

Decrease In Use of Natural Ventilation Techniques From Modern Day Construction of Buildings

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Abstract- Air Ventilation is defined as the intentional introduction of outside air for letting the fresh air inside and the hot air outside. Ventilators are the built terminology adopted for provision of ventilation, In general, Natural ventilators are provided by use of different types of openings viz.

1. At a Higher level just below the slab level and above the lintel level,
2. At Sill level in the form of Window openings
3. As louvers
4. As other types of openings like door arches etc.

The article would be mainly concentrating on the first category of Natural ventilators, which are provided at a higher level to let the hot air, which accumulates at the top, to get out and thereby allow the cool air come inside. Taking examples from History also, one can see use of ventilators in the form of Jharokhas, and clerestory windows which solved many other purposes too, In recent times with the increase in Mechanical ventilation techniques the use of natural ventilation techniques is getting decreased day by day, which as a result is causing a considerable amount of energy consumption and thereby causing environmental issues.

Index Terms- Ventilation techniques , Natural Ventilation , jharokhas, clerestory window

I. INTRODUCTION

Ventilation is a major topic studied under the subject of Services and Climatology in architecture studies, where the direction of wind flowing, the amount of air coming inside, the size and position of opening to be given is studied, As faculty members of Architecture and environmental related issues, it has been observed over the passing time that the things that are being taught during the course work are not actually followed when the student comes to practice.

The Ventilation inside a built space can be governed by many factors such as:

1. Quality of outside air.
2. Direction of flow of air that is from clean zone to dirty zone.
3. Outside direction of natural flowing air.

Also to ventilate a built space the provision of ventilators can be done by these types

1. Natural ventilation techniques
2. Mechanical ventilation techniques
3. Mixed or hybrid type

The article will focus only on the first type of ventilation technique in historical buildings with a specific purpose and its existing use today.

Body:

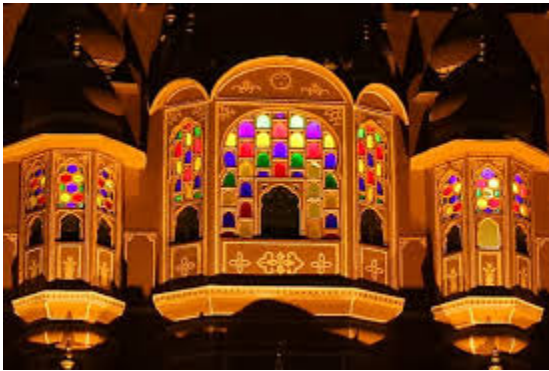
Natural ventilation techniques find their way long back, from the historical architecture where the built spaces, were designed to counter all types of weather changes occurring during the year, some examples from the old Mughal structures and structures from Rajasthan and also from Christian and Byzantine period are being shown where the openings were used for many different purposes. This opening was termed as Jharokha, which served the same purpose of providing steady and fresh airflow and also was a means of communication for the women with the outside world, this type is basically found in abundance in the Islamic architecture where the women had purdah system and were not allowed to interact directly with the outside world. So, the designers and artists that time evolved a technique that would solve both the purposes, Even now if we see some of the old Islamic Structures there is a significant use of jharokhas with proper study of wind direction and light also, The designers that time even took care of the shades and shadows formed thereafter, which in turn create aesthetically pleasing ambience.

The jharokhas that were provided, were beautifully carved out with intrinsic designs of floral motifs, serving the purpose of provision of natural ventilation, also apart from jharokhas in Mughal buildings and some Palaces during the king's rule in various territories in India.

Also in study of history one can see provision of clerestory windows in early Christian and Byzantine architecture, which were beautifully carved and aesthetically placed or positioned in the built space, the purpose again to admit light and fresh air and maintain privacy at the same time as they were provided above the eye level.

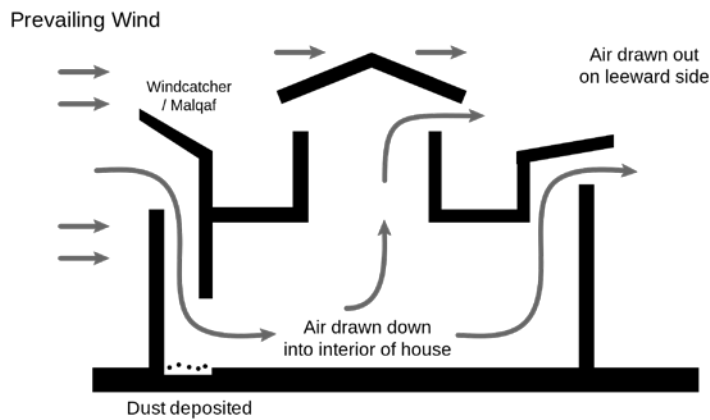


Examples from some of the Byzantine and Christian structures showing the clerestory window



Different types of jharokhas or openings in some of the palaces and forts

The theory of flow of air as taught is being shown in the figure below:



Here one more additional element is introduced that is a Wind Catcher, which again helps to catch the wind in more quantity and serves the purpose of a natural ventilator only.

These were some of the methods of provision of Natural ventilators.

Now, if we see the modern day construction, natural ventilation techniques are slowly getting decreased and are being replaced by the so called Elevation Treatment where the consideration of air movement, wind direction air flow is not taken, again here as an Architect, I would like to make clear that the same is not happening every where as there are many designers and Architects who take a note of climatic conditions and then design the structure,

The concern here is only the decrease in use of natural ventilation techniques, and increase in use of artificial ventilation techniques.

If we observe the modern day construction say for example Row Houses, we will see a typical standard planning with only a concern in mind of having elevation, there the placement of windows the use of ventilators is not studied, A ventilator has only found its place in the toilets and kitchen, as these places are supposed to be service areas so ventilator is must. Besides that one cannot find a ventilator any where else, which has resulted in use of mechanical ventilation techniques, which in turn cause harm to health also, as the flow of fresh air is missing, only mechanized air flows in and out.

Also one of the major reasons for cutting down the natural ventilation is the use of Mechanical ventilators such as air-conditioners and other types of forced artificial techniques like exhaust fans that help the hot air let out more swiftly and fast, thereby consuming a major portion of electricity which can be saved by proper provision of ventilation techniques, and systematic use of natural landscape and well planned outdoors, so that fresh air is in abundance.

II. CONCLUSION

To conclude here, in this growing pace of Commercialization of works and jobs one should not forget the designer's aim should always be to think of the users comfort and at the same time also about the consequences that can arise because of the constant use of mechanical ventilation techniques that may cause environmental as well as health issues.

REFERENCES

- [1] Manual of tropical housing, by Otto H Koenigsberger, Ingersoll T.G, Mayhew
- [2] Islamic architecture by Percy Brown.
- [3] World architecture, by Sir Banister Fletcher.

AUTHORS

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