Neighborhood Sustainability Assessment Tools: A Conceptual Framework for Their Use in Building Adaptive Capacity to Climate Change

Authors : Sally Naji, Julie Gwilliam

Abstract : Climate change remains a challenging matter for the human and the built environment in the 21st century, where the need to consider adaptation to climate change in the development process is paramount. However, there remains a lack of information regarding how we should prepare responses to this issue, such as through developing organized and sophisticated tools enabling the adaptation process. This study aims to build a systematic framework approach to investigate the potentials that Neighborhood Sustainability Assessment tools (NSA) might offer in enabling both the analysis of the emerging adaptive capacity to climate change. The analysis of the framework presented in this paper aims to discuss this issue in three main phases. The first part attempts to link sustainability and climate change, in the context of adaptive capacity. It is argued that in deciding to promote sustainability in the context of climate change, both the resilience and vulnerability processes become central. However, there is still a gap in the current literature regarding how the sustainable development process can respond to climate change. As well as how the resilience of practical strategies might be evaluated. It is suggested that the integration of the sustainability assessment processes with both the resilience thinking process, and vulnerability might provide important components for addressing the adaptive capacity to climate change. A critical review of existing literature is presented illustrating the current lack of work in this field, integrating these three concepts in the context of addressing the adaptive capacity to climate change. The second part aims to identify the most appropriate scale at which to address the built environment for the climate change adaptation. It is suggested that the neighborhood scale can be considered as more suitable than either the building or urban scales. It then presents the example of NSAs, and discusses the need to explore their potential role in promoting the adaptive capacity to climate change. The third part of the framework presents a comparison among three example NSAs, BREEAM Communities, LEED-ND, and CASBEE-UD. These three tools have been selected as the most developed and comprehensive assessment tools that are currently available for the neighborhood scale. This study concludes that NSAs are likely to present the basis for an organized framework to address the practical process for analyzing and yet promoting Adaptive Capacity to Climate Change. It is further argued that vulnerability (exposure & sensitivity) and resilience (Interdependence & Recovery) form essential aspects to be addressed in the future assessment of NSA's capability to adapt to both short and long term climate change impacts. Finally, it is acknowledged that further work is now required to understand impact assessment in terms of the range of physical sectors (Water, Energy, Transportation, Building, Land Use and Ecosystems), Actor and stakeholder engagement as well as a detailed evaluation of the NSA indicators, together with a barriers diagnosis process.

Keywords : adaptive capacity, climate change, NSA tools, resilience, sustainability