



## SUSTAINABILITY ISSUES OF CONCERN FOR BRIDGE ENGINEERS IN INDIA

**Alok Bhowmick**  
Managing Director,  
B&S Engineering  
Consultants Pvt. Ltd.,  
Delhi  
[bsec.ab@gmail.com](mailto:bsec.ab@gmail.com)



Mr. Alok Bhowmick, born 1959, graduated in Civil Engineering from Delhi University in 1981 and did his post graduation from IIT, Delhi in 1992. He has to his credit a number of major design projects in PSC, RCC and Structural Steel in India & overseas. The highlights of his carrier spanning more than 32 years include the design of notable structures in various parts of India and overseas. Mr Bhowmick has made significant contributions in the field of structural engineering both within and outside his organization by sharing his expertise and experience. He is an active member of several technical committees of Indian Roads Congress. He is a fellow member of governing council of Indian Association of Structural Engineers.

### Summary

This paper highlights the need for sustainable growth of bridge industry in the country. It underlines the fact that in a world of finite resources, economic development has to go hand in hand with the social progress with protection of the environment. It overviews the current state of practice in the concrete bridge industry in India and broadly discusses what sustainable bridge design is all about. The paper also underlines the potential benefits of pursuing sustainable bridge design and flags the urgent need for a development of a National Standard for sustainable bridge design. The paper emphasizes the urgent need for a focused campaign to bring a paradigm shift in the mindset of the stakeholders (Clients, Contractors, Consultants, Cement Manufacturers...etc.) for moving towards a sustainable growth. Finally, the paper recommends certain immediate steps to be taken with respect to design of bridges to address the sustainability issue.

**Keywords:** Durability, Sustainability, Cement, Bridges, Embodied Energy,

### 1. Introduction

The infrastructure growth in India is on an exponential curve, with the planned expenditure of more than 1 trillion US \$ in the 12<sup>th</sup> five year plan. The transport sector is a major source of emission of greenhouse gases, and therefore if India has to mitigate these emissions, transportation will have to become more sustainable and certainly more accessible to all sections of society. The production of cement and steel in India is likely to grow leaps and bounds in the coming years in consideration of the economic development. Considering that the current cement-grade lime stone reserves in India are expected to last only for next 35-41 years [1], it is essential to use this precious material with caution. India has the distinction of being second largest cement producer in the world, next only to China. With such a large scale housing and infrastructural developmental activities on the anvil, the most important challenge confronting the construction industry in India today is how to meet these challenges of the society in a sustainable manner.

Concrete as we know is the most consumed construction material in the world and ranks second only to water. As bridge engineers, we use concrete in practically every components, from