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COURSE OF MSc ARCHITECTURE FOR SUSTAINABLE
DESIGN

Abstract

**Solar Decathlon Africa. Considerations on the concept of
sustainability**

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Since 2002, more than 360 solar houses have been built in the Solar Decathlon competitions with more than 37,000 participants including students and academics and over 1.5 million visitors. The Solar Decathlon is an international university competition, established by the Department of Energy (DOE) of the United States of America in 2002. Participating students must design, build and operate an n-ZEB house, energy self-sufficient, powered entirely by solar energy. The Solar Decathlon phenomenon is in an expansion phase and involves many figures ranging from academia to international corporations, from students to government agencies, identifying its role becomes a prerogative to establish its effectiveness in the various contexts in which it is proposed. The topic covered in this thesis can be summarized in 3 words Solar-Decathlon-Africa (Solar-Dieci-Africa), ten parameters to determine if solar movement can be a positive contribution to Africa. The development path of the thesis topic is based on my experience, as a decathlete in the competition Solar Decathlon Africa 2019, member of the Inter House Team and representative of the Italian team, architectural part. Inter House is a team of students and professors from 3 different continents: Africa, America, Europe and four universities Université Cadi Ayyad, École Nationale D'Architecture Marrakech, École Nationale des Sciences Appliqués Safi, Colorado School of Mines and Polytechnic of Turin, which cover different disciplines from architecture, engineering, communication, marketing with the aim of creating a house n-ZEB to win the competition. Thanks to this collaboration and the trip to Marrakech for the participation in the second workshop Hands on Solar Decathlon Africa, I had the opportunity to experience and get to know a part of the African context. To experience how Moroccans, live their city, what are their habits, their architecture, their culture, their food, their material and their typical color. This led me to reflect on the impact that a competition like the Solar Decathlon can have on this territory. The research carried out in this thesis is aimed at establishing the possible effectiveness of the competition Solar Decathlon in producing prototypes of housing suited to the needs of the African context, in relation to trends in population growth, urbanization and electrification to contribute to sustainable development understood in its threefold dimension (social, economic, environmental) and to identify the critical issues and potential that revolve around this global experience. The research is carried out in successive phases of elaboration, following a process of historical synthesis and analysis, first of all of the African habitat and then of the winning projects of the Solar Decathlon editions from 2002 to 2018.

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