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**Autor:** Khan, F.R.  
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## **Architecture in Developing Countries**

Architecture dans les pays en développement

Architektur in Entwicklungsländern

**F.R. KHAN**

Dr., Partner

SOM

Chicago, USA

### **SUMMARY**

This report deals with the problems of planning and design of constructions in developing countries. In particular the influence of local, cultural and climatic conditions on the mass-production of constructions and construction parts in developing countries will be studied in detail. In some cases an answer will be proposed.

### **RESUME**

Ce rapport traite des problèmes de conception et de projet de constructions dans les pays en développement. En particulier l'influence des conditions culturelles et climatologiques des pays en développement sur la production en série de constructions et d'éléments de construction est étudiée en détail. Une réponse est proposée de cas en cas.

### **ZUSAMMENFASSUNG**

Die Frage der Planung und Projektierung von Bauwerken in Entwicklungsgebieten ist Gegenstand dieses Beitrages. Insbesondere die Frage, wie weit die Massenfertigung von Bauwerken und Bauteilen die spezifischen kulturellen und klimatischen Gegebenheiten in Entwicklungsgebieten berücksichtigen kann und soll, wird vom Verfasser eingehend erörtert und nach Möglichkeit beantwortet.



## HISTORICAL BACKGROUND

In the early civilizations of the world, architecture in each country was distinctly separate from other countries and represented the cultural, religious and political nature of each country. The conscious forms of architecture used for the ceremonial and governmental edifices were distinct in each continent, and in fact, within each continent, in each country. Architecture being the sum total of the building technology, aesthetic and spiritual values in each country, expressed itself in the dwellings for the masses in its humblest scale, and the monuments, the cathedrals, the mosques, the temples, and the pyramids in the grandest scale.

Before the industrial revolution in Europe which is also the time before the colonization of the countries of Asia, Africa, and Americas, every country of the world maintained a coherent pattern of architectural development tracing its history to the beginning of its own civilization. Methods and extent of communication between countries of the world were limited and very seldom one country created its architectural technology by blindly copying another country. Even when concepts and ideas between different countries were interchanged, they were small enough in scale not to have caused a total change in the existing architectural mode. Such interchanges caused only distinct, though small, influences within the original pattern and form of architecture.

The colonization of Asia, Africa and the Americas made a revolutionary impact on the established patterns of architecture in these continents. The colonizers brought their own technology and architectural attitude to the country they colonized; and being in control of the governments, superimposed types and forms of architecture totally foreign to these countries. In an earlier period, this was not so. During the period, say, between the 10th century and 15th century, small invading groups from Iran, Turkey and Arabia brought new cultural and architectural attitudes into North Africa, Spain and the Indian subcontinent. But they were refined and adopted to the original local architectural forms. And up to this time, there was no great distinction between developed and developing countries.

However, after the 15th century until very recent years, large scale colonization of Asia, the Americas and Africa created a new world order, the reclassification of countries into the developing countries on one side and the developed countries on the other. The new architecture in the developing countries must, therefore, be first viewed in the context of their past before understanding their present state, or projecting their future trend.

The architectural form most prominent and most referred to today from the historical past in every country represents the governmental, the religious, the ceremonial, and the defense and royal edifices. These are the conscious architecture distinct from the architecture of plain dwellings of the masses. In each country the forms representing these buildings vary considerably. The Mayan temples and the buildings in Chichenitsa in Mexico and Tikal in Guatemala have their own pyramid forms for ceremonial use and other special buildings for the political and religious functions, but they are distinctly different from the pyramids and the edifices of the pharaohs in Egypt. In a more recent period the temples in India developed their own distinct form quite different from the religious and royal buildings of, say, Morocco or southern Spain - the outcome of a different form of religious belief, cultural attitude and environmental factors. Even within the same country such as India, different forms of architecture evolved.



Where in the past strong influences have been carried on from one country to the other, such as the Arab influence in Spain or the Iranian influences in India, there has been a synthesis of those influences within the specific environment, but seldom a direct copy. For example, if one looks at the edifices and the monuments in India, one is reminded of these influences in the architecture of the mosques and palaces, but the ultimate form is clearly very Indian in character.

#### COLONIAL INFLUENCE

The European colonization of Africa, America and Asia brought with it new concepts of communication and transportation. It is this continuous imposition of architectural attitudes from the colonizing countries on to the colonized countries that invariably created a totally new and often irrelevant kind of architecture in the colonized countries. Many of the major buildings in Egypt, India and Mexico in the 19th century represented respectively the French, British and Spanish attitude towards architecture and space more than the classical Indian or Mexican concepts of space form.

#### HISTORICAL ARCHITECTURAL TYPES

In the pre-renaissance period, there was a strong similarity of overall arrangement of space for living and for transportation in the residential districts of major cities of the world. They were direct and simple response to local environment and climate rather than a pre-established concept of architecture. The traditional architectural materials were mud brick, bricks, timber and stone. These were the primary materials which have been used for centuries before steel and reinforced concrete was introduced in building construction in the last hundred years. The original construction materials were used in appropriate ways to respond to the environment as well as the cultural attitudes.

The climatic environment can be classified into three categories, viz., (I) warm weather and high humidity with considerable rain activity, (II) dry, hot, desert-like environment with high temperatures combined with low or high humidity, and (III) temperate zones with short cold winter, sometimes located on high plateaux.

The first climatic category of countries are mostly in the equatorial, humid areas of Africa, Asia and Central and parts of South Africa. In many of these countries mud and mud brick construction was prevalent, and extreme care was taken to avoid rainwater from falling on the walls and floor surfaces by providing sufficient roof projection over the exterior walls. Where brick and stone construction was used, exterior covered balconies were a part of the design to reduce the effect of strong rain activities. In response to high humidity and warm weather, cross ventilation was considered an essential part of architectural design. The original and natural architecture of these countries reflected very much these basic elements in the architectural principles and consequent forms.

In dry, hot, desert-like environments (Category II), the primary objective has been to keep the sun out from inside the building by reducing direct and indirect heat transmission. The resulting structures have invariably been heavy walls, either of mud, mud brick, or other masonry materials providing high insulation characteristics. The exterior windows have been extremely limited and these buildings have mostly been inward-looking, having the rooms facing inward through balconies (ewans) into a court. These buildings were designed to look to the sky for filtered light into



the rooms in the daytime and for cool air to fill the court and the rooms in the night. It is the retained, cool air during the day which provides comfort in the building. This inward-looking form or architecture and its plan has been the hallmark of the natural architectural forms in the desert-like environment. The architecture in the Middle East in general, and the Arabian Peninsula and North Africa in particular, repeats these natural forms over and over again.

In the temperate zones with short, cold winter (Category III), the architectural form allows both cross ventilation in certain times of the year and a tight, insulated walled space during the colder season. Exterior balconies and stepped-level construction is frequently used for use in summertime while the well insulated rooms are designed for use in the winter season. Examples of this kind of architectural forms can be found in Northern India, Iran, Peru and Chile, among others.

#### RECENT ARCHITECTURAL DEVELOPMENTS

The specific climatic and culturally responsive, interesting architectural forms have been greatly synthesized, automated and equalized by the recent deluge of technological developments in the industrial West and their quick marketability throughout the world. Materials technology such as the development of precast concrete, pre-stressed concrete, pre-fabricated construction elements, mass produced building systems, special construction techniques and construction efficiencies developed in the industrial Western countries have had such a tantalizing influence on the developing countries that the last vestige of specific forms of architecture in those countries have almost totally vanished.

The traditional methods of construction with masonry, brick or stone and later use of reinforced concrete and steel is still being used in all countries including the developing countries. Reinforced concrete is labor intensive and because of that, the developing countries find it optimal, more economical and easier for building buildings. Conceptually, facing the increasing demand for housing construction as well as industrial construction, prefabricated systems in steel and precast systems in concrete and pre-stressed concrete should be very attractive. As far as steel as a primary construction material, many of the developing countries are not sufficiently advanced in their technology as well as the volume of production so that its use in buildings in developing countries is not always found attractive. Precast concrete, on the other hand, is increasingly finding use for frame construction as well as for total systems including precast columns and in some cases the precasting of entire room units. The material technology and the construction technology are basically neutral in character and their use without reflecting the attitude of the people, the environment, the effect of the climatic characteristics, can only produce mundane architecture, to say the least.

Adding to the technology of materials and construction methods, the development of sophisticated air-conditioning systems, which could either be applied on the basis of a central process or localized in terms of window units, eliminated the need for developing forms to respond to the local climatic conditions. Copying the office building construction in the Western countries, buildings all over the world started becoming totally enclosed, air-conditioned places irregardless of the actual surrounding weather conditions of the country. In a similar manner, in the housing area, the concept of mass produced housing for the people became technically attractive and politically expedient enough to be introduced without much thought to their social and cultural effects. For the last twenty years, architecture has been mostly



the refinement of details to make the artificial environment work and not enough effort to create new forms within which newer technology of construction and materials could be fitted while responding to the local climate and cultural heritage. Equalization of architecture in all countries, and not just the developing countries, has finally happened and the result is that it is no longer possible to look at a building built in the last few years and say where it is located. Traveling from the Far East to the North African countries and into Central and South America one finds almost the same building forms and shapes repeating from country to country. Many of these buildings are only slightly less sophisticated copies of what is found in the more technologically advanced and developed countries of the West. One special case of this equalization that has been carried to an unfortunate proportion is public housing by mass production of similar units mile after mile that seem to represent space without identity, technologically created holes for people to live in. The more need the country has to produce housing for the masses, the more the same type of buildings being built. Contemporary technological advances know no national boundary and when combined with expediency of construction without environmental and human factors, they have created an architecture and an environment that is almost the same in every country and almost equally failing to satisfy the climatic needs of the countries and the cultural needs of the people.

#### WHAT CAN BE DONE

Many of the developing countries have now become acutely aware of the low level and quality of architecture that has been produced in the last twenty years or so. There is an increasing demand by the architects and engineers on one hand and the populace on the other to recreate and re-establish the basic essence of architectural heritage of the past. This is indeed a turning point for more relevant architectural solutions. The new consciousness combines the following attitudes.

- A. Adopt the latest technology of materials and machines to develop forms suitable for the country's cultural patterns and its climatic constraints.
- B. Reduce dependence on artificial environment and high use of overall energy by re-evaluating the original forms of architecture in those countries.
- C. Re-emphasize living, working and recreation as a part of overall planning and combine them in a more culturally relevant way.
- D. Use the technology of unitized and mass produced construction to develop non-repetitious forms and spaces.
- E. Create a sense of identity through variations in massing and eliminate the sense of mass production and its barrenness.
- F. Provide true choice for the people in selecting their homes and their places of work and recreation.

#### CONCLUSION

In view of the comments made above, it is interesting to note that countries such as India, Bangladesh, Pakistan, Iran, the Gulf States, Saudi Arabia, North Africa and Central America and South America are making efforts to limit the indiscriminate mass production type of construction and encourage architecture representing the environment and the culture. One must realize that such a move is by no means easy and requires a tremendous amount of studies, research and front-end expendi-



ture. But it is encouraging that almost all developing countries today, be they rich or not so rich, are actively searching for relevant architectural solutions. Since the construction activity is largely dominated by government funding, the decision to find relevant architecture using contemporary technology rests with the governments and their agencies. Fortunately, many of the decision-makers are indeed demanding of the architect/engineers and planners, the re-evaluation of what has been built to date in the light of the real cultural and climatic heritage and then the use of modern technology in developing appropriate and relevant solutions.

The private sector, unfortunately, is still not concerned enough about creating a relevant overall environment, but simply want to do what is the most technically and economically efficient in building construction. The result is obvious and discouraging. It is hoped that there would be more awareness and insistence by the general profession of architecture/engineering on incorporating in their design the elements of local heritage, character and environment. It is only then that we can say that the architecture in the developing countries will have achieved once again a renewed state of its own identity, beauty and human character.