Abstract

India is one of the world's leading producers of sugarcane, yet small and marginal farmers continue to face significant challenges in harvesting operations. Manual sugarcane harvesting is highly labour-intensive, time-consuming, and increasingly expensive due to labour shortages and rising wages. In addition to financial strain, workers involved in manual harvesting are exposed to serious occupational health risks, including skin cuts, infections, allergies, heat stress, and injuries caused by sharp cane leaves and cutting tools. These factors collectively reduce farmer profitability and create delays in supplying harvested cane to sugar mills, ultimately affecting income stability.

Although mechanized sugarcane harvesters are available in the market, most existing machines cost more than ₹30 lakhs, making them financially inaccessible to small-scale farmers who typically own 1- 5 acres of land. Furthermore, these large-scale harvesters are designed primarily for extensive, uniform farm layouts and require specific row spacing and crop planting measurements determined by machine owners or contractors. This forces farmers to alter traditional cultivation patterns and creates dependency on external service providers. Additionally, such machines are often unsuitable for fragmented and irregular land holdings, which are common in the Indian agricultural landscape.

This situation highlights a clear mechanization gap. The absence of an affordable, compact, flexible, and safe sugarcane harvesting solution tailored specifically for small and marginal farmers. Addressing this gap requires innovation focused on cost efficiency, adaptability to varying row spacing, operational safety, ease of maintenance, and suitability for small farm environments.

Through this problem statement, Bhaarath Cane Industries Private Limited invites innovators, researchers, startups, engineers, and industry experts to collaborate in developing practical and scalable solutions that can make sugarcane harvesting economically viable, operationally efficient, and safer for small-scale farmers. The objective is to bridge the affordability and accessibility gap in agricultural mechanization while improving farmer income, labour safety, and rural sustainability.