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Centre for Sustainable Agricultural Mechanization

National Strategies Related to Use of AI & Technological Innovations & Key Challenges in Agricultural Mechanization in Sri Lanka

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Status of Agricultural Mechanization in Sri Lanka

1. Market and Industry Structure

- Local firms supply tractors, harvesters, ploughs, seeders, Tea machinery, dairy machinery & protected agriculture materials etc., often via partnerships with global machinery brands, tailored for local farming needs.
- There's growth in the tractor & combine harvester market; for example, according to a market report, the market is expected to grow, driven by increasing mechanization demand.
- However, agricultural machinery (in general) adoption is still relatively low — some sources report usage is under 10% for certain machinery in small-scale farms.
- On the regulatory side, Sri Lanka has recently (2025) signed an MoU between the Sri Lanka Standards Institution (SLSI) and ESCAP's CSAM to improve machinery quality, safety, and trade through harmonized testing standards.

2. Policy & Institutional Support

- Tax rates on farm machinery increase recently & price is raised around 25% and discourage mechanization.
- But despite these, there's not a *very strong, coherent, long-term mechanization policy*. Mechanization policies are limited in consistency, and there is no robust "mechanization strategy" for all crop-types.

National Strategies Related to Use of AI & Technological Innovations in Agricultural Mechanization in Sri Lanka

1. Mechanization Adoption Varies Widely by Crop & Region

- In **paddy (rice) cultivation**, mechanization for land preparation is relatively high: tractors are used for land prep in about 81% of irrigated paddy zones, and 78% in rainfed areas.
- For harvesting paddy, combine harvesters are in significant use: for example, 97% usage in irrigated paddy harvesting, and 89% in rainfed regions.
- But for other operations (like ban-making, transplanting, weeding) mechanization is *much less common*.
- For **horticulture**, land prep often uses tractors or power tillers, but many tasks (weeding, fertilizing, harvesting) remain largely manual.
- In **plantation crops** (e.g. tea), mechanization is more limited. For instance, tea plucking is still a very labor-intensive activity, especially in hilly terrain, making adoption of mechanized plucking machines challenging.

2. Service-based Mechanization

- Because many small farmers cannot afford to buy machinery, “hiring concept” (rental of machinery) are common.
- There’s a national **Farm Mechanization & Training Centre (FMTC)** that provides training to farmers on mechanization, helping them understand and operate machinery efficiently.

Opportunities & Key Challenges for the Technogical Innovations & Agricultural Mechanization

High Capital Cost & Financing Constraints

• The cost of machinery is a big barrier, especially for smallholder farmers.
• Access to affordable financing is limited. Many farmers can't easily get loans or credit to buy mechanized equipment.
• Because of capital constraints, many farmers prefer renting/hiring machines instead of owning them.

Small Farm Sizes

• Landholdings in Sri Lanka are often fragmented and small, which makes mechanization less economically viable: big machines are not cost-effective on very small plots.
• This fragmentation reduces economies of scale for mechanization.

Skill / Capacity Constraints

• Many farmers lack the technical knowledge or capacity to operate, maintain, and repair machinery.
• There is a reluctance among some farmers to adopt new machineries, possibly due to low familiarity, perceived risk, or lack of training.
• The system for disseminating mechanization knowledge
(e.g., via the Department of Agriculture) is sometimes viewed as inadequate by farmers.

Opportunities & Key Challenges for the Technogical Innovations & Agricultural Mechanization

Limited Mechanization for Certain Crop Operations

• While land prep and harvesting are relatively mechanized in paddy, other operations (weeding, transplanting) remain manual, limiting productivity gains.
• For many specialty or high-value crops (horticulture, plantation), mechanization is underdeveloped.

Policy & Institutional Barriers

• Lack of a consistent, long-term mechanization strategy: mechanization initiatives can be ad hoc.
• Though there are subsidies and loan schemes, these may not sufficiently reach all farmers, especially the poorest or most remote ones.
• Coordination between government agencies, private providers, and farmer groups is limited; farmer organizations' role is not always maximized.

Knowledge & Information Gap

• Many farmers are not fully aware of the benefits of mechanization, or what machines are available / suitable for their context.
• There is limited extension support / advisory services that specialize in mechanization (beyond basic farming advice).
• Digital connectivity (for information dissemination) may be underutilized; mobile phone providers could play a bigger role, but there are constraints (capital, farmer capacity) to leveraging them effectively.

Opportunities & Key Challenges for the Technogical Innovations & Agricultural Mechanization

Maintenance, Spare Parts & Operating Costs

- Even if machinery is acquired, maintenance costs and access to spare parts can be problematic.
- Fuel price fluctuations also impact operating costs, which can discourage mechanization.
- For some types of terrain/crops (e.g., hilly tea plantations), certain machines are not very practical or cost-effective to maintain.

Standards & Safety

- Quality and safety of agricultural machinery is a concern. Poor-quality machines can be unsafe, inefficient, or break down easily.

Climate Risk & Timing

- Sri Lanka's agriculture is increasingly exposed to climate risk (erratic rainfall, extreme weather), which compresses the optimal "windows" for operations like planting and harvesting. Because of small windows, mechanization could help, but risk of machinery not being available at the right time (or hiring services constrained) can limit its effective use.

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