Ieoh Ming Pei, Doyen Modernist Master - A Tribute
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Cover design by Animish Thaker
Dear Fellow Architects and readers

Architectural world has lost a renowned architect I M Pei whose contributions are very well known across the globe. We have lost another member in Prof. Ved Raori from Delhi who was closely associated with the IIA.

We are deeply grieved at this loss and pray to God to bless these noble souls.

In this issue of JIIA we have the following papers and articles which will be of interest to our readers.

Ar. Suresh Athavale has poetically expressed his views on disaster management in a very interesting manner.

Ar. Asesh Sarkar and Ar. Monika Arorahave a detailed paper on various parameters that make any urban environment safe which is aptly titled ‘Analysing the Safety Indicators in Urban Environment’.

‘Manifestation of Elements of Architecture as a Language’ is another interesting article that focusses on relevance of these elements to a society’s cultural, religious and economical aspects written by Ar. Srushti Pathak

Ar. Vijay Sambrekar and Dr Suresh Ranade in their paper ‘Comparative Investigation of Traditional and Modern Passive Design Strategies’ highlight the relevance of traditional design concepts to sustainability in present day architecture.

Ar. B Sivashankaree in her paper ‘Integrating Research – India’s Architectural Education system’ has highlighted importance of systematic research in present day education system.

Finally, we have an article that under lines the importance of well-designed public spaces by Dr Aarti Grover and Ar. Poonam Saini titled ‘Evolution, Relevance and Design of Urban Public Spaces in India’

We are sure our readers will enjoy these papers and articles.

Ar Anand Palaye
Chairman - Publication Board & Executive Editor, JIIA
Dear Fellow Architects,

We all have known Ar. I.M. Pei as the Doyen of Modernist style of Architecture right from our student days. Several generations of Architects across the world have been inspired by his style of work & philosophy.

Born in Guangzhou, China on 26th April 1917 & raised in Hong Kong, he migrated to US in the year 1935 to study Architecture & establish his practice. He was known for his creative use of modernist architecture in complete harmony with natural elements & open spaces. Central to his philosophy of modernism was his belief in the theory of ‘Form follows function’ to which he added his own interpretation that, ‘Form follows intention’.

Among numerous master pieces of architecture, the Louvre Pyramid in Paris is considered to be the most outstanding. During his long career he was conferred virtually every award & recognition which include Royal Gold Medal, AIA gold Medal, Presidential Medal of Freedom, Pritzker Prize & Praemium Imperiale.

In his passing away at the age of 102 years on 16th May 2019 at Manhattan, New York, the fraternity of Architects has lost the Doyen of Modern Architecture but who will continue to inspire the coming generations of Architects through his work & philosophy.

Earlier on 22nd February 2019 in the passing away of Prof. V.P. Raori, we lost a distinguished educationist, philosopher & guide to thousands of students of Architecture not only in Delhi but across the country.

Born in 1935, Prof. Raori graduated from the Delhi Polytechnic (Delhi University), in 1957, followed by the Diploma in City and Regional Planning, from University of Rome, in 1960. He worked under legends like Walter Gropius, J. K. Chowdhary and J.A. Stein, before joining the School of Planning and Architecture, New Delhi, as Assistant Professor and eventually rising to the position of Director of the School.

In recognition of his life long contribution to the Profession of Architecture particularly in the field of Architectural Education, he was conferred with the IIA Madhav Achwal Gold Medal by the Indian Institute of Architects in the year 2003.

May his soul rest in peace.

Ar Divya Kush
President,
The Indian Institute of Architects
I M Pei

World of Architecture has lost an illustrious master architect Ieoh Ming Pei on 16 May 2019 at a glorious age of 102 years.

He was born in Guangzhou, China but grew up in Hong Kong and Shanghai and later moved to the United States and settled there.

His numerous contributions in architectural world are recognised and appreciated across the globe. He has been honoured and decorated with many prizes.

Though it will take several volumes to write about his works and contributions, Mesa Laboratory in Colorado, Bank of China Tower in Hong Kong and the Pyramid in Louvre are only a few of his several magnificent projects across the globe.

We at the IIA are deeply grieved at this colossal loss to the world of architecture.

We pray to the Almighty to bless his soul that will eternally keep inspiring architecture on this planet.

Team JIIA
C O N D O L E N C E S

PROF. VED PRAKASH RAORI

Distinguished Architect and Professor V. P. Raori, Born in 1935, graduated from the Delhi Polytechnic (Delhi University), in 1957, followed by the Diploma in City and Regional Planning, from University of Rome, in 1960. He worked under legends like Walter Gropius, J. K. Chowdhary and J.A. Stein, before joining the School of Planning and Architecture, New Delhi, as Assistant Professor and eventually rising to the position of Director of the School.

He has many books and articles to his credit. He was honoured by the National Press of India in 1993 for his outstanding contribution to Architectural education and profession.

He was a dedicated professional who passionately devoted himself in reshaping, promoting and developing the field of Architectural Education and Research at undergraduate, post graduate and doctoral levels. His career as an educationist spanned over four decades.

Professor Raori’s contribution to the field of Architectural profession was equally impressive. He had won several design awards. He had various prestigious projects to his credit. He strongly advocated that Architecture is an ever evolving discipline and requires an academician to be in close touch with the professional world.

He was a distinguished Fellow member of the Institute since 1974. In his long association with The Indian Institute of Architects he served the Institute in various capacities both at the National and Chapter levels.

In recognition of his life long contribution to the Profession of Architecture particularly in the field of Architectural Education, he was conferred with the IIA Madhav Achwal Gold Medal by the Indian Institute of Architects in the year 2003.

In his passing away on 22nd February, 2019, the profession has lost a distinguished Architect & Academician whose absence amongst us will be felt long after he has left for his long journey into eternity.

Ar Divya Kush
President,
The Indian Institute of Architects
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CALL FOR ENTRIES

The objective of the IIA National Awards is to encourage, acknowledge, appreciate and honour the creative contribution of the IIA members in the field of Architecture. The Awards are presented annually and carry a and Plaque and citation in each category.

The submission of entries for the IIA NATIONAL AAWARDS will be ONLINE AT www.iiaawards.com

Award Categories

1. Residential Projects - A
   Single Family Dwellings, Bungalows, Villas, Mansions, Farm houses etc.

2. Residential Projects - B
   Multi-Family Dwellings, Group Housing, Multi-Storied Apartments Gated Communities etc.

3. Commercial Projects
   Corporate/Office Buildings, Business and Commercial! Centres, Shopping Centres, Malls etc.

4. Public / Institutional Projects

5. Industrial/ Infrastructure Projects
   Factory Buildings/Structures, Worshpahs, Transport Terminals, Plazas etc.

6. Interior Projects - Residential

7. Interior Projects - Non Residential

8. Hospitality & Recreation Projects
   Hotels & Resorts, Amusement Paris & Multiplexes

9. Conservation Project
   Adaptive Reuse, Retrofitting/Restoration of Old and Heritage sites/structures.

10. Architecture UnBuilt Projects
    Designed but not built as on date - (1 to 8 categories)

11. Landscape Projects
    All Landscape Projects

12. Socially Responsible Architecture
    Sustainable Low Cost Regeneration of existing Social Housing and Community, Disaster Risk Reduction and Disaster Post-Construction.

13. Research Projects
    Original concise Architectural Research works.

PERIOD


ELIGIBILITY

IIA members having paid subscription up to 2017-2018 or Lifetime subscribers are eligible to participate in the Awards.IIA Office Bearers, Council Members, Chapter Chairmen, Publication Chairman/Editor; Award Committee Members are NOT eligible for participation.

ENTRY DOCUMENTS (UP TO 30 MB)

The submission process is entirely ONLINE, through the dedicated website - www.iiaawards.com

ENTRY FEE

The fees per Entry will be of 5000/- plus 18% GST

ENTRY DATES

The last date for uploading all the documents into the website is 30th July 2019. The last date for receiving the cheque/transaction slip at Mumbai is 5th Aug 2019

EVALUATION AND JURY

A distinguished Panel of Jury will assess all the entries. The Jury will comprise of the President of IIA or his nominee and a Panel of Eminent Senior Architects. (Names of the Jury Panel will be announced shortly).

The Jury will be a two stage process. From all the entries received, the Jury will do an initial shortlist of projects which will have to be presented live during the second stage Jury at Award function venue at Trivandrum on the 3rd, 4th & 5th Oct 2019. The final Jury evaluation will also be based on these live presentations.

PRESENTATION OF AWARDS

All the shortlisted entries will have to be presented live during the awards presentation program and also will be displayed for the exhibition. The shortlisted participants shall prepare their Presentation in PowerPoint format, which will be used for the live presentations. Further details will be intimated to the shortlisted participants. For clarification/queries, please mail us at iiapublication@gmail.com, coconvener@iiaawards.com, enquiry@iiaawards.com

The live presentation of all shortlisted entries by its architects, presentation of works by select Jury, Architect and the award ceremony will be held at Trivandrum on 3, 4, 5th Oct 2019.

As the host, IIA Trivandrum Centre invites Architects and Students of Architecture from all over India to participate in this event and get an insight on the various projects pan India. The registration forms are available online @ www.iiaawards.com from 20th July 2019.

For Registration to attend the event

Last date for registration to participate is 15th Sept 2019.

Early Bird Offer closes on 20th Aug 2019

PROGRAMME SCHEDULE -

03.10.2019
Closed door jury and Inauguration 04.10.2019
0830 HRS - Registration
0900 HRS - Shortlisted project presentations interlaced with sponsor presentation will happens simultaneously in THREE screens
1130 HRS - Tea; 1200 HRS - Presentation continued with sponsor
1330 HRS - Lunch; 1430 HRS - Presentation continued with sponsor.
1600 HRS - Tea; 1630 HRS - Presentation of works by select Jury members.; 1800 HRS - Entertainment

EVENT VENUE

KOVALAM, TRIVANDRUM

Convention center

05.10.2019
1000 HRS - Key Note, 1130 HRS - Tea, 1200 HRS - Key Note, 1330 HRS - Lunch, 1430 HRS - Key Note, 1600 HRS - Tea, 1800 HRS - Entertainment, 1830 HRS - Impressions of the Jury, 1900 HRS - Awards Ceremony, 2000 HRS - Dinner

IIA NATIONAL AWARDS 2018

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Disaster Management - A Poem

Ar Suresh Athavale

Suresh Athavale is an architect, completed Dip. in Architecture in 1963 and ARIBA in 1976. A specialist in steel construction, he worked in USA for 20 years before settling in Pune, India where he built his house (now 10-year-old), which is a three storey apartment in structural steel. Presently he is associated with Dr. BN College of Architecture for Women, Pune.

ssathavale@gmail.com

When we manage before or after,  
It's not one and the same.  
When we manage before or after,  
Are two different things.

The management earlier,  
We generally fail to plan.  
We generally fall in,  
To manage it later.

Disasters call in  
without warning,  
And then the situation  
becomes alarming.

We only keep thinking  
"something has to be done",  
But we just don't give a damn  
Until such a situations come.

Architects study Architecture  
They plan buildings for future,  
And not just design structures  
But to shirk disaster at any juncture.

What we by and large experience  
is unfortunate reality of indifference,  
Money takes the precedence  
Neglect towards compliance.

When "Disaster Management"  
is thoughtfully done,  
then battle against all odds  
is sure to be easily won.
Analysing the Safety Indicators in Urban Environment

Ar Asesh Sarkar - Email: aseshsarkar51@gmail.com
Currently Ph.D. Research Scholar at Architecture and Planning department, IIT Roorkee.

Educational qualifications: Specialization in Urban Planning (M.Plan) from School of Planning and Architecture, New Delhi, (2015-17), Graduated B.Arch. from Piloo Mody College of Architecture (2009-14).

Interests: Urban Design and Mental Health, Smart cities and smart technologies, Sustainable urban Planning, safety and security and urban planning Information and Communication Technology, Citizen Design science, Information Architecture, Technology Innovations and Urban Planning.

Ar Monika Arora - Email: moniarora93@gmail.com
Accomplished as an Assistant Director, Planning Presently offering 7 months of Industrial Experience in ISPER, Panchkula.


Potential Conflict of Interest in field of Rural Development, Sustainable Development, Smart City Planning, Urban Development, Infrastructure Planning.

Abstract
Over the years the urban population in India has been increasing. This fast trend urbanization is pressurizing the existing infrastructure leading to a competition over scarce resources in the cities. On the other hand, poor urban planning and design often leads to the failure of city management and thus increasing the crime rates. But United Nations in its report 2009 has defined different aspects which defines a safe city. How safe a city is, can be categorized into two- one that already has a high density of urban population like Delhi, Mumbai, etc. and another that is witnessing a rapid growth in terms of urbanization like New town Kolkata, Bhubaneswar etc. The paper aims to identify the indicators which are responsible for a city to be safe in terms of both spatial factors and social factors. The paper will also discuss the components and subcomponents of the indicators (Land use character, Design of a space, activities involved, Infrastructures, Social behavior/interaction and Environment. Lastly to formulate strategies for the city based on urban planning, urban design and Governance system. The entire paper will help us to take away the indicators to assess the safety and security pattern of a city.

“The pseudoscience of planning seems almost neurotic in its determination to imitate empiric failure and ignore Empiric success.”
- Jane Jacob

Key Words: Safe Cities, safe neighbourhood, planning and design, safety indicators

1. Introduction
Cities in India are witnessing tremendous growth in urban population. This fast trend urbanization is pressurizing the existing infrastructure leading to a competition and challenge over scarce resources in the cities. On the other hand, poor urban planning and design often leads to the failure of city management and thus increasing the crime rates. But United Nations in its report 2009 has defined three major aspects which defines a safe city. A city is safe if, it is safe from i) Disasters, ii) crime and Violence, iii) forced eviction of slums or insecurity of tenure. Global report says that there is huge amount of death due to this factor and it varies with city to city with different context. For example, the built environment has a direct relation with the number of crime cases. The
city having higher crime rate will have higher rate of fear of crime which unintentionally discourage the usage of a space. Poor planning gives a scope to stimulate and encourage more crime. The three components of crime are the victim, offender and opportunity. Good planning and design will reduce the scope of opportunity for the offender to execute the crime. Similarly, without proper safety management plan for disaster or without any approach to make the city slum free, it will cost huge human life loses. These three factors can be categorized under two broad factors, Spatial Factor and Social factor. For a Neighbourhood or a community level these can be further detailed out.

The spatial factors includes Land use and Design of space, Infrastructure, Environment and Social factors are affected by both endogenous and exogenous factors which includes Usage of space, Social interaction and Behaviours, Law enforcement and Management. All these six indicators can determine the safety pattern of a Neighbourhood level. To solve these issues three different strategies can be followed at different stages, planning strategies, Design strategies and Management strategies. There are two categories; one that already has a high density of urban population like Delhi, Mumbai, Kolkata, Chennai etc. and another that is witnessing a rapid growth in terms of urbanization like Bhubaneswar. The cities that are having rapid urbanization are the ones that need immediate measures for transformation and those that are rapidly growing can have a well-planned safe city project implemented at the initial stages of their development itself in order to sustain their long-term security needs.

2. Global Scenario
The rapid pace of urbanization attached with the growth of the city and its density is associated with increased crime and violence. Poor urban planning, design and management play a role in the determining the urban environment that put citizens and property at high risk. From the UN report, Global trends indicate that, crime rates have been increasing day by day. In the period of 1980 to 2000, total recorded crimes increased from 2300 to 3000 crimes for every 100,000 people1.

Other incidents reported to an international non-governmental organization (NGO), a minimum of 2 million people in the world are forcibly evicted every year. On the other hand between 1974 and 2003, 6367 natural disasters occurred globally, which has result a death of 2 million people and affecting 5.1 billion people. Paying special attention to urban vulnerabilities and violence shall reduce the probability of crime and ensure a secure and safe city environment. Building urban safety through urban planning, urban design, management and governance will promote institutional and organizational development, resource planning and management in order to enhance efficiency in governance. Enhancing safety and social cohesion are issues of good urban governance at both city and community level. These are prudent aspects which create an enabling environment for the inhabitants of the city, allowing improved quality of life and fostering economic development.

3. Indian Scenario
According to United Nations Environment programme report 2011, India is ranked second in the number of deaths due to natural disaster after china. More than 10% growth in crime rates in Tamil Nadu, Bihar, Odisha, Lakshadweep, West Bengal, Arunachal Pradesh, Assam, Jharkhand, and Manipur. 2.4 increase in the rate of cognisable crimes from 2012 to 20132.

The Ministry of Home Affairs (MHA) assesses and monitors the internal security situation, issues appropriate advisories, shares intelligence inputs, extends manpower and financial support, offers guidance and expertise to the state governments though as per the Seventh Schedule to the Constitution of India, ‘police’ and ‘public order’ are state subjects. The data collected by Housing and Land Rights Network India (HLRN) in 2017, government authorities, at both the central and state levels, demolished over 53,700 homes, thereby forcefully evicting more than 260,000 (2.6 lakh) people across urban and rural India, including the homeless3.

Figure 1 Classification of Various types of Eviction in India in 2017

Source: Force Eviction in India, 2017

4. Safety pattern in cities
4.1. Land use and Design of Space:
A well analysed Land use plan and its design of space is the top most factors responsible for the safety pattern. Without a proper Land use and without a proper layout it will affect the rest of the parameters. For example a mixed use inside the residential areas will involve more people activity.

Shops, cafeterias, food courts will keep a healthy interaction between the people. The street will be safer than any other streets. People will feel more secure and there would be no fear of crime. It can solve multiple issues at once. A proper Land use will also take care of the disasters so that if there is any chance of occurrence it would reduce the loss of life and reduce the amount of damage of the property. For example a required amount of open space is required 14 Sq mt/ person, a neighbourhood level park or a community park acts as an evacuation space if there is any kind of earthquake or fire hazards. It will reduce the amount of damage of structure and loss of life.

4.1.1. Land use Character
A Land use having more commercial areas and mixed use areas promotes more opportunities for more social interaction in that particular area. The person using this space acts as a natural surveillance and encourages the feeling of safety in the entire environment.

4.1.2. Layout
A residential community or a neighbourhood having proper service road and less cross interactions minimise the number of accidents. Intersections with intelligent traffic management system will reduce the number of signal jumping and road accidents.

4.1.3. Distance
Ensuring safety and sense of security are amongst one of the major factors when it comes to chooses place for living or sending children to school, Institutions, Jobs, or public Places. With the increasing population, demand for facilities is also increasing. So as to maintain the demand and safety in proportional manner, facilities should be provided at walkable distance and easy to move around.

4.1.4. Hierarchy of Roads
Hierarchy of roads are categorized on the basis of functionality and capacities. These are maintained in order to maintain safety though flowing vehicles having different PCU speed. It also helps people to move around freely when the roads are divided into National Highways, arterial, sub arterial, Collector roads , local roads , pedestrian foot paths , cycle tracks. This reduces the level of accidents and ensures safety.

4.2. Infrastructure
A definite number of infrastructures are required for a certain number of people or space at a minimum distance so that people can easily avail them. It also plays an important role in safety pattern, solving all the three factors. For example, if the optimum number of infrastructure is not available in an area, it will put an additional load to the existing infrastructure- it be a school, a hospital or a bus stop and it will thoroughly affect the entire system. Distance is another factor. If it’s not in the minimum proximity it will be of no use. Not only the required number but the condition of the structure should be taken care of. When the building is safe people are safe. The structural condition of building will also save lives. For example an earthquake resistant building will save life during earthquake and a fire safety measures like fire exits and evacuation balconies and sprinkler system will reduce the loss of life during any fire hazards. The sub components are discussed in details in the later chapter.

4.2.1. Social Infrastructure
A definite number of infrastructures such as (Schools , Institutes , parks ,open spaces , hospitals , nursing home , community centres and such) , are required for a certain number of people or space at a minimum distance so that people can easily avail them. For example, if the optimum number of infrastructure is not available in an area, it will put an additional load to the existing infrastructure and will direct effect the safety system. Lack of social infrastructure is directly associated with the community safety and security ,creating a fear of crime , issues with the community cohesion , sense of belongingness as the new communities take time to develop a sense of local identity and for strong social networks to flourish.

4.2.2. Fire station
It is necessary to provide fire station for every 2 lakhs within 1-3km and sub stations accordingly so as to provide safety especially in Urban Areas as they have high density. High Density and Mix Land use areas have major chances of been caught in situations such as open wire cables that catches fires, industrial areas with high voltage working machines and similarly for every Land use. So it is important to provide safety pattern to avoid hazardous conditions. Moreover, disaster management and rehabilitation centres will be encouraged from such safety measures.

4.2.3. Police station
As crime rates, violence, eve teasing and such awful activities are increasing now a days. So it is necessary to provide 1 police station for every 90,000 populations and 1 police post for every 0.4-0.5 lakh population. Vitality of streets and public areas with patrolling is a major factor for crime prevention. Because in mixed land use crime rates generally occurs at the dead end points or where different activities occurs imply with different users require more surveillance.

4.2.4. Street lights
Street lights are primarily intended to enable road users to see accurately and easily the carriage way and immediate

4 Welle, 2015; 5 URDPFI Guidlines
surroundings in the darkness. To control traffic on roads it is highly important to provide street lights as to promote safety, smoothness and harmonious flow of traffic.

4.3. Usage of space:
Proper Land use and required number of infrastructures alone will not help to maintain safety, if the usage of space is not maintained by the people for whom what it was intended. The space should be rightly used for what it is designed for. It will help bring people closer to one another, provide a healthier lifestyle and enhance safety among the society. As the gathering of people in a particular space is dependent on the usage of space, it’s an important factor regarding the safety pattern in the community.

For example, a street vendor sits in a defined space every day and night. He knows every people in his community. And due to his presence it becomes difficult for the criminal to act. Similarly, a park should be well maintained by the community or the ULBs so that people gather and interact on daily basis or weekly. Every space designated in Land use should be rightly followed to maintain a safe and secure environment in the society.

4.3.1. Activity
Urban areas are places where individuals meet, where social life is more extraordinary and complex, where culture is delivered, where monetary advancement together with specialized and logical changes are more obvious. So, Safety and security are amongst the most important factors while you are choosing the place to live and work. Some cities are working so well that they provide a good quality of life and maintain good living. Whereas other have problems such as pollution, crime, health problems.

Lack of safety directly affects the functionality of the urban areas and the aesthetics as well. When people do not feel safe, they try to change their life style and their different ways to adopt social networking. People try to avoid evening work and try to be back home before the sunset. People try not to use public transport in inactive hours, avoid parking vehicles in the underground.

They do not socialize and do not use public spaces such as parks etc. It’s compulsory for the society to promote public gathering as now a day’s people are getting anti-social and this is not good for the society so as to decline local crime problems and make business activities and life in public spaces more happening.

4.3.2. Public places
Shockingly, we live in a period when individuals are becoming progressively frightful about their security out in the open spaces. As dread assaults over the globe stand out as truly newsworthy, nationals are enthusiastically looking for wellbeing and security when they are out in the open spaces. The significance of giving a suspicion that all is well and good among individuals out in the open spaces can’t be thought little of. Other than being an essential human need, neglecting to have a feeling that all is well with the world in one’s regular condition can have different negative outcomes. The expenses of adapting to fear or different sentiments of weakness can incorporate enemy of social conduct and mentalities and may even have pressure related results).

Public spaces should be provided in an ample amount as we know that social gathering has stopped so by providing public open spaces we can make that area to life instead of making that area dead. In high Density areas, planning schemes should follow adequate public spaces in terms of location, quality and such as insufficient spaces increases potential conflicts.

This should be taken care of not to provide excessive of open land that ultimately turn’s into no-man’s land. Planning spaces should be planned avoiding empty places.

4.3.3. Mobility
People walking on roads don’t have proper walking facilities like proper footpaths, and even if footpaths are provided then there is no connectivity between two footpaths at the junction when people try to cross the roads accidents occur.

4.4. Social Behaviour/ Interaction:
Finally, it comes into the form of public interaction and behaviour both within the locality and outside on the street. At the time of need people should help each other to maintain balance and healthy atmosphere in the Community.

Figure 2 Social Behaviour among people

Source : Google, Social Interaction among People
India has a diverse culture and religion so people in Indian context have different occasions and celebrations throughout the year. Apart from this our community has associations where people can gather together to discuss their problems. We should always encourage this type of activities to involve more and more people, that is what we call in technical terms- community participation. It will help in reducing crime. People will be more active helping each other during any event of disaster and eventually with time, it will narrow down the gap between the people’s socio-economic status.

4.4.1. Residential areas
Safety and Security in the residential environment is a basic need of human and may be prerequisite for health. Adequate housing is a human right and to have a secure home to live in is one of the fundamental dignity, physical fundamental health.

4.4.2. Social spaces
Social Integration and social ties are additionally essential for diminishing potential clashes between the inhabitant and the users, for example regarding cohabitation between the new inhabitant and the user. They can also help people to be concerned about neighbours and thus generate sociability, involvement of the inhabitants with local life. People in bad socio-economic condition can thus be supported by others and prevent their life from falling into crime and social behaviour.

Social gathering points should be engaged with different activities going around so that area should be alive and people should feel safe to roam around. Social spaces encourage local sociability, which in a neighbourhood is essential to induce spontaneous surveillance.

4.5. Environment
We cannot avoid natural disasters directly or indirectly although we human beings are responsible for any kind of act. We call it an act of God but somehow we are responsible for it. So there should be CBOs and NGOs to help out the vulnerable population. Although government should take initiatives to mitigate this kind of problems. For example, a cyclone prone areas should have a proper early warning system, a flood prone areas should have all the data and maps on 5 years or ten years’ basis. It will help to reduce the loss of life and damage of property. Often slums are vulnerable to this, due to instability of structures. Government should take initiatives to help out this people considering them to be a part in our society. For example, various steps have been taken like IHSDP, BSUP, RAY, PMAY and slum free city action to make our society and city free from slums.

4.5.1. Natural Disasters
Experiencing the dangerous or violent natural disasters such as floods, tsunami, earthquake and many more can be traumatic for both children and young and devastation to the familiar environment and surrounding can be long lasting and distressing.

Current disaster planning and response emphasizes the need on all-hazard approach. We cannot stop such natural Hazards but we can certainly avoid such hazards through strategies. So there is a need to focus on strategies and disaster management plan by the management bodies such as Disaster Management team. All disaster management teams must adhere to designed structure to integrate successfully into the rescue effort.

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Source: EMBARQ Technical note (Welle and Li 2015)

4.5.2. Man-made Disasters
Any disturbances that disrupts a community where intervention is required to maintain public safety constitutes a civil disturbance. No matter the type of workplace, disaster
planning measures should follow the all-hazard approach i.e. mobility and flexibility. Such as shelter in place and evacuation plans especially in high rise buildings and medical care centres. Though we enjoying fuel for car and electricity in our houses but technological and industrial progress also puts natural environment at risk. The result is many variety of manmade disasters such as fuel spills, disposal of hazardous material. Accidents are the main cause of death. Accidents happen, even to people who are careful, but many accidents may be avoidable if simple precautions are taken.

The report compiled by the ministry’s Transport Research Wing said road accidents killed 150,785 people across India in 2016 — a 3.3% jump from 2015 when 146,000 lakh road fatalities were reported — indicating Indian roads continue to be one of the deadliest in the world⁸.

So it is necessary to follow the byelaws, preparation of plans, and regular check of buildings that are too old i.e. Building Safety.

### 4.6. Law Enforcement and Management

Lastly the entire process and system is dependent on a single factor-Law enforcement and management. If there are no management strategies and if the institutions are weak, law enforcement will be poor, finally resulting in collapsing of the entire system. For example if the community policing is weak or inactive it will increase the rate of crime in the community.

If there is no assurance or guarantee from the law enforcement department people will feel more insecure and the balance in the society to maintain safe and secure environment in the community. Similarly, if the management bodies of other department like fire department, Disaster management team, NGOs are not active it will delay the approach from the city being a safe city or a community.

All these six indicators can determine the safety pattern of a Neighbourhood level. To solve these issues three different strategies can be followed at different stages, planning strategies, Design strategies and Management strategies.

#### 4.6.1. Crime rate

The principle motivation behind executing safe city is to lessen wrongdoing and incite a sentiment of security among the subjects. It’s critical to be proactive about your security, particularly with regards to picking a place to live.

Crime and fear of crime can affect the way a city works as well as the attractiveness and functioning of some urban areas. When people feel threatened, they alter their life style and consequently the ways they use the city on daily basis⁹.

People do not use mode of public transport in the slack hours, many do not go out in the evening, avoid underground car parks, and children are not allowed to use public spaces such as parks and shut themselves in armoured flat or gated communities. Neighbourhood wrongdoing issues likewise make business exercises and life out in the open spaces decrease. Hence, wellbeing influences financial improvement.

#### 4.6.2. Community Policising

Community policing is collaboration between the police and the community in identifying the problems and solving the community problems. With the police no longer the sole guardians of law and order, Community people themselves take active part in enhancing the safety and quality of Neighbourhood. This will make community more active and aware of the surroundings. A foundation of trust will allow police to form close relationships with the police and will help in achieving the better results and achievements. Because without police and community participation, policing is not possible.

#### 4.6.3. Benefits of Community Policing

- Improved Immediate Environment.
- Aversion and decrease in the dread of Crime.
- Creation of positive attitude towards police.
- Empowerment of communities and redresses of the grievances

#### 4.6.4. Police patrolling

Police Patrolling helps in ensuring the safety and wellbeing of people within police precincts. Police Patrolling helps in monitoring suspicious or unusual activity. Police Patrolling ensure no criminal activity takes place in any shift, safety transportation of the detained suspects And even maintaining the integrity of crime scenes. Investigating abandoned vehicles, dispersing unauthorized, non-permitted crowds and much more.

**Figure 4 Incidence of Crime in India (1935-2015)**

8 NCRB, 2016; 9 SAFEPOLIS, 2006-2007
So, it is necessary to have police patrolling in the neighborhood and the city to ensure health and safety of the city.

4.6.5. Online complaint
All complaints and concerns regarding workplace safety, health and welfare issues are important and should be taken care of. Online Complaint is a useful tool so as to connect with the citizen.

Connectivity is one of the important components of the safe city and need careful attention in the assessment, planning and implementation. It is the backbone system in which the data travels from the surveillance systems to the data centres and control viewing centres.

5 Strategies
5.1. Planning Strategy
5.1.1. Crime and Violence
Providing social infrastructures with required number and within a walk able distance where it has a lack. A mixed use development within the community or local street can make places more economically and socially successful, as well as safer. (Minimum of 10% of mixed use in the Land use can bring an effective change in minimizing the fear of threat or crime. Development of community spaces and parks (under AMRUT scheme) brings a society more closely. Public zones to be normally accessible to everyone at all times with no automatic ability to impose access control measures.

5.1.2. Disaster Management
Ward level or at micro level disaster management plan should be prepared by the involving community participation. Volunteers and trainers should maintain a schedule accordingly. Various forms public awareness and education using local dialects, values, culture, stakeholders, community leaders, and local government’s high level governments should be promoted. Good practices to be introduced in the community based approaches to disaster mitigation. Through roads and cross junctions to be avoided inside the residential neighborhood area.

Minimum access and circulation route standards may be insufficient. Minimum Road width along with pedestrian lane should be designed for collector roads inside the neighborhood. Design for differently abled people should be executed.

5.1.3. Slums and forced Evictions:
Slum population is highly vulnerable. To make a slum free city and forced evictions, the ULBs should follow PMAY scheme. Providing facilities that match the needs of the community will generally increase the level of activity in a community.

5.2. Design Strategy
5.2.1. Crime and Violence
Shading of public realm space will encourage activity like in bus stops auto stands. Activities to be added at dead space where people rarely interact. Good landscape design will enable people to see what is happening around them and empowers them as observers over space. Signage can supplement cues from the built environment that support way finding by pedestrians and drivers. Openings in facades are a popular point of unauthorized entry to a building. Access may be gained either by breaking through a door, window or other aperture.

5.3. Management Strategy
5.3.1. Crime and Violence
By empowering members of the community as observers, people are more comfortable and encouraged to report suspicious behavior, misuse and crime. Active surveillance systems can afford a number of additional benefits to management and enforcing authorities. Management and maintenance of vacant plots, construction and demolition sites offers Environmental, Health & Safety benefits as well as a reduction in crime and in appropriate use of space. A good safety and security plan will incorporate elements that support effective operations and the work of the emergency services.

CCTV cameras can one of the parts for solution in reducing crime rates. Through the use of technology such as GIS with a mobile application are now being used in many cities for crime mapping. A crime map would be generated through which potential threats areas can be identified. The authority can take actions through spatial analysis or through the crime mapping (in terms of infrastructure, Patrolling).

The map can be generated with any time frame (days, week, months and years.) People feeling unsafe can generate a message within few seconds. The concerned authority can directly response and can take necessary steps at real time. Through this app it will bring courage to the user to feel safe everywhere. The implementation itself would reduce crime because of fear in criminal’s mind. It can be implemented at any cities or town.

5.3.2. Disaster Management
To consider all classes of people as a part of our society Government should take more steps to encourage public Participation. People should actively support and participate in community welfare organizations.

Through Community based disaster management vulnerable groups and communities can be transformed into disaster resilient communities which can withstand and recover from the stress and shocks from the socio economic political environment. Knowledge of prevention, mitigation and preparedness should be shared among the community.
National hazards may not be prevented, human hazards, technological failures; pollution civic strike can be prevented. Prevention will provide permanent protection from disasters or reduce the intensity of a disaster or to completely avoid a disaster.

5.3.3. Information, Education and Communication

Children should be made aware of Guidelines such as National School Safety Policy where all children, teachers and stakeholders are safe from Natural Hazards as they access their right to education. Capacity Building of Children, teachers, stakeholders, school personnel, state and district education machinery on school safety and disaster preparedness.

National Disaster Management Authority equips and trains other Government officials, institutions and the community in mitigation for and response during a crisis situation or a disaster. So every state should have disaster management plan so as to rescue at the time of disaster.

All disaster management teams must adhere to the structure to integrate successfully into the rescue effort. Increasingly, medical specialists are determining how best to incorporate their medical expertise into disaster management teams that meet the functional requirements of the incident command system.

6. Conclusion

Local/community planning gives communities direct power to develop a shared vision for their neighborhood/community and shape the development and growth of their local area. People can choose where they want their home, heir business to set up such as shops and offices to be built, have their opinion on what those upcoming structures should look like and what infrastructure facilities should be provided, and permit permission on planning for the new buildings they want to see moving ahead. Community planning provides a powerful set of tools for local people to ensure that they get the right types of development for their community where the ambition of the neighborhood is aligned with the strategic needs and priorities of the wider local area. This enables communities to play a much stronger role in developing the areas in which they prefer to live and work and in supporting new development proposals.

This is because unlike the parish, village or town plans that communities may have prepared, a neighborhood plan forms part of the development plan and sits alongside the Local Plan prepared by the local planning authority. Decisions on planning applications will be made using both the Local Plan and the neighborhood plan, and any other material considerations.

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Manifestation of Elements of Architecture as a Language

Ar Srushti S Pathak - Email: srushti.pathak13@gmail.com
Ar Srushti Pathak completed her B.Arch from Sardar Vallabhbhai Patel Institute of Technology (S.V.I.T), Gujarat, (2016) and Master of Interior Design from Arvindbhai Patel Institute of Environmental Design (A.P.I.E.D.), Vallabha Vidhyanagar, Gujarat, Sardar Patel University in the year 2018. Currently working at Ahmedabad, Gujarat in a Private Designing Firm from July, 2018 till date and have been working on Adaptive Reuse Projects and Exhibition spaces as well as private projects as an Architect and Interior Designer. Her work specialization includes Museum Exhibit Planning, Spatial Designing and Restoration Works. She has keen interest in Architectural History, Archeology and Ancient Indian Architecture.

ABSTRACT

Language is the medium of communication for each and every discipline. One of the important traits of any language is that, it provides a system that can convey meaning. Also it reflects other variety of aspects of culture. That is the beauty and identity of language of any discipline.

Architecture as a language has its own major features. It communicates about the people and their cultural aspects like life style, art and literature, aesthetic sense, climate and topography of region through its distinct style, elements and its place in the timeline of human history in a tangible and intangible way.

In India the journey of Architectural evolution dates back from Indus valley civilization till today’s contemporary designs which are an amalgamation of different architectural styles spread through the migration of people, imperialism and globalization. A panoramic view of this journey along with preservation, transmission and reinterpretation of the architectural work can be deciphered with the help of language of architecture.

Architectural language is both, profound and open ended which can be interpreted as per individual’s perception. For example, the ancient monuments of the country acknowledges one about the rich and varied cultural heritage, also the skill of the craftsmen of freezing the time in the stones by carving the day to day life and their natural surroundings for the communication with the next upcoming generation.

The present paper unfolds and exemplifies the elements of the Architectural language and their significance for social, cultural, religious, spiritual, historical, economical elevation of the society.

Any language has its own specific structure. It comprises of symbols which are sounds, gestures or written characters that represent objects, actions, events or ideas. In the language of Architecture, these elements of the built mass (buildings and monuments) depend on the distinct style of the particular region, its historical background, climate and topography. These combination and systematic arrangement of the elements communicates about the people and their cultural aspects, which forms the Language of Architecture. The language of Architecture is another means of communication that associates values, conjures notions and creates visual clues. Julia Morgan, an American Architect supports this notion by her quote, "Architecture is a visual art, and the buildings speak for themselves." She also believes that, "My buildings will be my legacy, they will speak for me long after I’m gone."

As we know, the country which is enriched by tradition and folklore, almost every aspect of Indian life has a special significance, which is translated into symbolic expressions through its Architectural Work. The detail related to this has been given in the table below:
Cultural interference in the development of the Architectural Language

The study has been taken that how the different architectural styles were developed by the mixing of the two or more original styles because of the migration of people, imperialism and globalization. The aim is to realize the change in the nature of architectural language with cultural interference and adaptability.

Indo-Islamic Architecture is one of the best examples of transmission of architectural language between the two religions. If we take the example of regional Mughal architecture, even if it was built by the Mughal emperors, the influence of Hindu motifs and craftsmanship can be seen in the Islamic Monuments because of the local craftsmanship. It communicates about how the Hindu and Islamic influences were fused together.

Hindu craftsmanship seen in the form of a Trabeated structural system in sandstone with corbelled domes and non-structural arched panels for the stylization and construction were overlaid upon the Islamic sense of geometry scale and rectilinear structural grid decorated with floral filigree. It clearly shows the overlapping of two

<table>
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<th>Value</th>
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architectural languages due to the cultural inferences. The above discussed aspect is further elaborated in the given example of one element (Jali) prominently used in Indo-Islamic Architecture.

Jali (Stone carved screens) as an Architectural element is used in Indian Traditional Architecture. Before the Islamic Era, the motifs and patterns were nature inspired and organic. In Mughal monuments the use of Jali retained but,
the language changed as they started using the geometric patterns in some regions. The basic idea of using these screens was to admit mellow light into the space and to allow the cool breeze in the interiors but not the harsh sun light. These screens cast the shadow and prevent heat to enter the spaces to maintain comfort against Indian extreme climatic conditions.

**Architectural Language : Interpretation of Hindu Mythology and Philosophy**

The Architectural language is both, profound and open ended. According to the perception, it unfolds different aspects. The built form itself a sculpture; The Hindu temples boast the most perfect example of Architectural language that convey the Hindu mythology, philosophy and its divine ecstasy. Temple as an Architectural built form, has different elements that communicates the following aspects:

It clearly reflects the religious beliefs of the people and the journey of individuals from the materialistic world to mortal and divine world towards the "Moksha". From the profane group activities to singular oneness depicted through strong hierarchy. Each part within the entire scheme seen as a comprehensive composition and a single integral unit. In the philosophy of Hinduism, Five (05) types of living organisms are described. (1) Annamaya Kosha, (2) Pranmaya Kosha, (3) Manomaya Kosha, (4) Gyanmaya Kosha (5) Anandmaya Kosha. Taking the example of the Architectural language of traditional stone carved Hindu temples which represents this concept. On the outer facade, starting from the bottom, the plinth carving depicts the daily life relations of human and nature (Annamay kosh). As we go upwards from the ground level, accessed by a narrow flight of stairs, it articulates another variation in the understanding of a complex - a transition from human to sacred. The physical act of climbing allegorically emphasizes the ascents to the heavens. Above the plinth level, we see the human figures with different postures in communicative way after that the carved figures of Apsara and Gandharva, that is the depiction of the Pranmay and Manomaya Kosha respectively. Then comes the sculptures of Deities and Gods, who are believed to be giver of the knowledge and ultimate super powers. That carved fringe represents the Gyanmaya Kosha. Above all of these the 'Shik卡拉' - the pyramidal steep form capping the inner most sanctum of the shrine denoting and establishing the connection to the divine. Merging with the Parabrahma is the ultimate goal and happiness described in the mythological references. Thus 'Shik卡拉' depicts the Anandmaya Kosha, which can be seen from the Figure 03.

All these manifested elements of the Hindu Temple Architecture elaborated above communicates about the belief of people, their culture, religion, spirituality and history, that forms a language in which all the temples were constructed. This hierarchy of the Temple Architecture can be compared to the Maslow’s hierarchy of needs proposed by Abraham Maslow in Psychology (Figure 04).

**Socio – cultural context in Architectural Language**

A case study has been taken to study the socio-cultural context in Architectural language by understanding the elements of very commonly seen building typology in the western hot and arid parts of India - The step well (Vav). It is exalted to become a socio-religious institution the. As subterranean architecture, it provides effective natural insulation through earth mass in the hot and dry climate. The excellent example of this building typology is Rudabai stepwell in Adalaj (Gujarat -India). This five storeyed structure is braced with cross beams all along its length to retain earth. This construction methodology develops its own language in terms of its spatial organization. Here the only visible clue above the ground is the pair of large pilasters flanking a wide flight of steps. They become the inviting portal to climb the steps leading to a platform.
Although there is a straight linear symmetrical organization of elements along the horizontal axis, the visual references continuously change due to inclined movement at every step. While the sight lines extent through the entire length of the well, the visual frame constantly changes with the changing eye levels, perspectival alignments and the resultant visual compositions all along its depth. (Pandya, Y. (2013).

The sequential frames at every floor along the path to the water portray the image of Lord Vishnu under the hood of Sheshnaga - the serpent god as a consistent visual focus and a reminder of a journey of the Patal Lok - the nether world. Another interpretation leads to compare it with the womb of Mother Earth - the journey conjures the sense of ablution. Developed language and associated mythology with its perceptions elevate a simple utilitarian device to the status of a social as well as a religious node.

Here the gradual unfolding of spaces creates a sense of curiosity. A dialogue is established between the subject and the perceiver through the mutual process of encoding and decoding of messages, thus making the entire process interactive as well as the discovery very personal and intuitive. We understood the communication through the elements of historical monuments and their styles but, the common people of any country has developed their own Architectural language according to the climatic conditions and topography of the region. This is known as the Vernacular Architecture.

Architectural Language : Vernacular and climate responsive methods

India is a country which faces different extreme climates all over the expanse. Security and protection from climatic elements have been the prime considerations in man’s efforts to create shelter for himself using the techniques of construction developed. Vernacular build forms evolved trial and error to provide a harmonious balance between buildings, climate and life style. These techniques and forms developed a distinctive style of architecture for each climatic zone of the country.

For example, "Haveli" is a very traditional Indian dwelling. It’s architectural planning comprises of the spatial arrangement of the activities around courtyard (chowk or aangan) and this courtyard is intensively used as a setting for a whole range of daily rituals, but climatically the courtyards were created for the better ventilation system in the houses of hot and humid climate and created the cooler conditions in the traditional houses through giving escape to the hot air. Also the heavier wall construction and shading produced by the dense settlement are the elements of architectural language developed in indigenous manner.
Vernacular architecture can be said to be 'the architectural language of the people' with its ethnic, regional and local 'dialects,'" writes Paul Oliver, author of The Encyclopedia of Vernacular Architecture of The World. The need for shelter is basic to man. But transcending this is a set of overriding values, intrinsic to the human condition; a concern for life, for community, for beauty.

Through the centuries, man has created his habitat through an intuitive and instinctive process. In India the villages of Banni in Kutch (Gujarat), a Pol in Ahmedanad (Gujarat), The desert city of Jaisalmer (Rajasthan) and Bamboo housing in the Assam region are some of the major examples of the same.

The villagers of Banni, Kutch build circular houses of mud, roofed with thatch. Materials eminently suited to their hostile desert environment. Clustering of huts and the arrangement of open spaces communicate about their life style, art, aesthetic sense as well as the utility value of locally available materials.

**Present scenario and Implementations**

Unfortunately, there has been a growing disregard for traditional architectural language around the world due to modern building technology quickly spreading a “loss of identity and cultural vibrancy” through what the Architectural Review recently described as “a global pandemic of generic buildings.” People have come to see steel, concrete and glass as architecture of high quality, whereas a lot of vernacular methods including adobe, reed or peat moss are often associated with underdevelopment. Ironically, these local methods are far more sustainable and contextually aware than much contemporary architecture seen today, despite ongoing talks and debates about the importance of sustainability. As a result of these trends, a tremendous amount of architectural and cultural knowledge is being lost. But still we can see a ray of hope as some Architects and Designers are trying to revive the traditional Architecture adopting such methods. Charles Correa (Indian Architect) designed 'Jaipur Kala Kendra', in which he took the inspiration from the Indian traditional step well Architecture and continued the Architectural Language of the ancient Rajasthani Step wells (Baori) and developed the planning of the central court using the prominent element - 'Steps' in modernize form seen in the figures.
Conclusion

The research and relevant case studies emphasize on the justification that Architecture as a language conveys various aspects elaborated above. Perhaps with the careful analysis, one may be able to identify such other elements and meanings unique to each cultural group.

An attempt to bring the understanding of the concept of traditional Indian Architectural works and to revitalization of the same which will help to preserve local traditions and other social, cultural, religious, spiritual, historical, economical and philosophical values.

Therefore it is recommended that the need to adopt a culture - sensitive approach to enhance the Architectural language through the manifestation and understanding of the elements used in ancient architectural works and to carry forward it into the present and futuristic developments.

REFERENCES


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ABSTRACT

In India, traditional values as well as the timeless way of building compact residential environments is now threatened by new and foreign influences. These influences are incompatible with the climate of the country and traditional culture of its people. In the context of the worldwide concern for global warming and a need for reduced carbon emissions, increased energy efficiency, reduced waste and need for alternative sources of energy, this paper reviews passive design strategies that were used in the traditional buildings across India and assess their potential in modern design. This study offers a classification of vernacular environmental design traditions based on West Maharashtra climatic regions and a detailed study of thermal comfort in traditional and modern dwellings using environmental performance modeling. The results show that traditional passive techniques provide a high degree of comfort for a longer part of the day while potentially minimizing energy use. Some problems were identified specifically in West Maharashtra region in adopting the passive strategies to the present context. For example, there are limitations in the use of traditional building materials, such as earth, but suitable alternatives with similar properties can be readily adapted to the same effect.

Sustainability in Indian settlements is static and is based on the living practices. India has got diversified climatic, topological and vast socio conditions due to which each region has its own unique identity with climate base responsive building designs and its knowledge in the form of vernacular architecture. This traditional wisdom of building human habitats is known to be tested by time for its sustainability in various settlements. This paper talks about West Maharashtra settlement, achieving sustainability through planning, orientation, materials and architectural practices evolved from long time due to socio, economic and environmental factors. Factors results in two levels i.e. macro and micro level. Macro level broadly focuses on planning & architecture aspects. Micro level describes art, architectural details and socio practice affecting built habitat. Trained designers of modern era have mostly ignored it. The study of passive design traditional strategies with local vernacular architecture and lessons about climate responsive planning, techniques can be helpful to generate an approach towards energy reduce and climate responsive building design in West Maharashtra corridor.

Key Words: Passive Design, sustainable Architecture, tropical, vernacular, thermal comfort, Climate responsive design.
Introduction:
For centuries, India has upheld a tradition of building with nature and it is only post independence that there has been as urge in a tactless following the so called ‘global trend’. In an attempt to break free from the British rule of 200 years, independent India, instead of evolving on its traditional roots, started blindly following the trend in the west. The architecture of centuries of trial and error was abandoned in a moment. Not only modernism but globalization as well has much influenced the Indian building industry. The last few decades have seen an incredible increase in the amount of mass housing and glass towers, in a climate where the sun is not an asset but an inconvenience. Tall apartment blocks, with concrete structure and thin filler walls, generously adorned with glazing and an array of air-conditioning units sticking out of the windows blot the landscape.

In West Maharashtra context, this study is an attempt to rediscover those vanishing passive design strategies that were the architectural statement of the West Maharashtra regions for centuries and served the purpose well and to see if they can be employed in the current architectural statement that completely lacks the empathy to environment. It should be emphasized that this study does not advocate reverting back to the traditional vernacular architecture of West Maharashtra, but to acknowledge the ingenious traditional architecture that was a result of centuries of trial and error to find that harmony with the forces of nature. It cannot be denied that the changed scenario does not permit one to go back to the traditional vernacular. The lifestyles, the needs of the people, the material use, and the aesthetic expectations have all changed and thus, need a different approach in residential design. But the passive design solutions that the traditional vernacular architecture offered cannot be ignored, considering the potential they offer. Hence, there arises a need to explore these traditional design strategies and reinterpret the knowledge of the past to suit the energy needs of the present and the future.

West Maharashtra Climate has a major effect on the performance of the building and its energy consumption. Reducing energy consumption, using natural resources and providing comfortable, healthier and sustainable living spaces are the aims of a climatically responsive sustainable building design strategies.

Sustainable design and construction strategies are of great importance now a days. One may say that sustainability was already a driving force in the past, exhibiting its validity through the different forms and techniques used. Therefore, from Vitruvius till today, problems and precautions in design and construction did not change fundamentally, although many developments have been seen in materials and technology.

Moreover, these developments may have had some negative effects. That is the reason why the building process should be discussed in a holistic way. In other words, climatically responsive design, selection of materials and building techniques must be evaluated together and the final product should perform well during its whole service life. Sustainability, which is presented as past decades in Maharashtrian courtyard houses concept, has been in fact applied since long culture and was realized spontaneously in traditional architecture.

When sustainable design and construction strategies of West Maharashtra traditional architecture are under scrutiny, then it is possible to observe how traditional buildings and settlements in this region were designed in harmony with the local cultural, topographical and climatic conditions and how their design and construction could be integrate in today’s design practices.

This study is based on comparative investigation and research strategies, which has been carried out on passive building techniques used in the hot-dry areas West Maharashtra. The study first aims to show the similarities and the differences of the traditional housing principles in climate responsive design point of view. Secondly, contemporary buildings it aims to put forward the basic principles and their meaningful changes in usage that can be used for sustainable housing designs of the West Maharashtra region. In this study, design strategies in hot and dry climate were examined and modern and traditional houses were evaluated in terms of design strategies, such as selection of the area of the dwelling, distance between buildings, orientation, building envelope and building form ending with passive design principles.

Though the modeling analysis was limited to the effect of thermal mass, material properties and urban layout, and did not consider specifics of evaporative or ground-tempered cooling which is used in the regions as an aid to cooling; it nevertheless gives an inking to the effect of passive strategies in the traditional buildings of West Maharashtra when compared with the modern construction of this region. It thus, points out to certain lessons that are to be learnt from vernacular architecture and which can be incorporated in modern architecture to make it more efficient energy responsive buildings. The comparative investigation of
features and results from the modeling a analysis are presented in this article that can be deciphered from the analytical study and thermal analysis can be point out and how these can possibly be incorporated in Modern building design specifically West Maharashtra settlements and support residential region. Threshold and model analysis is a suggested mode of analysis as per research methodologies are concern.

**Climate / Environment**

Climate had a major effect on the performance of the traditional building architecture and its energy consumption in hot dry area of Iran. Lack of water and energy sources in these areas forced people to build their houses with some strategies based on minimum energy consumption. Heating and cooling usually use largest portion of energy in buildings. Therefore, builders tried to use natural climatic strategies for coping with harsh conditions. These strategies include: layout orientation, distance between buildings, building orientation & form, climatic elements such as Varandha wind catchers, central courtyard, and so on.

The first aims to introduce these strategies and then, to categorize these characteristics at three levels
- a) Macro scale
- b) Medium scale
- c) Micro scale

In addition, the mentioned strategies will be explained in their level of performance and the relevant elements in other levels. Furthermore, this aims to put forward basic principles and changes in their usage that may be of benefit in sustainable housing designs in the future. In this study, the cited design strategies will be examined and modern and traditional houses will be evaluated in terms of design criteria - such as, selection of the area, distance between buildings, orientation, building envelope and building form. Its a simplified evaluation and comparison of a traditional house with a contemporary house will be given.

The most important design parameters affecting indoor thermal comfort and energy conservation in building scale are distances between buildings, building form, building envelope design, self efficiency in building materials and optical and thermo-physical properties of the building envelope. Among these parameters, building envelope design, as it separates the outdoor and indoor environment, is the most important. All of these parameters are related to each other and the optimum values of each should be determined depending on the values of the others and their optimum combination should be determined according to the climatic characteristics of the West Maharashtra region.

**Orientation and urban form:**

The orientation in traditional residential planning was designed to take advantage of the prevailing wind direction and to minimize the solar insulation in the building. There is no reason why the same principles cannot be followed in modern day planning, even when using court planning. The house form in modern planning is dictated by the economic status and multilevel planning are finding preference as against the traditional linear layouts. Yet, considering the benefits of orienting to reduce insulation and increase wind movement in planning should be considered by designers. Building depth should also be kept within the limit required to provide good ventilation and lighting in different spaces.

**Typology ( Courtyard / Non courtyard )**

The lack of space and the westernized design trend have steered house planners away from adapting the courtyard in house design, along with the changes in lifestyles of West Maharashtrail people, such that they no longer require a semi-enclosed space to do household chores. The box-like design makes the modern house deeper than can be efficiently serviced by natural ventilation. The use of courtyard typology allowed for ventilation through well-shaded openings and a store for cooler air from the night ventilation. But similar effect, to a lesser degree, can be achieved by designing an multilevel court space with high-level ventilators and provision for night cooling.
Building form:
West Maharashtra region in a hot and dry climate, the most preferred house plan is one with a courtyard. In order to minimize the area affected by the solar radiation, compact forms are chosen. By arranging those forms with courtyards, shady areas can be obtained. In courtyards, with the help of water and plants for evaporative cooling, the floor temperature can be minimized by the high walls surrounding the courtyard, shady areas can be obtained and the open areas can be used during the day. Channels for water poured out from the pool are important elements for cooling. Water is often spread by channels to the floors of the courtyard and evaporative cooling from the surface of the courtyard floors which are made of porous stone contributes to that effect. Courtyards are always on the ground floor and have different forms depending on the landscape of the house.

Evaporative cooling.
In West Maharashtra regions with scarcity of water, this technique was limited for its want of water features or the requirement of keeping gunny bags or earthen pots wet, but with the advent of fine-spray sprinklers, the strategy can be successfully adapted much more efficiently in modern design by making passive water sprinkler systems in house by means of water curtains and wet landscapes.

Shading/Jali work windows.
Jali windows make a distinct aesthetic expression but are a concern for safety and pest control along with being expensive in both time and money. They can be designed to be used as the safety guards between the glass and pest screen shutters in a window, or more appropriately be used in high-level openings with pest screens. Alternatively, the use of louvers/blinds and tinted or heat-reflective windows instead of clear float glass windows will also help in increasing the efficiency of the windows. Shades must be designed to keep the solar insulation out while letting the light in, as such light shelves can be used for better performance of windows. Deep overhangs and verandahs are also loosing importance in design but are an efficient way of shading windows as well as walls and reducing the sol-air temperature while providing a usable semi-enclosed space.

Fenestration design.
Vernacular architecture features fenestration design variation in the different climate zones to either minimize solar gains or take advantage of the air movement, which is often ignored in the modern residential design and can be easily adapted to increase thermal comfort. The modern house has large glazed areas not well-shaded from the sun and oriented in all directions. The use of different types of openings for different purposes in a dwelling should be incorporated in design as per the climate requirement.

Building envelope:
Sustainability and energy efficiency are greatly affected by a building’s skin. The amount of surface area, material choice and insulation strategies are key elements in buildings located in West Maharashtra region. The buildings are built in cubic forms and architects tried to minimize the ratio of outdoor surfaces of buildings to the space required instead for habitation. Linear Court forms helped buildings to have a lower exposure to hot weather factors than more linear forms of building.

Optical and thermo-physical properties of the building envelope:
In the hot and dry climatic areas in West Maharashtra in examples of traditional architecture, to benefit from the time lag of temperatures in the building envelope, materials with greater thermal mass have been chosen. These kinds of thermally massed envelope details are very convenient for continental climates, where the summers are very severe with high swings in daily temperature variations. This big thermal mass will slow down the heat transfer through the envelope and thus higher day-time temperatures will be reached indoors although outdoor air temperature is much lower and consequently more stable indoor thermal conditions will be provided. On the other hand this thermal mass, which has higher surface temperature on outer side will rapidly lose heating energy to the atmosphere via radiation at night to start the next day from a cooler level.

Stack effect openings/wind towers.
Modern house design often ignores the principles of fenestration design for ventilation, focusing on providing large glazed areas for visual aesthetics. The traditional
principles employed for increasing the wind movement in indoor spaces can be efficiently adapted to the current West Maharashtra context, by providing high level trickle vents or atrium spaces with ventilators. The use of wind towers is discouraged also due to aesthetic concerns but a well-designed wind tower can add to the aesthetic expression and provide an efficient way to cool buildings. It can also be coupled with sprinklers to provide evaporative cooling, further enhancing the potential. Traditional architects were obliged to rely on natural ventilation to render the inside condition of the buildings more pleasant. The air trap was a common specific feature of architecture found in the majority of hot dry regions of West Maharashtra regions. Air traps were normally positioned in a suitable location in the house according to the size of the building, and the number of air traps that were necessary to cool the summer.

In old times and in traditional buildings in hot and dry West Maharashtra regions the air trap functioned like the present modern air conditioning system. Air trap is like a duct whose end is underground and the top is elevated above a specific height on the roof. At the upper outlet many small openers or ducts may be set. At the end of the air trap at the bottom of the door, often a pool is set whose water was provided by water ducts. The height of air trap, the number of openers and the location of the air traps depends on the location and orientation of building.

The air trap operates in response to the condition of the wind and sun radiation in the region. The inside and outside walls absorb a lot of temperature during daytime. As a result they cause a balance of temperature at night and bestow the attracted warmth to the cold night air. The wind catcher functions on several principles. They are built with their long ventilation shafts positioned to catch any hint of a passing breeze to channel down into the house. The interlinking rooms of old buildings were designed to circulate the air that fluted down the wind catchers.

Carved exposed surfaces/ Self shading ornamentation.
Traditional design took the benefit of carved wall surfaces to increase surface area for radiative loss and also to self-shade the wall. Some modern designs also use textured wall finishes or exposed brickwork in different courses to the same effect.

Roof design.
The thin concrete roof characteristic of the modern dwelling is the source of high solar gains and some traditional design principals can be successfully adapted to reduce the solar gains. The use of double roofs is an efficient way of reducing heat gains and can easily be incorporated in modern design. The use of earthen pots for insulation in traditional houses can also be adapted in modern design to reduce heat gains. The use of high roofs to facilitate stack effect should be incorporated in design to increase air movement. In the warm humid region, the use of a low thermal mass roof that reciprocates the external conditions is useful for the fact that it cools down faster in the night restoring the dwelling to comfort conditions. Although it also heats up faster, it might be beneficial to explore the use of movable insulation to prevent heat gain in the day but promote heat loss in the night.

Materials.
This is perhaps the most difficult aspect to adapt, as most traditional construction materials are outdated and unsuitable to current standards. But as demonstrated in the analysis, they have a profound effect on the thermal performance of the building and there is ample scope of improvement in the current envelope design specifications. The modern brick-concrete construction does not provide
the long thermal lag, and the rapid cooling in the hot and humid climate. In the hot and dry zone, the heavy thermal mass of the walls and the roofs of the traditional house provides long thermal lag ideal for a climate with high diurnal range, keeping the house comfortable both in the day and the night while in the hot and humid zone, the high thermal mass of the walls provides some thermal lag while the thin roof allows the house to cool rapidly in the evenings to maintain comfort conditions. Materials having similar thermal properties as the traditional stone or mud walls can be found or composite walls made to perform similarly which find naturally in abundant. The use of cavity walls and insulation can be applied to the same effect.

Use of vernacular materials such as stone, brick and wood is always one of the concerns in the architecture of West Maharashtrian buildings. As an illustration, they used to use excavated foundation soil from river bed in order to make bricks. There are many examples like this which are incorporated in today's architectural concepts for sustainable building design. Vernacular material selection, compatibility, embodied energy, application of passive energy and design environmental strategies in waste and technology management concerning the impacts in the environment are all concepts that are part of sustainable building design.

Conclusion:
It can be concluded that the traditional passive strategies can be effectively adapted to modern design conditions and benefit the comfort conditions in dwellings. As perspective study from the thermal modeling, only through the effects of materials, orientation and shading, the traditional West Maharashtra dwelling are comfortable for 60–65% of the time as against the modern dwelling which is comfortable only for 35–40% of the time on an average hot day. Most of the design-based strategies are easy to adapt and the material-based strategies have alternative solutions that can be used to make the buildings more energy-efficient in the ways identified in this study.

Further exploration is required to understand the other strategies apart from the thermal performance of materials, layout and shading; in order to fully comprehend the combined effect of these strategies. An exploration into finding different combination of these strategies in modern design might unravel a solution for a completely passive design approach in West Maharashtra region.

Climate responsive passive design strategies in hot and dry area of West Maharashtra region were discussed in this paper through three levels.

In the first level orientation of buildings, form, pattern of planning and traditional and contemporary settings of plan were considered as macro strategies. Review and development of these traditional residential patterns should be considered in hot and dry climate of West Maharashtra region.

Medium scale strategies cover building form, building envelop, self-efficiency in materials and optical and thermophysical properties of building envelop in this paper. Sustainable architecture force us to re-think what we do and synchronize traditional methods of construction and the use of domestic materials. Blending of traditional and contemporary building technology to enlish the comfort aspect.

Finally, micro scale strategies demonstrate some more relevant architectural design methods which are the same as contemporary passive systems. As an illustration, old wind-catchers have been developed into advanced passive cooling systems in recent time to develop natural method of wind cooling and channeling.

Consequently, consideration and development of the above passive strategies allow contemporary architects and designers to build contemporary architecture in a more sustainable, comfortable and self-sufficient way. This comparative investigation of Traditional to modern passive strategies of energy reduce systems gets comprehensive and systematic approach of climate responsive panning for the future West Maharashtrian residential.

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Sliding Fitting has been a versatile and outreaching result of shift towards futuristic technology. The concept has already created a furore. The instances of its vivid application are manifold. From doors of automobiles that move sideways to the screens of our tabs, the execution of the principle is universal & inescapable. Smooth, fluid like soft movement, there are a very few motions that can stand up to it.

In keeping with the moving dynamics towards sliding technology, Hettich has launched SlideLine M, Sliding door system, another name for design in motion designed for 2 door or 3 door cabinets where the simple installation system adds a cadre to the system.

The product is ideal for use in Kitchens in overhead units, in living rooms & to facilitate the movement of side cabinet doors in bathroom furniture to access the contents within. Whether in wall unit or as clever alcove solution, SlideLine M is an integral part of the modern kitchen.

Be it wooden, aluminum framed, or glass doors up to 30 kg weight, SlideLine M is functionally equipped to deal with each element. The 2- track bottom running sliding door system is your ultimate answer to a source functioning as a practical design element altering the interiors of your favorite premises. The product caters to door height up to 2000 mm & door width from 300-1800mm with +/-2mm height adjustment.

The silent mechanism slows down the process of closing, opening and the colliding direction of the doors with the choice of the activation point being positioned where ever desired. SlideLine M’s inset door position & silent system is perfectly safe for children’s little hands & feet. The runner & guide profile can be easily installed on all sorts of carcase & worktop materials as they provide the option of being screwed on, stuck on or groove mounted. Standard SlideLine M fitting sets have been used securing the safety constituent of the product. The fitting has been tested to EN 15706, Level 3 assuring the long lasting quality & functionality of the product.
Integrating Research - India's Architectural Education System

1. Abstract:
This paper focuses on the need and importance of research and self-driven learning by discovery through an intellectual thought process as a part of present architectural education in India. It would promote the value enriched classical method of teaching the subject along with the ability of students to question the method by itself.

This can be a great tool for perpetuating and illuminating the contemporary learning process whose outcomes would be much more sensible. According to me, “Any product as an outcome of intellectual design process would have minimal flaws”. Process oriented design approach should be inculcated in the learners rather than a product driven approach. A small refinement in the contemporary architecture education adopted by most of the colleges would produce not merely architects, but intellects who can play a sensible part in the future development of our nation.

2. Architectural education in India:

2.1 History of architectural education in India:
Architectural education dates back to Vedic era under the principles of Gurukulam system. It was called as ‘vaastu-shashtra’ which was a part of Vedic scripture. It led to the development of building architecture and the planning of ancient cities such as Mohenjo-Daro, Harappa etc.... But this system of education faded over a period of time.

When British East India Company came to our land, they brought along new construction materials and technology along with their structured education system in architecture. It was called ‘Ecole de Beaux’ which had its roots in Paris and spread across various parts of the world. This system included division of students lead by a benefactor. Each studio dealt with various issues in the practical field with a practicing architect. The main pedagogic tool comprised of meticulous core study of architecture with competitiveness among the students. The new students learned from the critiques of their work by old students. As far as India is concerned, its royal artisans and the architects of religious structure of that period have built a wide variety of their masterpieces which still remain an inspiration to all of us. The knowledge of how these marvels were executed is still unknown in spite of advancements in technology. On the other hand, although there were many mundane Western influences, architects like Louis I Khan and Le Corbusier have given a sensible direction to modern Indian architecture and planning. But the common ground between these two is evolution and execution of ideas through a great understanding which is gradually declining over a period of time. Due to advent of globalization and industrial revolution, Indian architectural practice continues to evolve in many directions.

2.2 Architectural education at present:
The current system of architectural education in India started in 1913 at Sir JJ School of Art, Bombay. During 1960, there were only 15 architecture schools in the nation. At present in 2019, there are 477 colleges. Though the number of colleges is increasing to meet the demand for more architects, the congested five year curriculum followed by most of the schools lacks emphasis on research which should be the back bone for teaching architecture.

The aim of architectural education is to teach, inspire and train students to play a sensible part in the future development of India and equip them to meet the challenges that they would face when they are in practice. The system of turning the architectural design problem into a continuous sequence of episodes called stage submissions such as ‘site analysis’, concept, ‘site zoning’, ‘program analysis’ etc... is highly contentious. Since each phase of submission is individually graded, students are not

Ar B Sivashankaree - Email: sivashankaree@measiarch.net
Qualification:
1. B.Arch (2008 – 2013) - School of Architecture and Planning, Anna University, Chennai, Tamil Nadu.
COA reg no: CA/2015/69922
Designation: Assistant Professor.
motivated to transfer learning from one episode to another. It is more like mandatory ritual by preparing a checklist to drive a product rather than a process oriented outcome. There has to be a healthy relationship between the ideals of students and their form of expression developed through a continuous process of architectural thought and technique as a part of pedagogy. Though architecture is an integrative discipline of various fields such as STEM (science, technology, engineering and mathematics), the current muddle with the curriculum seems to be a complete fragmentation of learning. Each field seems to be isolated and unrelated to other fields.

There is neither horizontal integration of various subjects and studios across one year nor vertical integration of learning episodes from one year to another. One must understand that “Knowledge cannot be delivered and transferred in isolated fragments”. Although some of the architecture schools in India and the faculty associated with them implement research oriented intellectual architectural teaching process, many are still following the outdated methods. Methods, techniques or tools utilized for implementing such teaching should be brought to limelight through conferences, articles, papers etc... for wider propagations.

3. Need for Intellectual thinking:
According to John Ruskin in his book ‘seven lamps of architecture’, “Know what you have to do and do it” which is a great principle for success in every direction of human effort. He has also stated, “For I believe that failure is less frequently attributed to either insufficiency of means or impatience of labor, than to a confused understanding of things actually to be done”. Therefore, the work of an architect has to be clearly defined in terms of specialization in the field which can be achieved through perpetuating their area of interest. There is also an immediate need for intellectual thinking in organizing architectural education towards practising architecture.

Though values of research and theory as elucidating ideas cannot be accentuated, practice always entails theory. If research and development is emphasized as a part of architectural education, the confusion at practice can be greatly reduced. The importance of research and development in a systematic course of training would be capable to afford a value added intellectual discipline.

Well directed, it can clarify the understanding of students, give them confidence and certainty of purpose and develop their critical judgment.

4. Research as a part of architectural education:
With the increasing influence of science and technology, architects are termed as “scientists with an artistic framework” rather than “artists with a scientific framework”. According to Vitruvius in his ‘Ten books on architecture under the chapter Education of the architect’, “The architect should be well equipped with knowledge of many branches of study and varied kind of learning, for it is by his judgment that all work by other arts is put to test”. This does not mean logical sequence and formulae can ever replace the creative act, but creativeness can surely benefit from a clear thinking process. Uniting the technical and imaginative elements is as essential as humanity is to soul and body. One must aim to understand the design problem before seeking its final solution. Incorporating research in studio design is important because, research is about searching for information which can help students to understand the problem better. A series of searches could improve the design product. The advantage of process oriented approach in design is to understand what to do, when and why with the aid of research which also means search. Design on one side and research on other, bring along a difference in focus. Design is not only used for process but also for its end product, on other hand research inherits the word ‘search’ by itself. Transitioning the product driven approach to process oriented approach has some linked benefits with research.

A research defined project will comparatively have a larger scope starting with context, intention and completion with correlation between results. Instead of running in a straight line towards a solution, students should be encouraged to take time to ask sensible questions, to compare alternatives produced and to analyze the constraints along with critical judgments. This move from product to process will enhance the lateral thinking process and meet the principal goal of architectural education. It can form the base that is critical to have ability to process information in addition to being creative and inventive, and it can teach one not to accept everything that is offered.

5. Role of research cell in architecture schools:
An architect should be well equipped in subjective theory as well as practical knowledge and application. Considering research and development as the backbone of architectural education, establishing a research cell can act as a knowledge management support system to architectural schools. It can nurture research culture in the students as well as teacher by encouraging research in newly emerging and challenging areas of architectural education and its multi-disciplinary fields.

This would enhance the general research capability of students. Apart from this, introducing research as a part of architectural education by incorporation in the syllabus
and method of teaching the architectural design process from the base level (first year of architectural education), with increase of depth in research in subsequent years, would definitely enhance the intellectual processing of information acquired from various resources. For instance, at first year of architectural education, the design projects and experimentations based on theoretical principles could be explored through small scale research problems with a stress on inferences by the students. During second year, sequential research as a part of design process would help them identify their areas of interest which prevents monotonous designs and enhances practical innovations.

At third year which is a very crucial part for students of architecture, the students being more exposed to both practitioners and other scholars who work with important issues in the field, research helps them to learn more about their areas of interest. It also helps them to compete globally in competitions.

And it encourages the students to choose the right office for their practical training, perhaps an office which specializes in the student’s thrust area and get trained effectively. By final year, the students could do a good thesis with logical sequence in overall design approach with minimal flaws and stress free since their area of interest could help decide their thesis topic. This system of research oriented architectural education also motivates the learners to take advantage of their architecture profession to investigate and resolve information in any field (planning, media, ecology, environment, human rights, by-laws, etc...).

5.1. Establishing knowledge incubator as a part of a research cell:

Knowledge incubation centre is a virtual library which could be developed and established through qualitative information in the field of research and development and as a part of the institution’s research cell. It should be updated periodically by the faculty and students based on new innovations, inventions and discoveries not limited to the field of architecture and urban design but also science, technology, engineering, mathematics, history, astronomy biology, environment, planning etc...

The resources of the architecture schools such as books, magazines, journals, labs, E-books, E-journals, research papers, studio works, experiments, etc. can be used more effectively through this centre. Knowledge & inputs of living personnel (experts in the field) can also be of great impact. Virtual library development is very much a team effort involving students and faculty. Group co-ordination and co-operation can lead to fruitful results in developing this particular facility.

Considering the potential aspects of this knowledge incubation centre, it could act as a base for any research or design approach carried out by the students or faculty members and the end product could be uploaded, which would again act as a preliminary base for any other future research process. Other potential aspects of this centre are, increase in the digital information access, updating of information regularly by the staff and students, original documents could be preserved and its potential can be utilized to a maximum, resource sharing can be enhanced between one / more institutions, library services can be improved. It could help students to bid and win competitions worldwide. Intellectual thinking can be enhanced and it could pave the way for a multifaceted exposure.

The designed incubator should be user friendly with flexible search engines, which should focus on quality rather than quantity, inter-operability should be flexible. Regular monitoring and perpetuation is needed. Stagnation at one particular point is possible which is to be avoided. It should always have an eye on the future.

6. The exemplar :

6.1 Consider “History of Greek architecture”: Its underlying ideas could be explored and explained. For example: marble statues of women in long robes called caryatides (Figure 1) took the place of columns in a Greek public building. The researchers should be able to find out and explain that Greece won over Caryae (a state in Peloponnesus); that the Greeks killed the state’s men and took their wives as slaves with long robes not only to identify them as slaves but also to burden them with the weight of their shame, thus making reparation for their state. Hence, certain public buildings created by architects in that era were designed with statues of women as columns to carry the physical load in order that the sin and punishment of the people of Caryae might be known to the future generations.
6.2. History of architecture + Mathematical principles = Acoustics.

In ancient Greek theatres (Figure 2), bronze vessels are instilled in the niches beneath the seating in par with the music intervals based on mathematical principles. When the performer’s voice hit the vessel, the power is increased and reaches the audience as a clear and sweet sound.

7. Conclusion:
Architecture being a noble profession primarily serving the habitat needs of our nation, intellectual thought process is highly needed. It could be achieved through research oriented architectural education system which encourages students to identify, develop, nurture and master in their area of interest which would prevent basic flaws in practice.

To be precise, architecture must be at a distance from itself but within its own boundaries. It is mandatory for the students to choose and develop the skills from the ocean of this multifaceted profession.

Therefore, from initial years of the architectural education, the students have to be directed through various forms of learning and recognize the intercourse between all studies through research and development so that they can comprehend them all.

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Evolution, Relevance and Design of Urban Public Spaces in India

Dr Aarti Grover - Email: a.grover@spa.ac.in
Dr. Aarti Grover is an architect with a specialization in Landscape architecture and Doctorate in Architecture. Her Ph.D. explored Gender perceptions and preferences in Urban Public Spaces. With a professional experience of almost 18 years, she is presently working as an Assistant Professor at the Post-Graduate Course of Landscape Architecture in SPA Delhi. She has worked on projects of various natures and scales related to Landscape Architecture, Architecture and Interior Design, in the capacity of both advisor and consultant. Her career is a balanced mix of practice, teaching and research. The key areas of her interest are Regional-Planning and Site-Planning, Landscape Urbanism, Habitat Studies and Ecology, Social aspects of Urban Landscapes especially Gender-Space Relationship.

Ar Poonam Saini - Email: poonamsaini.ska@gmail.com
Ar Poonam Saini is a landscape Architect presently working with Delhi’s leading landscape firm Satish Khanna Associates, SK-A. With an overall experience of around 17 years, she has been involved in architectural and landscape projects of various scales and nature. As an associate of SKA, she is responsible for master planning and landscape design, detailing, execution and supervision of numerous projects including commercial, residential, institutional, recreational and townships. Her approach to landscape design is derived through study, analysis and exploration of visual and functional uses of space. The key areas of her interest are Urban Landscapes, Ecological landscapes, landscape engineering and detailing, Site planning and Master planning exercises.

INTRODUCTION
Our perception of well-being and quality of life is determined by the extent of fulfillment of our needs. These needs can either be physical or psychological. To fulfill the psychological needs one has to interact with others. This act of interaction gives rise to the idea of outdoor space where one can sit, chat and share his thoughts. From here originates the concept of ‘open space’ in general and ‘urban space’ in particular.

In the Indian situation, many traditional open spaces have sustained life for centuries. Moving ahead with time, these spaces got crowded with people and activities but are still relevant in modern context. Indian towns are characterized by the clustering of buildings with balconies overlooking streets and courtyards providing public space both at neighborhood level as well as at city level. These courtyards or squares accommodate multiple activities ranging from religious activities, marriage ceremonies and celebration of festivals. Taking examples from Indian cities, it has been observed that the nomenclature and character of these community open spaces may have varied at regional level due to cultural diversities but the function they serve remains more or less same. ‘Chowks’ in Jaisalmer, Ahmedabad and ‘Chaupars’ in Jaipur, all speak the same vocabulary despite of being present at different places and times.

Basically, an urban open space is distinguished by predominant characteristics, such as the quality of its enclosure, the quality of its detailed treatment and activities that occur in it. The square or plaza is both an area framed by buildings and an area designed to exhibit its buildings to the greatest advantage. A small city may have a single square that serves as traffic hub and gives its character. Great cities have squares of every size, style and purpose, demonstrating the varied ways in which space can be contained and manipulated. Typically a plaza is paved, enclosed by high density structures and surrounded by streets or in contact with them. It contains features meant to attract groups of people and to facilitate meetings.

The research aims in understanding the essence of urban plaza that exists in the urban city structure. It tries to highlight what kind of squares enrich our cities, bringing in certain issues and solutions pertaining to their design aspects. It will illustrate examples of urban plazas in traditional and contemporary times, especially Indian examples.

URBAN OPEN SPACES IN INDIAN CONTEXT – STREETS AND CHOWKS
Many open areas in Indian cities and villages are bisected by ‘desire lines’. These paths are either formed by trampled lawn or compacted earth, ‘line of least resistance’ or the shortest and easiest route from point A to point B. These desire lines were the genesis of many streets in Indian villages and traditional cities. In some cases these streets evolved from left over spaces after building or were designed elements imposed on the landscape in a grid or other
pattern. For example Chandni Chowk in Delhi is one of the most known streets.

According to Charles Correa

“A component of primary importance to any city is the quality of its streets.”

The chowk has been an important public space in traditional Indian cities since ancient times. Often where two streets crossed they would open up to form a chowk. Whether as a market square or temple square or a square in front of a mosque, these spaces have been important parts of people’s lives. The chowks were the ‘pulse’ of the city, acting as markets, open spaces, venues for cock fights, storytelling, preaching and spending time. Chowks can also be seen in villages – the village square or in older parts of large metropolises, e.g. Hutatma Chowk (Flora Fountain) in Bombay. It is also a place for elders and women to relax and gossip, children to play and generally a central community place for the village where dramas are enacted and singing and storytelling in the evenings mark festivals and celebrations.

Correa claims that several chowks have been converted into “glorified parking lots” in many Indian cities. It is suggested that chowks and public plazas need to be rehabilitated as important nodes in the city. Parking should be restricted and should be discreet at the edge of such square if at all allowed.

OPEN SPACES OF MOHEN-JO-DARO, INDUS VALLEY CIVILIZATION

Mohenjodaro is one of the oldest examples of city planning. The city comprised of two major parts – the citadel which was raised and the lower town. The citadel had large open spaces for public activities, the most important being the Great Bath. The streets of the city were wide and are at right angles to each other with chowks at the intersections. They formed the major open spaces of the city. In the lower town, the open spaces were in the form of courtyards surrounded by houses. These were the major places of interaction for general public.

CASE STUDY 1: CHAUPAR AS AN URBAN OPEN SPACE – BARI CHAUPAR JAIPUR

Re-planned in early 18th Century, the city of Jaipur was designed according to rules of Vastu Shastra. The major open spaces in the city were palace precincts, Chaupars, Large and small pockets of open spaces within each mohalla for informal gathering and open spaces with in temples and monuments.

CONTEXT
Chaupar is a cruciform board game played with quaternary lots in the form of long dice. The design of the cross junction of roads in Jaipur city resembles with that of Chaupar and hence the name.

PRESENT SITUATION
The Chaupar which was initially designed as the prime open space for large scale activity served well in the conditions that prevailed at that time but with the changing time, increasing population in the city, changing life-styles and increasing vehicular traffic, the character of the space has transformed drastically. The chaupar which used to be a highly active space housing public gathering and activity stands merely as a rotary intersection.

CASE STUDY 2: SECTOR 17 PLAZA, CHANDIGARH

The city centre was literally the central geographical point of the city and the heart of the urban life during the first phase of Chandigarh. Four wide pedestrian ways were designed to lead into a central chowk or square on which would front the principal buildings. Access to these buildings as well as to the central district is throughout a slow- traffic loop road with
large area as set aside for parking space, thus making the entire complex free form traffic noise and hazards. Over time, many changes in context, landuses and design have come up leading to piecemeal development in the absence of any integrated landscape. The plaza lacks appropriate landscape structure to respond to the contemporary changed needs of the users.

**CASE STUDY 3: ANSAL PLAZA, NEW DELHI**

The plaza lies amidst the major commercial area of HUDCO place. It is surrounded by residential area at the back and large green which imparts quality to the space. Landscape design of the plaza consists largely of hard landscape. Vegetation/plant material has been introduced minimally only for aesthetics. The plaza is constructed on a slab, with two basement levels below thus limiting the height of trees. Lighting has been designed as an integral part of landscape of

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Analysis</th>
<th>Bari Chaupar, Jaipur</th>
<th>Sector 17 Plaza, Chandigarh</th>
<th>Ansal Plaza, New Delhi</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>LOCATIONAL ASPECTS</td>
<td>Open space closely related to dense built environment. Hence has potential to be designed for community.</td>
<td>Centrally located with regard to city’s structure. Easily accessible to all.</td>
<td>Located in a prime position and well connected with the circulation network.</td>
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<td>2</td>
<td>HISTORICAL SIGNIFICANCE</td>
<td>In earlier times this open space was used as meeting place as well as for large scale gatherings in times of religious / political rallies.</td>
<td>Originally designed as a cross-axial motif with 4 pedestrians culminating into a chowk - a concept in traditional Indian markets.</td>
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<tr>
<td>3</td>
<td>FUNCTION AND ACTIVITIES</td>
<td>Space designed for both active and passive recreation as well as city level gatherings. But now serving as traffic intersection and local shopping.</td>
<td>Main activities - commercial and recreational (both active and passive).</td>
<td>Primarily shopping arcade but also designed for passive recreation and cultural events.</td>
</tr>
<tr>
<td>4</td>
<td>SCALE</td>
<td>Space is perceived at a human scale as the vertical planes containing the space are only 2-3 storey high.</td>
<td>Not comprehensible at human scale due to its dimensions.</td>
<td>Space lies well within human scale limits. Small scale detailing creates intimate spaces.</td>
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<td>5</td>
<td>CIRCULATION</td>
<td>Enormous chaos between pedestrian and vehicular traffic as the space does not provide separate routes for different users.</td>
<td>Primarily for pedestrians. The conflict between pedestrian and vehicular occurs only due to the absence of proposed over bridge and improper edge detailing.</td>
<td>Mainly pedestrian plaza as vehicular entry is restricted to the basement.</td>
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<td>6</td>
<td>MICROCLIMATE</td>
<td>Initially designed as microclimate modifier due to presence of step-wells but today acts as a generator of heat and glare due to intense vehicular activity.</td>
<td>Lot of paved surfaces generate enormous heat; trees and water have been used as microclimate modifiers.</td>
<td>No shade provided in terms of vegetation in the central space. Hence difficult to use in hot summers, not responsive to the climate.</td>
</tr>
<tr>
<td>7</td>
<td>LANDSCAPE ELEMENTS</td>
<td>Trees, fountains, benches, steps for seating, roof-terraces.</td>
<td>Trees, Planter edges designed as seating, fountains, benches, murals, sculptural fountains.</td>
<td>Amphitheatre steps, planter edges, decorative light fixtures, topiary forms.</td>
</tr>
<tr>
<td>8</td>
<td>CULTURAL / SOCIOLOGICAL VALUES</td>
<td>Initially designed for day to day cultural and social activity, today primarily acts as a rotary intersection; but on festivals serves the original purpose.</td>
<td>Major hub for social activities and cultural events on weekends.</td>
<td>Mainly acts as a relief and relaxation space for the shoppers.</td>
</tr>
<tr>
<td>9</td>
<td>SURFACES</td>
<td>Total absence of soft surfaces.</td>
<td>Large paved surfaces initially barren, now dotted with vegetation and soft surfaces.</td>
<td>Mainly hard paved surfaces with negligible incorporation of soft surfaces.</td>
</tr>
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<td>10</td>
<td>VISUAL PERCEPTION OF SPACE</td>
<td>A large open space which loses the effect of being large due to unforeseen growth of traffic and encroachments.</td>
<td>Visually the whole plaza seems to be a series of small courts linked to each other.</td>
<td>The plaza seems to be the visual centre of the whole setting and catches attention due to its centrality, scale and detailing.</td>
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the plaza, using similar materials and integrating the design with planters, etc. Red sandstone and white marble have been used for paving. The hard surfaces generate enormous amount of heat during summers that it becomes difficult to sit there in the day time.

BROAD RECOMMENDATIONS BASED ON INFERENCES FROM THE LITERATURE AND CASE STUDIES

From the above study it is understood that there are certain basic principles and essentials which need to be taken care of while designing any urban plaza or town square:

- The urban plaza should be located in a central location which is linked well with the city by means of transportation to attract people.
- The success of a plaza depends primarily on the activity it holds to generate interest in people. Certain of such don’t get visited by people only because they don’t offer any activity which can attract people.
- Also, there is a need to distribute the landuses and thus the activities in such a manner that all areas of the plaza are activated leaving none of those dull or redundant.
- The scale of the plaza should relate well with the number of people it is expected to cater to. There should be enough flexibility so that it can serve to individuals as well as large crowds. Small details and niches can be worked out to create intimate spaces.
- The most important requisite for any plaza is that there should be practically no conflict between the vehicular and pedestrian traffic. These plazas need to be pedestrian-friendly. Also the accessibility of the specially-abled and the essential services like the fire-tenders should be considered while deciding on the circulation scheme.
- The response to climatic conditions is very essential. The distribution of hard and soft areas needs to be worked out. The presence of shade-giving trees and water features can help in modifying the microclimate in hot areas.
- All the landscape elements used in a plaza should be in the same vocabulary leading to unity in design and visual continuity. This would help generate a distinct design image and render identity to space.
- The design and detail of a public area should essentially relate to the socio-cultural habits of the users to make the place popular among them.
- The plaza has to be visually comprehensible. It should not give the visitor a sense of being lost. Also factors like security, safety etc. need to be considered.
- The basic needs like utility blocks, drinking water fountains, appropriate lighting etc. need to dealt with care and distributed uniformly.
- The encroachments need to be checked in such areas and in case it is inevitable like in Indian context, the vendors and hawkers should be sympathetically treated and spaces for them allocated in the design layout.

BIBLIOGRAPHY:
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