TEA RESEARCH INSTITUTE OF SRI LANKA

Issued in: July 2019 **Guideline No: 01/2019**

GUIDELINES ON ADAPTATION STRATEGIES TO MINIMIZE CLIMATE CHANGE IMPACTS ON TEA PRODUCTION

Introduction

Climate change or global warming, which is considered to be a result of anthropogenic emissions of Green House Gases (GHG) such as CO_2, CH_4, N_2O, O_3, CFCs to the atmosphere is reportedly posing a threat to tea production. The tea industry in Sri Lanka sustains livelihood of a significant portion of the population in the country and brings in much needed foreign exchange. Sustainability of the industry is vital not only because of its socio-economic importance, but to address environmental concerns as well. It is primarily because majority of tea lands are on steep terrains and in watershed feeding areas to the river systems of the country that are highly vulnerable to soil degradation in the event of bush debilitation, death of bushes and abandonment of tea lands owing to low productivity.

Impacts of climate change

The rising CO_2 levels, ambient temperatures and variation of rainfall are likely to affect carbohydrate assimilation, chemical attributes of tea leaf, pest and disease infestation, soil quality, evapotranspiration and rainfall pattern influencing land productivity and quality of tea. Studies carried out at the Tea Research Institute of Sri Lanka have shown that most of the tea growing areas in low country, mid country and Uva are either highly vulnerable or vulnerable to climate change impacts while those in up country are relatively less vulnerable. Therefore, it is imperative that appropriate adaptation measures be implemented to minimize adverse impacts of climate change on the tea sector.

Adaptation strategies

Moisture stress, excessive soil moisture/flood (extreme rainfall), heat stress, high intensity of weed, pest and disease infestations and soil degradation (soil erosion, loss of organic matter, *etc*.) are the key issues influencing tea land productivity under climate change. Therefore, the following adaptation strategies have been identified addressing those key issues and their impacts on growth and tea yield. In addition, raising awareness of tea growing communities on climate change and its impacts is imperative to successfully face various unforeseen challenges connected to climate change.

Attention should also be paid for seasonal weather forecasting and meteorological disaster predications issued by relevant organizations and landslide prone areas/locations to prevent/minimize weather related disasters.

- Planting of tea cultivars, improved seedlings and grafted plants well-adapted to adversities of weather (drought, water logging, warm climatic conditions, *etc*.) and tolerant to various pest and diseases.
- Establishment and management of shade trees and shelter belts to modify micro-climate around tea bushes.
- Soil and soil moisture conservation and rain water harvesting (contour and leader drains, stone terraces, SALT hedgerows, mulching, burying of pruning, *etc*.)
- Improvement of soil organic matter content in tea lands (shade trees, cover crops, mulching compost and bio-char application, soil conservation, *etc*.)
- Integrated pest and disease management
- Improvement of soil aeration and drainage to remove excess moisture from the root zone
- Irrigation during dry spells
- Judicious use of fertilizers to minimize loss of nutrients (e.g. nitrogen) due to high temperature and extreme weather conditions (slow release fertilizers, timing and frequency of application, *etc*.)
- Selection of lands with suitable growing conditions (soil and environmental) for replanting/new planting of tea
- Crop diversification to reduce risk of mono-cropping especially where soil conditions are marginal for tea cultivation
- Diversification of income through other avenues (e.g. Ecotourism, livestock farming, bee-keeping, *etc*.) to compensate impending losses from tea
- Afforestation, reforestation and establishment of energy/timber plantations and watershed in tea plantations

Tea Research Institute of Sri Lanka
Talawakelle

Copyright

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, scanning or information storage and retrieval system without the prior written permission from the Director, Tea Research Institute of Sri Lanka, Talawakelle