

EVALUATION OF SUSTAINABILITY INDICATORS FOR URBAN DEVELOPMENT IN BHUTAN

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Abstract

This study attempts to develop urban sustainability indicators for urban development in Bhutan, aiming to introduce sustainability assessment. A set of indicators and their weighting were identified through questionnaire surveys and consultations with stakeholders. The findings indicate a need for a comprehensive sustainability framework for urban development in Bhutan.

Key Words: Sustainability indicators, urban development, Bhutan

1. BACKGROUND

Bhutan is blessed with a rich natural environment and a beautiful built environment. But Bhutan is also undergoing fast development and rapid urbanization. The growth rate of Bhutan's urban population was the highest among the eight South Asian countries, at 5.7 percent per year from 2000-2010⁽¹⁾. This rapid urban growth has already created severe pressure on the lives of the people living in the urban sectors and to the nation as a whole. Urban centres are already experiencing the adverse effects of urbanization such as water shortages, housing scarcity, sanitation and waste disposal problems, deteriorating air quality through pollution and the proliferation of squatter settlements in sensitive environment areas⁽²⁾.

The development philosophy of Bhutan is guided by the four pillars of Gross National Happiness (GNH)⁽³⁾ whereby 'Gross National Happiness is more important than Gross domestic product'⁽³⁾.

Sustainability assessment (SA) is a complex appraisal method. It is conducted for supporting decision-making and policy in a broad environmental, economic and social context, and transcends a purely

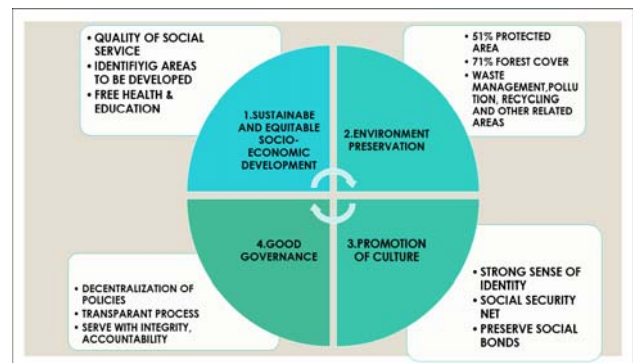


Figure 1: Four pillars of Gross National Happiness (GNH)

technical/scientific evaluation⁽⁴⁾.

Even though the context and scope of sustainability and GNH differ, they have in common that they require a major shift in mindset and attitude of the practitioner. The difference is that GNH explicitly defines happiness as overall goal of sustainability⁽⁵⁾. Many research and development in the last decade have led to the conclusion that global urban sustainability assessment tools are not universally applicable, specifically for developing countries, be-



Figure 2: Proposed Sustainability chart

cause of differences in priorities for urban development⁽⁶⁾.

Subsequently, Bhutan currently does not have the indicators to monitor and assess the sustainable urban development that is in-line with the principles of Gross National Happiness.

This study attempts to develop urban sustainability indicators for urban development in Bhutan, aiming to introduce sustainability assessment.

Through extensive literature review of the three Global Urban Sustainability Tools (BREEAM Co, LEED-UD, CASBEE-UD), the relevant indicators were reviewed and proposed, to identify the Key Sustainability Indicators for Bhutan (Fig. 2).

Thereafter, a set of indicators and their weighting were identified through questionnaire surveys and consultations with stakeholders.

2. METHODOLOGY

Two methods were used in this study. First, through nation-wide questionnaire, that revealed the key environmental and socio-economic development challenges from the stakeholders' perspectives, which represents the main challenges to establishing a sustainable urban development in towns and cities in Bhutan.

The questionnaire survey was conducted through google form (Online) with a sample size of 100 respondent, which includes professionals working in the field of built environment in Bhutan.

Second, Delphi questionnaire survey was designed

on 44 structured items on a 5-point Likert-type scale. Descriptive analysis was conducted on the collected data. The Delphi panel consisted of professionals and experts working in various agencies in Bhutan.

3. FINDINGS AND DISCUSSION

Through the nation-wide questionnaire survey: Obtained 10 category and 37 factors (Fig. 3). All the 37 factors reached consensus. The confirmed levels of importance were all equal to or above 3. Transportation and movement has been recommended for further adoption and analysis in this study. Safe drinking water scored the highest (4.73) and Use of diverse water source scored the lowest (3.72), which clearly reflects that Bhutan has abundance of clean drinking water but suffers from low-quality infrastructure.

Consequently, the ten categories and the consensus factors, could be useful for policymaking for sustainable urban development in Bhutan.

4. CONCLUSION

A set of indicators and their weighting were identified through questionnaire surveys and consultations with stakeholders. These components highlighted the fundamental issues with socioeconomic and environmental development from the viewpoints of the stakeholders, which stands for the main difficulties in

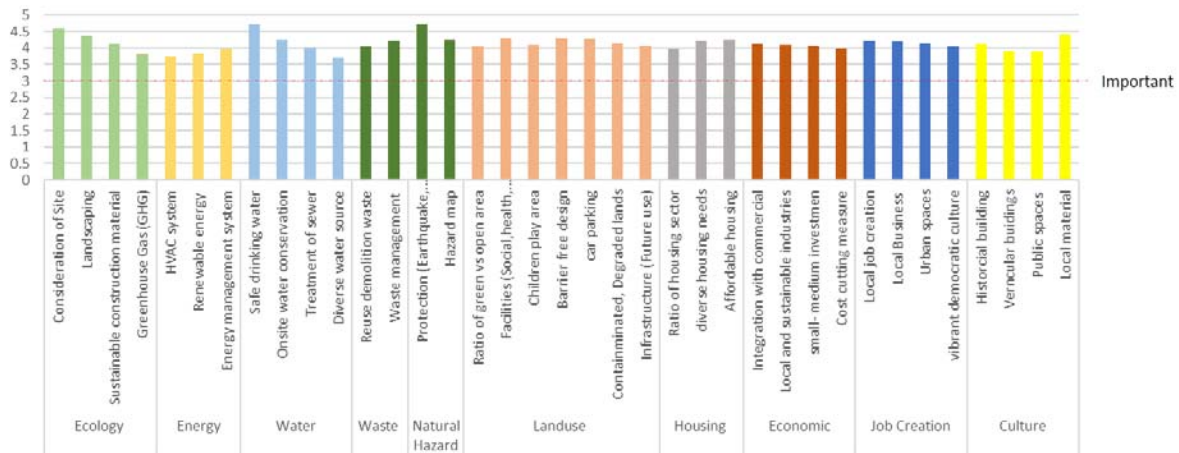


Figure 3: Mean value of the 10 category and 37 factors

developing a sustainable urban development in Bhutan's towns and cities.

Further, the study shall include Delphi expert survey and the result shall be compiled as part of this paper in the final presentation for the conference.

The findings of this study indicate a need of comprehensive sustainability framework for both existing and new urban centres and towns in Bhutan.

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