Brief Note for election of the CSAM Governing Council (INDIA)

Agricultural mechanization plays a key role in improving agricultural production and productivity in developing counties. Net sown area in India is about 141 million ha and number of land holding is 138 million. The average farm size in India is small (1.08 ha). The small and marginal land holdings (less than 2.0 ha) account for 86% of land holdings. Medium and large land holding (more than 4.0 ha) account for only 5% of land holdings which are suitable for individual ownership of farm machinery. Farm mechanization saves time and labour, reduces drudgery, cut down production cost in the long run, reduces post-harvest losses and boosts crop output and farm income. It was also observed that there was a direct correlation between farm power availability and productivity during the past six decades. The small land holding poses challenge to mechanization; however India is trying to overcome these challenges. Haryana state of India has the highest tractor density per thousand hectare of net sown area of 96 tractors and followed by 79 tractors for Punjab against all India average of 43 tractors. The cropping intensity in Indian agriculture increased with increase in power availability. The sale of paddy transplanter, power weeder, combine harvesters, rotavator and thresher in India is growing at a compound annual growth rate (CAGR) of 50, 50, 28, 20 and 10%, respectively. The availability of labour to work in agriculture is crucial in sustaining agricultural production. The population dynamics of Indian agricultural workers shows that by 2030, the population of agricultural workers in the country will be about 230 million of which 45% will be the female workers. The combined share of agricultural workers and draught animals in total farm power availability in India reduced from 60.8% in 1971-72 to 8% in 2020-21. It is predicted that the population in rural areas will decrease to 62.83% in 2025 and to 44.83% in 2050. There may be many reasons including rainfall, crop variety, timely use of tractor and farm implements, and electricity availability etc. in increasing the food grain productivity during the period. The average farm power availability has been steadily increasing and estimated to be 3.03 kW/ha in year 2023. The average farm power availability is being targeted to increase to 4.0 kW/ha by 2030 to assure timeliness and quality in the field operations. The custom hiring centers are helping in promoting farm mechanization. They used to provide hiring services of equipments and machineries for carrying out different farm operations in their vicinity. Thus it avoids owning and maintaining the costly equipments and machines by small and marginal farmers.

In India, the Indian Council of Agricultural Research (ICAR), New Delhi is apex body which primarily looks after the need of research and development activities, need based region-specific technologies and specific-problem related issues. The Agricultural Engineering Division of ICAR comprises five research institutes, six All India Coordinated Research Projects (AICRPs), two network projects and four Consortia Research Platform (CRPs). Out of six AICRPs, four AICRPs with their Coordinating Cells and centres are operating from the ICAR-Central Institute of Agricultural Engineering, Bhopal, which caters to the engineering needs emphasizing on sustainable agricultural mechanization of the country. These are i) Farm Implements and Machinery

(25 centres), ii) Ergonomics and Safety in Agriculture (9 centres), iii) Energy in Agriculture and Agro Industries (16 centres) and iv) Animal Husbandry Mechanization (11 centres). The other two AICRPs with their Coordinating Cells and centres are operating from the ICAR-Central Institute of Post Harvest Engineering & Technology, Ludhiana. These AICRPs are on Post harvest Engineering and Technology (30 centres) and AICRPs on Plastic Engineering in Agriculture Structure and Environment Mangement (14 Centres).

Most of the member countries are having small land holder farmers similar to India. Our experience to tackle challenges in agricultural mechanization will be helpful for many member countries. With all given strength and rich experience, India would like to be a member of the Governing Council of CSAM to play important role in CSAM program with following aim, vision and commitments:

Aim

Our aim is to promote sustainable agricultural mechanization for food security, improved rural livelihoods and sustainable development of agriculture across the Asia-Pacific region.

Vision

Support CSAM program for sustainable development of agricultural mechanization in the Asia and Pacific.

- To offer our expertise for promoting agricultural mechanization to any member country of Asia and Pacific.
- To facilitate in organizing seminar/conference/training activities related to sustainable development of agricultural mechanization.
- To exchange scientific/technical information of mutual interest.
- To help in developing sensor/automation systems for smart/precision agriculture in the members countries.
- To encourage capacity building of the researcher/engineers/technicians and manufacturer of the member countries in the field of advance design and manufacturing of agricultural machines for production and post production agriculture.
- To encourage the entrepreneurs for establishment of custom hiring centres for farm mechanization in the member countries.
- To develop collaboration between research Institutes/universities/academia and Industries among the member countries for sustainable mechanization.
- India has robust standard and test code development facilities and shall help in developing standards/test codes of Agricultural Machinery for member countries.
- To help in in-situ and ex-situ management of crop residue management in members countries.