A Method to Assess Aspect of Sustainable Development: Walkability

Authors : Amna Ali Al-Saadi, Riken Homma, Kazuhisa Iki

Abstract : Despite the fact that many places have successes in achieving some aspects of sustainable urban development, there are no scientific facts to convince decision makers. Also, each of them was developed to fulfill the need of specific city only. Therefore, objective method to generate the solutions from a successful case is the aim of this research. The questions were: how to learn the lesson from each case study; how to distinguish the potential criteria and negative one; snd how to quantify their effects in the future development. Walkability has been selected as a goal. This is because it has been found as a solution to achieve healthy life style as well as social, environmental and economic sustainability. Moreover, it has complication as every aspect of sustainable development. This research is stand on quantitative- comparative methodology in order to assess pedestrian oriented development. Three analyzed area (AAs) were selected. One site is located in Oman in which hypotheses as motorized oriented development, while two sites are in Japan where the development is pedestrian friendly. The study used Multi- criteria evaluation method (MCEM). Initially, MCEM stands on analytic hierarchy process (AHP). The later was structured into main goal (walkability), objectives (functions and layout) and attributes (the urban form criteria). Secondly, the GIS were used to evaluate the attributes in multi-criteria maps. Since each criterion has different scale of measurement, all results were standardized by z-score and used to measure the co-relations among criteria. As results, different scenario was generated from each AA. MCEM (AHP-OWA)-GIS measured the walkability score and determined the priority of criteria development in the non-walker friendly environment. The comparison criteria for z-score presented a measurable distinguished orientation of development. This result has been used to prove that Oman is motorized environment while Japan is walkable. Also, it defined the powerful criteria and week criteria regardless to the AA. This result has been used to generalize the priority for walkable development. In conclusion, the method was found successful in generate scientific base for policy decisions.

Keywords : walkability, policy decisions, sustainable development, GIS

Conference Title : ICEES 2015 : International Conference on Environmental and Earth Sciences

Conference Location : Venice, Italy

Conference Dates : April 13-14, 2015