

**INNOVATE
CATALYZE
TRANSFORM**

Climate and smart agriculture
*Climate change through innovative
resilient solutions*

Dr. Nafees Meah

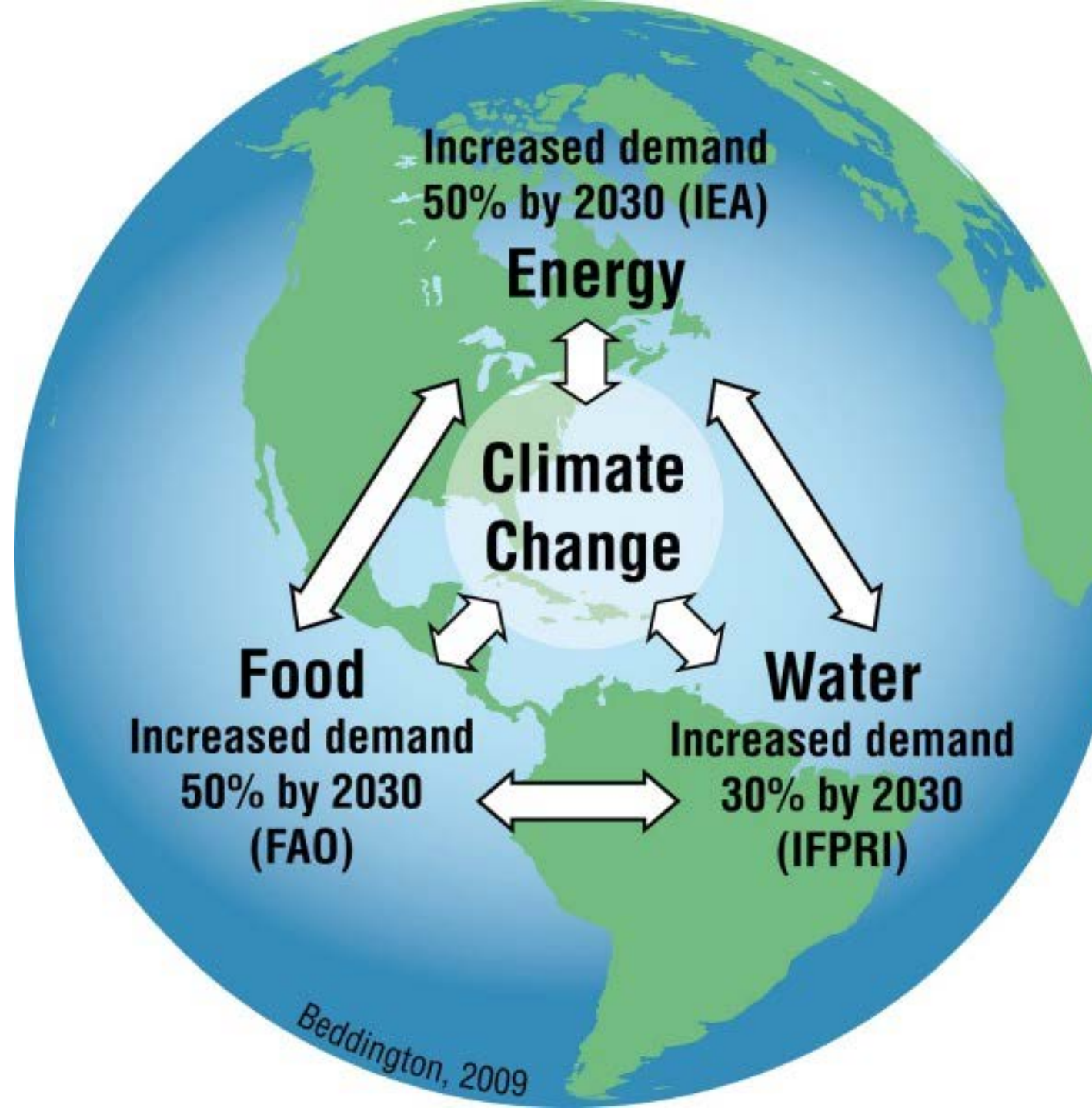
IRRI Representative - South Asia

“Perfect storm”

Professor Sir John Beddington FRS

UK Chief Scientific Adviser

2008 -2013



Climate change is increasing the frequency of extreme weather events

Flooding in South Asia 2017



- How do we feed the world when there is:
 - Increasing population
 - Increasing demand for food
 - Less land per capita
 - Less water per capita
 - Urbanisation
 - Climate change
- IRRI research and innovation
 - Increasing productivity
 - Improving nutrition
 - Lowering inputs
 - Adapting to climate change



Climate resilience in rice cultivation: Swarna-Sub1 + DSR story



Farmer: Mangal Yadav
Village: Shivrajpur, W.C.,
Bihar, India
Var: Swarna-Sub1
DSR Sowing date: May 29,
2016



Swarna-Sub1 inundated
for 2 weeks (23rd July to
6th August 2016



Crop after receding flood on
9th August 2016



Harvest: Nov. 9, 2016
Yield : 6.14 t/ha



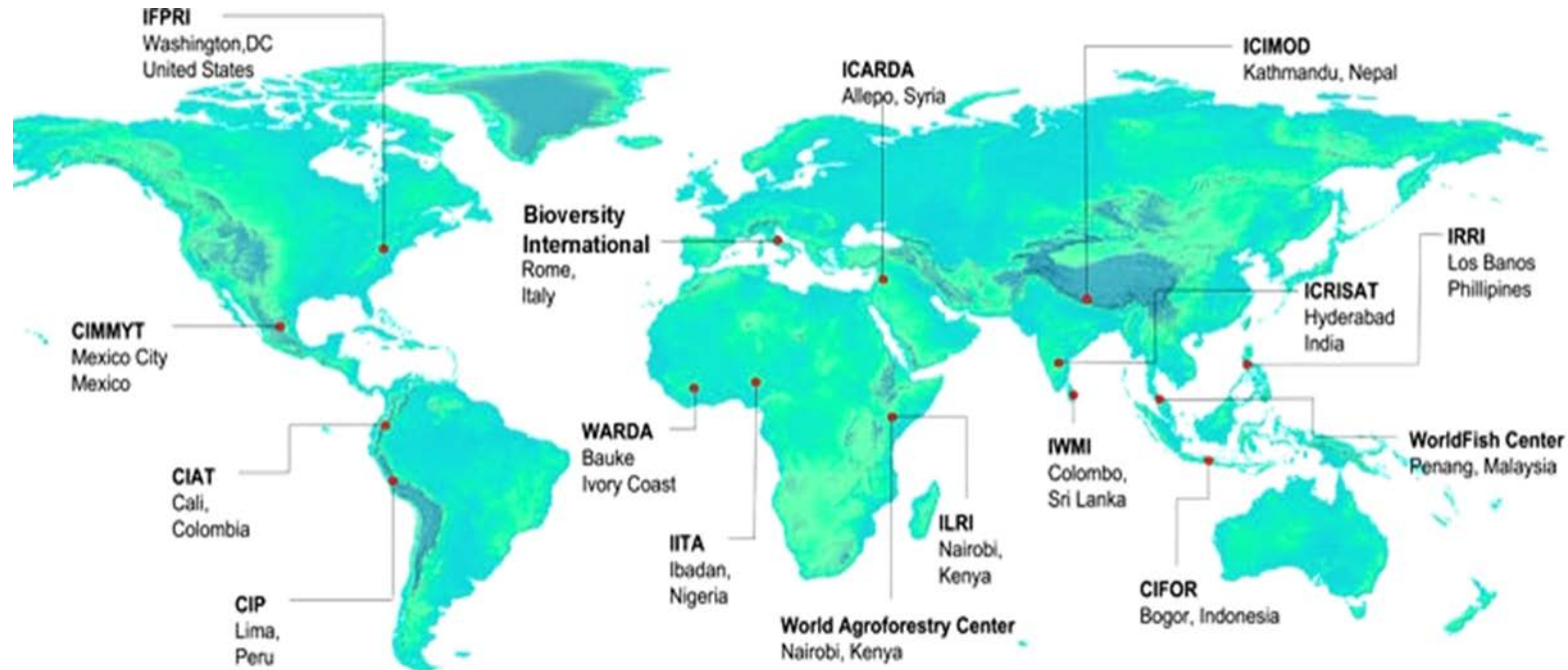
Matching post-flood
management practices for quick
regeneration and growth

Adoption of Stress Tolerant Rice Varieties

Seed production of STRVs during 2015 & utilized during 2016

Country	Flood tolerant (Sub1 varieties) (tons)	Drought tolerant (tons)	Salt tolerant (tons)
Bangladesh	45000	2600	16000
India	90000	45000	250
Nepal	4500	2500	
Total seed produced (tons)	139500	50100	16250
	2.79 mha; 5.58 m	1 mha; 2 million	0.325 mha; 0.65 m

CGIAR Research Program on Climate Change, Agriculture & Food Security - Strategic (CCAFS): a partnership of international agricultural research and global change (Future Earth) Research Communities



RESEARCH PROGRAM ON
**Climate Change,
Agriculture and
Food Security**



Alternate Wetting and Drying in Rice Cultivation



Reduce water use

By reducing the number of irrigation events required, AWD can reduce water use by up to 30%.



Mitigate GHG

AWD is assumed to reduce CH_4 emissions by an average of 50% compared to continuous flooding.



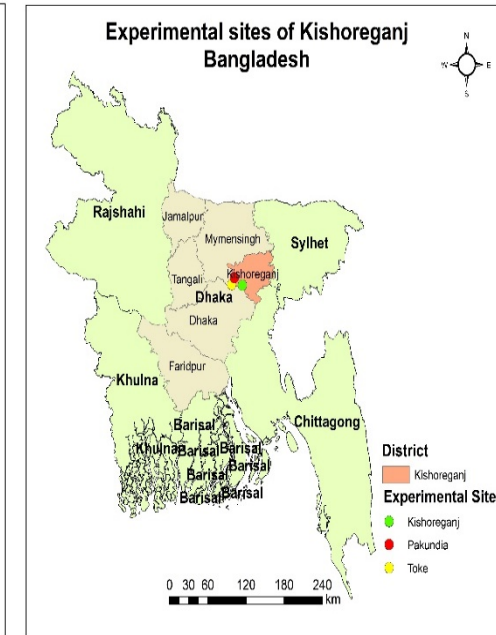
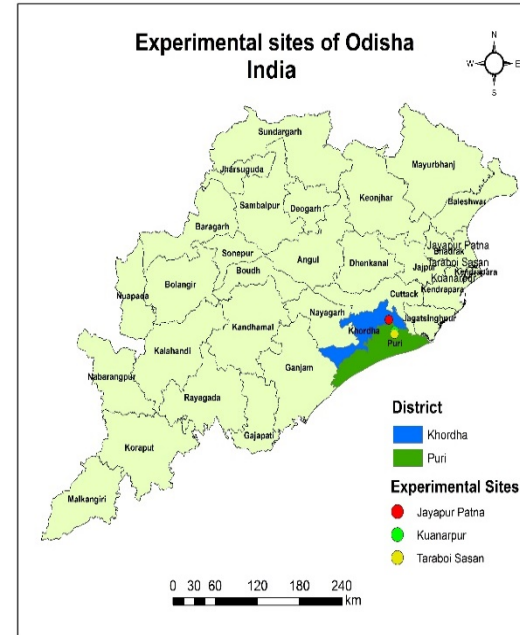
Increase returns

AWD does not reduce yields compared to continuous flooding. Farmers can save money on irrigation costs.

Climate Smart Agriculture Practices in South Asia

Activities, Sites and Objectives

- Identify, develop and refine CSAPs related to rice based systems
- Generate database/ information system for development of typologies and recommendation domains, and
- Involve in cross cutting activities including gender, monitoring and evaluations, and capacity strengthening



Objectives

Science-based, scalable evidences for climate smart agricultural practices related to rice-based system identified and implemented through Climate Smart Villages (CSVs)

Targeting CSAPs: Odisha (India)

Challenge	New Science	Outcome	Evidence
<ul style="list-style-type: none"> ❖ Erratic rainfall – • Late on set of monsoon • Less time available for sowing /nursery raising / transplanting • Heavy showers => Submergence and stagnant flooding during high tides ❖ Cyclonic storms in summer • Crop lodging ❖ Acute shortage of irrigation water in summer • in canals, • in L I points due to frequent load shedding ❖ Low input(water / Fertilizer) Use Efficiency ❖ Maintaining soil health in double crop sequence ❖ Crisis of agricultural labour ❖ Distress sale of paddy 	<ul style="list-style-type: none"> ❖ Varietal substitution by Flood tolerant varieties (Swarna sub 1) ❖ Varietal substitution by stiff straw varieties to resist lodging (BINA 11) ❖ AWD method + channel to field irrigation & crop substitution to summer paddy ❖ Real time fertilizer management through RCM and green seeker ❖ Residue management and green manuring ❖ Mechanized farming ❖ Substitution to summer paddy by green/black gram and ground nut ❖ Weather forecasting and advisories 	<ul style="list-style-type: none"> ❖ Large acreage under non puddled paddy ❖ Varietal substitution by stress tolerant paddy ❖ Water saving irrigation practices ❖ Sustainable production practice through ❖ Improved Fertilizer use schedules ❖ Green manuring and residue management ❖ Farm mechanization ❖ System alteration to Rice-Rice practice ❖ Escaping climatic hazards 	<ul style="list-style-type: none"> ❖ Young farmers involved in R & D activity ❖ Post graduate research scholars exposed to the initiatives ❖ Attempts taken for Gender parity in select farm activity ❖ High cost non-farm activities preferred ❖ Operation based programmes conducted ❖ Greater exposure to farmers and grass root workers needed ❖ Long duration select trainings require• ❖ Attempts taken for Gender parity in select farm activity ❖ Publications waiting , action initiated
