

Enhancing Food Security and Alleviating Poverty Through Water and Soil Management Using Nuclear Techniques

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**Nuclear Technology for
the Sustainable Development Goals**



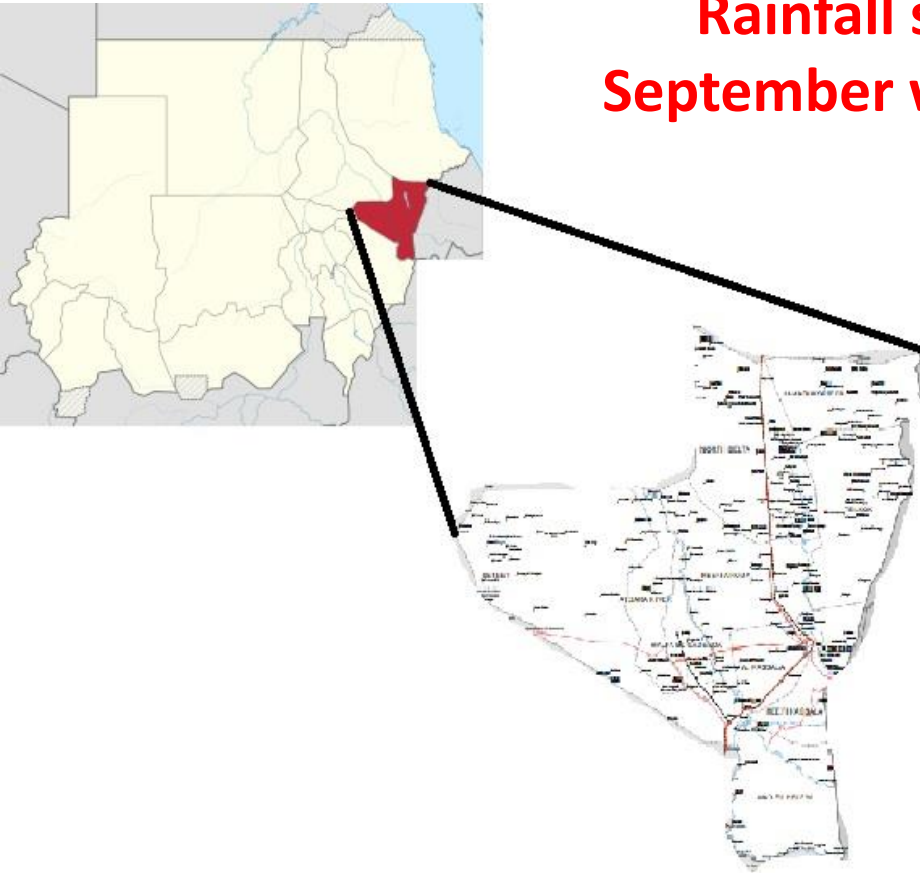
Introduction

- ❖ Sudan's vulnerable to climate change;
- ❖ Food security is dependent on rainfall, particularly in rural areas where >70% of population lives.
- ❖ Majority of land is vulnerable to changes in temperature and precipitation.
- ❖ Rainfall erratic and high variability

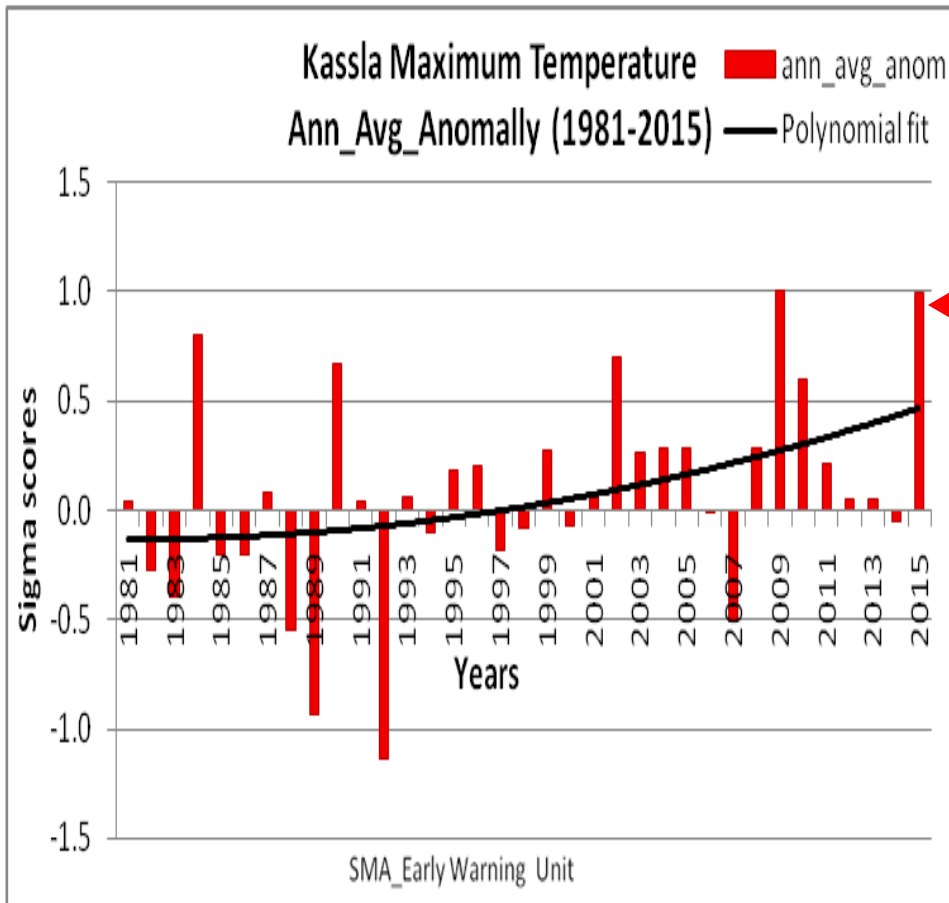
- ❖ Problems facing:
 - Inappropriate farming practices,
 - inadequate skills and knowledge on agricultural water and nutrient management (irrigation and fertilizer).

Kassala State in Sudan

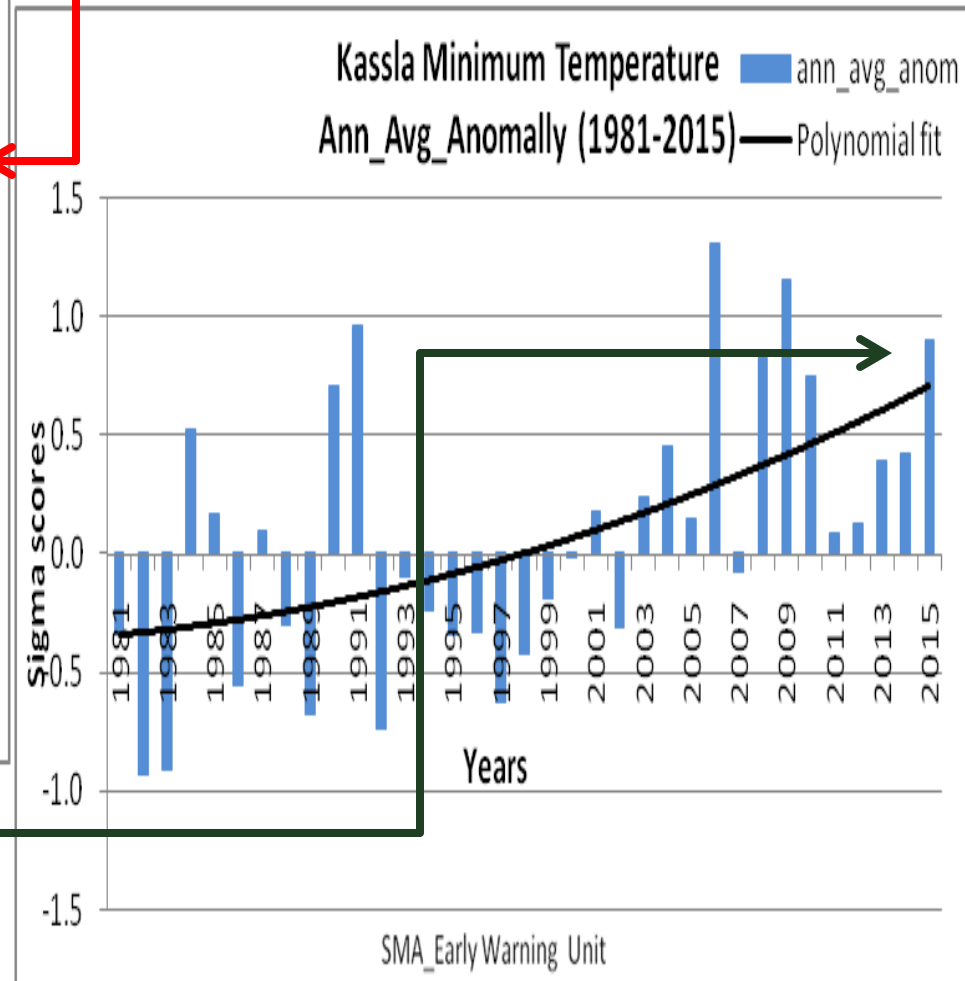
Rainfall season is short from July to September with average rainfall ~ 200 mm per year



Climate Change Affecting Kassala State



The days are getting hotter



The nights are getting warmer

Food Security Situation in Climate Change Hotspot States in Sudan

State	Food Deprivation (%)	Depth of Hunger (kcal/person/day)
River Nile	15	282
Gadarif	22	283
Kassala	30	356
South Darfur	32	296
North Kordofan	40	335
White Nile	41	389
Sudan	33	344

Optimizing Coping Strategies Using Nuclear Techniques

- Irrigation water management

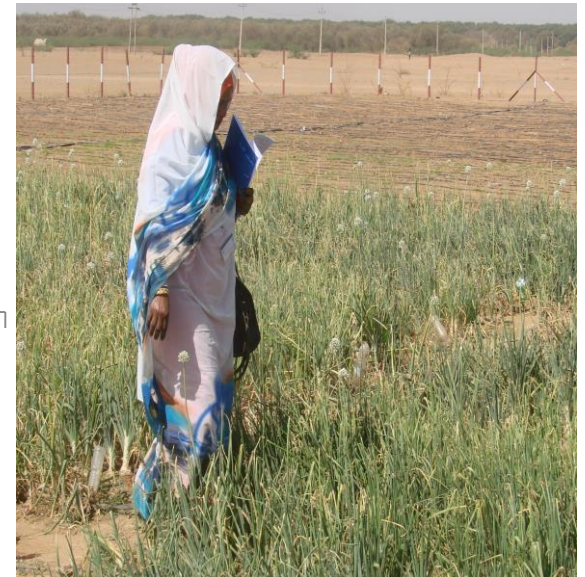
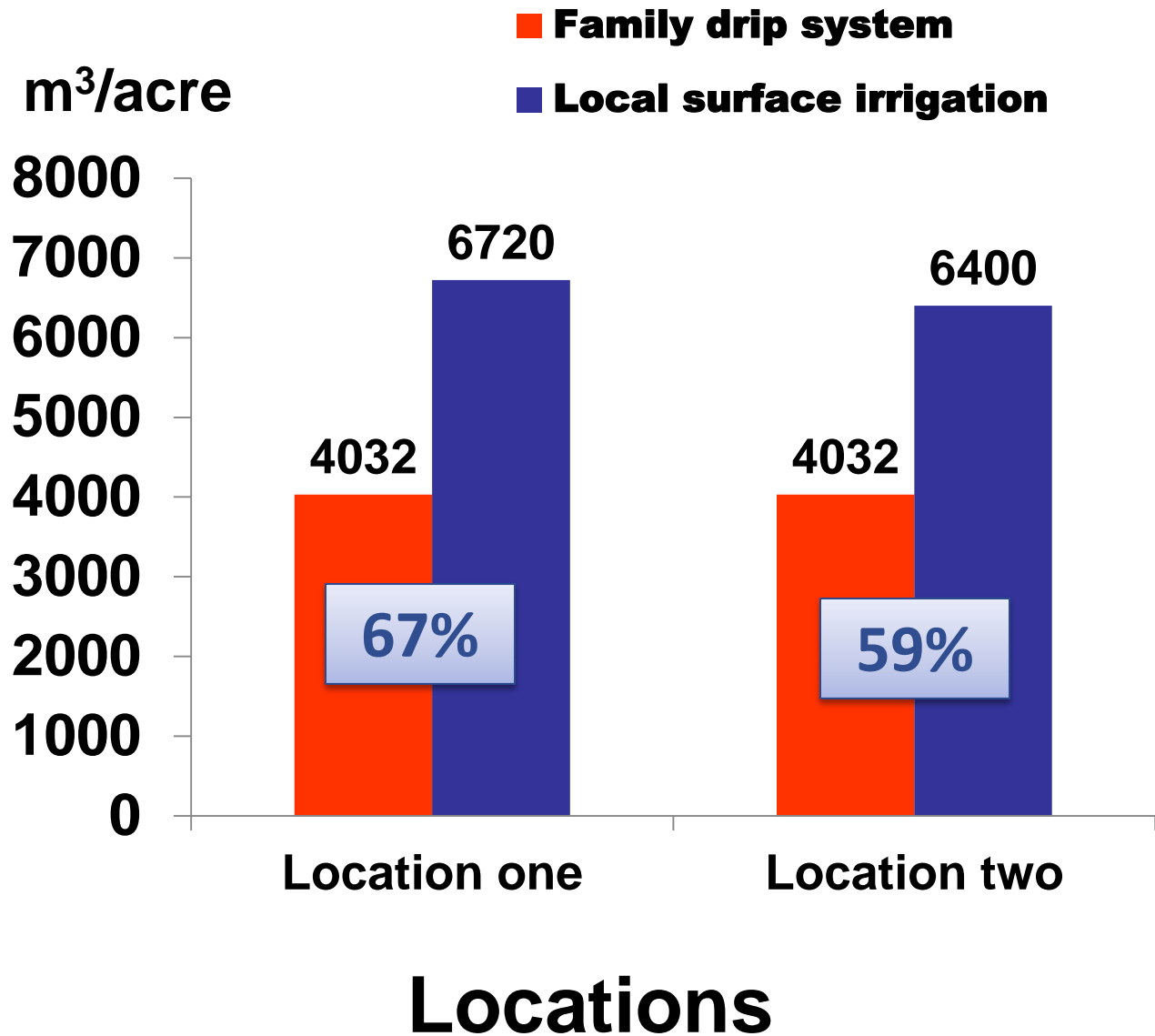
(Using Soil Moisture Neutron Probe)

- Fertilizer management

(Using Nitrogen Labeled Fertilizer-N15)

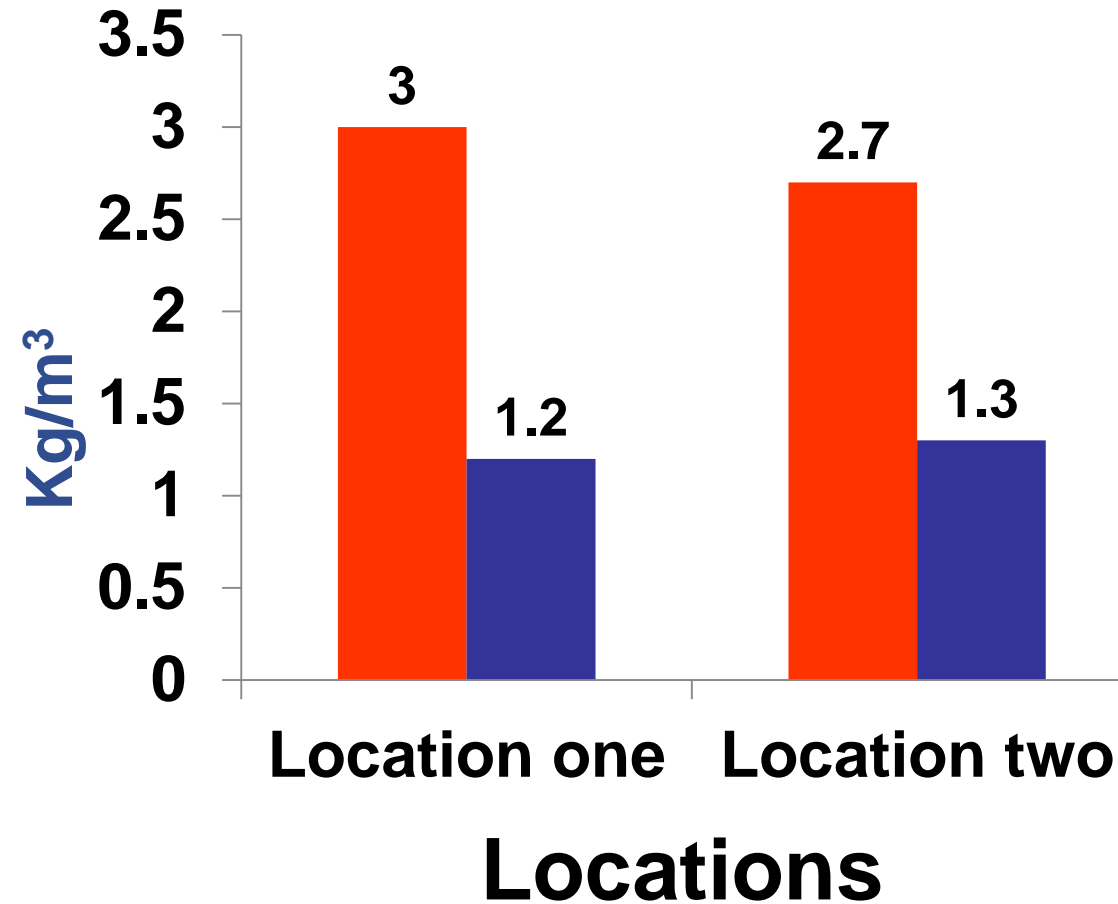


Total Water Applied



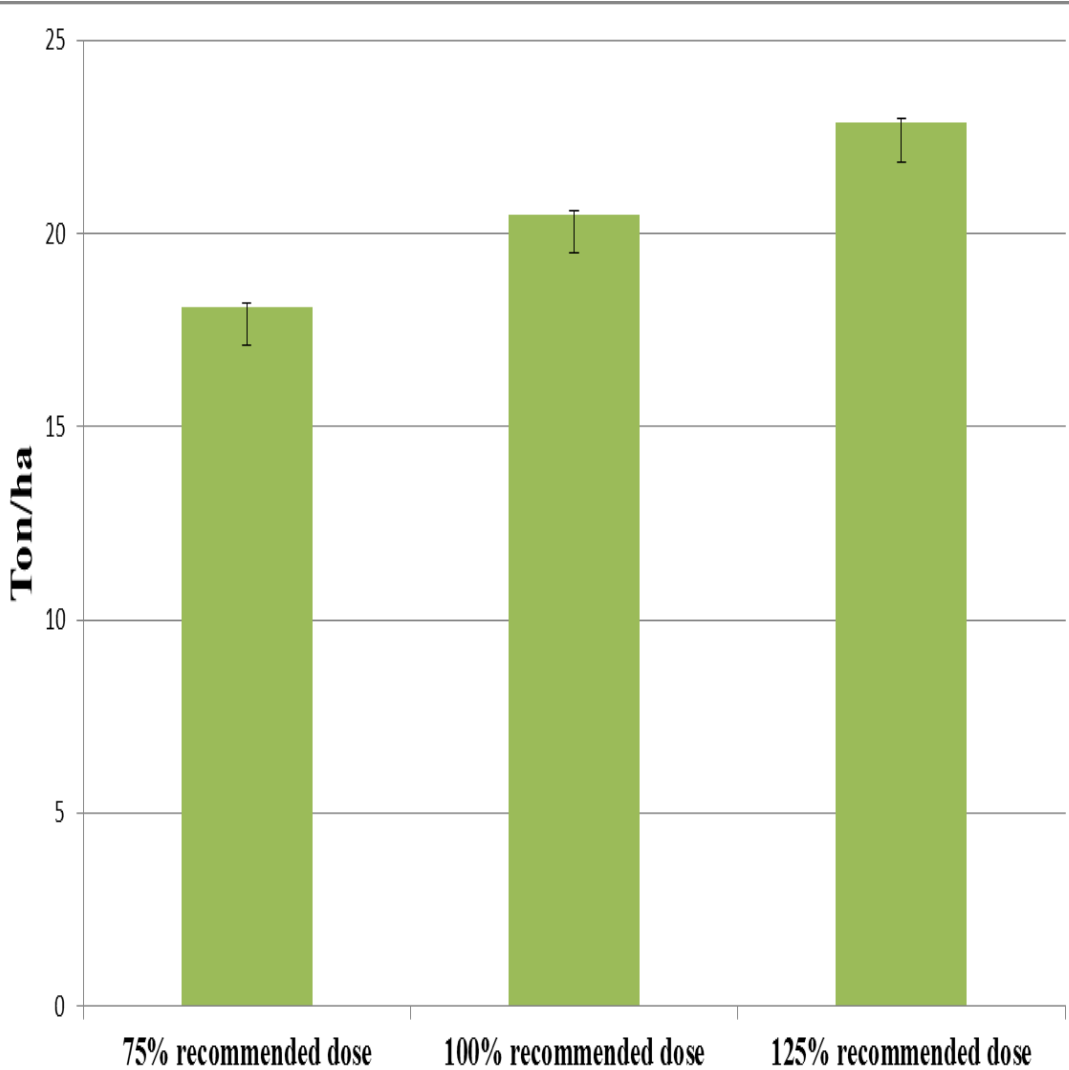
Irrigation Water Productivity

- Family drip system
- Local surface irrigation



N-Fertilizer (Urea) Rate and Onion Production under drip irrigation

Recommended Urea dose = 43 kg/ha



Upscaling of Coping Strategies: Family Drip System

2014

- 360 Farmers in 3 Villages 50% Women
- Partner SRC/UNHCR

2015

- 1200 Farmers in 10 Villages
- Partners Practical Action, German Agro Action, SRC/UNHCR, Plan Sudan, Talaweeit For Development N.G.O.

2016/2017

- Planning for 30 units to accommodate 900 women in North Kassala and Red Sea State
- Partner Talaweeit For Development N.G.O.





Video

Thank you!

Acknowledgement:

- IAEA's regional project RAF5071 on 'Enhancing Crop Nutrition and Soil and Water Management and Technology Transfer in Irrigated Systems for Increased Food Production and Income Generation' (AFRA)
- Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture for technical support
- Agricultural Research Corporation (ARC) for providing logistical and technical support

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