

IMsc4 Architectural engineering studio

Reflection

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Relationship between research and design

The choice of my research topic (climate design: passive acclimatisation strategies) as part of my graduation project in the studio of architectural engineering was motivated by the following aspects:

- The conviction of the potential of passive climate design to create comfortable living spaces without the implementation of mechanical installations in a context I am familiar with.
- The reduction of the carbon footprint of buildings during use, which allows to reduce the environmental impact of buildings.
- The social impact of climate passive architecture, by reducing the dependence on mechanical climate conditioning equipment and the energy costs associated with its use. These measures have a particularly important benefit for low-income residents who experience energy poverty, difficulty in paying for housing energy costs.

The proposed project consists of the design of housing for migrant workers attracted by the agricultural sector of the province of Almeria. Migrant workers in Almeria, particularly African migrants, are a social group suffering and at risk of energy poverty due to their low purchasing power and high levels of unemployment.

The research aimed to nourish the architectural project with low tech strategies for the passive design of housing on the following levels: spatial distribution of the architectural volumes and the in between spaces, morphological characteristics of the volumes and materialisation.

Climate adaptation has guided and was a determining consideration in the decision making process for the design of vernacular architecture in the studied context, in the urban, building and material scales. The study of this heritage and the positioning of climate adaptation as the backbone of the design in the different scales of my project has contributed positively to argue a large part of the decision making during the design process.

Relation of the graduation project, Masters track and graduation track

The housing proposal alternative for migrants living in substandard housing seeks the social integration of a vulnerable group that is indispensable to the agricultural economy of Almería. The project seeks to contribute ideas for the dignification of the housing of the migrant workers and to strengthen their economic and social development. The project also aims to create spaces for social interaction and the confluence of identities, the relationship between the native population and the migrant population.

Furthermore the project involves the search for solutions to minimise the environmental impact of the housing proposal. Through the study of the flow of materials in the agricultural system, synergies and opportunities are sought for the agricultural system and the construction of housing in this environment.

It also proposes strategies which aim to reinforce the resilience of the agricultural sector, the population and the environment. How to cope with the problems arising from climate change, drought, torrential rains, increased immigration and the loss of bio-diversity. Even so it will envisage how to reduce the environmental impact of the agriculture and construction sector in the context of Almería. These issues are addressed in the project and are closely related to the principles of action of the harvest architectural engineering studio.

Reflection of the research methods and approach

During my research I sought to understand the climatic characteristics of the Almería region, to learn more about desirable climatic conditions in interior spaces, the passive strategies present in the vernacular architecture of Almería and passive design strategies for the hot arid desert climate.

These questions are broad and therefore the research was developed with some generalisation and little depth in the different sections. The methods and approach have been useful to obtain the knowledge and tools for the development of the project.

Continuing to analyse and study ways of adapting architecture to the climate in a passive way contributes to enriching the means available to reduce the carbon footprint of architecture.

The local analysis of the vernacular architecture of Almería for the adaptation of architecture to the local climate illustrates strategies for passive energy design. The translation of this knowledge to contemporary works can also contribute to the enrichment and continuity of the cultural identity of the context.

Relevance

The problem of access to decent housing affects migrants in multiple places in the south of Europe. This project is conceived in relation to the activity of the agricultural sector in Almeria, Spain but can be understood as a response to a migration problem in general, that may increase over time. Therefore, the design of affordable housing with good levels of comfort will contribute to more decent living conditions for their temporary inhabitation.

The poor living conditions of agricultural migrant workers form a problem in the regions with intensive agriculture activity in Spain. The chosen context is one of many places in the country with intense agriculture activity and with informal settlements.

The specific research of the project will be contextualized in the arid climate of Almeria and could therefore be relevant for different locations in the province. As a consequence of climate change, large areas of Spain will experience a transition from a mediterranean climate to an arid hot desert climate. Therefore the research of methods for passive climate design in the arid climate may become more and more relevant to achieve comfortable climates while aiming to reduce the carbon foot print of the built environment

Ethical issues

The migrant community in Almeria is composed of migrants with and without residence permits. Irregular residence status attracts many migrants to seek work informally in Almeria. In many cases migrants without residence permits suffer from conditions of social exclusion and depend on NGOs for housing, health treatment, food, hygiene, orientation, etc. The development of a housing project for migrants in Almeria raises the question of how to accommodate everyone without excluding undocumented migrants and the question of who is responsible for funding such projects. In many cases, institutions refuse to encourage the development of migrant settlements for fear of a "pull effect" that would increase the arrival of new migrants.

Most informal settlements are irregularly located on private land. Most informal settlements are located outside urban centres where migrants reside segregated. The aim of the project is to foster the social integration of migrants, but this is difficult to achieve if they remain excluded from urban centres. This raises the question of how to resolve this situation by addressing the real needs of the collective.