Climate-Smart & Sustainable and Inclusive Agriculture: The Sri Lankan Context

Professor Janendra De Costa
University of Peradeniya

Overview

- Key requirements for climate-smart, sustainable & inclusive agriculture within the Sri Lankan context
- Prioritizing the key requirements
- Matching strategies, crops and climate challenges
- Short-, medium- and long-term strategies

Key requirements

(1) Building resilience to climate change

(2) Sustainable increase in productivity
(Sustainable intensification)

(3) Inclusivity of the rural populations
(Sustaining livelihoods)

(4) Reducing greenhouse gas emissions

Building resilience to climate change: Sri Lankan Context

- Resilience against extreme climatic events
  - Droughts
  - Floods
- Tolerance to increasing temperatures
- Tolerance to salinity
- Countering the loss of income and livelihoods as a result of climate change/extreme climatic events

Sustainable increase in productivity: Sri Lankan Context

- Increasing crop yields without a proportional increase in inputs
  - Fertilizer → Increasing fertilizer use efficiency
  - Water → Increasing water use efficiency
- Building the natural resource base
  - Soil fertility
  - Natural enemies of pests and pathogens

Reducing/removing greenhouse gas emissions: Sri Lankan Context

- Reducing the emission of methane from lowland rice lands
- Reducing the emission of nitrous oxides from all cropping lands
- Reducing the emission of methane from ruminants
- Minimizing the increasing CO_2 emissions from greater mechanization
- Increasing energy efficiency of the tea manufacturing process

Prioritizing requirements within the Sri Lankan Context

The basis for prioritization …

- Stabilizing the Sri Lankan Agriculture Sector after recent shocks and upheavals should take priority
- Restoring farmer confidence is a key aspect of stabilization and keeping them engaged in farming

Prioritizing requirements within the Sri Lankan Context

Requirement	Priority
Adapting and building resilience to climate change	Requires immediate action
Sustainable increase in productivity	Medium-term goal
Reducing/removing greenhouse gas emissions	Long-term goal
Engaging the rural populations	Overarching

Crops/Sub-sectors to be prioritized

- Rice
- Tea
- Maize
- Other field crops
  - Vegetables, Pulses
- Coconut
- Rubber
- Spices
- Fruit crops

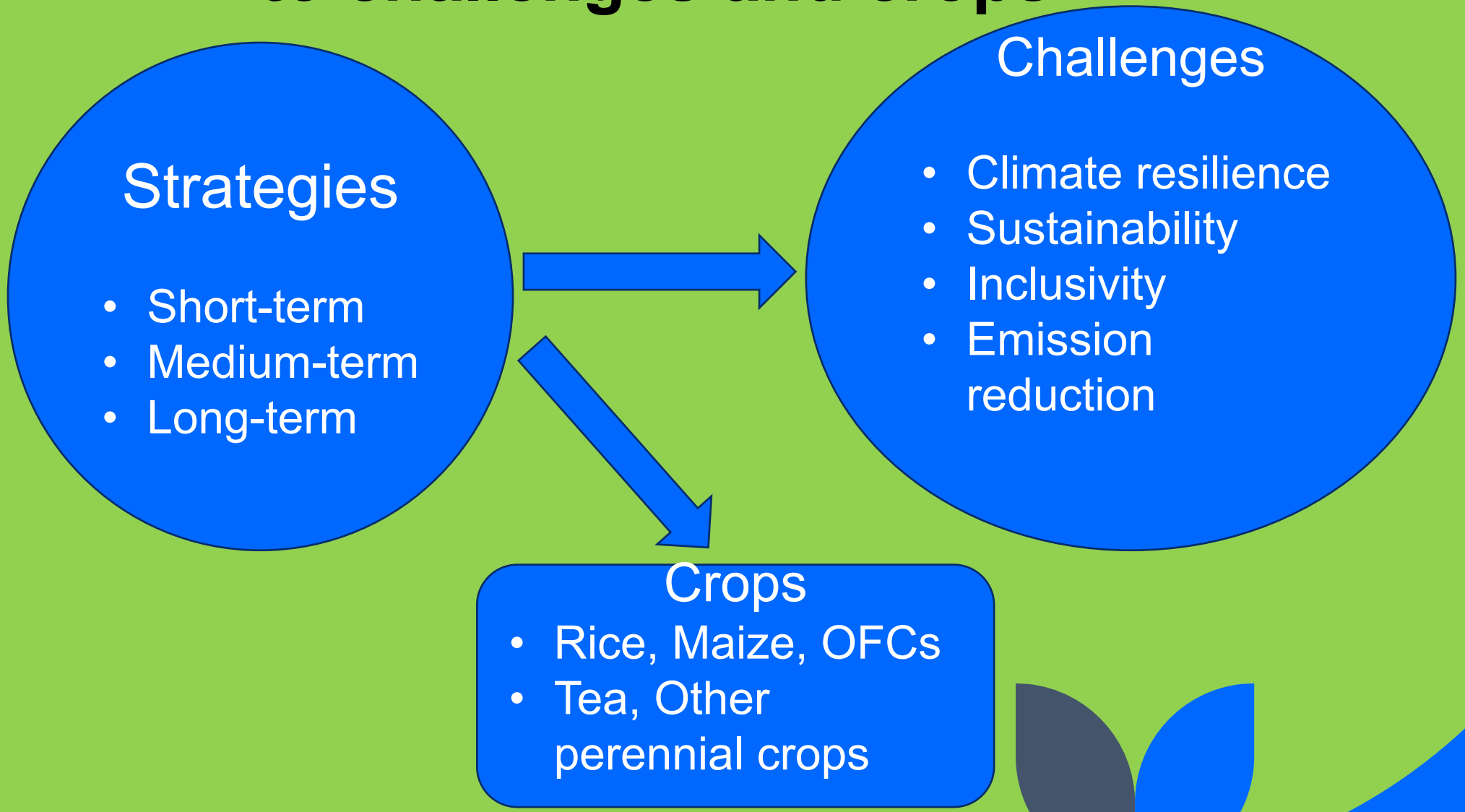
Prioritized based on:

- Contribution to food security and social stability
- Foreign exchange earnings
- Farmer engagement and contribution to their livelihoods

Key challenges

Requirement	Key Challenges
Adapting and building resilience to climate change	• Increasing climate variability • Increasing temperature
Sustainable increase in productivity	• Decreasing soil fertility • Soil erosion & degradation
Reducing/removing greenhouse gas emissions	• Long-held farming practices
Engaging the rural populations	• Decreasing income • Weak farmer-extension linkage

Matching strategies to challenges and crops



Short-term strategies

- Address the most urgent concerns
- Immediate implementation is possible
- Technologies are already available

Short-term Strategies for Rice, Maize & OFCs

To increase resilience against drought

To give the best possible chance of getting through a drought

- Selection of varieties to cultivate
  - Short-duration drought-escaping varieties
  - Identified drought-tolerant varieties

- Cultivation with the onset of rains
  - Make maximum use of the naturally-available water

Short-term Strategies for Rice, Maize & OFCs

To increase resilience against drought …*continued*

Technologies to use the available water more efficiently

- Adoption of water-saving irrigation strategies
  - Alternative wetting and drying for rice
  - Recommended water management packages for OFCs
  - Deficit irrigation for OFCs

- Adoption of soil moisture conservation practices in OFCs
  - Mulching

Short-term Strategies for Rice, Maize & OFCs

To increase resilience against drought …*continued*

- Strengthening farmer-extension service linkage
  - To increase farmer adoption of climate-smart strategies
  - Build trust and confidence

- Improved climate predictions
  - Region-specific
  - Provided prior to cropping season's commencement
  - Possible variation within the season, especially for rainfall

Short-term Strategies for Rice, Maize & OFCs

To increase resilience against drought …*continued*

- Increased coordination and co-operation among different institutions
  - Institutions responsible for allocation and release of water for agriculture
  - Ensure that the requirements of all sectors are taken into account

Medium-term strategies

- Require time for achieving their objectives
- Time-scale of achievement is crop- and technology-specific
- Require sustained investment of resources and effort

Development of tolerant varieties

- Drought tolerance
- Heat tolerance
- Salt tolerance
- Submergence tolerance

Progress has been made

- Especially in rice, OFCs, tea and coconut
- However, adoption of these tolerant varieties has been slow
- In tea, low rates of replanting hampers the adoption of drought tolerant cultivars

Development of Resource-Efficient varieties

Crop varieties with

- Greater nutrient use efficiency
- Greater water use efficiency

Need to be incorporated in to breeding programs as breeding objectives

Zonation of croplands based on climate vulnerability

- Climate vulnerability maps have been developed
- However, whether they are used in decision-making in crop selection for specific seasons is doubtful
- Increased capability of region- and season-specific climate prediction is required to prompt farmers to adjust their farming practices to changes in the climate

Expansion of the climate monitoring network

- An urgent need
- Inadequate number of weather stations especially in the dry and intermediate zones
- Extremely low number of automated weather stations
- Additions to the existing network through research projects

Increasing climate resilience of tea and other perennial crops

- Short-term strategies are limited
- Adoption of soil moisture conservation strategies is a medium-term strategy
- Proper establishment and maintenance of shade in tea lands
- Strengthening grower-extension linkages is essential for increased adoption of climate-resilient technologies

Long-term strategies

- Addresses natural processes that occur over decadal or longer timescales
- Time-scale of achievement is crop- and technology-specific
- Require sustained investment of resources and effort

Long-term strategies

- Increasing the soils' capacity to retain water and nutrients
- Building up of soil organic matter
- Harnessing the potential of soil microorganisms / Stimulation of soil biological activities

Overarching Strategies

- Targeted investment in technology generation through research
- Strengthening of the farmer-extension linkage to create shared objectives
- Strategic incentives for technology adoption
- Achieving synergy among all stakeholders in the value chain

Thank you

Janendra De Costa
janendrad@gmail.com