

DESIGN AND TECHNOLOGY. PEOPLE, SYSTEMS, ENVIRONMENT

DAD - A human-centred approach to an innovative design of affordable housing

Funded By	DAD - Funzionamento DAD - Progetti finanziati da Ateneo DENERG - Progetti - Progetti ricerca finanziati da Ateneo
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Context of the research activity	<p>Cities play a key role in facing global challenges, dealing with the climate and ecological emergency, and addressing social and economic inequalities. In this framework, the issue of appropriateness and "affordability" in social housing projects is crucial. The research aims to contribute to the design and implementation of integrated and innovative strategies/solutions, with an holistic approach to sustainability, able to generate impact on people's quality of life in dense urban settlements.</p>
Context of the research activity	<p>Cities are central in dealing with the climate and ecological emergency, and addressing social and economic inequalities. Firstly, they are growing at an unexpected and exponential rate, particularly in emerging economies: by 2050 it's projected that more than two-thirds of the world population will live in urban areas. In this context, there is a dramatically increasing demand for affordable housing. It is estimated that one billion people live in slums globally – a figure that is expected to double by 2030 – and another 1.6 billion live in sub-standard housing. Cities are also facing a big challenge in driving an effective and just transition to reach climate neutrality by 2050. In Europe, households are responsible for almost 30% of the CO2 emissions, mainly due to an energy-inefficient housing stock. Nevertheless, 85–95% of these buildings will still be in use in 2050, which means that this inefficient housing stock needs to be renovated to reach the climate goals. Since energy poverty is a growing problem in the EU, "affordability" is one of the key issues, especially for vulnerable and low-income households. Housing is one of the basic human needs, and a basic prerequisite for health: World Health Organization defined it as a "residential environment which</p>

Objectives

includes, in addition to the physical structure that man uses for shelter, all necessary services, facilities, equipment and devices needed or desired for the physical and mental health and social well-being of the family and the individual”.

Apart from the economic perspective, “affordable” hence means physically adequate and appropriate for human living. Having access to quality affordable housing is fundamental to reduce poverty, improve equal opportunities and guarantee a sustainable growth. For this reason, reducing drastically the quantity of people living in conditions below the minimum standards is part of the objective n. 11 of UN Sustainable Development Goals (SDG).

The aim of the research is to investigate how to combine different strategies and technologies, such as circular and ecological building techniques, low carbon and high performing energy configurations, renewable energy sources and smart digital solutions, in the design and implementation of affordable housing.

As recommended by the Directive 2018/844/EU, measures to improve the energy performance of buildings should not focus only on the building envelope, but include all relevant elements and technical systems in a building, such as passive elements that participate in passive techniques aiming to reduce the energy needs for heating or cooling, the energy use for lighting and for ventilation and hence improve thermal and visual comfort. On the other hand, digital solutions in the built environment may offer new opportunities: connectivity targets and ambitions for the deployment of high-capacity communication networks are therefore important for smart homes and well-connected communities.

While ensuring that each building meets the minimum performance requirements, a district and neighbourhood approach, will be explored for a better economy of scale and a wider access to opportunities, as recommended by the EU New European Bauhaus initiative.

Skills and competencies for the development of the activity

- Knowledge gained on a Course study related to research topics such as: Need/requirement/performance approach in architectural design; Building construction technologies and sustainable materials; Bioclimatic design; Circular design; methods for the assessment of environmental, economic and social sustainability; ICT-based tools.
- Skills in Adobe Suite, Office, Cad, 3D software
- Skills in spoken and written English and Italian
- Experience in workshop activities and/or fieldwork is desirable