

Editorial Article

Sustainable Materials – An Approach to Enhance Sri Lanka's Economic Resilience



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The government of Sri Lanka officially announced and accepted that the country was facing an economic crisis in April 2022. While a plethora of economic analyses and explanations were published, they commonly pointed to long standing structural vulnerabilities over the past few decades. After four years, Sri Lanka still faces significant challenges in generating the resources needed to repay accumulated debt. Within this economic landscape, persistent pressures such as widening budget deficits, high cost of living, and inflation continue to shape daily realities. A closer look at Sri Lanka's import structure reveals a heavy dependence on essential commodities including fuel, pharmaceuticals, machinery, agricultural inputs, and materials. This dependency not only strains foreign reserves but also exposes the economy to external shocks. It is within this context that a rethinking of material strategies becomes not only relevant, but necessary.

Materials, whether for everyday commodity use or advanced technological applications, form the backbone of any modern economy. Sri Lanka's reliance on imported materials places a continuous burden on national expenditure. Addressing this requires more than substitution; it calls for a transition toward a sustainable material economy rooted in local resources and innovation. It must be noted that Sri Lanka is not a country with resource limitations but that of resource underutilization. Such an approach aligns naturally with the country's environmental conditions and resource availability, while also opening new pathways for value creation.

Sustainable materials, broadly understood as renewable resources that can be produced without long term environmental degradation, are gaining global attention. While many developed nations are progressing toward long term targets such as "*net-zero*" emissions, for Sri Lanka the urgency is far more immediate. The current economic climate demands a shift toward locally available materials and processes that reduce dependency on imports while supporting domestic industries. This shift is not purely technological; it also requires a change in how materials are perceived, produced, and consumed.

Sri Lanka is uniquely positioned with a diverse base of natural resources that can support such a transition. Natural rubber, for instance, remains one of the country's most established materials, offering both economic and environmental advantages through renewability and carbon sequestration. While the industry has evolved from raw latex exports to a range of value-added products, there is still considerable scope to move toward more advanced and sustainable material systems. In doing so, attention must also be given to reducing reliance on imported chemical additives and improving environmental management practices within production.

Similarly, the exploration of biomass derived materials presents an opportunity to connect sustainability with circular economy principles. Agricultural residues such as rice

husk, sugarcane bagasse, and other lignocellulosic waste can be transformed into functional materials, creating value from what is otherwise considered waste. This not only addresses environmental concerns but also introduces new economic streams. In parallel, traditional knowledge systems; such as natural dyes and fiber processing; offer an underutilized foundation that can be revitalized to meet modern sustainable market demands.

The potential of biopolymers and natural fibers further reinforces this direction. Materials such as cellulose, starch, and chitosan, along with fibers derived from banana stems, pineapple leaves, bamboo, and even lotus stems, demonstrate that sustainable alternatives are not distant concepts but locally available realities. However, the challenge lies in translating these possibilities into scalable technologies and commercially viable products. Bridging this gap requires coordinated efforts between research institutions, industry stakeholders, and policy frameworks.

From a research perspective, even small-scale innovations can contribute meaningfully to this transition. For example, our work on converting sawdust based lignocellulosic waste into value added materials reflects a broader principle: maximizing resource utilization (<https://www.elsevier.com/about/press-releases/elsevier-foundation-chemistry-for-climate-action-challenge-2026-turning-waste-into-climate-action>). Timber waste, often treated as a low value by product, can be re-engineered into functional alternatives, reducing pressure on raw material extraction while addressing environmental concerns associated with deforestation and waste accumulation.

Ultimately, sustainable materials offer more than an environmental solution; they represent a strategic pathway toward economic resilience. By fostering innovation, encouraging entrepreneurship, and building industries around locally sourced materials, Sri Lanka can gradually reduce its vulnerability to external dependencies.

A collective shift in mindset among consumers, policymakers, researchers, and industry; will be essential to drive this transition forward. In doing so, Sri Lanka may find that the path out of economic crisis is not solely through financial reform, but through redefining how it values and utilizes its own material resources.

In this sense, the crisis itself may serve as a turning point; that of transforming necessity into an opportunity to rebuild a more resilient, self-reliant, and sustainable material future.