

SMARTNESS IN IMPLICATIONS OF APPROPRIATE BUILDING TECHNOLOGY- LEARNING FROM THE PAST

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Abstract: Buildings are the best representative of man's experimentation and the very change in definition of buildings in every civilization was inevitable. They are representative of the era during which they were built in. They are the best translators of the kind of lifestyle that the community adopted and measures they took for making their habitat in lieu with the existing climatic conditions and infrastructures available. The 'Appropriateness' of the best of buildings cannot be justified or generalized and is based on certain local and self-sustaining parameters which allowed its evolution and sustainability. This paper attempts to point out all the probable reasons that led to smart selection of 'Appropriate Building Technology' which stands common irrespective of time. It also assesses the change in character of various elements of a functional building today which holds well even after a decade. The paper emphasizes in capturing the parameters based on which smartly adopted checklist led to periodic emergence of built form and glorification of civilizations.

Keywords: Built forms, Variables of Transition, Old Buildings & Smartness in Adoption.

Introduction: The term '**Appropriate Building Technology**' is referred to the building making techniques those are sensibly and suitably adopted for making of buildings. Smartness refers to the process pertaining to wise selection of tools that are appropriate to the climate, socio-economic conditions and natural resources of an area which contribute to sustainable development. Smartly adopted technologies ensure the adoptability of the buildings over a longer period of time. The buildings that were made a few hundred years ago stands today in forms of office, hotels or a library or an important landmark. They are historically narrative, architecturally dynamic and environmentally sound. These buildings are examples of the built-forms which stand intact due to their physical manifestation, design style adopted and social

acceptance.

The fall-out due to the life styles and development strategies post independence in India in terms of inequity, rural to urban migration, housing shortage, growing pollution and depletion of natural resources has made us aware that the basic need of a sustainable society will not be met through the conventional methods, materials and technologies. Our future lies in the concept of development strategies which needs to be re-examined to meet the periodic demand. We need to create and promote new approaches for which we are more accountable today than previous decades. But this can't be done without taking a cue from the past. We have to foresee the developing trend based on protocols where 'Solutions grow from Place'. **Buildings** are



direct results of people's taste, behavior and their requirements within the available parameters and context. The concept of comfort keeps on changing and buildings of each era have a completely different look. Buildings are dynamic forces representative of the change which also dictates the social and

economic adaptability of the society at that point of time. Evolution and expression of built form always revolved around Prevalent style, Techniques of execution, Man power, Economy, Social adaptability and Associated constraints.

Key Constants: Being Appropriate or choosing to be Smart cannot be generalized and is a subjective protocol. Application of **Appropriate Building Technology** is actually an age old consideration as the buildings were always an outcome to suit the

time, place, culture and environment. However a few factors acts as a Key Constant that stand good and dictate Smart Solutions and Parameters of Appropriateness in buildings irrespective of time frame can be listed as -

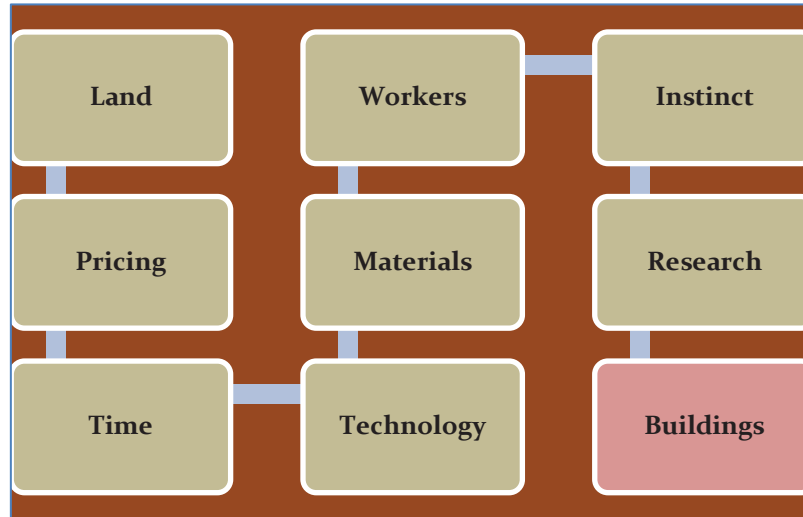


Fig. Parameters of Appropriateness – the Key constants guiding the evolution of past present and future buildings.

► **Land** – Proper selection of land – its proximity with its end users and related concerns in terms of projected use of the buildings serves as an indicator of smartness in establishing their sustainability. Buildings today don’t have central courtyard, big verandahs, running corridors, thick walls or high ceilings like the buildings of the past. The proportion of open areas has also drastically gone down. The growing population, rural to urban migration has only resulted to decrease in space per

person in an urban area. The pictures here are indicative of the two extremes of the city’s skyline. The picture on the left below shows high risers taking over and the ones on the right show an interesting change in the use of a central space. So, *selection of land acts as a smart indicator in ensuring better buildings of tomorrow - Increase the urban area or develop the peripheral area. Abundance in land ensures better growth and futuristic development of a city.*

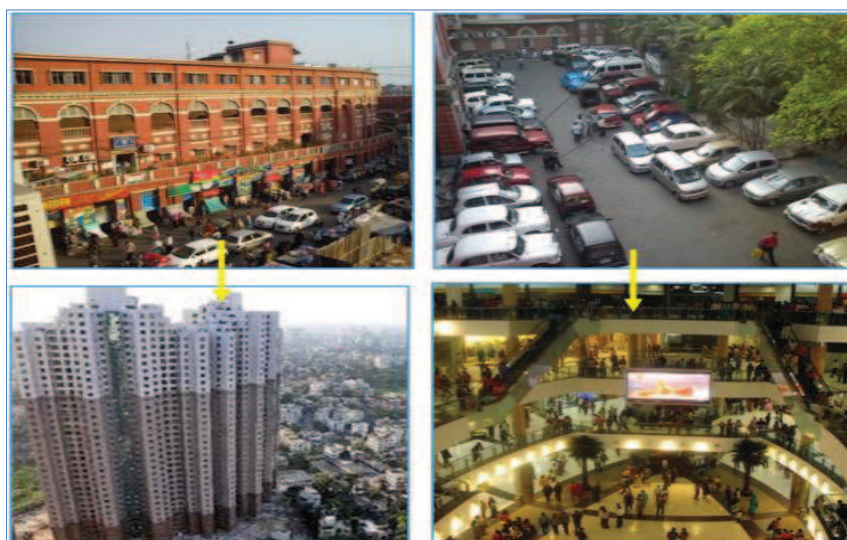


Fig. Change in use of space.

► **Pricing** – The escalation in the price of land area has taken a dynamic leap over the period. Every inch of space holds its justification which was not the case with buildings of the past. This has led to vertical expansion of buildings which in a way is smart as it makes the opportunity to maximize open

spaces. But the problem is so huge in nature that the concepts of development are constantly re-examined to meet the demand. *A constant need to create and promote new approaches for a smart, accountable and sustainable future within the budget works as a deciding factor.*

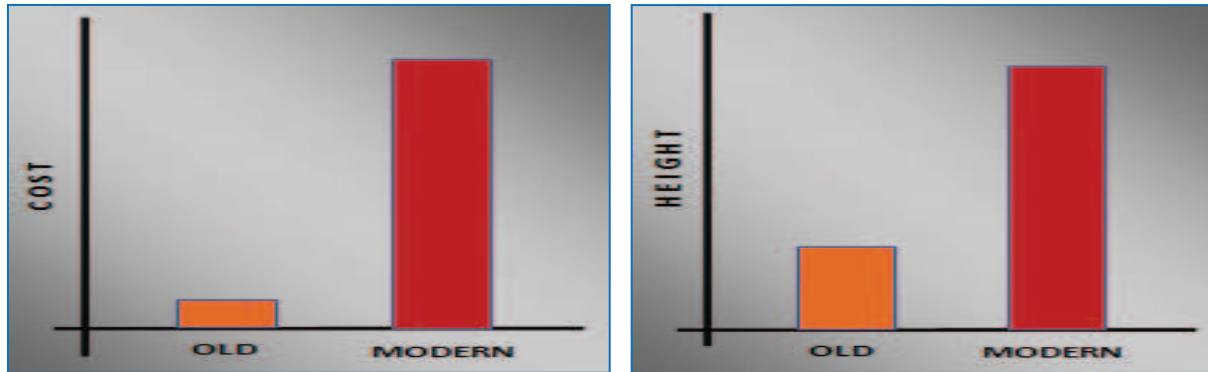


Fig. Land pricing & change in skyline.

► **Time** – Time is a smart decider in completion of a project today. The deadline to complete a building is also indicative of the fact that elaborate thoughts are not given at micro level design considerations of a new construction. For the buildings of the past, the time taken for completion of construction was not a rigid factor and we have

examples of buildings being completed in as long as 20 years. While shaping up a modern building, though one has to keep the balance of the modern day's requirements along with the budget *but taking a cue from the old buildings - deciding on optimum time especially on the design process will be a smart move in shaping of modern buildings.*



Fig. Constraints within time.

► **Workers** – In the modern context, skills and workmanship of local labors has taken a different dimension altogether due to technological advancements. The efforts and dedication towards execution of each element which were so very evident in the buildings of the past - has been losing its way. In the past, the workers had their expertise and motivations in executing their building making skills from their natural instincts and hence relied mostly

on perceptions. The knowhow, imagination and skills of the local labors or the craftsman played a huge role into the Evolution of buildings over the years and they made it a point to differ from the rest and keep a signature statement of their workmanship in each era. *There is a saying in architecture – ‘Solutions Grow From Place’ - Smartness rests on designer to learn from this and not make their buildings look like as if it could be placed in any city on this earth.*



Fig. Workmanship of skilled labors.

► **Materials** – Building materials that are locally and readily available and simple enough to be handled by people. Smart and fundamental knowledge of building materials which are produced with appropriate technologies without much consumption of energy have to be prepared and

proposed. The availability and accessibility of building materials was the guiding factor that dictated the construction in each era in the buildings of the past. For example we see temples made up of sandstone in Southern India and the use of marbles in Western India. *Studying*



Fig. Use of locally available materials.

stonework and brickwork in old buildings can provide smart information about its methods of procurement, production and construction. Smartness lies in taking a cue from the past for our future buildings.

► **Technology** – Change in technology has always been the reason for the change in concept and look of buildings in each era. Users have been adapting to these changes with the given constraints

in every generation. ‘Appropriate Building Technology’ is referred as a process adopted to build the buildings sensibly using all scientific knowhow in lieu with time, place and climate. *The buildings of the past were environment friendly as they were designed to suit the best of comfort conditions but due to the technological advancements, the concept of comfort has*



Fig. Openings dictating change in look.

changed. But elements of the building like walls, roofs, openings in old buildings hold many clues to technical evolution of modern buildings.

► **Instincts** – Modernizations are direct results of people's taste - their requirements within the parameters available around that facilitate this change. Instinctive smart thinking by human minds makes a city grow as different priorities take over.



Though human beings are adaptive in nature but human eyes seldom get tired of repetition. Human minds are always at work and there is always a desire for experimentation and see something new. The desire to assess, compare and compete with respect to what is going on around us is all human psychology. Hence, we see results in the



Fig. Walls, openings & floor heights

transformation of design in structures with every passing phase. The buildings of the past had acute planning strategies in the form of wall thickness, wide

Research: The whole process should be frozen with smart reasoning of aspect concerned with 'Appropriate Building Technology'. A few elementary variables has to be answered by a few queries –

- If the material procured locally or partially or entirely imported?
- If it is cheap, abundantly available and easily renewable?
- If there is any transportation cost involved or if could be produced at lower cost?
- If its production and use require a high energy input, cause wastage and pollution?
- If there is any acceptable alternative material which eliminates these problems?
- If the material and design considerations climatically responsive?
- If the construction technique provide sufficient safety hazards?
- If the material and technology be used and understood by the local workers?
- If repairs and replacements possible with local means?
- If the process matches with the materials and constructions of nearby buildings?
- If the land is situated in the close proximity?
- If there was optimum balance between the costing and land availability?
- If the time given justifies the essence and sustainability of the built form?

openings, and floor heights and so on. These features had significantly contributed to in built energy efficiency.

- If local workmanship was studied and indigenous styles adopted involving locals?
- If the local technology and knowhow combine with and modern technology?
- If it keeps the civilization ahead of the rest?

Conclusions: India is experiencing an unprecedented construction boom. Our country doubled its floors space between 2001 and 2005 and is expected to add another 35 billion square metres by 2050. Change is inevitable and we no longer see the kind of buildings that we use to see 150 years back especially in old historic cities. The concept of comfort keeps on changing with the circumstances and the buildings are the best pointers to the changes adopted over the period of time. Traditional architecture sets an example for modern architecture that physical comfort is achieved by passive means. Irrespective of where the buildings are built and situated, the probable parameters as identified for smart execution of Appropriate Building Technology stand same. What is essential is to take the wisdom of the past and formulate some conclusion and evolve buildings of tomorrow. Buildings are reflectance of the socio-economic, cultural, ideological, ecological and climatic factors that have shaped us over generations and smart assessment of each of these parameters will automatically make buildings more humanized, more climate responsive and visually intricate buildings of tomorrow.

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