



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

GLOBAL LEARNING AND EVIDENCE EXCHANGE
CLIMATE-SMART AGRICULTURE

DECEMBER 5–9, 2016 // SIEM REAP, CAMBODIA

Managing Climatic Risks in Agriculture in South Asia: Climate Services

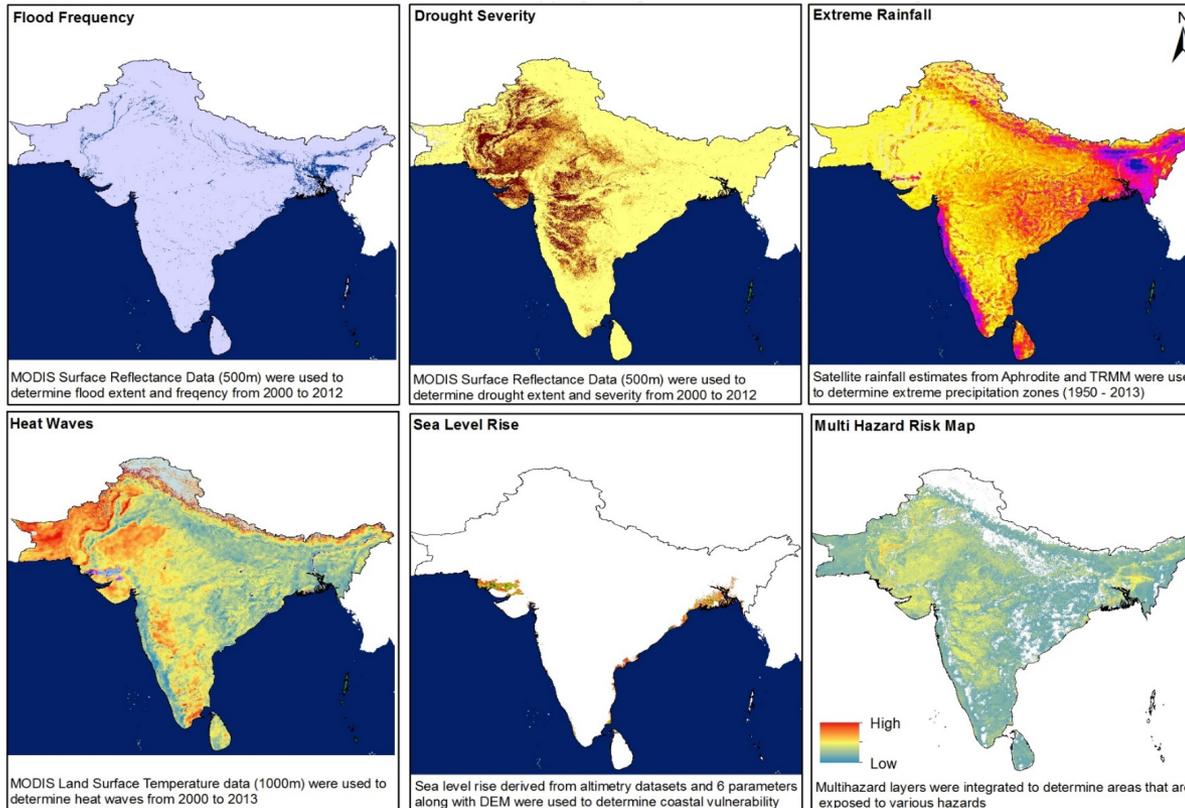
Pramod Aggarwal



USAID
FROM THE AMERICAN PEOPLE



CLIMATIC RISKS ARE COMMON IN SOUTH ASIA

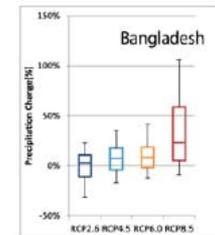
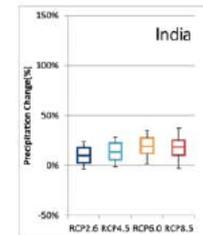
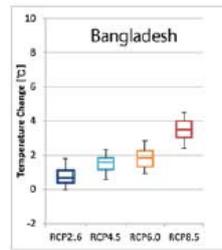
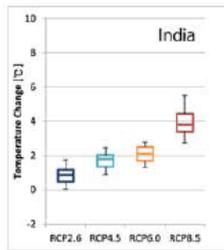
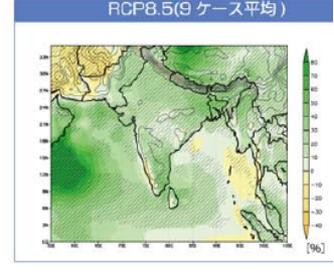
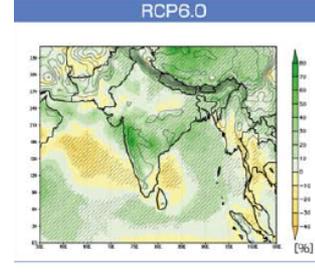
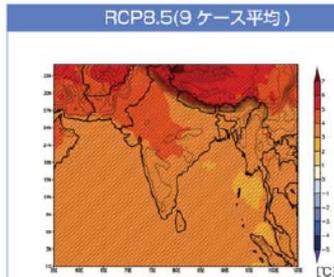
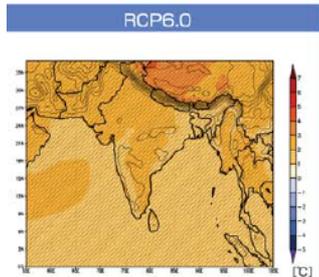
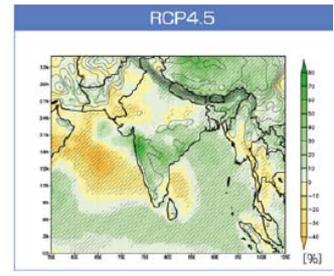
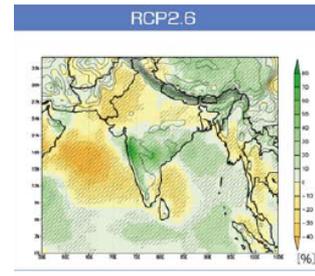
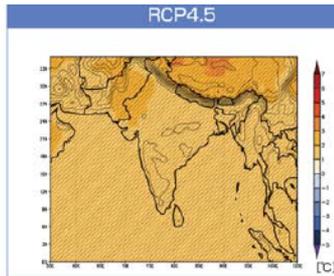
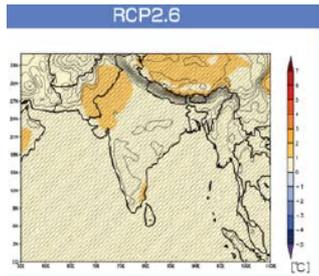


- Drought: 70% land
- Floods: 12% land
- Cyclones: 8% land
- Frost: Northern regions
- Heat: Frequent at many places
- Coastal salinity ingress
- One of the most vulnerable regions to climatic variability
- Food security and poverty are the key issues





CLIMATE CHANGE SCENARIOS FOR SOUTH ASIA



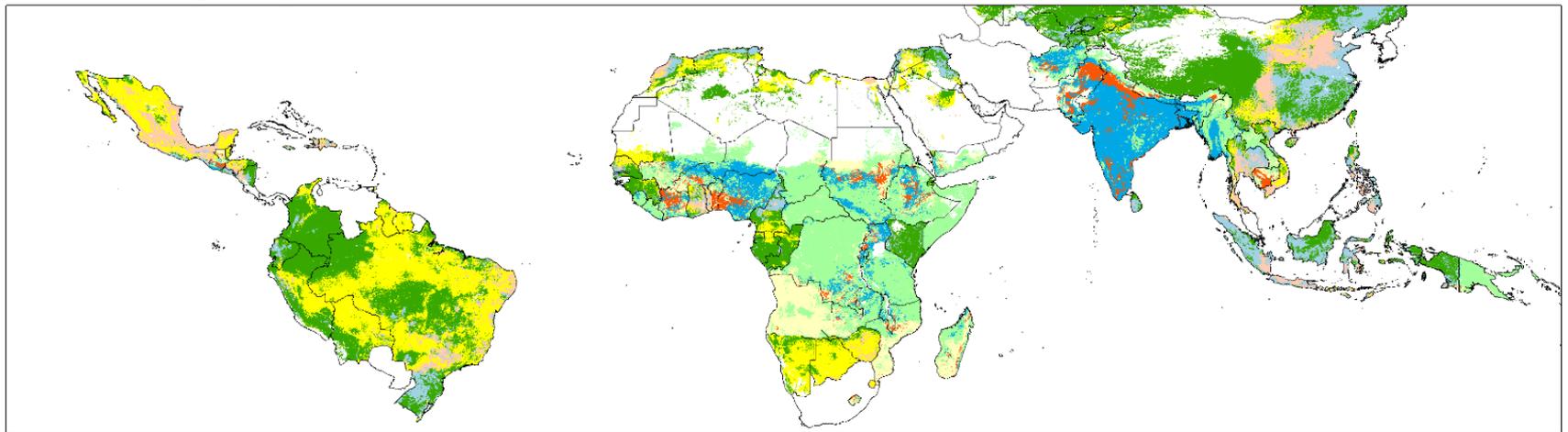
Source: GCM Project, Japan.





CLIMATE CHANGE AND AGRICULTURE: SA—A HOTSPOT

- Agriculture production loss by 10-50% by 2050, if we do not start adapting now.
- Increased production variability due to more frequent droughts, floods, and heat events.
- Large implications for intra- and international trade.



HIGH EXPOSURE
High Sensitivity
Low Capacity
High Capacity

Low Sensitivity
Low Capacity
High Capacity

LOW EXPOSURE
High Sensitivity
Low Capacity
High Capacity

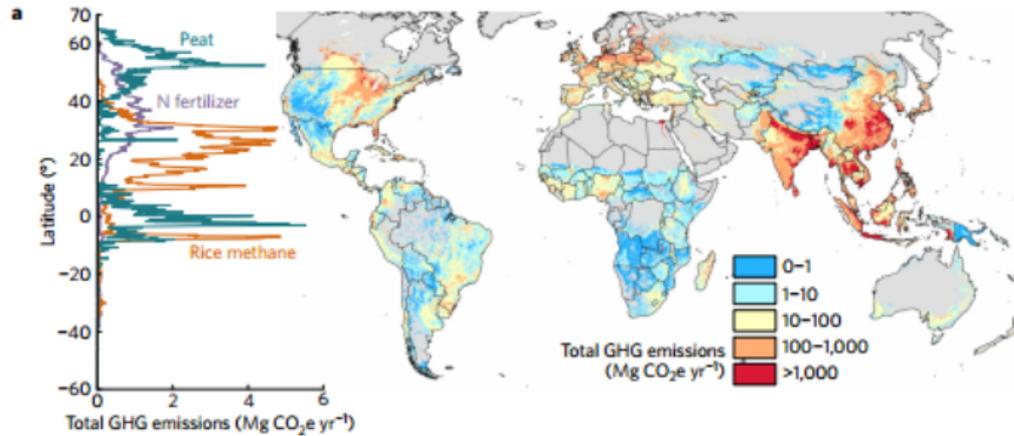
Low Sensitivity
Low Capacity
High Capacity



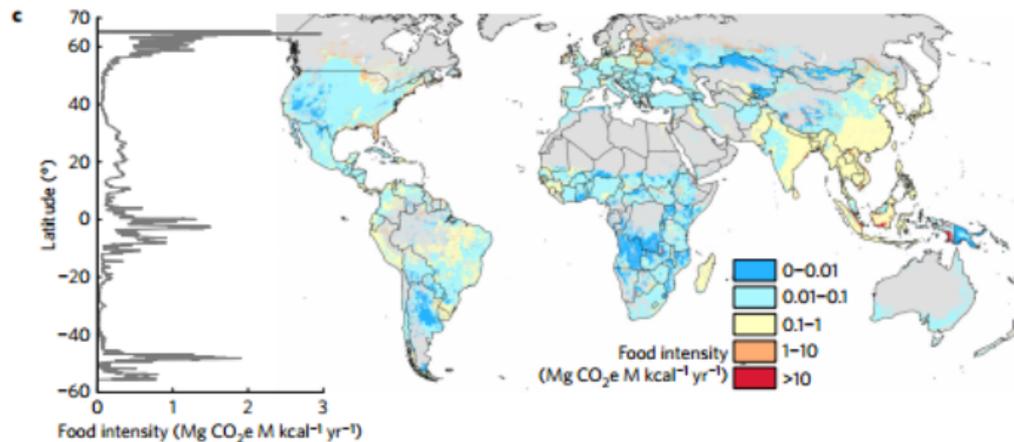


CLIMATE-SMART AGRICULTURE: SOUTH ASIA AS A HOTSPOT

GHG
Emissions
From
Agriculture



Food intensity



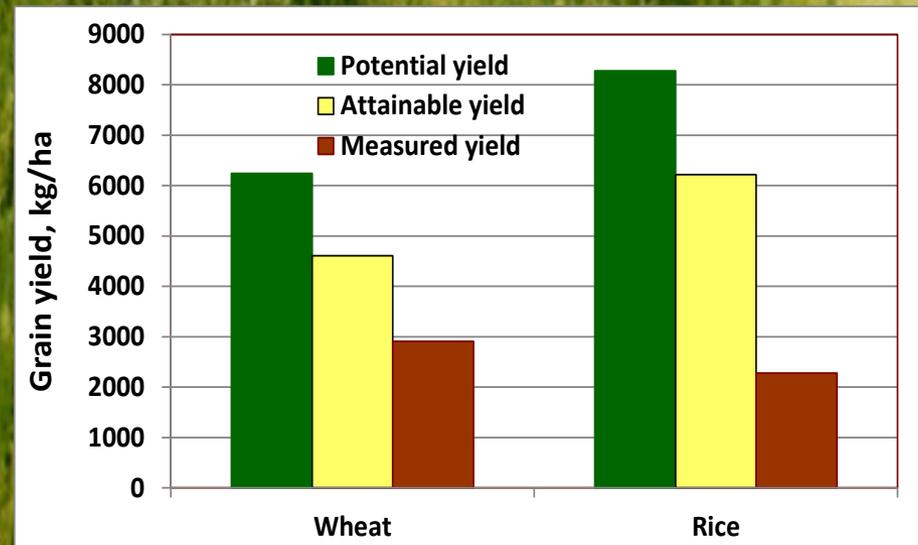
Source: Carlson et al. Nov 2016





SOUTH ASIA: HOME FOR 40% OF WORLD'S POOR AND YET A LAND OF OPPORTUNITIES

- Huge and increasing demand for (quality) food
- Untapped potential: large yield gaps
- Diverse agro-climates
- ICT and Big data
- Climate change: increase in rainfall, new temperature zones
- Focus today on climate outlook and services





SOUTH ASIA CLIMATE OUTLOOK FORUM REGIONAL CLIMATE CENTRE OF WMO AT PUNE, INDIA

- Consensus product every season based on nine global models: India, Australia, Canada, China, France, Japan, India, UK, USA, WMO
- Capacity building
- Outlook by other global agencies as well

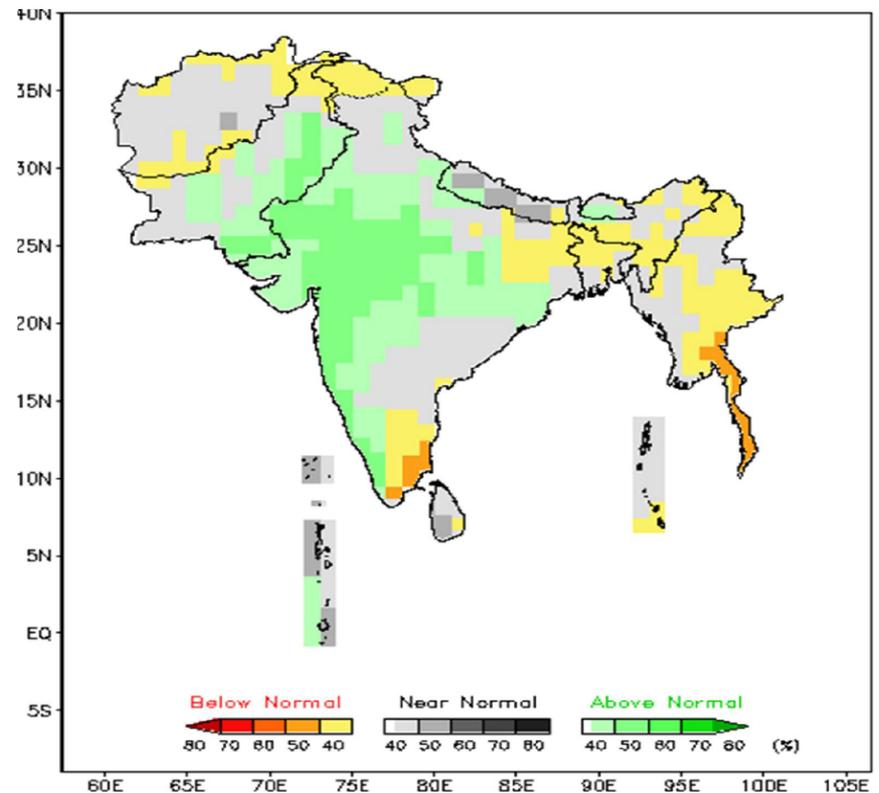


Fig.1. Probability of the most likely category for the 2016 Southwest Monsoon Rainfall over South Asia based on this consensus statement.

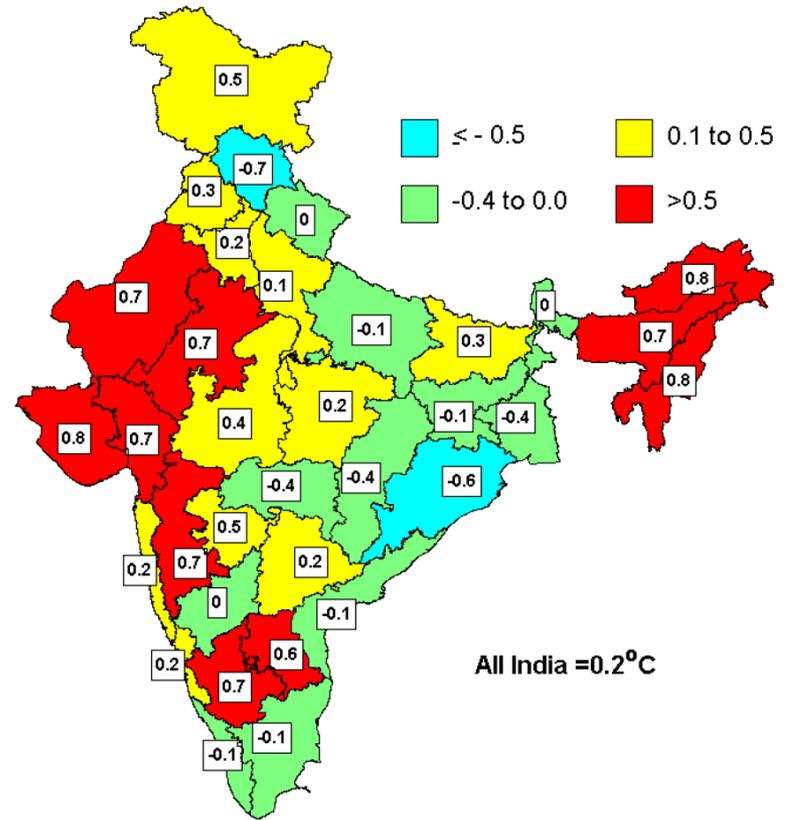
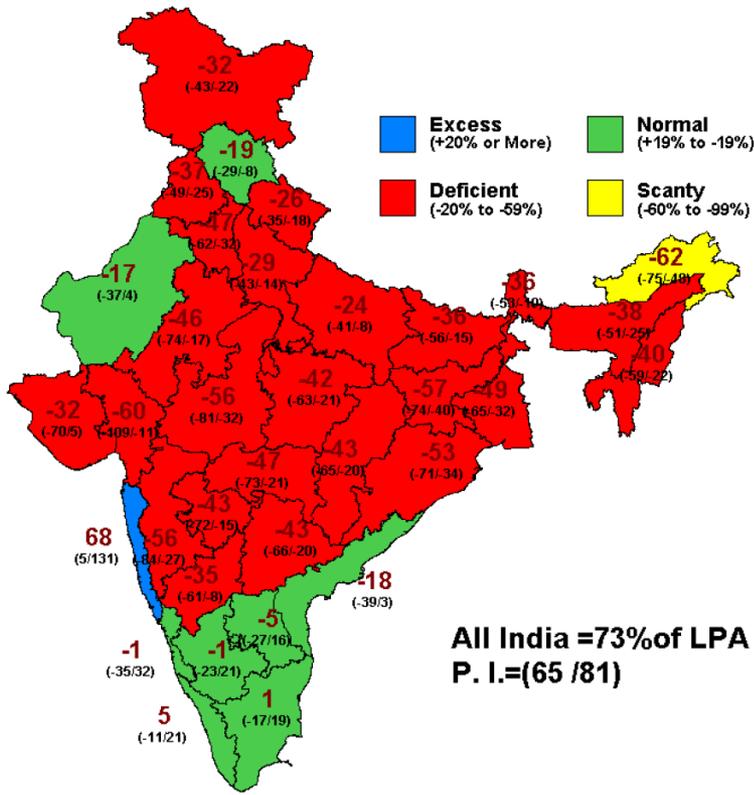




FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

SEASONAL CLIMATE OUTLOOK BY INDIA MET DEPT.

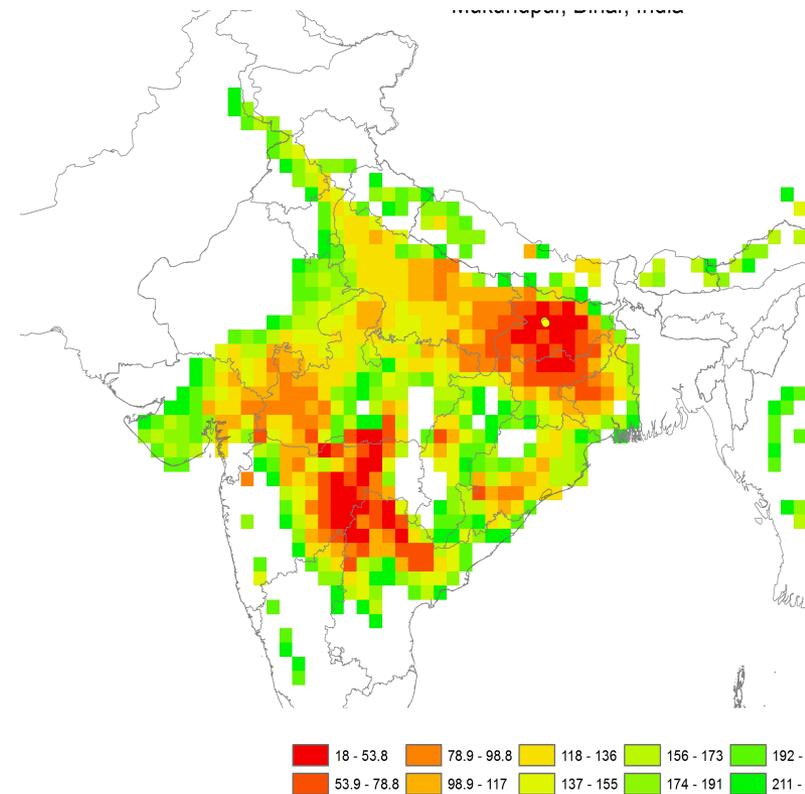


USAID
FROM THE AMERICAN PEOPLE



CLIMATE DATA: SOURCES

- Country Met Agency: Large series in India, modest elsewhere
- Private sector
- WMO
- NASA; NOAA
- Aphrodite
- IRI map rooms
- Value-added gridded data- IMD, CRU, ...
- Satellite weather data
- Climate change data: IPCC, CCAFS, RCC-IITM,
- Issues of data quality, access, time





CLIMATE SERVICES IN THE REGION: STATUS, CHALLENGES AND OPPORTUNITIES

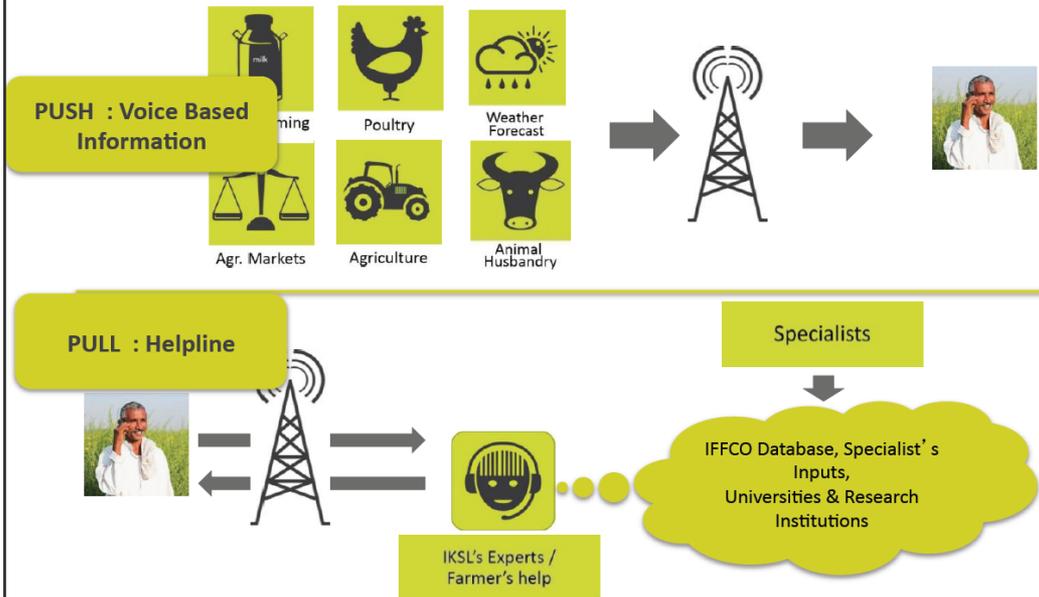
- Weather-based agro-advisories
- Precision agronomy
- Insurance
- Early warning systems of drought, flood, food shortage





ICT AND WEATHER-BASED AGRO-ADVISORIES

Architecture & Service Construct



Source: IMD and IKSL

Current status

- > 5 million farmers in India
- Several pilots in Bangladesh and Nepal

Challenges

- Generic advice; need to make this demand driven
- High dropout rate
- Opportunity costs for farmers

Opportunities

- Cheap android phones; crowdsourcing and cloud computing for customization; PPP models





PRECISION AGRONOMY

- Decision support systems
- Sensors: satellite, UAVs to hand-held
- Precision fertilizer and irrigation recommendations for smallholders
- Scale-large pilots
- Constraint: business model, capacity





AGRICULTURE INSURANCE

- 30 million insured farmers in India; dissatisfied with products and services
- Keen interest in Nepal and Bangladesh; pilots

Challenges

Non-scientific triggers; objective loss assessment; moral hazards; premium subsidy; awareness

Opportunities

1. AEZ-specific “indices” for rainfall/temperature
2. Integrated models for loss assessment
3. MRV schemes managed by farming communities
4. Bundling crop insurance with risk-mitigating technologies
5. Improved models for delivery- PPP models

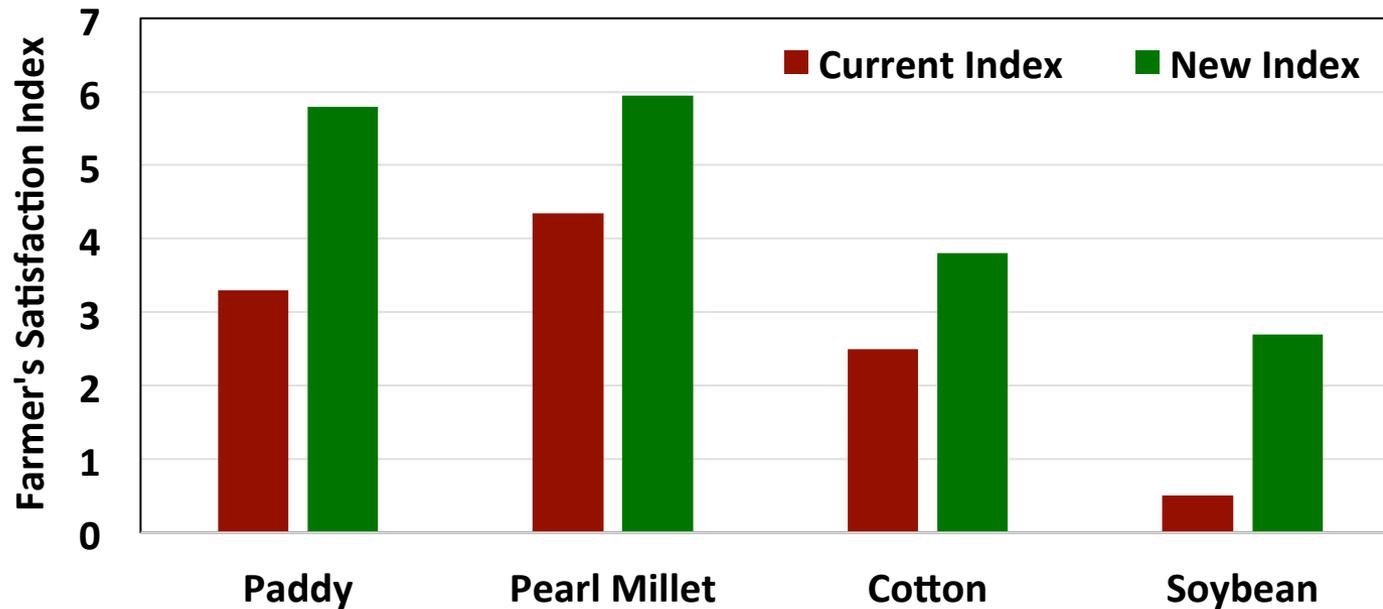




FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

IMPROVED TRIGGERS FOR WEATHER INSURANCE: WIN-WIN PRODUCTS FOR FARMERS, INDUSTRY AND GOVERNMENT



USAID
FROM THE AMERICAN PEOPLE



EARLY WARNING SYSTEMS: DROUGHT MONITORING IN SOUTH ASIA



	1 Existence of Drought Early Warning System	2 Capability to contribute to Drought Monitor/ Early Warning
Afghanistan	No	Very Low – No prediction capability
Bhutan	No	Very low – daily and seasonal rainfall prediction
Bangladesh	No	Medium – experience in flood warning, usage of drought prediction tools
Maldives	No	Medium – Experience in flood & rainfall early warning
Nepal	No	Low – experience in collecting post-drought information
India	Yes – especially powerful in certain regions	Very high – experience in usage of different drought indices
Pakistan	Yes	Very high – weather radar and GIS spatial integration systems capability to identify drought
Sri Lanka	No	Low – capacities exist, but need improvement

Source: Tyagi, GFCS, 2015



Table: Overview of the responses. Colour scale indicating country capacity:

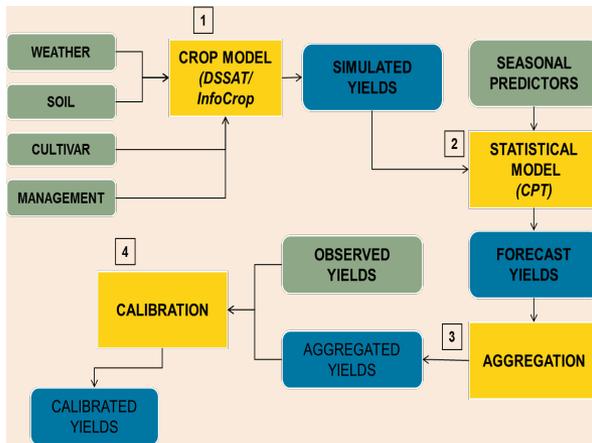




EWS FOR FOOD SECURITY: CCAFS R4D REACHES SCALE

CCAFS Science

CCAFS Regional Agriculture Forecasting Tool



CCAFS Output

Evidence of tool demonstrated; capacity raised in Nepal



CCAFS Outcome

Being used by the Nepal government for Food Security Monitoring in real time



Also working with Government of India, Bangladesh and Sri Lanka.





CONCLUSION: MANAGING CLIMATIC RISKS IN SOUTH ASIAN AGRICULTURE



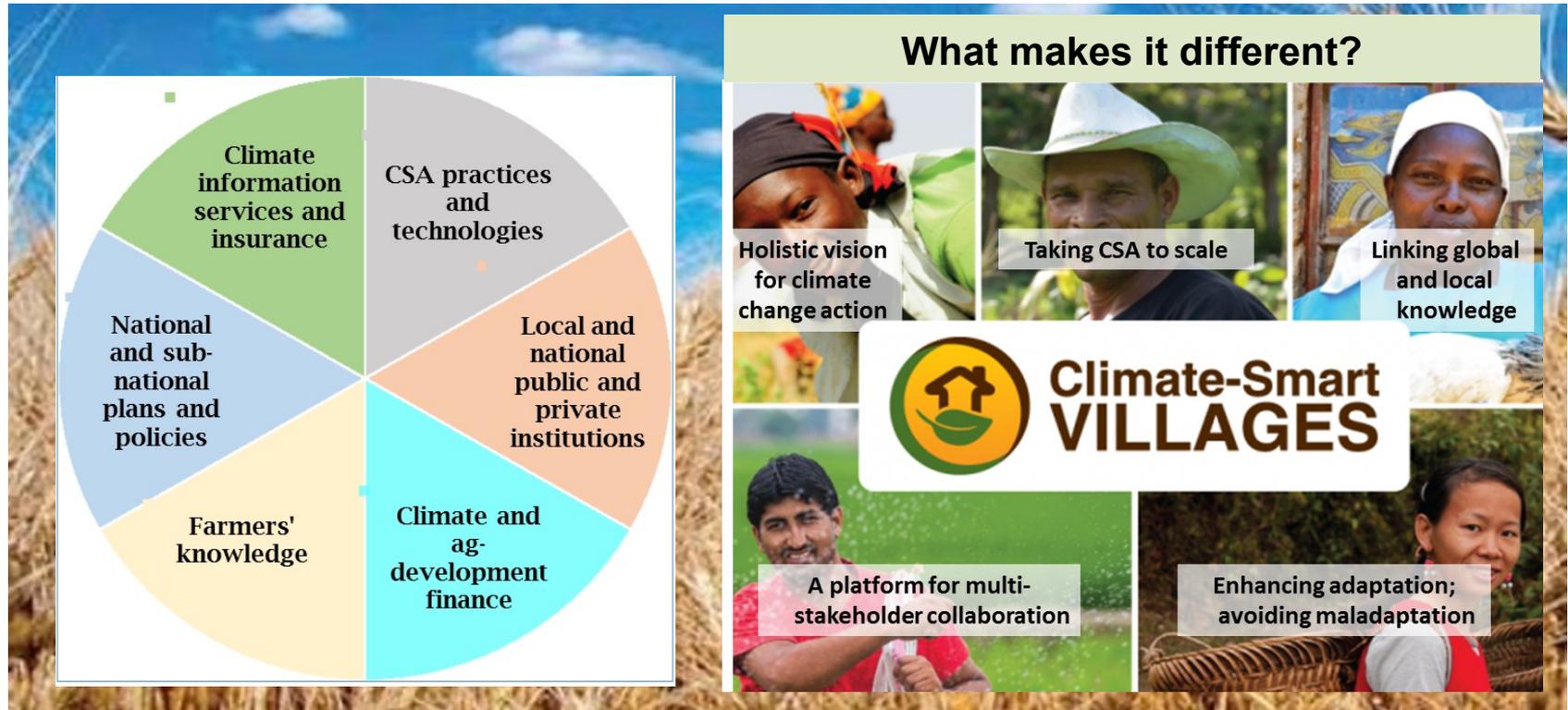
1. Climatic risks have always been there but are now increasing.
2. Big opportunities for targeting climatic services: advisories, insurance, EWS, precision agronomy.
3. Stakeholders need participatory, tested and integrated solutions: relevant climate services linked with relevant practices, technologies and institutions—CSA.
4. Need for right partnerships (science-policy, PPP), incentives, investments, institutions and policies.
5. South-south learnings.





CLIMATE-SMART VILLAGE R4D APPROACH*: A HOLISTIC STRATEGY FOR SCALING UP

*To test, through participatory methods, technological and institutional options for dealing with climate change in agriculture; with the aim of scaling up and out the appropriate options and drawing out lessons for policy makers from local to global levels.





FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

Pramod Aggarwal

***CGIAR Research Program on Climate
Change, Agriculture and
Food Security***

***Borlaug Institute for South Asia
CIMMYT, New Delhi-110012, India***

p.k.aggarwal@cigar.org



USAID
FROM THE AMERICAN PEOPLE



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

www.feedthefuture.gov



USAID
FROM THE AMERICAN PEOPLE