on the identification and assessment of issues in the existing urban situation, through a process of stakeholder consultation with a variety of stakeholders. Though stakeholder consultation was more a suggestion rather than a mandate, almost every CDP has a section on it. The consultative process however superficial, at least got recognition and became a starting point in urban projects. If only JNNURM had made a special mention of women within the stakeholders, the process of gender inclusion would have been part and parcel of the scheme and consequently, in the development of the Mission cities that would become a model for the rest.
- *Convergence of Social Schemes:* Sectors and projects that are eligible under the Mission include convergence of health, education and social security schemes for the urban poor as well as civic amenities like community halls and child care centres. Though indirect, it is a positive mention with regard to women. However, as health and education are clearly mentioned as inadmissible components for JNNURM assistance, many CDPs[5] have hardly touched upon these factors.

GENDER BLINDEDNESS OF THE SUBMISSIONS

Submission I

Undoubtedly, any improvement of the existing urban services or provision of new infrastructure in a city would enhance the quality of life for all citizens, men or women. A gender-informed basis for any such scheme would lead to better and more holistic alternatives of development. Some components of the two sub-missions of the Mission have been chosen to highlight how experiences and issues of women are vastly different, with enormous implications on other aspects of their lives with the objective to commence an awareness of a gendered approach to urban development.

- *Urban transport:* Effective public transport implies that which is safe and efficient and has universal access to all citizens thereby, reducing the usage of private vehicles. Women are most vulnerable users of a public transport system that is inefficient and unsafe. Women have lesser ownership of private vehicles as compared to men. Moreover, their journeys are more complex, frequently involving other activities like dropping and picking up children, shopping etc that may entail switching various modes of transport. The quality of roads in the country leaves much to be desired. The frequent pot-holes, steep speed breakers, often without any markings, would mar the journey of any individual, let alone that of pregnant women or the elderly. Inadequate pedestrian facilities make the simple task of crossing a road hazardous for any. The present carrying capacity of public transport, such as buses and trains to accommodate the mobile population

Research in Australia and overseas shows overwhelming evidence that women are fearful of particular situations including:

- any modes of transport other than the car;
- going out at night;
- walking to the nearest shops;
- use of public transport, in particular train travel at night;
- the use of a public telephone;
- walking to a friend's house;
- walking through a neighbourhood park or walk home from the cinema, restaurant, bar or pub;
- the situation at either end of a public transport journey i.e. waiting at a bus stop or walking from the station to a parked car;
- the use of city centre car parks particularly at night and if multi-storeyed;
- driving alone at night; and
- open spaces (parks and the countryside) and pathways (alleyways and underpasses) (Bell, W 1998).

Overcrowded unorganised public transport

of a city is insufficient, leading to overcrowding. The demand is always more than the supply and hence, women are forced to board such crowded modes of transport in order to reach their workplace, in fact, to do most of their activities within the public sphere. Women are therefore, forced to constantly nudge their way through to simply gain access to and use a public facility.[6] The condition and quality of these modes of transport is also highly substandard, leaving much to be desired. Women form a substantial proportion of the workforce and in many cases; have to give up their sources of livelihood due to poor connectivity to workplaces from far flung areas as well as within the city. This is compounded for those who lack the means to own private modes of transport (or afford other semiprivate means such as autos and taxis). Due to this reason, many women were deprived of their regular livelihoods and jobs when slums dwellers from Delhi were resettled on the periphery of the city (Dupont 2008). Research has shown that women are often seen and see themselves as illegitimate users of public space (Vishwanath & Mehrotra 2008). Women's safety and security always form the basis of women's entry into public spaces and therefore, into public roles. Safety is desired at all stages of usage of public transport; during the journey and at either end of the commute. As women generally become victims of molestation and harassment, they experience constant tension of preventing such instances. The very spaces and modes of transport which women fear most are likely to be the ones they spend most time using (Bell 1998).

- *Parking spaces and street lighting:* Not only is the Indian city rendered unsafe by crime and violence, but impersonal and fearful to many by fast moving traffic, bad roads, isolated and poorly lit public parks and parking lots (Tiwari 2006). In many cities of the developing world, the pedestrian is ignored to accommodate vehicular traffic – this leads to crowded areas (on streets and inside public transport) and more chances of anonymous petty sexual crime towards women. Their fear for safety gets heightened in open and closed parking spaces, parks, pathways and subways. Frequent headlines scream from newspapers on a daily basis about women being raped in car parks even in up-market areas or in moving vehicles, even public transport.

Young girls bear the brunt of water scarcity and distance from source

Women's participation in the public domain is not a matter of choice but their own safety. Aged women are fearful of even venturing out of their front door. Some CDPs, especially of the mega cities like Mumbai and Delhi, pointedly speak of the necessity of reducing crime in cities to make them safe, however not even a single CDP mentions the importance of this factor in facilitating the mobility and participation of women in the urban domain.

Submission II

Many studies such as those carried out by SEWA, Water and Sanitation Programme of the World Bank[7] among others have proven the differential and enormous impact of poor water supply and inadequate sanitation facilities on lives of women. Solid Waste Management experts also emphasise at the segregation of 'waste at source' and the fact that municipalities lack adequate infrastructure and resources to manage city waste. Here too, women must be taken as the starting point, as in the current context, they are the ones taking care of cleaning, laundry, cooking and reuse of waste and thus, should be educated about sustainable waste disposal. It is also a well-established fact that treating women and children as the prime target group for provision of basic services would automatically cater to all. However, 'the low level of participation of women, particularly in decision-making' related to water and sanitation is discouraging (SIDA cited in Pickford 1998, p. 131).

- *Water Supply:* Water is critical to all, especially those who have to deal with water scarcity on a regular basis. The urban poor, largely concentrated in slums in cities, pay far more for the precious resource of water. Sadly, India's contribution is negligible towards the MDG of halving the number of people in the world without access to clean water. The WSP (Water and Sanitation Programme) of the World Bank has criticised that even huge government outlays for water supply have not been able to meet the challenge of provision of water to people mostly due to institutional leakages and a supply driven approach (D'Monte 2007). The most successful projects in India have been those that have involved the community. The Swajaldhara project has been the most effective till date as it is community led and acknowledged women's greater role in regular water supply for a community. Sadly, only one state (Tamil Nadu) has managed to complete this project in totality (*ibid.).* Women are the 'water experts in any locality' (UNICEF) and are primarily responsible for collecting and managing water and scarcity, quality, accessibility to it, impact women deeply. Slums in any city are often devoid of legal supply of water from the ULBs. Thus, their residents resort to diverse means of arranging water for their families. Such means do not ensure a regular supply that is adequate to

Kabeer classifies policies into either 'gender blind policies' (policies that recognise no distinction between the sexes and therefore incorporate biases in favour of existing gender relations) or 'gender aware policies' (policies that recognise that men and women are part of development and that they are constrained in different and often unequal ways as potential participants and beneficiaries). Gender aware polices are separated into three types (although not mutually exclusive), depending on the degree to which they recognise and address gender issues:

- **Gender neutral policy approaches:** use the knowledge of gender differences in a given society to overcome biases in development interventions. They work within the existing gender division of resources and responsibilities
- **Gender specific policies:** use the knowledge of gender differences in a given context to respond to the practical gender needs of either women or men; they also work within the existing division of resources and responsibilities
- **Gender-redistributive policies:** are interventions, which intend to transform existing distributions to create a more balanced relationship between women and men. They may target both or only one group. These policies touch on strategic gender interests.

As quoted by King (2001)
www.regional.org.au/au/apen/2001/n/KingC1.htm

Women at river front for procuring water, washing and bathing

meet the needs of a household. Women's daily lives are then wound around the procurement of water. In times of scarcity, the only available water source in the vicinity becomes a jostling sea of humanity fighting for those few drops of water. In such cases, a woman's personal hygiene becomes the last priority, making her susceptible to health concerns. Also, frequently erratic supply affects her livelihood options - either she has to be home bound to ensure water or take obligations from willing neighbours. Most often, long distances have to be traveled in order to reach the water source thereby, reducing time that one could have spent in other activities or means of livelihood. The nexus between water and statistics like increasing school drop out rates for girls has been often repeated. UNICEF reports that women spend four hours on an average everyday in lugging water to their homes. Accidents and fights are not uncommon and carrying heavy containers of water also impacts the health of young girls besides loss of a normal childhood.

- *Sanitation:* One in every three Indians does not have access to a toilet! Cities have slightly better coverage than villages – approximately 58 percent (Sharma 2006). Such statistics are misleading at times as they do not present the real situation such as usage and maintenance of toilets, provision of water for washing and even discrimination against some communities from using the same toilets. With the perspective of women, lack of proper sanitation facilities has not only immense health implications but also plays havoc with their dignity on a daily basis. This does not imply that men do not need sanitation facilities but imagine 'women waiting for the cover of dark to perform a necessary function every single day of their lives' *(ibid.).* This is a common story of slums in any city. Women resort to drinking less water in order to save money as every use of a public toilet costs them at least two rupees. Generally public toilets lack bathing facilities and those that have, charge for usage, denying the poor the privacy needed for bathing and defecation. Some studies point at the readiness of slum dwellers for paying user charges for certain facilities but in spite of that there are problems like poorly lit toilets, poorly maintained toilets and isolated toilets that discourage women from using them. Surveys in Mumbai have revealed that existing public conveniences for women in the city are less than a third of what is available to men *(ibid.).* SEWA has done appreciable work in some slums of Mumbai where people, especially women, have constructed

Gender quotient in CDPs of six mega-cities

Name of City	Specific gender consideration/ neutrality/omission	Rating
Ahmedabad	- A word search of the entire CDP of 180 pages shows the usage of the word 'women' only once under Community and Social development where the CDP recommends NGOs to work with all stakeholders such as poor, women and so on. - The CDP is an excellent document covering all aspects of Urban Development and its vision specifically states 'better quality of life for all citizens' but none of the chapters or strategic goals of specific sectors mention needs of women as a target group.	***Gender Blind***
Bangalore	- The participative consultation specially involved women and youth of slums and their need for more employment opportunities has been highlighted. - This CDP very clearly states that 'women should be the center of any kind of rehabilitation of the slums as their empowerment would solve many social issues and ensure sustainable provision of basic services in the slums'. - The Bangalore Water Supply and Environmental Sanitation Master Plan has specific component for addressing gender issues and processes designed to involve women and lower socio-economic groups. - The CDP also emphasises on proper implementation of 33 percent reservation for women at all levels of the urban governance structure.	***Gender Aware*** Acknowledges contribution that women can give in provision of urban services but has no specific provisions in the sector of urban transport
Chennai	- This CDP acknowledges women as a part of work force of the city in its section on Employment and Labour. It elaborates on statistics such as number of females and males presently working, eligible to work and willing to work (projection). This will ensure job creation that has a consideration for women too. - For the Urban Infrastructure sectors such as transport, water and sanitation, there is no special reference to female users.	***Partly Gender Aware***
Delhi	- This CDP states that the Municipal Corporation provides housing facilities for working women in the city but there is no projection of present and future need. - During Stakeholder Consultations for this CDP, specific issues have been raised and documented like women finding it 'unsafe and embarrassing' to defecate in open. - A gender sensitive CDP would have been a strong document for enhancing the safety and appeal of this city which is not only the national capital but also the 'rape-capital'. There is no convergence of issues highlighted by other studies, for example, the Human Development Report for Delhi (HDR) 2006 by the United Nations has highlighted crime and discrimination against women as well as their poor access to urban services as a major setback in the city's Human Development Index (HDI).[8]	***Gender Blind***
Hyderabad	- Many experts have described this CDP as one of the best. In terms of its gender-quotient too, it rates a little higher than its counterparts, though a lot still remains to be asked. - Besides stating concerns over rates of female literacy, its process of consultation with stakeholders assured one-third participation of women stakeholders. - It also acknowledges the fact that 'poverty has a visible gender dimension' and that incidence of poverty among women is higher and female-headed households are the poorest of poor. - The CDP also stresses on convergence of social development programmes of different departments so that they are more focused and beneficial to minorities, women and other marginalised groups. - This CDP also recognises the important role of women in preservation of the environment through afforestation in the city and their contribution through urban nurseries and backyard plantations by composting home waste. - There are also proposals of well lit parks in the municipal area where safety of women and children has been said to be a primary concern	***Gender Aware*** Recognises women as a particularly vulnerable group. In spite of this, the gender sensitivity of the CDP does not come through all the urban sectors specifically Water and Sanitation and Urban Transport.
Mumbai	- 30 percent reservation of women among Corporators of the Municipal Corporation of Greater Mumbai (MCGM). - It states that there are 13 percent women headed households in slums. - Though health and education are inadmissible components under JNNURM the CDP has chapters on these, with nominal reference to women needs. - There are pro-women proposals in the CDP like training colleges for women; toilet facilities for women and children in slums; credit schemes for women; slum sanitation schemes proposed with particular benefits for women. - But there is no mention in urban transport, environment, water supply and disaster management	***Partly Gender Aware***

their own toilet facilities and maintain them too, as such a provision has freed them from many ordeals. The repeated concerns about success of the female literacy programmes in the country can be partly assigned to the lack of proper toilet facilities in schools as girls around the age of puberty drop out from schools at alarming rates.

CDPs THROUGH A GENDER LENS

CDPs are a product of the rationale, guidelines and objectives of the Mission. Stakeholder consultation and therefore, participation is mentioned in JNNURM, though it is not mandatory. It is heartening to see that almost all the CDPs have gone through a process that has brought in the stakeholders' perspective, however limited or superficial it may be. Due to this process, participation has become the new buzzword in urban development. Gender concerns within urban development could be highlighted, if only the guidelines had made a mention of it like in the case of stakeholder consultation. Although there is a mention of the marginalised sections within the stakeholder consultations, the mention of women as a particularly deprived group, in addition to the urban poor would have made that vital difference.

A brief analysis of the gender quotient of the CDPs of the six mega-cities is presented in the given table. It is just an enquiry to see if any gender-based concerns have penetrated the CDP process of identification of issues and proposal of projects. For this analysis, Kabeer's (King 2001) classification of policies has been used. None of the six CDPs qualify as 'gender specific' or 'gender redistributive'. Hyderabad and Bangalore have scored the highest amongst the six although there is definite gap between recognition of women as a vulnerable group and concrete specific provisions to cater to their needs.

CONCLUSION

The primary objective of JNNURM is to create 'economically productive, efficient, equitable and responsive cities' in the context of an India aspiring to be global leader in all spheres. The aforementioned objective is still elusive as development of cities, including housing, urban transport, water, sanitation and other urban services, has exacerbated the frustration of women while they balance work and home. As the work-family tension has a disparate impact on women's ability to participate in public life, easing that tension is central to achieving citizenship for women as a group (Silbaugh 2007) furthermore, assuring the wholesome fulfillment of the Mission's objective. One of the most progressive aspects of the Mission is that the CDPs are dynamic documents giving the scope for modifications as per different emerging needs. This paper is an initial step in terms of suggesting avenues for modifications from a gender perspective. Gender mainstreaming is no longer a demand specific to women but is now an issue of citizenship.

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Notes

1 Though the general notion of working population does not include unpaid domestic work (mostly by women in the Indian context), this paper believes in the inclusion of this category within the working population.

2 Please refer to Box for definitions of Gender Blind and Gender Aware by Naila Kabeer.

3 Optional reform (d) from the JNNURM Toolkit, source: www.jnnurm.nic.in

4 Buildings of any kind do not take into consideration the specific needs of women such as childcare spaces, or for that matter even separate toilets.

5 Many critics of the Mission state that CDPs have become a collection of profit making large urban development projects like Roads, flyovers and bridges, a gender sensitive approach or focus on social development projects thus seems like a far cry.

6 In Delhi, in a 45 seater bus, only eight seats are specifically allotted for women. Often women have to fight or face harassment from male passengers in order to access these seats.

7 For further details see www.sewaresearch.org, Engaging with Citizens to Improve Services, a Collection of Case Studies of the Water and Sanitation Program, World Bank, New Delhi, 2007.

8 The HDR of Delhi has a section on the female disadvantage, which has many implications for inclusive and sensitive urban planning and infrastructure development. For further details see Delhi Human Development Report, 2006, pp. 26-36.

Book Review

Hands on Heritage: Handbook on Cultural Education : *INTACH, New Delhi, 2003, pp. 136, Rs. 150.00*

Slowly Down the Rajpath *: Mansara, Lucknow, 2007, pp. 18, Rs. 25.00,* ***Where is the Mother?*** *: Mansara, Lucknow, 2007, pp. 11, Rs. 25.00,* ***Hap'pant Meets Asfu Dadu*** *: Mansara, Lucknow, 2007, pp. 15, Rs. 25.00.*

Rediscovering Heritage, the fun way

ANSHU MESHACK

For those perturbed about the loss of a sense of history among today's children, here is a unique concept that brings home the importance of our heritage and cultural wealth: an engaging series of children's books that uses story telling to showcase the rich cultural history of Lucknow. The four books together form a complementary collection that entertains as it teaches, and builds towards an interest that can be productively channeled into activities compiled in a well presented handbook for teachers and parents alike. A collective review is given.

Written in a lucid style by Neeta Das and complemented by visually appealing line drawings by Shubhrajit Das, the three booklets highlight the need for heritage conservation in a compelling manner. Woven into a contemporary setting, 'Slowly Down the Rajpath' in the historical city of Lucknow follows a group of three school friends who take an exploratory bicycle ride around the Rajpath and discover a cultural wealth they knew little about. In a similar setting, 'Where Is My Mother*?'* traces a lost baby pigeon's search for her mother and her excursion through Kaiserbagh, unintentionally gathering some interesting information about its historical significance. The most appealing is the third in the series, 'Hap'pant meets Asfu Dadu', a heartrending tale of a little boy's dream of revisiting the Imambara with Nawab Asaf-ud-daula, who built the spectacular and intriguing culturally importance monument in the late 18th century. The Nawab is devastated by the squalor and ruins of what is considered one of the grandest buildings in Lucknow and a symbol of the city's fabulous architectural heritage. The Nawab's anguish is evident when he laments, 'I was hoping to see my kingdom, changed but alive. But alas, nobody cares for the old!' It is a lesson for children and adults alike to appreciate, respect and conserve the architectural legacy, which, left uncared for, will fall to tragic ruin much like the Nawab in the dream of Hap'pant.

Recognising the need to institutionalise the process of heritage awareness, Heritage Education and Communication Service of INTACH has put together a Handbook on Cultural Education, an easy to use guide to make heritage awareness enjoyable and educational for 10-15 year olds. The activities are divided into three separate but inter-related sections for natural, built and living heritage that cover the natural environment, historical buildings, living traditions and artistic beauty, making the handbook easy for co-curricular teaching with site visits.

For parents and teachers keen to inculcate in children a sense of pride in their unparalleled historical and cultural heritage, these unique books serve as groundwork for lively discussions and planning fun trips to heritage sites, some in the neighbourhood of our bustling cities.

Anshu Meshack is the Chief Executive Officer of Charkha Development Communication Network, a Delhi based NGO.

Events and Conferences

GREAT ASIAN STREET SYMPOSIUM 2008 (GASS)

Date: December 5-7, 2008
Location: Singapore
5th GASS 'FUTURE-ASIAN–SPACE' charts a field of topics directly related to the future of Asian urbanism. It acts as catalysts for constructive thinking about Asian cities in the 21st century.
Organised by: Department of Architecture, National University of Singapore
Contact: D Boontharm
Website: http://www.arch.nus.edu.sg/conferences/gass2008/

SUSTAINABILITY CONFERENCE 2009

Date: January 5-7, 2009
Location: Mauritius
The Fifth International Conference on Environmental, Cultural, Economic and Social Sustainability 2009 conference will work in a multidisciplinary way across the various fields and perspectives through which we can address the fundamental and related questions of sustainability.
Organised by: Common Ground Publishing
Website: http://s09.cg-conference.com/

HERITAGE IN ASIA: CONVERGING FORCES AND CONFLICTING VALUES

Date: January 8-10, 2009
Location: Singapore
Rapid change across Asia today means the region's heritage is at once under threat and undergoing a revival as never before. This conference examines heritage in relation to Asia's broader social, environmental and economic changes.
Organised by: Asia Research Institute
Contact: Valerie Yeo
E-mail: ariyeov@nus.edu.sg, tcwinter@hotmail.com, aripd@nus.edu.sg
Website: http://www.ari.nus.edu.sg/events_categorydetails.asp?categoryid=6&eventid=814

INDIA STONEMART 2009

Date: January 8-11, 2009
Location: Jaipur, Rajasthan, India
India Stonemart 2009 is the largest exposition on stone industry which showcases the world of natural stones and ancillary products and services most comprehensively, conveniently and competently. It assumes strategic and competitive importance for anyone related with the stone industry, in India and internationally.
Organised by: Centre for Development of Stones (CDOS) and Federation of Indian Chambers of Commerce & Industry (FICCI).
Contact: RK Gupta/ Balvinder Singh Sawhney
Website: http://www.stonemart-india.com
E-mail: info@cdos-india.com, stonemart@ficci.com, balvinder@ficci.com

11TH INTERNATIONAL CONFERENCE ON HUMANE HABITAT (ICHH) 2009

Date: Jan 29-31, 2009
Location: Mumbai, India
The theme of the conference is Sustainable Humane Habitats: Revitalising City Centres and Promoting Transit Area Development. Educators, researchers, architects, planners, engineers, social scientists, environmentalists, policy makers, administrators, developers, managers, corporate associations, non-governmental organisations, concerned citizens and students interested in revitalising city centres, encouraging public transportation systems, promoting transit area development and developing sustainable humane habitats are invited to actively participate in ICHH 2009.
Organised by: International Association for Humane Habitats (IAHH)
Contact: Prof. Akhtar Chauhan
E Mail: ichh2009@humanehabitat.org
Website: http://www.humanehabitat.org / http://www.chalmers.se/arch/SV/aktuellt/kalendarium/11th-international

DESIGN-BUILD FOR WATER/ WASTEWATER CONFERENCE

Date: March 4-6, 2009
Location: Denver, Colorado, USA
The two and one-half day conference will focus on current issues, best practices and challenges facing professionals in the water/wastewater industry. It is an opportunity for leaders to explore the hallmarks of integrated project delivery, discover possibilities, share realities, and learn new integrated strategies. The purpose of the conference is to provide quality educational and networking opportunities for public utility owners and the water community. They will focus on the application of integrated design and construction techniques that can lead to the creation of successful project implementation methodologies.
Contact: Patrick Wilson
Website: http://www.dbia.org/conferences/waterww/

SUSTAINABLE DEVELOPMENT 2009

Date: May 13-15, 2009
Location: Cyprus
The Conference addresses the subjects of regional development in an integrated way as well as in accordance with the principles of sustainability. It has become apparent that planners, environmentalists, architects, engineers, policy makers and economists have to work together in order to ensure that planning and development can meet our present needs without compromising the ability of future generations.
Organised by: Wessex Institute of Technology, UK and University of Thessaly, Greece
Contact: Irene Moreno
Email: imoreno@wessex.ac.uk
Website: http://www.wessex.ac.uk/09-conferences/sustainable-development-2009-6.html

STREMAH 2009: ELEVENTH INTERNATIONAL CONFERENCE ON STRUCTURAL REPAIRS AND MAINTENANCE OF HERITAGE ARCHITECTURE

Date: July 22-24, 2009
Location: Tallinn, Estonia
The conference will aim to bring together scholars and professionals to discuss a variety of topics related to architectural and maritime heritage. In addition the meeting will discuss the future of maritime structures, addressing problems such as the role of development schemes and the relationship between tourism and maritime heritage and the need to protect the latter by suitable legislation and support initiatives.
Organised by: Wessex Institute of Technology
Contact: Claire Shiell
E-mail: cshiell@wessex.ac.uk
Website: http://www.wessex.ac.uk/conferences/2009/stremah09/index.html

Heritage Album

KARNATAKA HERITAGE: AIHOLE, BADAMI, BIJAPUR AND PATTADAKAL

Poonam Verma Mascarenhas

Aihole, Badami, Bijapur, and Pattadakal located in the Bijapur district in northern Karnataka, constitute a significant heritage tourism trail. The three sites of Aihole, Badami and Pattadakal are tied together by historical association, as all three acted as capital cities of the Chalukyas from the fifth century AD to the seventh/eighth century AD. Bijapur, on the other hand is a reflection of Islamic architecture under the rule of Adil Shah Sultans from the 16th/17th century period.

Aihole is the site where exploration of stone as building material for temple construction began. The collection of temples around, act as a testimony to the experiment and learning that led to the development of a code for temple construction, establishing their architectural significance as the precursors of the Hindu temple form.

Gateway with carved brackets at Aihole

The shikhara and the apse, a developing temple form at Aihole

Trabeate construction and carved screens in stone, Aihole

Water structure attached to temple, Aihole

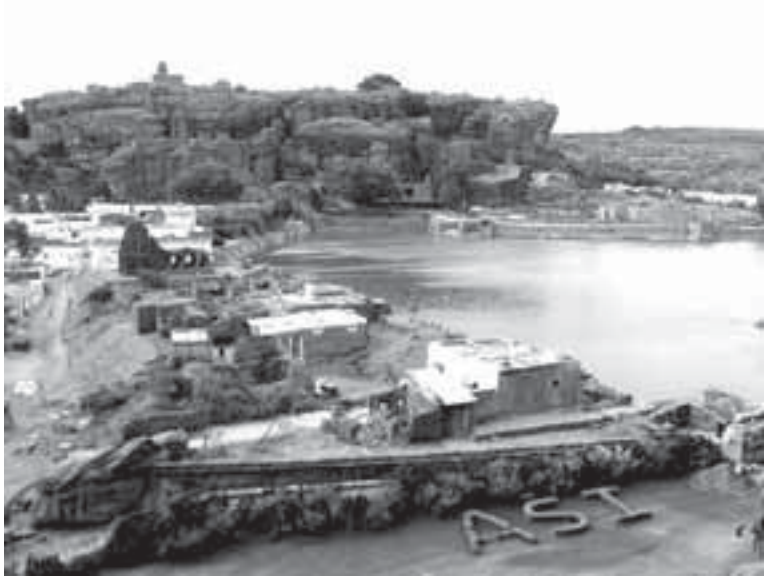
Evolution of temple architecture that commenced at Aihole reached its culmination by the seventh century AD and is seen executed at Pattadakal (20 kilometres away), as a collection of ideas perfected in proportions and spatial articulation. In the temples at Pattadakal, from the seventh and eighth centuries, stone as building material was no more an exploration. Post attaining the structural confidence, adornment as in sculpture found its place of pride as a dynamic medium of expression and story telling in varied forms and styles.

Badami is an exquisite example of ancient planning wisdom in exploration of the geographical features at a site. The natural rock formations are unique in their colour and texture giving the site immense energy. The Bhuthanath Lake surrounded by hills is a focal point in the

Detail of ornate stone carving at Pattadakal

Use of round columns and sculpture in stone reached a level of refinement at Pattadakal

View of the shikharas of north Indian and south Indian styles at the temple complex of Pattadakal



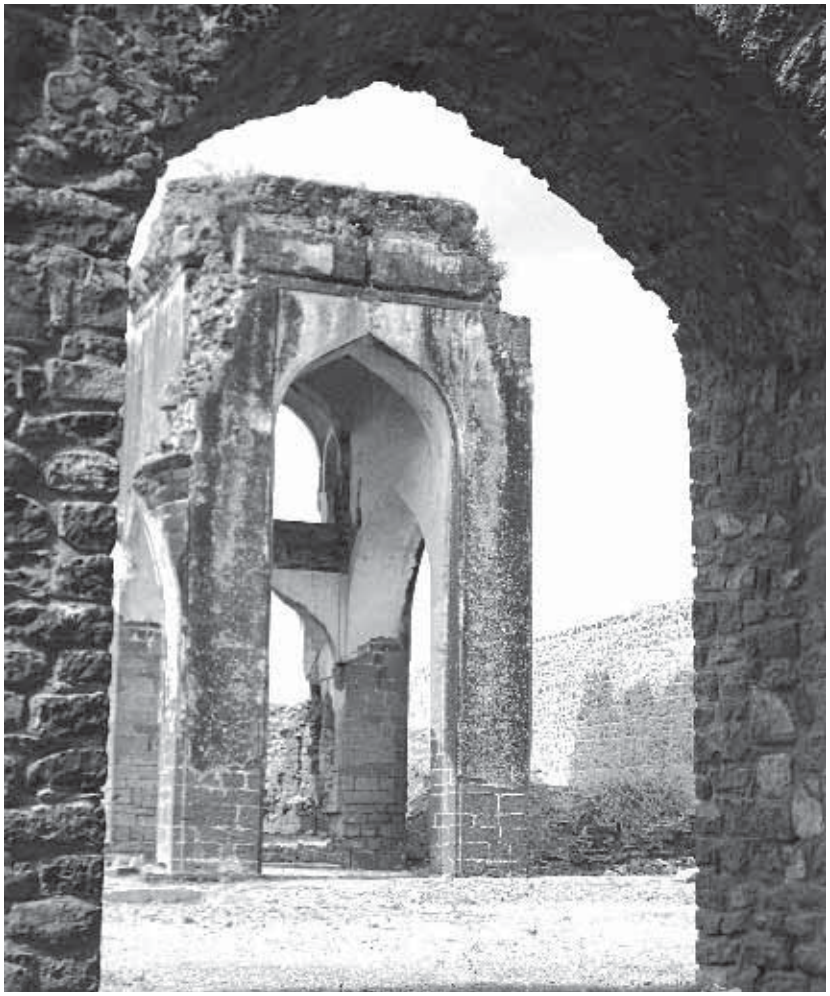
View of Bhuthanath Lake and temples along its shores at Badami

The natural rock formations unique to Badami

landscape that has been assigned religious association by the community from historic times. Badami is known for its rock cut caves and temples along the shores of the lake and the natural gorge leading to the city. Besides, the rain water harvesting system employed by the creation of a dam to the lake, demonstrating wisdom from the past adds to the valuable significance of the site.

Bijapur is a living city with a number of architectural wonders such as Jumma Masjid, Ibrahim Roza, Bara Kaman and most importantly the Gol Gumbaz, the second largest dome in the world. The built heritage of the city also comprises of lesser known mosques, tombs, palaces

Carving on the rock cut cave surfaces of Badami



Ruins of a theatre in the outskirts of Bijapur that could be revived as a cultural centre

A nameless haveli in a by lane of Bijapur with exquisitely executed stone carved elements which may appear in wood

and *havelis* that are under threat due to issues such as lack of awareness and ownership. While religious sites are being maintained by the community in casual manner with little understanding of the significance, secular built heritage is languishing, un-inherited and unattended. There is potential for adaptive reuse, as evident in the case of ruins of a theatre in the outskirts of Bijapur that could be revived as a cultural centre with a little imagination. A planned tourism policy with conservation as its guiding factor is a dire need of the city to ensure the continuity of its built heritage and increased popularity amongst cultural tourists.

The Gol Gumbaz, Bijapur

Exquisite carving in Arabic on façade, Bijapur

The author is an Architect practicing in Goa. She has a Charles Wallace Fellowship and Masters in Conservation from York, UK.

INTRODUCING

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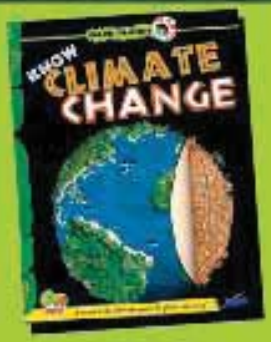

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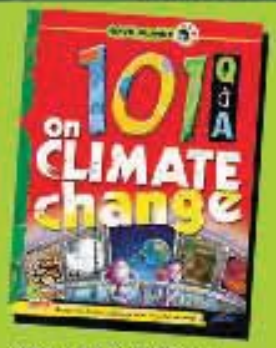

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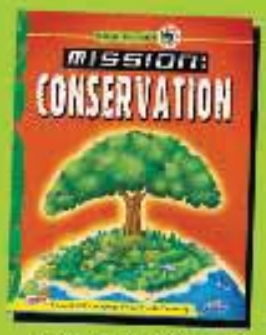

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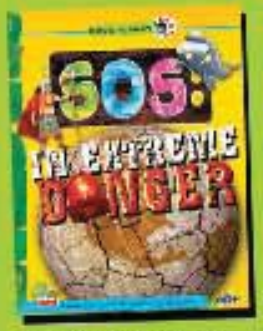

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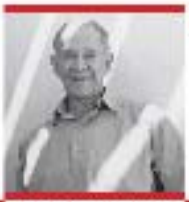

Ricardo Legorreta, Principal Architect, Legorreta + Legorreta, Mexico

Dr. Joachim Krausse, Scholar, Curator, Author, Filmmaker on Buckminster Fuller

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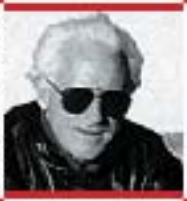
Melkorka Zaera Polo, Principal Architect, Foreign Office Architects, UK

Antoine Predock, Principal Architect, Antoine Predock Architect PC, US



Hani Rashid, Principal Architect, Asymptote Architecture, US

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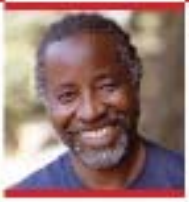
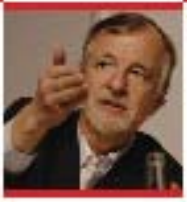


Dr. John Francis, Director, The Bene Walker, US



Prof. Herbert Girardet, Director, World Future Council, UK

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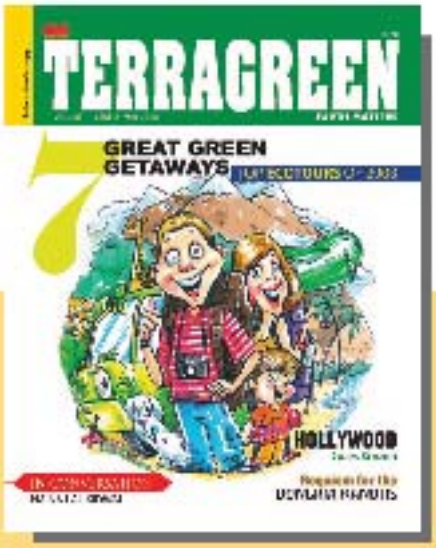

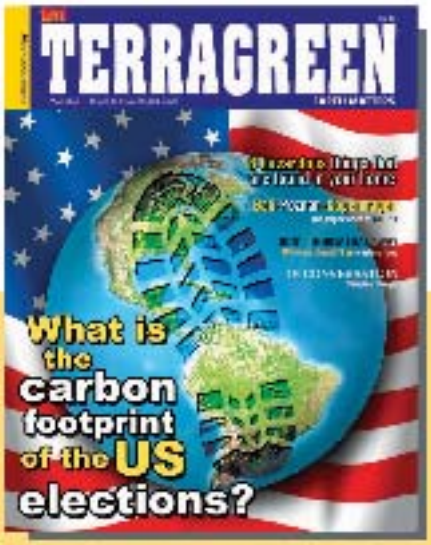

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