

Transformation of Housing in the ecology of desert climate

A Bioclimatic -Passive Solar Design vision of the Building integration with a dry environment

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INTRODUCTION/BACKGROUND

This investigation arises from the need to include the systems of environmental natural conditioning and the architectural project in the ecology of the desert dry-climate.

In this research, it is proposed to investigate the main features and techniques used in Southern Peru as an answer to build in a desert environment with high levels of sunlight and very few rain days. Identifying the historic processes of the vernacular architecture, in which we recognize evolved coherent forms, making possible to define the strategies with which to recreate architecture responsive to the ecology of the desert dry-climate.

RESEARCH STAGES

The research will be developed in six chapters covering three research stages: First stage would be describing the main concepts of thermal comfort and technical premises useful in the subsequent stages of the research project. In the second stage, research will analyse the relation of the architecture and the environment, establishing an interaction constant and referred to the thermal and light aspects of the architectural space, expressed as models of sustainability.

The third stage will analyze the process of transformation and environmental conditioning of buildings realised by his inhabitants through specic/

valuable case studies in Arequipa City.

The research wants to demonstrate the basic concepts of a new constructive mentality and to illustrate through examples and analysis of application, that to construct in accordance with the climate does not suppose to limit the freedom of design and the creativity.

The urban vernacular architecture should develop a new form, sensible to the local microclimate and the same climatic determinism of architecture of the desert dry-climate. It is considered the form to adapt or “to acclimate” the house to the environment and it’s emphasized the environmental transformation of the house realized by the residents. In these cases the building stops being a device, to be observed like connected architectonic fact to its ecological system, in an intimate relation between a building and surroundings.

This transformation can distinguish appropriate architectonic strategies and identity characteristics that could become the base from a repertoire of present architectonic design, that in addition, has the value of conforming a program diverse and fit to the contemporary needs, ingrained in the uses and needs of the people.

IDENTIFICATION/DESCRIPTION OF THE PROBLEM

- (1) Nowadays the environmental-space is uprooting of the building projects constructed in dry-arid regions of Southern Peru, developed on non-appropriate models to the climatic conditions.
- (2) The loss of regional identity and urban image caused by an architecture that does not know the ecological reality. The absence of incentives to promote the use of renewable energy resources of the zone, in which a noticeable tendency stands out towards the “artificial air conditioning”, associated with a transformation in the habits of consumption and ways of life of the society as a whole.
- (3) The disappearance of the solar culture and the fading of the sensitivity of a “culture of the desert climate”, replaced by the culture of the conditioned air (use of devices with high levels of energy consumption), and the decline of a type of inhabitant who learned to live in limited/inadequated spaces imposed by the environmental conditions of the dry-climate conditions.

IMPORTANCE OF THE RESEARCH

This project is very important, it will represent the evaluation of skills and use of concepts and techniques in the construction and design of housings taking experiences based in more limited environments and conditions, allowing his application in another similar locations at costs lower than the traditional ones

The implication of this research goes beyond the aspect of the architecture; also there will be obtained experiences that will be benefiting the rational use of the natural resources in good of the ecology and of the environment of the planet earth.

This study will adopt a critical position and shows the value of building in direct relationship with environment, where the development of the life is an ecological success as far as the survival strategies and adaptation of all the alive beings. The desert territories appear like vast open extensions, with great energetic potentialities in order to receive new proposals of design and alternatives of development that are radical and essentially different from the present ones. On the other hand, the vernacular Southern-Peruvian architecture is a paradigmatic example of an appropriate and adapted architectonic answer to the desert climate. Nevertheless, this architecture whose language of formal expression was rich in components of solar protection like facades and ceilings, has been disappearing of the urban and architectonic landscape, to take step to an architecture whose expression is the crystal facades and the active use of equipments with high levels of energy consumption.

The results of this investigation would be useful for future projects of energy effective building design, in relationship with the natural environment, integration with the landscape and armonizing with the ecology of the surroundings. This new conception of the project, that looks for not only the connection of the building with its surroundings, but the combination and interaction between the artificial system projected and the natural ecosystem, from an ecological notion of the sustainability.