Pragmatic Engineering and Lifestyle

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Pragmatic Engineering and Lifestyle: Responsible Engineering for a Sustainable Future

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INVESTOR IN PEOPLE

To everyone who practices responsible engineering and living.

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He has published 38 refereed SCI-indexed international journals, four book chapters, one patent, and contributed to research presentations/invited talks in several international conferences. He has participated in two research projects funded by ANID National Agency for Research Development, Govt. of Chile, as a Responsible Investigator and Sponsoring Investigator. He has two projects as an Investigator and Co-Investigator funded by Universidad Technologica Metropolitana, Santiago, Chile. He currently works as a postdoctoral researcher guiding several UG students who are working in the area of Mechanical and Materials Engineering. He is an active reviewer of various international projects (Fondo para la Investigación Científica y Tecnológica-FONCyT de la República Argentina) and international peer-reviewed journals in the area of Mechanical Engineering and Materials Science and Engineering.

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Book Description

Pragmatic Engineering and Lifestyle draws together international experts from engineering and architecture to disclose the latest insights into forging viable means to sustain tomorrow's needs. It focuses on breaking through barriers and fully realizing promising remedies by explicitly including the social aspect in the equation. The best way to engage the entire society is to involve them in the development and execution of the solutions. This book covers, among other topics, simple and responsible engineering and living, ecological and socially friendly buildings and infrastructures, socially resilient farming, and agroecology. This is an indispensable volume for tomorrow's engineers, architects, and policymakers. Veridically, every soul should be acquainted with, and be part of, *Pragmatic Engineering and Lifestyle.*

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Preface

Tall buildings will continue to be an integral part of tomorrow's society. Pragmatically, measures must be taken to design them to be socially, economically, and environmentally sustainable. Al-Kodmany maps out the unsustainable aspects and furnishes the remedies for improving the sustainability of tall buildings whenever and wherever they are constructed in Chapter 1, "High-Rise Developments: A Critical Review of the Nature and Extent of their Sustainability."

Replacing fossil-fuel-based fibers in engineering applications such as reinforcing building materials is inevitable. The selection of the most appropriate natural fiber for a specific task with the required engineering properties such as strength, on the other hand, is not a simple process. In Chapter 2, "Application of Expert Decision Systems for Optimal Fiber Selection for Green Building Design Components," Balo and Sua present an approach for selecting the best fiber. For this green building case study, a reference is established using materials from different places.

To sustain a thermally comfortable living standard, traditional air conditioning systems must be transformed into renewable-energy-driven ones. Deshmukh et al. present the latest "Advances in Solar driven Air Conditioning Systems for Buildings" in Chapter 3. The emphasis is on reducing energy usage and, for this, solar adsorption is a promising method as it is a green technology that uses solar energy for driving the cycle.

For most developed countries, heated water is a life necessity. Tapping into solar energy can result in substantial savings in heating bills, both financially and environmentally. Singh et al. present the use of water-based Trombe walls, along with appropriate thermal energy storage, for providing heated water in Chapter 4, "Evaluating Water-based Trombe Walls as a Source of Heated Water for Building Applications." They find superior performance in terms of supplying heated water for building applications and reducing the heating load during typical Canadian winter days.

Gökgöz and Yalçin present "Investigating Waste Management Efficiencies and Dynamics of the EU Region" in Chapter 5. We cannot live responsibly if we do not manage the waste that we produce responsibly. The European Union scenario is analyzed using Slack Based Measure and Super Slack Based Measure in this chapter. Reuse and recycling resonate, and zero-waste-oriented policies are effective tools for increasing waste management efficiency.

A case study of a zero-waste-to-landfill site is disseminated in Chapter 6, "The Multipronged Approach of Solid Waste Management toward Zero Waste to Landfill Site: An Indonesia and Thailand Experience," by Permana et al. It is critical that we understand 'zero waste,' meaning no waste to the landfill rather than no waste produced. To dump no waste in one's backyard, a multipronged approach involving all stakeholders from all levels of government to every individual is required. It is found that the waste management activities realized by individual households and communities are the prerequisite for the upper levels of governing bodies.

Another way to look at zero waste is conservation, that is, start with waste reduction and proceed to zero waste. Yazdani and Lakzian detail the creation of measures to limit waste volume and toxicity in Chapter 7, "Conservation; Waste Reduction/Zero Waste." The idea is to preserve and recover resources rather than burying or burning them. A pragmatic approach is the engineering of cradle-to-cradle products, where the end of one product becomes the beginning of another. As expected, zero waste can only be accomplished with the participation of all stakeholders.

Kanda et al. enlighten us with "Adoption of Green Building Practices in Kenya: A Case of Kakamega Municipality" in Chapter 8. The aim of the study is to further green building adoption in developing countries. To do so, a better understanding of the state of green buildings is realized via a detailed survey. With that, the promotion of health and well-being, along with minimal impact on the environment via green building, can be furthered with the help of incentives including legislation and certification programs.

Furthering renewable energy is a necessary element for a sustainable future. Compressed air energy storage is one of the most promising technologies for mitigating the intermittency of renewable energy and the mismatch between energy supply and demand. In Chapter 9, "Transient Thermodynamic Modeling of Heat Recovery from a Compressed Air Energy Storage System," Ebrahimi et al. expound on the transient behavior of a compressed air energy storage system with heat recovery from the compression process and using it for heating the air during the expansion phase. Heat recovery is the key to mitigating CO_2 emission while simultaneously boosting efficiency.

Healthful nourishment is essential to sustain tomorrow and, thus, responsible fishing is included as Chapter 10, "Trawl Fisheries Management and Conservation in Malacca Straits." In this chapter, Wong and Yong convey a systematic analysis of trawl fisheries management and conservation measures in Malacca Straits. They highlight resolving of unclear and conflicting national and international territorial waters rights, strengthening national and multilateral research collaboration, employing effective and cost-saving ecological tools to identify and expand marine-protected area, and other measures to further sustain marine fisheries.

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