

**Dear Readers,**

We are pleased to bring to you our edition on Trend(s) of Futures(s) of Concrete(s) guest edited by Dr Chetan Hazaree. His core areas of specialization are Construction Aggregates and Concretes. Besides being engaged in construction R&D, he has varied experiences in dealing with materials' issues on hydropower, nuclear, underground, metro, railway and road projects. With over 40 publications and diverse experience of research, innovation, and execution, he likes to share practical experience in multiple ways, often bringing in practical insights, challenges, and ways of solving such problems in most lucid and practical ways. He has a Ph.D. in Civil Engineering Materials from Iowa State University, U.S.A.

This edition attempts to bring forward accelerated and versatile advancements by various stakeholders to build sustainably. We encourage you to read these perspectives on trends and share your feedback with us.

Production Editor  
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## TREND(S) SHAPING FUTURE(S) OF CONCRETE(S)



Please accept my greetings  
Dear Readers!

I hope this special issue of ICJ finds you safe and doing well during the transitory phases of COVID pandemic. It is important that we check on each other for safety and well-being!

Starting with 'why' always acts like a guiding force and channelizes efforts efficiently. The overall pace of proceedings is encouraging a belief that the interactions across stakeholders in concrete industry are limited to bring about visible commensurate-to-progress maturity. While concrete construction is witnessing an increasing surge, it is vital to align all these stakeholders to craft a vision for their concrete(s). Moreover, with industries employing R&D and innovation teams, significant, direct and applied advancements are fashioning in advancing not just the body-of-knowledge, but also the state-of-the-art and -practice. Our effort to synthesize, share and exchange such multi-stakeholder information culminated in designing of this edition. While doing so, benchmarking with global leaders could be an essential first step to derive directions and save invaluable time and energy. In addition, such milestones will help us design "our leaps and bridge our gaps".

The pluralized theme of this issue, trend(s) shaping future(s) of concrete(s) signifies its intent of capturing multitudes of human efforts across many value chains weaving the fabric of concrete making and construction. These human efforts testify human emotions to preserve, to develop, to grow and to sustain in concrete ways. From cradle to grave or from concept to commissioning, trends in widening the applications of concrete, its selection, designing, making, and remaking are on a rise

like never before. Fueled by the desires to make concrete an environmentally preferred material, Policy makers, Governments, Developers, Contractors, Corporate houses, Academicians, Social enterprises, Professional bodies, and public are all becoming aware of their responsibilities. While developing countries witness faster makeovers, it will be immensely beneficial to have these transitions reach and implement with greater speed in India. Synergized interactions amongst various stakeholders across the value-chain will be a key factor in deciding the paths that emerge.

Accelerated and versatile advancements and transformation in terms of concrete making raw materials, designing methods, testing, recycling, etc. are percolating our World. A combined, albeit not synergized, effect thus produced is making it difficult to comprehend concrete (as we know today) in a singular material form for future. There will be variants and mutations that would make concrete a more comprehensive and more widely accepted material. Hence, there will be many-a-trends that will shape many-a-futures for many-a-concretes.

With these thoughts in mind and making it relevant to the theme, myself along with the ICJ team solicited contributions from multiple stakeholders. Although our efforts were to curate a multi-stakeholder contribution, a wide gap between trends in research and trends in practice made it challenging to assemble the desired literary contributions envisaged within a limited period. Consequently, making a humble beginning, this issue has emerged as a tussie-mussie of perspectives from Academia, research organizations, producers and practitioners further embellished by interactions from industry leadership.

Beginning with a note on how a leading building material company, LafargeHolcim, is setting its global roadmap for sustainability, we capture the thought process expressed by their

Chief Sustainability Officer, Magali Anderson. This is followed by interactions with the Director General of National Council for Cement and Building Materials (NCCBM), Dr B N Mohapatra and the Chief Executive Officer of Rodic Consultants, Satish Kumar Sharma. These interactions capture perspectives on contemporary trends as seen by a research organization and design and project management consultancy. Taking a birds' eye view, both these interactions emphasize needs for integrated approach involving all stakeholders and education.

Meghna Gill an architect, India, comments on the increasing need for integrating the psychological, social and cultural sustainability aspects. These aspects will soon form the building blocks of modern-concrete making. In the following article, emphasizing innovation, Christophe Levy, the Scientific Director of the LafargeHolcim Innovation Centre, France, glances into the future of ready-mix concrete, building his arguments from a geography that has a long-established legacy and special preference for concrete.

Summarizing ten trends in reducing carbon footprint of concrete, Leonel Lema, Executive Vice President, Structures and Sustainability and Dr Colin Lobo, Executive Vice President of Engineering from the National Ready Mixed Concrete Association (NRMCA), U.S.A, note that reaching carbon quasi-neutrality in a few decades is a matter of life or death for concrete industry. With the shutting down of coal-fired thermal power plants, our dependence on coal fly ashes might be phased out. Byproducts such as bottom ashes from the incineration of biomass, coal and sewage sludge are presenting

their potential candidatures as concrete ingredients. This however needs to be reviewed in the gamut of the bigger canvas of concrete making. This is captured in the paper authored by Drs da Silva, Silva and De Brito from Lisbon.

Dr Ketan Sompura provides an admixture manufacturer's perspective on the current challenges faced in India and the need to rapidly embrace modern chemical admixtures to be used in modern day concretes. Finally, Dr Sharvil Faroz et.al. bring out a limitation regarding today's design engineering practices that while being good at structural designing tend to ignore durability considerations and life-cycle estimation mechanisms. Besides highlighting limitations in specifications and codal provisions in commensurately addressing such issues, this paper emphasizes the need for better education and understanding on deterioration mechanisms of bridges and need for effective specifications for delivering 100 years of service life.

Considering these contributions as perspectives from diverse leaderships, I request you to read their contributions with an open mind. With a hope that this issue will inspire further thinking and help initiate some interactions amongst various stakeholders, I present to you this edition for your reading pleasure. It would be nice to hear your objective feedback and critique, which would help us improvise further special issues.

Happy reading and trendsetting!

**Chetan Hazaree**  
Guest Editor, ICJ

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