
Editorial: towards a digital, healthy and safe sustainable built environment

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Biographical notes: Rita Yi Man Li serves as an Associate Professor in Department of Economics and Finance in Hong Kong Shue Yan University. She the founder and director of Sustainable Real Estate Research Center. Her major field of research interests lies in construction safety, sustainable building, housing economics, real estate economics and construction informatics. She acts as a journal editorial board member for many journals, an author of 9 books and over 300 articles over the past eight years. Over the years, she has won many local and international awards. She acts as a PI and co-I for many academic research grants.

Recent days in July recorded an unprecedented heavy rain that caused flooding in many places Worldwide. In Belgium, residents in Liège were ordered to evacuate. In Germany, North Rhine-Westphalia and Rhineland-Palatinate's vehicles were swept away along a street near Verviers. In the Netherlands, thousands of people in towns and villages along the River Meuse had to leave their houses (The Visual and Data Journalism Team of BBC, 2021). In China, Henan's flooding also occurred against the backdrop of global warming. All these remind us of the crisis of climate change and the importance of sustainable development. Sustainability, an idea that considers economics, social and the environment, has become a long-term goal to achieve a more sustainable world (Li et al., 2021). In this issue, we cover four main aspects concerning sustainable built environment: (1) greenhouse gas emission and building cycle, (2) Building Information Modelling (BIM), (3) health and safety, and (4) facilities and land value.

Greenhouse gas and building cycle

Sudarsan and Sridharan found that the building and construction industry contributes over 35% of Global Greenhouse Gas emissions, making it one key contributor to global warming. To compute carbon emitted in building lifecycles, a study was carried out in a residential building in Bengaluru and a commercial building block in Hyderabad. This assessment used a formula that is usually used for estimating the carbon emission of building materials. Based on the research results, using sustainable materials such as recycled steel and ferrock could lower Greenhouse Gas emissions by around 87%. The total emission and associated cost by adopting sustainable building materials is also estimated and compared with conventional materials. The results justified the relative higher costs of sustainable material through a Cost-Benefit Analysis approach.

Building information modelling

Digitalisation is often considered one significant move toward sustainability as that reduces the use of papers, decreases the need to cut trees, lowers costs and improves work productivity. As such, many construction companies adopt Building Information Modelling (BIM). Hilton et al. suggested that the United States Army Corps of Engineers (USACE) has to educate its stakeholders concerning the of using Building Information Modelling (BIM) in their projects. USACE enhances BIM execution requirements, instructions and guides project teams. Vijayeta studied the synergy between Blockchain and BIM functionality. It was found that high interconnection exists between BIM in the use of Quantity Take-Off with blockchain principles such as transparency, efficient data management, centralise progress tracking and reporting, improved teamwork between stakeholders, formation and transmission of a unique digital object. Besides, respondents of this research were in favour of payment settled via cryptocurrency.

Health and safety

A sustainable built environment must be safe (Li et al., 2019) and healthy. The absence of these shall discontinue the development of related industries and lead to a loss of expertise and human resources. Umar estimated costs of accidents in Qatar reached US\$ 205,526, while in Oman's costs was about US\$ 415,620. They are nine times and 16 times higher than the costs of accidents in Australia, the UK and the USA, respectively, on average.

Meshram et al. developed a framework for re-planning workplaces after the outbreak of infection. For developing the framework, they identified re-design needs based on: (1) literature reviews and online case studies, (2) real-time case studies and office design expert interviews and (3) statutory requirements implemented by the government departments. Results indicated that various re-design measures were needed. Yet, there were significant costs associated with all the efforts. The research offers insights into the stakeholder decision regarding comprehensive re-design interventions and peripheral solutions to ensure workplace health is not compromised.

Facilities and land values

Sustainable healthy property development is associated with affordable land and housing price. Vaishampayan et al. analysed various factors affecting land rates in Jodhpur, Rajasthan, Kudi Bhagtasni via Hedonic Pricing Model and heat map. Their results suggested that infrastructure facilities such as sewerage, water supply, and roads significantly impacted land prices.

References

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