

# Government Perspective of Climate Smart & Sustainable Agriculture: Available CSA Technologies/ Practices Challenges and Way Forward



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# Changing weather patterns, commonly known as climate change have emerged in the agriculture sector during the past few decades becoming the main risk factors in agriculture.



The major adverse impacts related to climate change include;

- An increase in frequency and intensity of disasters such as droughts, floods and landslides,
- Increased variability and unpredictability of rainfall resulting in frequent crop failures particularly in the rain-fed farming systems,
- An increase in atmospheric temperature creating multiple adverse environmental effects creating biotic and abiotic stresses for crops and
- An impending rise in sea level impacting land related issues in agricultural and other ecosystems in the coastal regions.

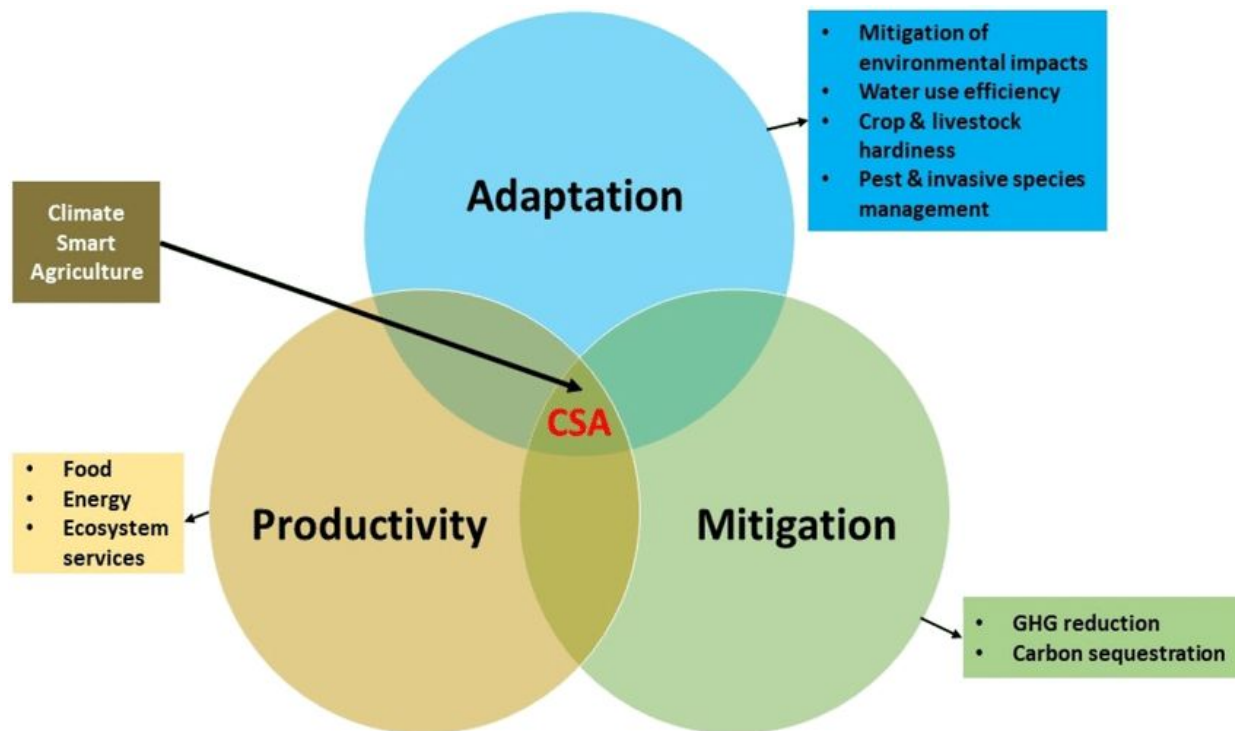


# Climate Smart Agriculture (CSA) :

Is an integrated approach to managing croplands, livestock, forests and fisheries that addresses the interlinked challenges of food security and accelerating climate change

## Three pillars of CSA

1. Adaptation
2. Mitigation
3. Productivity



# Three main Policy documents/ plans related to CSA

## **National Agricultural Policy (NAP) (2021)**

### **Related thematic areas :**

- *Promote adoption of appropriate adaptation and mitigation measures to increase climate resilience of the agriculture systems*
- *Strengthen food systems by connecting urban and rural communities to tackle climate shocks and other disasters*

## **Nationally Determined Contributions (NDCs) in the Paris Agreement (updated in 2021)**

**NDC 1:** *Reduce postharvest losses and value addition of fruits and vegetables*

**NDC 2:** *Increase crop productivity*

**NDC 3:** *Improve the adoption of renewable energy for crop farming/ value addition*

## **Sri Lanka Climate Prosperity Plan (2022)**

- *SL government have started work on a Climate Prosperity Plan to fully commit to supporting the Paris goals of limiting global warming to 1.5 Centigrade.*
- *On climate resilience, it seeks to have the key economic sectors fully adapted, especially through the implementation of more sustainable land and water management practices.*

# Climate smartness - 6 categories



# CSA technologies or practices available in Sri Lanka

## Thematic area – Crop/ Livestock management



1. **Crop diversification with short-age legume crops**

2. **Crop rotation**

3. **Cultivation of biotic and abiotic stress-tolerant crop varieties**

(Short age; Pest / drought/ heat tolerant varieties/ Paddy – Salinity/ submergence tolerant varieties)

4. **Rearing adaptive breeds**

5. **Cultivation under control envt for high-value crops/ Protected agriculture/ Rain shelters**

6. **Seasonal-adapted planting times/ Planting with onset of rains/ cultivation in suitable agro-ecological regions**

7. **‘Parachute’ method of paddy seedling broadcasting**

8. **Dry sowing of paddy**

9. **Cover crops**

10. **Home gardening**

11. **‘Sorjan’ cultivation - Wet zone**

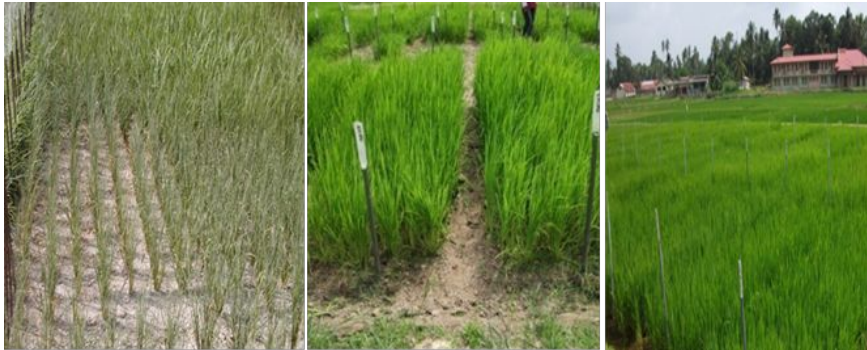
Geographic  
area  
Cropping  
pattern/  
season  
Agro-eco  
system



Third season mung bean cultivation



'Paratute' technique in paddy broadcasting



Screening of rice varieties for droughts



Dry sowing of paddy



Big onion true seed production in rain shelters



Cover crop cultivation under coconut

## **Thematic area - Soil management**

- 1. Multi-purpose soil conservation bunds and terraces**
- 2. Contour planting**
- 3. Organic manure/ Compost**
- 4. Biochar application**
- 5. Mulching**



Contour planting in uplands



Mulching



Multi-purpose soil conservation bunds



## **Thematic area - Water management**

- 1. Rainwater harvesting**
- 2. Drip and sprinkler irrigation systems**
- 3. Plot consolidation of paddy fields/ Laser levelling**
- 4. Alternative wetting and drying (AWD) in rice cultivation**
- 5. Recharging of groundwater through percolation pits**
- 6. Rehabilitation and maintenance of Cascade systems in the dry zone**



Sprinkler irrigation



Drip irrigation



Rain water harvesting

## Thematic area - Energy

1. Photovoltaic lights for agro-farms, protected houses and storage houses
2. Solar-powered water pumping
3. Biogas technology



Biogas  
production



Solar water pumping coupled sprinkler irrigation

# Thematic area - Agro-forestry/ Perennial crop production



Paddy based agro-forestry

1. **Agroforestry (agriculture-forest integration)**
2. **Crop-livestock integration**  
(Intercropping/ Alley cropping/Silvopasture)
3. **Boundary trees and hedgerows**
4. **Fruit orchards**
5. **Cultivation of multi-purpose nitrogen-fixing trees**



N-fixing tree cultivation





Crop - livestock integration



Fruit orchards

# Thematic area - Weather forecasting

## Agro-met advisories and alert systems

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**விவசாயத் திணைக்களம்**  
**Natural Resources Management Centre**  
**DEPARTMENT OF AGRICULTURE**

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My No. } NEMCC/Agro-met Advisory/2022/02

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Date } 07.02.2022

Director General of Agriculture,  
Department of Agriculture, Peradeniya

Through:  
Director (Natural Resources Management Centre),  
Department of Agriculture, Peradeniya

*Recommended & forwarded*  
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**Agro-met Advisory: February 2022**  
(For the months of February, March and April)

Department of Meteorology (DoM) forecasts a near normal rainfall for February to April (FMA), over most parts of the country. For February, near or slightly above normal rainfall forecast has been issued over most parts of the country. The seasonal weather outlook of DoM further stated that, near normal rainfalls over Eastern and Uva provinces during March and a forecast has not been issued for the other areas. No weather prediction has been issued for April too. With the available weather information, it is advisable to consider general climatological rainfall values for agriculture planning. Agro-ecological region-wise expected average rainfall values are attached in Table 1 - 3.

According to the Irrigation Department (ID), the average effective storage of major reservoirs is about 66%. Recently updated summary of daily water levels & storage of major reservoirs are attached in Table 4. ID further assured that the available water in major and medium reservoirs is sufficient to continue the rest of 2021/22 Maha Season and for the inter-season cultivation, for potential areas.

Considering the weather forecast of DoM and irrigation water availability information of ID, the following agronomic interventions are recommended to ensure optimum productivity under existing situation,

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- Since the weather forecast of DoM predicted a near normal rainfall for February to April, lesser amount rainfall can be expected to the entire island. Therefore, when irrigation scheduling, more attention should be paid for rice to ensure water supply during reproductive stage.
- It is advisable to plan harvesting of paddy under prevailing dry period, considering short-term weather forecasts issued by DoM to avoid any sudden short-interval rains.
- Paddy farmers who are planning cultivation activities for the coming 2022 Yala season, advisable to start the cultivation on time with the onset of First Inter-monsoon (FIM) rains. The dates of the onset of FIM will be informed in near future by DoM.
- For paddy fields with the potential for 4<sup>th</sup> season cultivation (ie. after completion of the Maha season and before the cultivation activities of Yala season), short age legume crops such as Mung bean can be cultivated. Farmers in potential areas (Hambantota, Amuradhapura, Kurunegala, Puttalam and Moneragala), can start Mung Bean cultivation for 4<sup>th</sup> season in mid-February. Seed and Plant Material Development Center (SPMDC) assured availability of seeds to fulfill the farmer requirements.
- Farmers who are willing to cultivate short age legumes such as Mung bean, cowpea, soy bean etc. instead of paddy for 2022 Yala season, advisable to start cultivation in mid-April.
- Vegetable and Potato farmers in the up-country areas (altitude is above 1,500 m) are advised to pay attention to the daily weather forecast of DoM for possible occurrence unfavorable conditions with ground-frost during February with a significant drop of temperature (below 6 °C), under the predicted dry weather condition.
- Please consider that this advisory was prepared based the on national level forecasted information and therefore, it is advisable to consider localized detailed information, as a supplementary to this advisory.

dated Agro-met Advisory will be issued in early March for the rest of 2021/22 Maha season and Yala season in consultation with the Department of Meteorology and other relevant resource s and stakeholders.

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# Compilation of available CSA technologies/ practices in Sri Lanka



Consortium for Scaling-up Climate Smart Agriculture in South Asia (C-SUCSeS) Project



## Project Steering Committee Meeting

27<sup>th</sup> October

## Policy Roundtable Meeting

28<sup>th</sup> - 29<sup>th</sup> October

## Kandy, Sri Lanka 2023

Inventory of CSA technologies with details of their targeted climate risks, spatial suitability, farmer acceptability ratings and targeted farming systems -



# International collaborations in CSA related programmes/ projects - DOA

## Development of climate resilient crop varieties/ technologies

### Atlas of Climate Adaptation in South Asian Agriculture (ACASA)

- *This comprehensive Atlas aims to provide granular-scale information for South Asian countries by integrating various spatially categorized data sets.*
- *It aims at improving access to climate risk and solution option analytics for South Asian countries.*

## Development of the Soil Atlas of Asia and National Soil Information Systems (AFACI)

### Objectives

- *To develop soil information for Sri Lanka, make available to national/ global soil information system for sustainable soil management to better planning of food security*

# Consortium for Upscaling Climate Smart Agriculture in South Asia (C-SUCSeS) Project

## Goal

- *To promote sustainable and resilient agricultural intensification in South Asia through enhanced capacity (policy, institution and skill) to scale up CSA strategies and technologies*

## Objectives

- *To accelerate the identification of and scaling up of viable CSA interventions through national policies and programmes in South Asia*
- *To set up effective and efficient mechanisms for knowledge-sharing, policy dialogue, and cooperation in research and development programmes among SAARC countries on CSA*



# Inhibitors in scaling-up CSA technologies/ practices



FARM STRUCTURES  
- SMALLHOLDER



LOW ACCESS TO  
CREDIT, INSURANCE  
AND INFORMATION



COST OF CSA -  
FIXED TO VARIABLE  
COSTS



SOCIAL AND  
INSTITUTIONAL  
NETWORKS -  
STANDARD  
PATTERN OF  
TECHNOLOGY  
ADOPTION



LACK OF MARKETS  
AND DEMAND



SOCIAL AND  
ECONOMIC  
DISCRIMINATORS



POLICY OFFSETS  
AND INHIBITIONS -  
TRADE, DOMESTIC  
POLICIES



# Main categories of the constraints in adoption in CSA technologies/ practices

- 1. Inherent risks associated with technology adoption**
- 2. Inadequate exposure and knowhow**
- 3. Unaffordable capital costs for smallholders**



# Recommendations in scaling-up CSA technologies

- Selection and adoption of Site-specific CSA technologies
- Wholistic approach in implementations (Central Govt. - Provincial Govt. - MASL, etc./ Several ministries and agencies)
- Promote CSA through already implemented national programs and projects (Ex. GAP, IPNS, Soil conservation, Cultivation planning programs, etc.)
- Establish resource sharing mechanism among the farmers through community organizations (Ex. High capacity solar water pumping systems)
- Enhance CSA knowledge availability to all stakeholders
- Encourage the involvement of the private sector, including agribusinesses and input suppliers, in the production and distribution of CSA technologies (*Machinery hub, Extension Digitalization, Marketing* etc.)



**THANK  
YOU**