

# The System of Rice Intensification (SRI)... ... is climate-smart rice production

SRI creates a *triple-win* situation for agriculture, climate security, and food security because it:

1. Sustainably increases rice production and farmer incomes (greater crop *productivity*)
2. Strengthens crops' resilience to climate change and variability (facilitates *adaptation*)
3. Reduces rice production's contribution to climate change (helps promote *mitigation*)

## 1. Productivity

Rice yields are increased by 20-50%  
– sometimes >100-200%

SRI methods work for hybrids, HYVs,  
local and indigenous varieties

- Higher water productivity gives 'more crop per drop'
  - **Reductions in irrigation water requirements** – by 30-50% per hectare; and
  - **Higher water productivity** – more output of grain per unit of water input – by 30-100% [1]
- Higher nutrient-use efficiency
  - **Less fertilizer and agrochemical inputs** needed by 30-50%, and by 100% with organic SRI when relying on organic fertilization; higher nutrient uptake by larger root systems [2]
- Higher seed productivity and better quality
  - **Seed multiplication rate** can be >1000 times, compared to gox with standard methods
- Greater factor productivity
  - **Labor productivity** – higher rice yield per day of labor [4]
  - **Benefit-cost ratio** higher due to higher yields with similar or lower production costs [4, 7]

## 2. Adaptation

SRI plants show improved resistance to drought, floods, storms, pests, diseases

- Improved drought resistance
  - SRI plants thrive with 30-50% less irrigation water per land area, due to deeper, larger, less senescent root systems [5,7]
  - Reduced competition among plants creates stronger plants above and below ground
  - Organic matter-enriched soils able to store more water and furnish nutrients
- Higher pest and disease resistance [6,8]
  - Stronger and healthier plants
  - Less humidity in the plant canopy
- Greater resistance toward rain and wind damage from storms
  - Thicker tillers, deeper roots, wider spacing
  - Increased uptake of silicon into leaves and tillers from soil that has aerobic conditions
  - Reduced lodging – 10% lodging vs. 55% under conventional cultivation methods [6]



Vietnamese farmer shows the difference between SRI-managed rice (left) and conventional rice (right) after a typhoonon.



An Indian farmer shows healthy SRI-managed rice plants during a drought.

### 3. Mitigation

#### SRI enhances carbon sinks and lowers emissions that contribute to GWP

- **Expansion of carbon sinks**

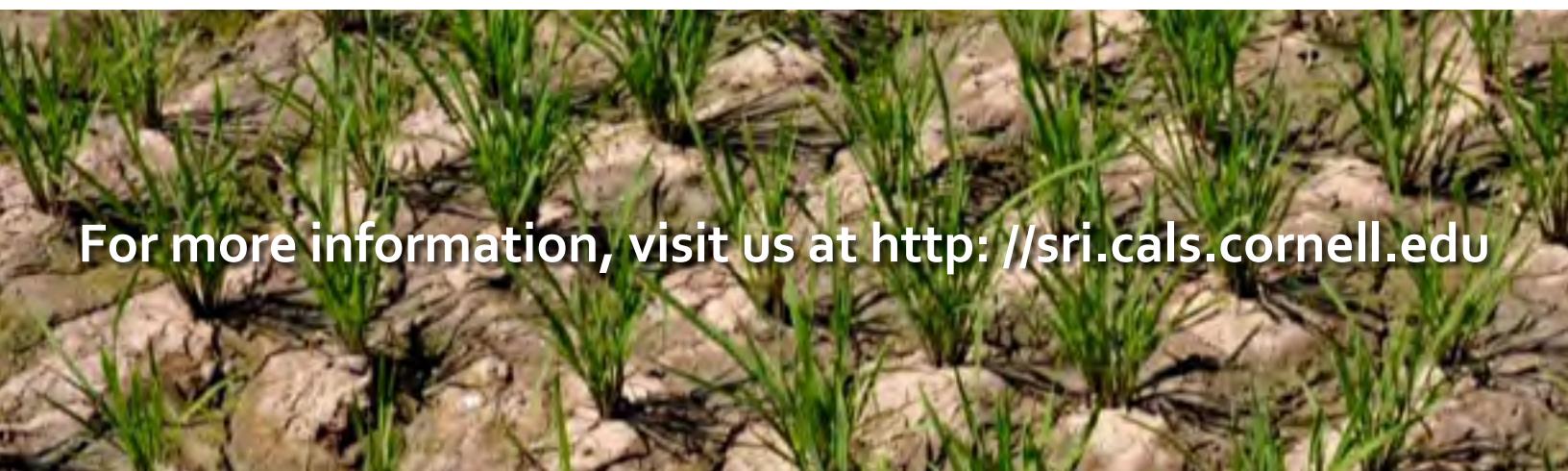
- **SRI rice plants sequester more carbon** – higher grain and straw yield, and more root biomass
- **Increased soil organic matter** through SRI practices that improve the soil with more organic matter application and increased root exudates
- **Associated agro-ecological practices sequester carbon**, such as green manure production, integration with agroforestry, surface mulch applications, etc.
- **Reduced carbon footprint** due to less use of agrochemicals (including the manufacturing, and shipping of fertilizer)

- **Reduced greenhouse gas (GHG) emissions from paddy soils**

- **Methane ( $CH_4$ ) is reduced** by between 22% and 64%, as soils are maintained under mostly aerobic conditions [10,11,3]
- **Nitrous oxide ( $N_2O$ ) is only slightly increased** or sometimes reduced as use of N fertilizers is reduced;  $N_2O$  increases do not offset  $CH_4$  reductions, so GWP is reduced [9,10,11,12]
- **Total global warming potential (GWP) from flooded rice paddies is reduced** 20-30% [10,12,3], even up to 73% [11]

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