System of Rice Intensification (SRI) is an agro-ecological practice for increasing the productivity of irrigated rice cultivation by changing the management of water, plants, soil and nutrients. SRI promotes the growth of root systems, increases the abundance and diversity of soil organisms by keeping the soil moist but not flooded, and provides frequent aeration and conditioning of soil with organic matter. This agro-ecological practice stimulates plant growth by transplanting young seedlings, avoiding disturbance to roots and providing crops with wider spacing to encourage greater root and canopy growth. The agricultural methodology is based on well-founded agro-ecological principles which have been successfully adapted to upland rice and have shown increased productivity over current conventional planting practices.

The purpose of this technical brief is to guide where this practice, technology or strategy could be applied. It may be applicable in other circumstances, but this brief focuses on where it is possibly most suitable. Content is general, and should be contextualised depending upon locality. The brief provides an overview, details of appropriate agroecological characteristics, appropriate conditions and inputs, possible outcomes and impacts, how the practice, technology or strategy should be applied, potential benefits and drawbacks, and provides suggestions for further reading in terms of CCARDESA materials and other sources, including those used to develop this technical brief.

**MOST SUITABLE AGRO-ECOLOGICAL CONDITIONS**

**Value chain**
- Maize
- Sorghum
- Rice
- Livestock
- Other

**Climatic zone**
- Arid
- Semi-arid
- Sub-humid
- Humid

**Annual average rainfall (mm)**
- < 250
- 250 - 500
- 500 - 750
- 750 - 1000
- 1000 - 1500
- > 1500

**Topography**
- Flat to gentle slope (0 - 5 %)
- Moderate to rolling slope (6 - 15 %)
- Hilly slope (16 - 30 %)
- Steep slope (> 30 %)

**Soil texture**
- Light
- Medium
- Heavy

**Water source**
- Rainfed
- Partly irrigated
- Irrigated

**MOST APPROPRIATE CONDITIONS AND REQUIRED INPUTS**

**Farming system**
- Does it require collective action
  - Yes
  - No

**Characteristics**
- Subsistence
- Commercial Small
- Commercial Medium
- Commercial Large

**Farm size (ha)**
- < 2
- 2 to 5
- 5 to 10
- > 10

**Mechanisation**
- Manual
- Animal
- Mechanised

**Human resources**
- Labour intensity – level of effort
  - Low (household)
  - Medium (seasonal)
  - High (outside labour)

- Gender/youth smart (low investment/low labour requirements)
  - Yes
  - No

**Financial resources**
- Initial investment
  - Low
  - Medium
  - High

- Maintenance Costs
  - Low
  - Medium
  - High

- Access to finance capital or credit required
  - Yes
  - No

**Enabling Environment**
- Extension support
  - Yes
  - No

- Access to inputs
  - Yes
  - No

- Market access
  - Yes
  - No

The technical brief is part of a series of materials designed to support Knowledge Products on climate smart agriculture available here: www.ccardea.org/saaiks-knowledge-hub
POSSIBLE IMPACT/OUTCOMES

### Socio-Economic Impacts Positive or Negative

- **Return on Investment Realisation Period**
  - Short
  - Medium
  - Long

- **Crop production**
  - Negative
  - Neutral
  - Positive

- **Fodder production**
  - Negative
  - Neutral
  - Positive

- **Farm income**
  - Negative
  - Neutral
  - Positive

- **Household workload**
  - Negative
  - Neutral
  - Positive

- **Food security**
  - Negative
  - Neutral
  - Positive

### Ecological Impacts Positive or Negative

- **Soil quality/cover**
  - Negative
  - Neutral
  - Positive

- **Biological diversity**
  - Negative
  - Neutral
  - Positive

- **Flooding**
  - Negative
  - Neutral
  - Positive

- **Crop/livestock water availability**
  - Negative
  - Neutral
  - Positive

- **Wind Protection**
  - Negative
  - Neutral
  - Positive

- **Erosion control**
  - Negative
  - Neutral
  - Positive

These descriptors indicate whether the practice, technology or strategy has a positive, neutral, or negative impact or outcome. Those with no box are deemed not-applicable.

### TECHNICAL APPLICATION

To effectively implement SRI practices:

- **Step 1:** Consider separation of high-quality seeds from low-quality seeds through soaking them in plain or salt water and the unviable seeds will float on the surface of the water.
- **Step 2:** Plant the seeds on an unflooded, raised bed with adequate drainage and fertile soil.
- **Step 3:** After 8-12 days, transplant single young seedlings into a grind pattern with wide spacing between hills (25 cm x 25 cm).
- **Step 4:** During crop growth period, control the flooding and research and follow alternate wetting and drying irrigation practices.
- **Step 5:** Consider application of compost and mineral fertiliser for nutrient enhancement.
- **Step 6:** Use a mechanical weeder for the control of weeds and maximisation of soil aeration.
### SUMMARY/KEY ISSUES

**Benefits**
- Increased and diversified crop yield resulting in increased farm income
- Improved food security
- SRI reduces GHG emissions
- Existing water availability patterns to accommodate the irrigation schedule.

**Drawbacks**
- SRI is a labour-intensive agricultural practice.
- Occurrence of methane emissions from rice fields caused by flooding.

### CCARDESA Related Content

### Additional Information
- Food and Agriculture Organisation (FAO), 2013. *System of Rice Intensification (SRI).* Rome, Italy.