Technological Approach for Achieving Sustainable Development Goals

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World Engineering Day for Sustainable Development is celebrating this day under the theme: "Shaping a Sustainable Future Through Engineering". This theme emphasizes the critical role engineering plays in achieving the United Nations' Sustainable Development Goals (SDGs). The 2025 celebration aims to bring together policymakers, leading scientists, engineers, industry representatives, and international organizations to explore how engineering can drive sustainable development and address global challenges. The UN SDGs (United Nations Sustainable Development Goals) are a set of 17 global goals designed to address major global challenges, including poverty, inequality, climate change, environmental degradation, peace, and justice. They were adopted as part of the 2030 Agenda for Sustainable Development by all 193 UN member states. These goals were finalized on September 25, 2015 at United Nations Headquarters, New York, USA and was adopted during UN Sustainable Development Summit

The SDGs were built upon the Millennium Development Goals (MDGs) (2000-2015) and were designed to be more inclusive, comprehensive, and universally applicable. The target year to achieve these goals is 2030. They address global challenges, including poverty, inequality, climate change, environmental degradation, peace, and justice. In all there are 17 SDGs, and almost all have role of engineers in achieving that. However, in this article, following goals will be addressed: (i) Zero Hunger – End hunger, achieve food security, and promote sustainable agriculture; (ii)No Poverty – End poverty in all its forms everywhere; (iii) Clean Water and Sanitation – Ensure availability and sustainable management of water and sanitation for all; (iv) Climate Action – Take urgent action to combat climate change and its impacts; (v) Life on Land – Protect, restore, and promote sustainable use of terrestrial ecosystems, forests, and biodiversity. These goals are interconnected, meaning progress in one can impact others. The UN encourages governments, businesses, and individuals to work together to achieve these ambitious targets by 2030. These goals can be achieved with technologies available, social and institutional constraints in applying these technologies in field.

- (i) Zero hunger: Government of India has already moved in this direction by providing 5 kg grains to about 800 million people so it can be assumed that this goal has been achieved upto good extent. However, there is need of ensuring that the lowest strata of society not only get foodgrain to satisfy its hunger, but also ensure their nutrient security. Hydroponic production of vegetables can be one technology which if adopted properly can fill this gap. Although standard technology is available, it is still a costly option. RPCAU, Pusa developed a system using waste water bottles fixed on bamboo frame which can be be fabricated using local material at very minimal cost. If adopted, this has potential of eliminating hunger with nutritive food available to poorest of poor.
- (ii) No Poverty: Poverty eradication especially rural poverty can be alleviated by creating micro entrepreneurship in rural areas. Few technologies viz., Sukhet model, monetization of agricultural waste, and integrating Rapid Aquaculture system, cookies preparation by

fishes produced and its supply to aaganwadi children. These will create huge employment opportunities which will alleviate poverty alongwith environment improvement and waste management.

- (iii) Combating Climate change impacts: Erratic behaviour of rainfall is creating havoc with urban life. We need to redesign urban drainage system in view of changed rainfall pattern due to climate change. Further to reduce carbon footprints, solar energy use has to be increased. Solar powered irrigation system for riverine areas and flood prone areas will be discussed as these areas require special type of solar energy systems.
- (iv) Life on Land Protect, restore, and promote sustainable use of terrestrial ecosystems, forests, and biodiversity: Accelerated reclamation of degraded lands, Forest fire protection

A road map depicting need for further innovations and refinement for achieving these goals within our socio economic and institutional framework will also be presented.