Learning from Hybrid Innovative-Vernacular Solutions in Building Design: Emergy Analysis of Sudanese Energy-Saving Technologies

Silvio Cristiano and Francesco Gonella

ABSTRACT

Building design needs to consider that the lifetime of its products will likely face relevant environmental and socio-economic changes, strongly related to the limits imposed by the geo-biosphere. Taking action to face such limits beyond trendy, debatable “green-washing” policies can be either a forward-looking choice or rather something imposed by necessity. These have been the premises of the collaboration between humanitarian NGO Emergency Onlus and architecture firm TAMassociati in designing hospitals in the African regions of Sahara and Sahel: in fact, several African countries – long living in scarcity – represent an example, and an opportunity to learn of some alternative to the mainstream development model. In this work, some vernacular building techniques are revisited towards a low-tech innovation for energy saving and renewables use that, in a next future, could turn out to be useful also for architecture in the Global North; they are here reviewed under a systemic point of view, and presented with the evaluation of their potential advantages in terms of long-term socio-environmental sustainability. The investigated low-tech innovations able to use local renewables yield net savings one order of magnitude higher than conventional solutions, while granting a strict energy demand such as that of a specialised North-like hospital in a hot dry area. Such results seem therefore as an encouraging example from which to learn also in other contexts with a milder climate, where possible poorer energy drivers (e.g., the sun) would be clearly matched to less extreme conditions.

Citation
