

# 9<sup>th</sup> Regional Forum on Sustainable Agricultural Mechanization in Asia and the Pacific

Transforming Food Systems through Sustainable Agricultural Mechanization in the  
Region

Friday, 26 November 2021  
15:20-15:50 Beijing Time (GMT +8)



**BOOSTING NATURE-POSITIVE PRODUCTION**

*SCALE-APPROPRIATE MECHANIZATION FOR CONSERVATION AGRICULTURE*

Mr. Ngin Kosal, Director of Department of Agricultural Engineering, Cambodia.

## Overview Challenges in Agriculture

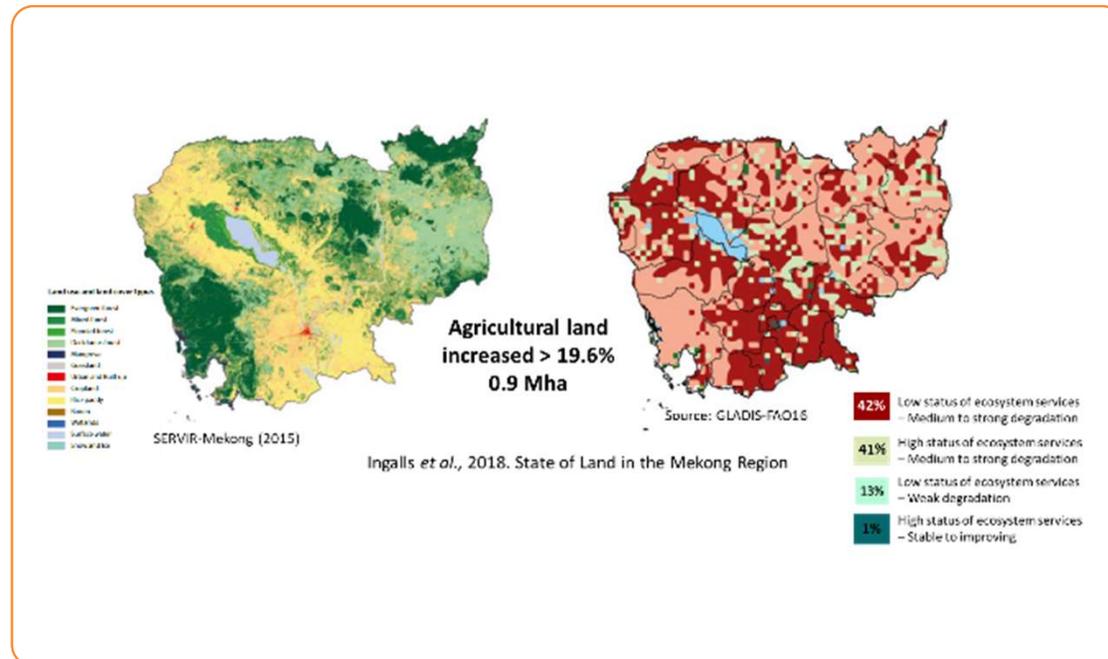
There is a need for the Cambodian agriculture sector to reinvent itself by shifting from increased production through land expansion and excessive use of inputs towards sustainable intensification.

Small holder farmers are particularly **vulnerable to climate change** given their high **dependence** on rainfall and minimal crop diversification.

Cambodian agricultural lands are under threat of **degradation** and soil fertility depletion due to deforestation.

**42%** of land in Cambodia is under strong degradation.

The **annual cost of land degradation** in Cambodia is estimated at **USD 677 million**.



# The Need for Sustainable Intensification Solution

Sustainable Intensification looks at optimizing resource utilization and management whereby farmers produce greater yields by using fewer inputs and without increasing land area. Among the key components of sustainable intensification, CA is one of them



## EFFICIENCY

better use of on-farm and imported resources



## SUBSTITUTION

focuses on the replacement of technologies and practices



## REDESIGN

(transformative) to harness ecological processes and connect scales (field to markets).



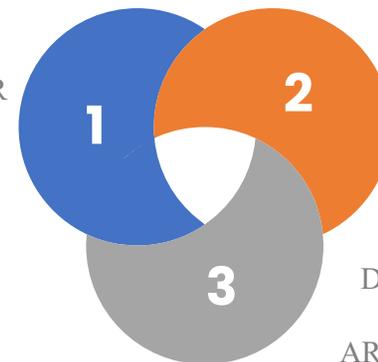
## CONSERVATION AGRICULTURE LEADS TO:

- **Healthy soil**
- Increased **resilience of the production systems**



## THREE PILLARS OF CONSERVATION AGRICULTURE

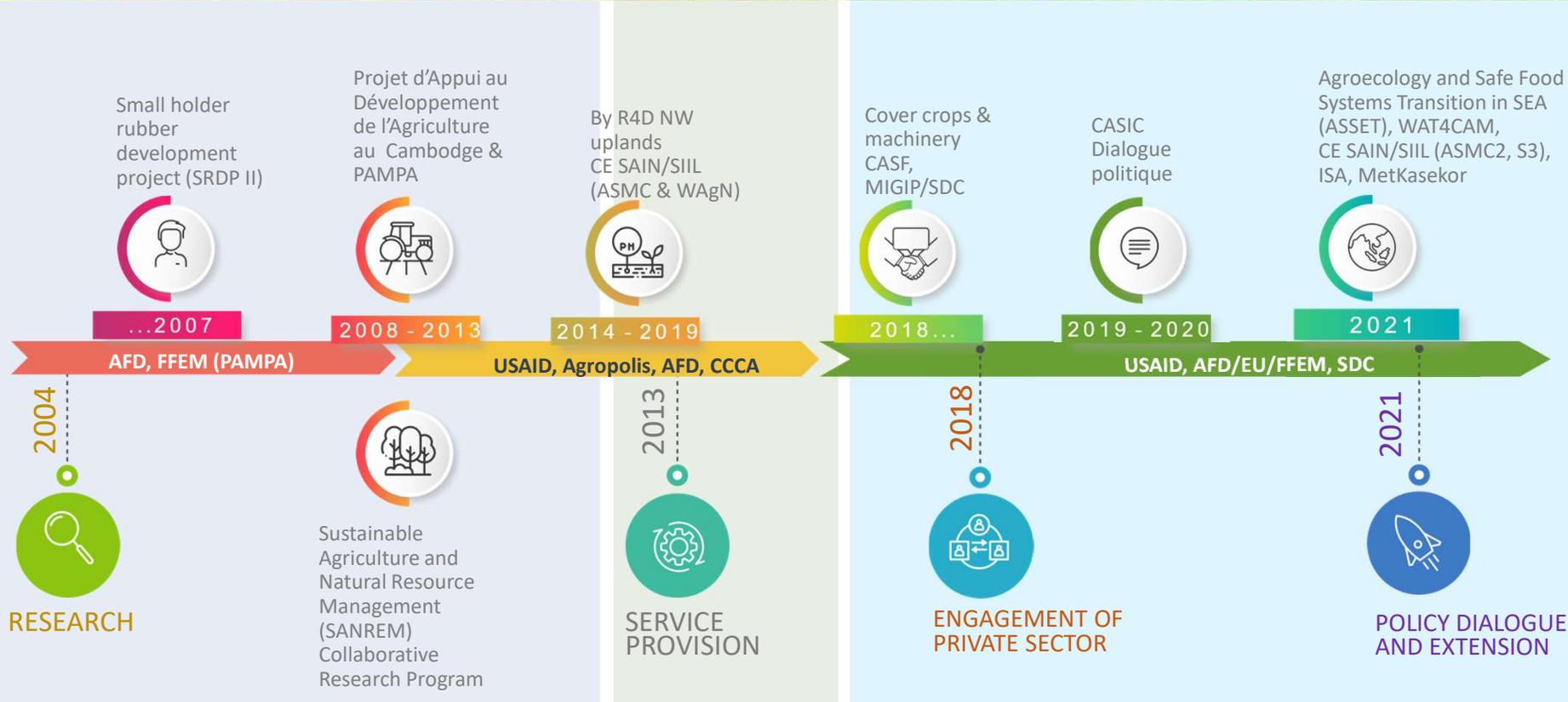
MIMIMUM OR NO SOIL TILLAGE



PERMANENT SOIL COVER

SPECIES DIVERSITY & SPATIAL ARRANGEMENT

# Different Initiatives Towards the Transition





## Our Lesson Learnt from Previous Experiences of Promoting CA

With different activities in order to promote CA, we have collectively built our foundation of promotions by working closely with private sectors who invest in CA to promote CA farming practices and CA machineries and Technologies to SHFs.

In April 2018, The Centre for Sustainable Agricultural Mechanization (CSAM), a regional institution of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), was instrumental in hosting the Regional Workshop on the Role of Mechanization in Strengthening Smallholders' Resilience through Conservation Agriculture in Asia and the Pacific. There were a few other projects that have supported the promotion of CA in Cambodia, namely the Conservation Agriculture Services with a Fee (CASF) and Mekong Inclusive Growth and Innovation Program (MIGIP). Swisscontact runs MIGIP and focuses on engaging the private sector in technologies. CE SAIN runs CASF, in partnership with DAEng, DALRM/CASC/CIRAD and SC and funds the activities of the different partners. These two important projects have helped to realize the commercialization of CA machinery based on the foundations laid earlier.

Hence it leads to a foundation of promotional activities such as series of steps from Searching, Creating Demands, and Create Service provisions, and Private Sector Engagement. We also manage to build the framework for promotion of innovative agriculture products and to find more sustainable way to exercise the promotional framework/activities that has been proof effective under experiences from projects, namely **Metkasekor Model**.

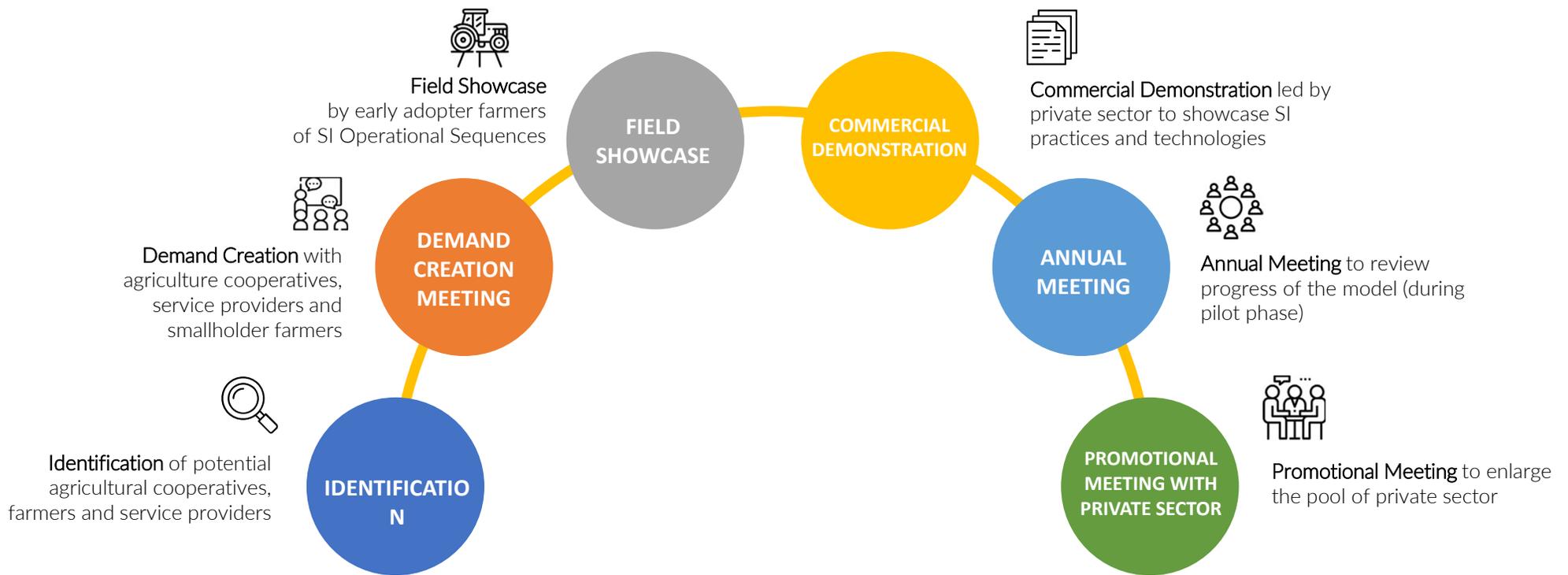
# MetKasekor Supports Sustainable Intensification



**មីតូកាសេករ**

MetKasekor is an innovative extension model. MetKasekor focuses on opening the market for private sector investments. The model is a government resource for the future with the intention to improve the public agricultural extension service system in Cambodia.

# Metkasekor Steps



# MetKasekor Technologies



# MAIZE, CASSAVA & RICE CROP CALENDAR

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

## MAIZE



**Step 1**  
Prepare land  
(for 1st year only)

Land leveler



No-till planter & Sunnhemp



**Step 2**  
Plant cover crop



**Step 3**  
Roll over cover crop &  
plant main crop

Roller crimper & no-till planter



**Step 4**  
Harvesting

Combine harvester



**Step 5**  
Plant cover crop or  
new main crop

No-till planter  
(Sunnhemp or maize)



## CASSAVA



**Step 1**  
Prepare land  
(for 1st year only)

Land leveler



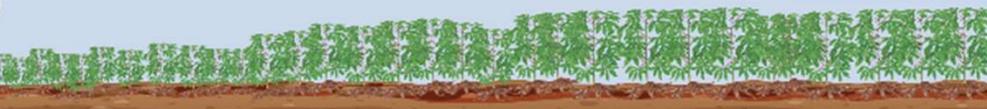
**Step 2**  
Plant cover crop

No-till planter



**Step 3**  
Roll over cover crop &  
plant main crop

Roller crimper & no-till planter



**Step 4 & 5**  
Harvesting (Feb)

Plant cover crop or main crop  
Cassava harvester & no-till planter



## RICE



**Step 1**  
Prepare land  
(for 1st year only)

Land leveler



**Step 2**  
Plant cover crop

No-till planter & cover crop



**Step 3**  
Roll over cover crop & plant main crop

Roller crimper & no-till planter



**Step 4**  
Harvesting

Combine harvester



**Step 5**  
Plant cover crop/main crop

No-till planter  
(Sunnhemp or rice)



# Current Outcomes



## Farmers

645 have applied



## Imported CA No-till planters

8 & Local Land Plane 9 have been sold & used



## Private partners

4 (1 No-till importing Machinery, 1 local seed broadcaster producer 1 Cover Crops Seed Producer, 1 MFI)



## Local Service Providers 3

and 1 Company service provider



## Target Area

2 Provinces (Battambang and Preah Vihear)



## Cover Crops have been produced 17

Tons from private companies and sell across Cambodia



## HA Land Covered

1101



## Current Challenges

- Even though the current interventions have been gradually raising more awareness and application of CA from farmers, there are still slow progress of adoption of CA Machineries from local service providers counterpart. Due to that the gap of providing services from emerging demands from farmers who want to apply CA are still struggles to meet the demand for machineries services.
- Local service providers are taking the transition very slowly due to several challenges.
  1. The imported No-till Machinery comes with quite a higher cost compare to conventional tillage machinery. For that, they need big investment to try for new machinery business.
  2. The market is still new to them so that they need more times to see more demands from farmers so that they can decide later to try venture in the CA business.
  3. To operate CA services, they also need support from supporting institutions, both publics and private, to provide more trainings on the use of CA machineries as it is new operational modality and requires understanding of better maintenance.



## CURRENT STUDY INITIATIVE TO SUPPORT ON FOSTERING CA MACHINERIES ADOPTION

- As some challenges have been mentioned, to support on fostering the CA Machineries Adoption DAEng is working with CIRAD and Swisscontact to form a TASKFORCE aiming to **Support to Agricultural Cooperatives and private service providers to foster the uptake of services for Conservation Agriculture.**
- The objective of this taskforce is to look at introducing a **financial scheme and capacity building to support the engagement of agricultural cooperatives and private service providers** into CA and agroecological systems.
- **A package of implements** will comprise 5 implements including a **land leveller, soil cultivator, no-till rice seeder, roller crimper, and a seed broadcaster** for an estimated cost that would range from \$20,000 to \$24,000 based on the implements purchased. **Two financial schemes will be tested** with (1) a first financial scheme targeting ACs with collateral support from public funds to ensure the uptake of a loan representing 50% of the overall cost, and (2) a second financial scheme targeting private service providers with a discount scheme of 50%.



THANK YOU

