



SUSTAINABLE CONSTRUCTION IS A UNION OF 3M'S: MATERIALS, METHODOLOGY, AND MODELS

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When Abu Dhabi launched the ESTIDAMA Pearl Building Rating System in 2010, it was as much a decisive action as it was a precursor of more regulations in the global construction industry. Accordingly, administrations in leading cities globally have tightened the regulatory noose in construction, mandating stakeholders to comply with green building ratings. The overarching objective is to drive sustainability in an industry accounting for about 36% of the global final energy consumption and about 40% of the CO2 emissions.

The sustainability discourse in the construction industry is often centred around materials, and for the right reasons: Cement, the most utilized construction material in the world, is responsible for up to 2.8 billion tonnes of CO2 emissions annually — about 7–8% of the total emissions globally. To put that into perspective, if the cement industry was a country, it would be the third largest emitter in the world. As an architect, I cannot help but despair over the industry's "carbon legacy" that could echo through the ages. So, what can be done to reduce that disproportionately high footprint?



De-carbonization of construction materials

A general rule of thumb is to replace cement with alternative, low-footprint, renewable, recyclable materials. As per local feasibility and socioeconomic conditions, bamboo, stones, and laminated timbers make a good case in this regard. Such materials allow architects to reconcile the project with local habitats and the environment while reducing embodied carbon. However, in most locations, particularly urban centres, such materials are unviable due to several reasons, including cost, climatic deterrents, a lack of availability, and local by-laws.

Such circumstances — exemplified by most urban centres in the Middle East — require architects to re-envision how cement is used. Typically, by reducing the clinker ratio — the percentage of clinker in cement — the cost of production and the environmental impact can be decreased significantly. Most importantly, provisions to reduce wastage must be made. As it turns out, as much as 30% of the total building materials delivered to a site could be wasted during construction. The use of efficient project management software helps keep the on-site material wastage in check.