smart skills
smart sustainable agriculture

Course 5: Climate-Smart Agriculture (CSA) Techniques

M4: Water Resource Management under Changing Climates

Co-funded by the European Union

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contents

This module aims to help learners understand how to manage water resources efficiently and sustainably to cope with increasing climate variability and water scarcity.

At the end of the module, learners will have a better understanding of water-saving principles and practices

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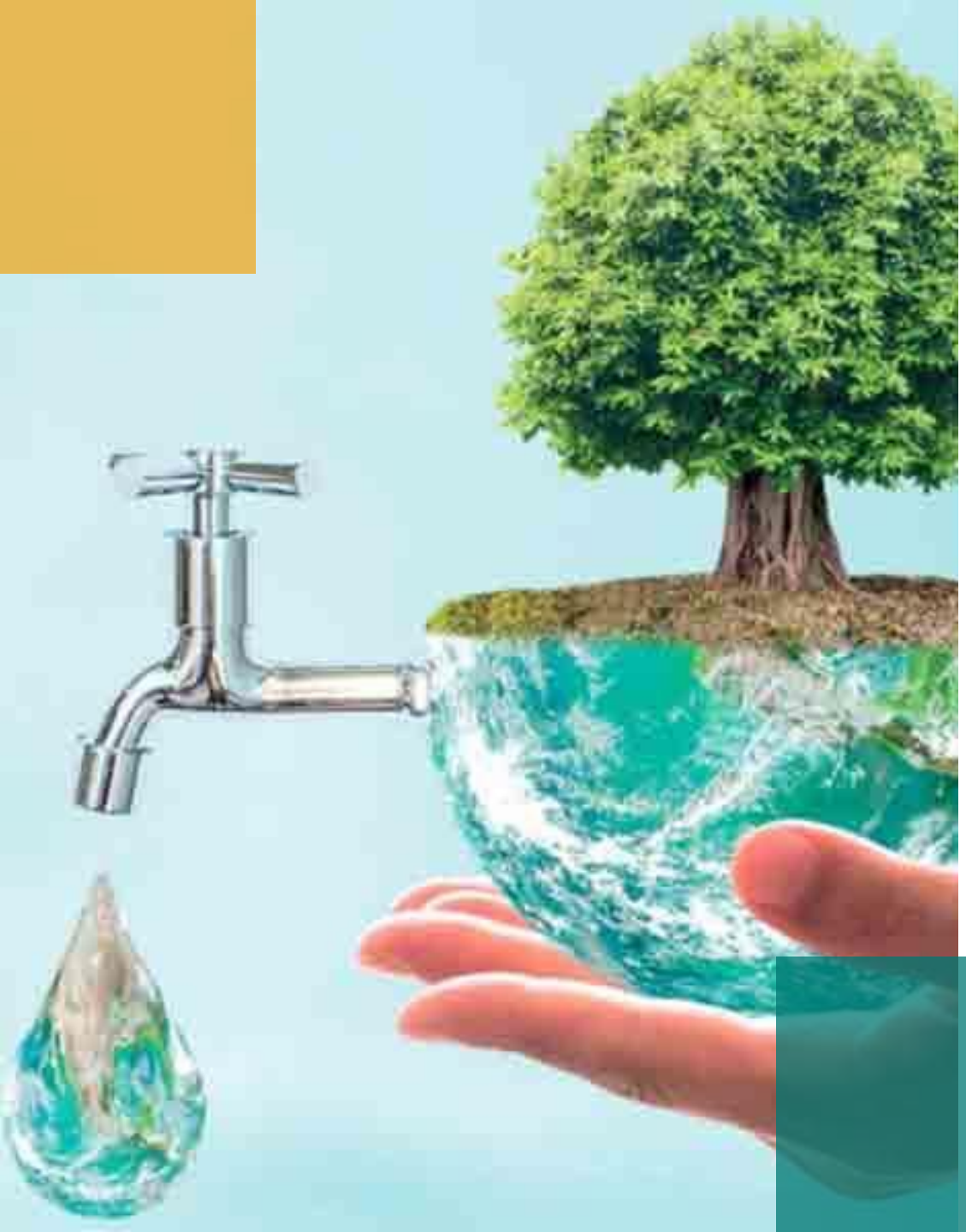
01

WATER-SAVING IRRIGATION SYSTEMS FOR DROUGHT RESILIENCE



Water scarcity

Water is becoming increasingly scarce in agriculture due to climate change. Adopting efficient irrigation systems is key to improving resilience to droughts.

Water-Saving Techniques

Drip irrigation

Delivers water directly to plant roots, reducing evaporation and saving up to 30–50% of water compared to conventional methods

Mulching and cover crops

Help reduce evaporation from the soil surface

Moisture sensors

Moisture sensors: Monitor soil water levels in real time, helping to irrigate only when needed

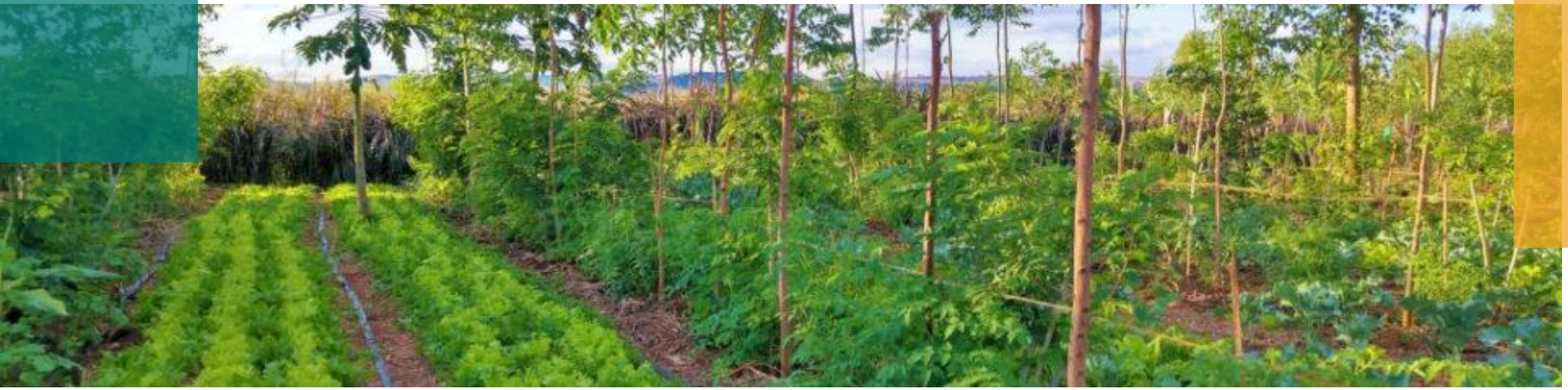
02

CAPTURING & STORING RAINWATER FOR EFFICIENT USAGE

Capturing and Storing Rainwater for Efficient Usage

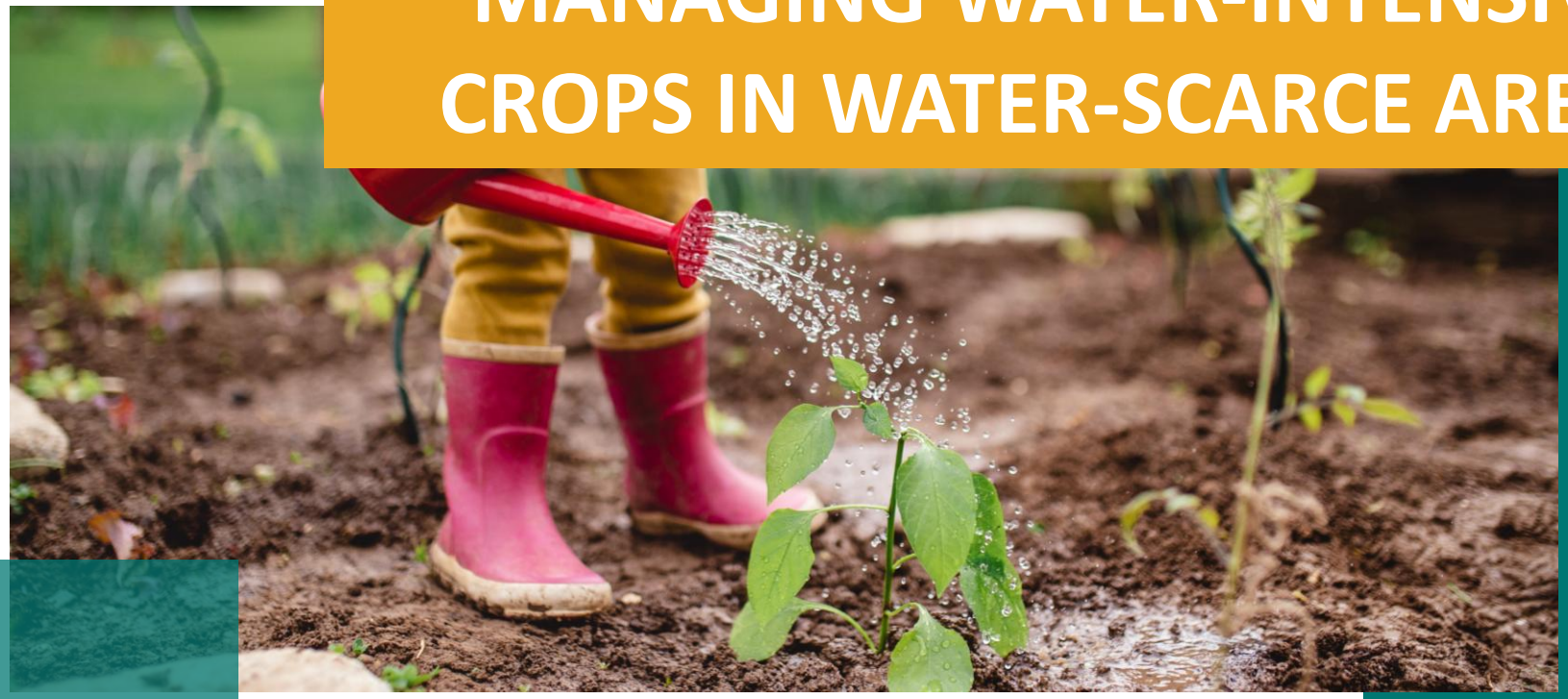
Rainwater is a natural and free resource—but often **wasted**. Collecting and storing it improves resilience during dry periods.

- **Rainwater harvesting systems:** Tanks, ponds, or underground cisterns to store rainfall from rooftops or fields.
- **Contour bunding and swales:** Techniques that slow down water runoff and enhance infiltration.
- **Agroforestry integration:** Trees improve infiltration and reduce surface runoff, helping recharge water tables.



03

MANAGING WATER-INTENSIVE CROPS IN WATER-SCARCE AREAS



Water Intensive crops

Some crops like:

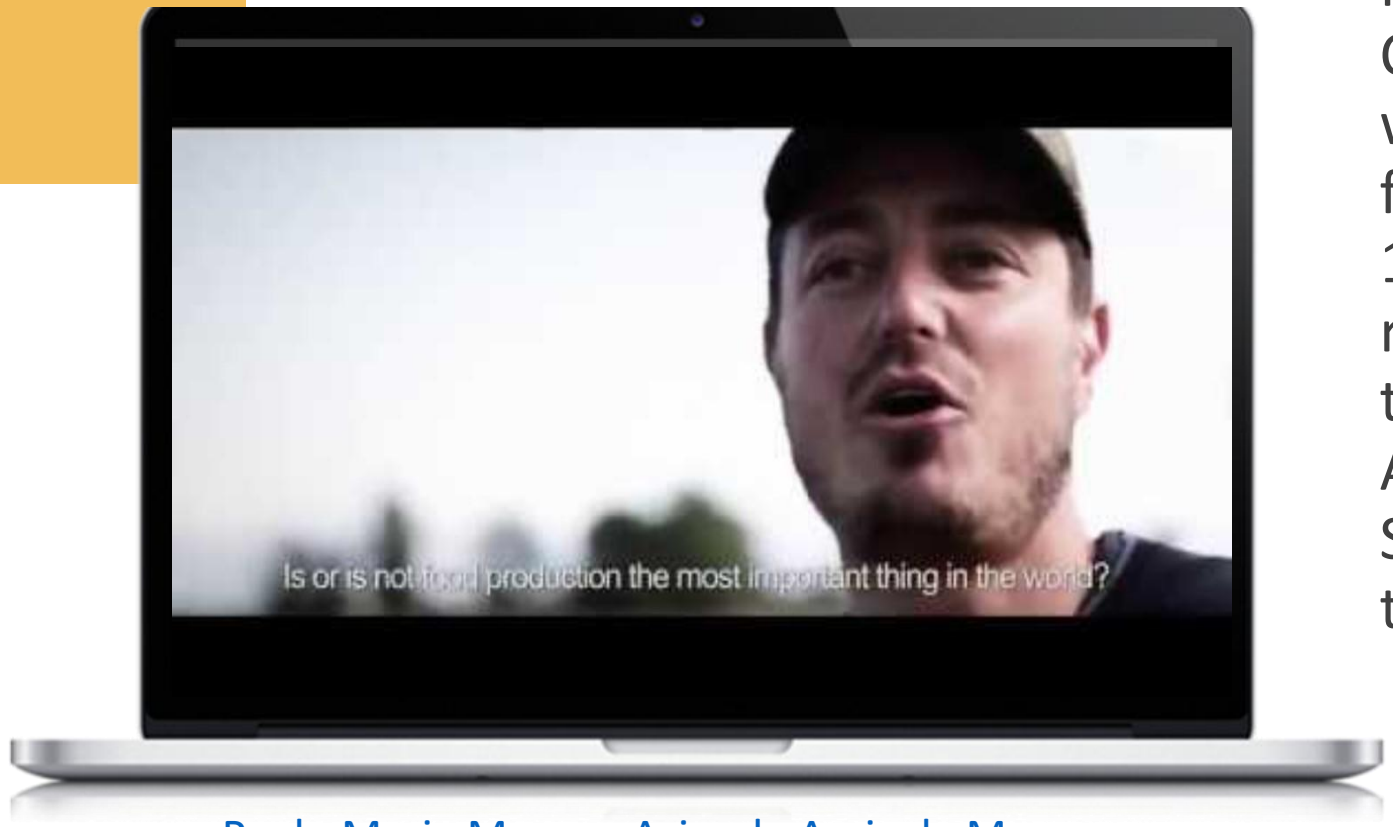
- Rice
- Cotton
- Sugarcane

require large amounts of water. In areas facing water stress, adaptation is essential.

What to do…

- **Switch to drought-tolerant varieties:** Choose crops or cultivars that require less water (e.g., millet, sorghum).
- **Schedule irrigation based on crop stages:** Water only during the most sensitive growth phases.
- **Diversify cropping systems:** Integrate crops with lower water demands or those that provide soil cover and improve moisture retention.

Dry seeding rice



Dry rice farming is the new frontier of agriculture. These are the words of Paolo Mosca, a rice grower from Crescentino, in the province of Vercelli, who is experimenting with this new form of agriculture on his family farm, 120 hectares of land all cultivated with rice. A technique, the conservative one, that Paolo learnt in his travels between Argentina, the United States and Brazil. So much so that he was the first to have the courage to experiment it in rice.

Paolo Maria Mosca - Azienda Agricola Mosca

04

LETS PRACTICE

Smart Water Decisions

Scenario: You're managing a farm in a semi-arid area. Water availability has dropped by 30% over the past 5 years.

Which strategy do you apply first?

A) Continue flood irrigation but shorten the growing season
B) Invest in drip irrigation and plant cover crops
C) Remove all trees to increase land for cultivation

Best Answer: B – Drip irrigation reduces water waste, and cover crops improve soil moisture retention.

Conclusion – Module 4

Efficient water management is essential to climate-smart agriculture. In this module, you learned how to:

- Design irrigation systems that save water
- Capture and store rainwater
- Adapt crop choices and practices in water-scarce areas

UP NEXT

*Explore strategies for **reducing emissions in crop and livestock systems** in **Module 5**!*

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