Annex 1 Transdisciplinary Mission Oriented Research Program on Value Chain Development for Tea Sector

Concept Paper/Proposal

1. Rationale of the proposed Programme:

The NSF currently focuses on taking research into practice and transdisciplinary mission-oriented research program (TMORP) which is introduced with the objective of conducting research with the participation of researchers, practitioners and other key stakeholders in the value chain thereby transcending research outputs for the benefits of the industry and society. As the initial step of the process, the Research Division intends to address the plantation sector and its research gaps with special attention to the tea sector as tea remains a vital industry in terms of its contribution to national output, employment, and net foreign exchange earnings.

Tea is the main export agriculture crop which brings foreign exchange of US\$1.3 billion to the country (https://www.srilankabusiness.com/tea/about-tea/industry-capability.html). Sri Lanka is the fourth largest tea producer in the world and contributed to 6.5% of global production after the People's Republic of China (40.5%), India (23.3%), and Kenya (8.6%). However, in order to win the competition in the global marketplace, tea industry needs more value-added products, branding as well as mechanization of some of its activities for productivity improvement. There are gaps that need research interventions for the improvement of this industry. Collaboration among producers, distributors, and retailers, along with technology utilization, is crucial for adapting to market trends and ensuring a sustainable and resilient tea value chain in a dynamic global landscape.

2. Challenges faced by the Tea Sector (Based on the several stakeholder consultations that NSF had):

Lack of Manpower:

One of the major issues highlighted by many is the lack of manpower. The current tendency of youth; finding other means of occupations, leaving the plantations and seeking employment in Colombo and other major cities and their exposure to wider world due to new technologies available is creating this issue. Many small, medium and large-scale plantations are facing this issue.

High Production Cost:

There has been a significant reduction of tea production as well decline in productivity in Sri Lanka according to tea board and tea research institute. It was noted that Sri Lanka has a high production cost compared to India, China, Indonesia, and Kenya. This is creating problems when competing in the world tea market.

Lack of Value Addition/ Product Diversification:

Many stakeholders highlighted that Sri Lanka is still exporting 70% of tea as bulk tea and not as processed value-added tea. While Sri Lanka should address niche markets like organic tea, it is necessary to come up with new value-added products like ready to drink beverages from tea, cosmetics, pharmaceuticals, energy boosters etc.

Not compliance with International Standards:

The export market is really affected by the lack of availability of guidelines that need to be adhered to when exporting tea. A certification and traceability mechanism are needed to overcome this issue.

Not adopting New Technologies:

The tea sector is reluctant to adopt new technologies currently available and used by the competitive countries like China, Kenya. There are new machines for harvesting, drone technologies for fertigation, application of weedicides etc. There are productive agronomic practices like density planting to overcome some barriers. However, the tea sector is not adopting these new technologies, and it is creating issues when competing in the export market.

Irresponsible Agriculture Practices at ground level:

Some recent incidents of rejections were due to the irresponsible agriculture practices that takes place in the plantation sector. Hence, it is required to apply GAP, GMP to Tea Industry.

Climate Change effect on Tea Plantations:

In recent times, climatic changes that are taking place in different parts of the world, including teagrowing areas, have changed the quality of the tea that is being produced. Tea production as well as the taste of tea is affected by the Climate Change scenarios.

Degraded Lands

The current lands have been used for decades and decades. So now the soil is depleted, and water retention is scarce in the tea growing lands. It is needed to find new lands for tea growing as well as mechanisms to retain water, fertilizer applied is a intervention needed.

2. Programme Objectives:

- **2.1.** To enhance productivity of the tea sector through diffusing of modern technologies. Technological advancements, including precision agriculture, blockchain, and data analytics, play a crucial role. These technologies enhance traceability, transparency, and efficiency throughout the supply chain, from plantation to consumer. Mechanization of the tea sector from cultivation to production and packaging is a must. This will also address the major issue of lack of labor, quality, productivity in the tea sector.
- **2.2.** To develop Good Agriculture Practices (GAP) for the tea sector by developing a "Tea Cultivation Manual" which will lead to minimizing the irresponsible agriculture practices at ground level. This manual will provide insights as to integrated pest management techniques, density farming techniques, correct pesticide application, correct weedicide methods and traceability that will lead to good agriculture practices in the tea sector.
- **2.3.** To conduct comprehensive market research to identify the perceptions of next generation (Generation Z) on Ceylon Tea. This will enable the retaining of "Tea break" which is now moving towards "Coffee Break" concept and will address the competitiveness with other emerging beverages.
- 2.4 To introduce value added and diversified products from Ceylon tea to the world tea market. Market diversification by introducing different blends of tea, value added products from Ceylon tea and introducing cosmetics and medicinal products from Ceylon tea rather than exporting tea leaves as itself. A multidisciplinary R&D approach to produce and commercialize these to industrial scale in collaboration with industry partners

3. Expected Programme Outputs:

Output 01: Enhancing productivity through Technology diffusion. This output will promote diffusion of modern technologies to tea sector. Simple, easy to handle and cost-effective technologies to develop or upgrade the machinery needed for the tea sector and research-based data on improved productivity when tea plantations are mechanized.

Output 02: Preparing a "Tea Plantation Manual" This output will develop "Tea Plantation Manual" including recommendations for good agricultural practices (GAP) and good manufacturing practices (GMP).

Output 03; Identifying the perceptions of the next generation (Generation Z) on Ceylon Tea. This output will promote to conduct comprehensive market research/ market survey on next generation expectations from Ceylon Tea

Output 04: Strengthening the unique Pure Ceylon Tea brand, Value Addition/ Product Diversification for Ceylon Tea. This output will promote **n**ew/innovative value-added products/diversified products from Ceylon tea for the tea market based on the industry needs which can be immediately commercialized.

4. Target Beneficiaries

- Sri Lankan economy and there by the general public are the ultimate target beneficiaries.
- The actors of the tea value chain; the producer, distributer, auctioneer, blender or packer, wholesaler, and retailer will be the direct beneficiaries.
- The community that the lively hood is tea plucking, pruning and tea-based industries will also be the direct beneficiaries
- The policy makers, decision makers are also one key target beneficiary as these research interventions can lead to science-based policy decision making.

5. Mode of intervention/stakeholders in terms of the projects

The proposed projects will operate through a transdisciplinary research approach. This research will foster the triple helix model and public-private partnership will be encouraged. Participating Institutions could support this programme by providing in-kind support or financial support.

Local:

- Sri Lankan Universities (Colombo, Moratuwa, Sri Jayewardenepura, Peradeniya, Sabaragamuwa, Wayamba Ruhuna, Rajarata etc.),
- R&D Institutions (TRI, NERDC etc.),
- Sri Lanka Tea Board, Plantation Ministry, Smallholder Tea Board etc.
- Private sector R&D Institutions (Dilmah, Elpititiya Plantation, LOLC, Browns etc.)

International:

• International collaborations will be encouraged with countries like China, India