



**INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI  
SHORT ABSTRACT OF THESIS**

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**SHORT ABSTRACT**

The idea of sustainability is based on three pillars: environmental, economic, and social, per the Brundtland report. Housing is a type of architecture with which any occupant can connect. It is a place that supports an occupant's physical, emotional, cultural, and social needs, which support their consciousness. The methodology includes an extensive literature review, data collection, and analysis to understand, achieve, and balance sustainability. The study identified an evident gap in current green building rating systems regarding the inclusion of social and cultural indicators. There is an inclination for quantitative approaches, such as energy, the environment, and resources. The study found that it is viable to identify, recognize, and determine social and cultural indicators that are both tangible and intangible.

There is a need to cater to more sustainable housing that is socially and culturally appropriate for the transition to a low-carbon future. In most research regarding the sustainable built environment, participation and feedback are limited to industry experts and professionals, and residents are excluded. This study presents residents' views regarding the incorporation of socio-cultural indicators and the understanding of sustainability. This study focuses on socio-cultural sustainability: incorporating culture as the fourth pillar of sustainability or as an extension of social sustainability. This study attempted to fill this gap by collecting data from Indian residents, thus validating social and cultural indicators according to occupants' needs. Through a secondary data review and survey research, this study intends to find relevant socio-cultural indicators that are occupation-defined. The context of this study is specific to India and its residents, with a limited set of people involved due to restrictions resulting from COVID-19. This study aims to determine a way to more effectively integrate the physical and intangible aspects of housing for socio-culturally focused and sustainable development by establishing a theoretical framework.

The developed theoretical framework is further translated into a practical toolkit. The assessment tool is designed and developed in Microsoft Excel. Each section has design guidelines based on sustainable design practices and best practices followed by national standards and codes. The categories of the tool are identified in the framework

and are sectioned into various categories and sub-categories. The template is made in a spreadsheet format, and the tool is designed and developed using Microsoft excel. Each sub-category is detailed with specific design guidelines. The guidelines are based on sustainable design practices and best practices followed by national standards and codes. The scoring for the entire sheet and every section is on a scale ranging from "Poor" to "Best Practice" with score values (-1, 0,3,5), which are color-coded. All criteria within each category have been assigned equal weightage (i.e., 3 for good practice) except for innovation which is 1. The score of each section is calculated and reported after every sub-category's data. The final score calculations for the overall category are displayed at the bottom of the worksheet. The last tab, "Result," provides a concise summary of all the data, divided by category and multiple graphical charts. The toolkit covers seven categories of effect, identified as they have the most significant potential to reduce a building's environmental impact and remove the most frequently met problems and barriers in a balanced, sustainable design. The tool is later validated by industry experts who have worked in the development of similar assessment tools. The tool is checked with heuristics principles for user interface testing with the help of participant observation. The tool version V1 is revised based on the feedback received, and further V2 is developed and validated.

