Building resilience to climate change induced extreme weather events through agriculture with a focus on the system of rice intensification

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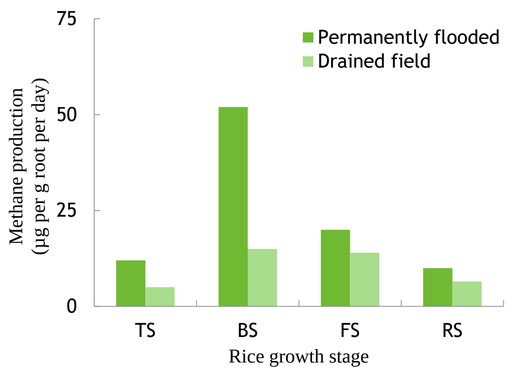
Background

- The occurence of extreme weather events has increased in the past decade around the world.
- Investments need to be made in the agriculture sector so that food systems can withstand the challenges posed by extreme weather events.
- Floods in late summer and dry spells during winter lead to colossal damages to farmers, resulting in food insecurity and destroyed livelihoods.
- Floods in September 2014 led to losses worth billions of US dollars in the Kashmir region, with agricultural crop completely destroyed.
- Unplanned urbanisation and reckless farming practices have been blamed for aggravating the effects of climate change induced events.
- Unsustainable practices are believed to have reduced the water holding capacity of the soil, leading to frequent flooding.
- Due to soil degradation, 12 million hectares of agricultural land are lost every year around the world.
- Methane as a greenhouse gas is 25 times more potent than carbon dioxide and is generated in huge amounts during rice cultivation under permanently flooded conditions.
- Rice is a staple for the majority of the 1.7 billion South Asian population, a number that is predicted to increase to 2 billion by 2030.

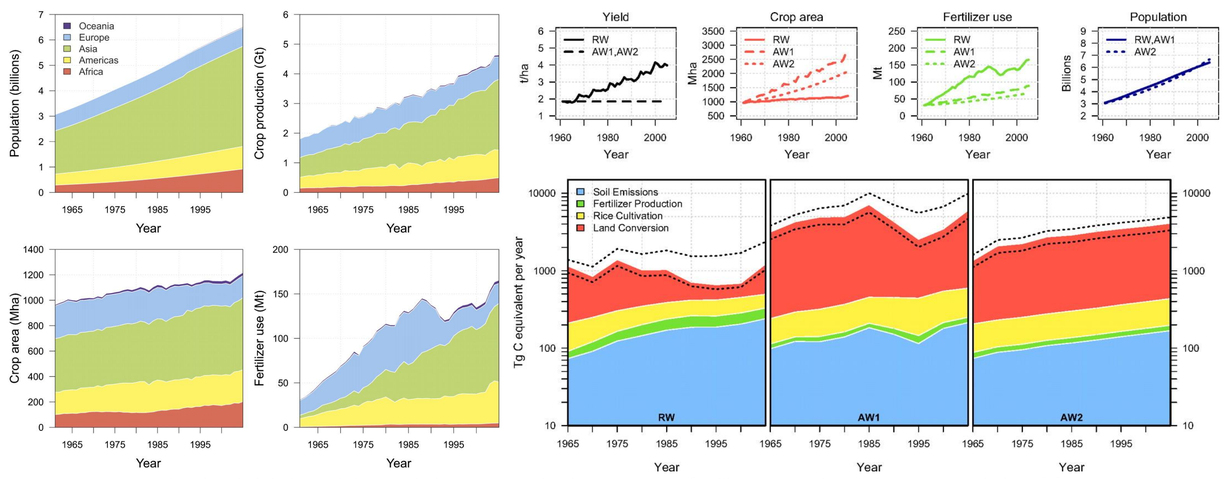


Methane production rates in rice roots at the rice tillering (TS), booting (BS), grain filling (FS) and ripening stages (RS) during the 2009 rice season [2].

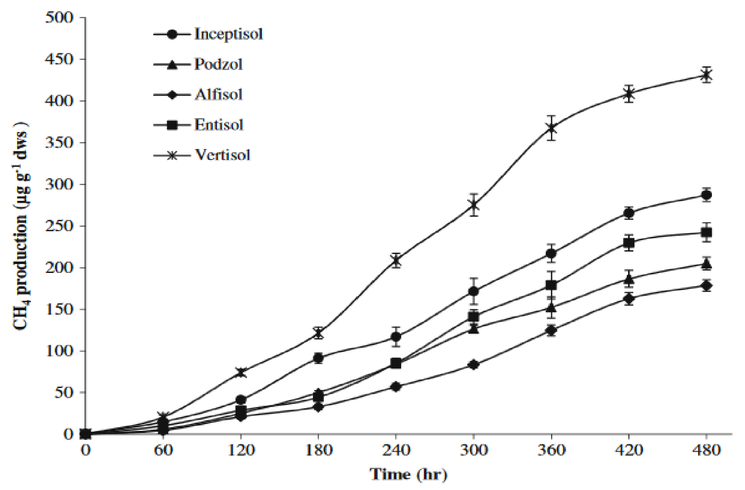
A rice field in Hanoi, Vietnam after typhoon in September 2005. Conventional rice-growing methods were used in field on right, while SRI methods were used in field on left [4].

Project Aims

- Introduction and the implementation of farming techniques resilient to climate change.
- Quantifying the impact of the climart smart techniques on climate change mitigation through reduced greenhouse gas emissions.
- Reducing the water consumption in agriculture by avoiding flooded conditions in rice paddies.
- Building food security through low emissions crop intensification techniques.
- Introduction and implementation of the System of Rice Intensification on a community scale in the Kashmir region – a temperate Himlayan climatic region.
- To propose and integrated approach in agriculture to tackle the multiple challenges of food security, climate change mitigation, and the loss of cultivable soil.



Regional and global trends in population, crop production, crop area, fertilizer use, and greenhouse gas emissions [5].



Variations in cumulative methane production during rice cultivation potential of different soil orders [3].

Methodology

- On ground experimental trials of SRI will be undertaken in the region under consideration.
- During the trials, in addition to analysing the yields, a comparison of the effect of flooded paddy method and SRI on methane emissions and soil quality will be assessed.
- Upon completion of successful trials, a capacity building program will be developed in association with the Hamburg Online Open University working group RuDev of the Institute of Wastewater Management and Water Protection.
- The system of intensification will be applied to other crops in the region with the aim of creating or regenerating sustainable sources of livelihood in the region.

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