



*Aims at*

# **GFCS: Agriculture and Food Security**

## **Current status of the use and needs for climate services and interfacing mechanisms**

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INDIA METEOROLOGICAL DEPARTMENT**



# Major challenges in Third Pole region

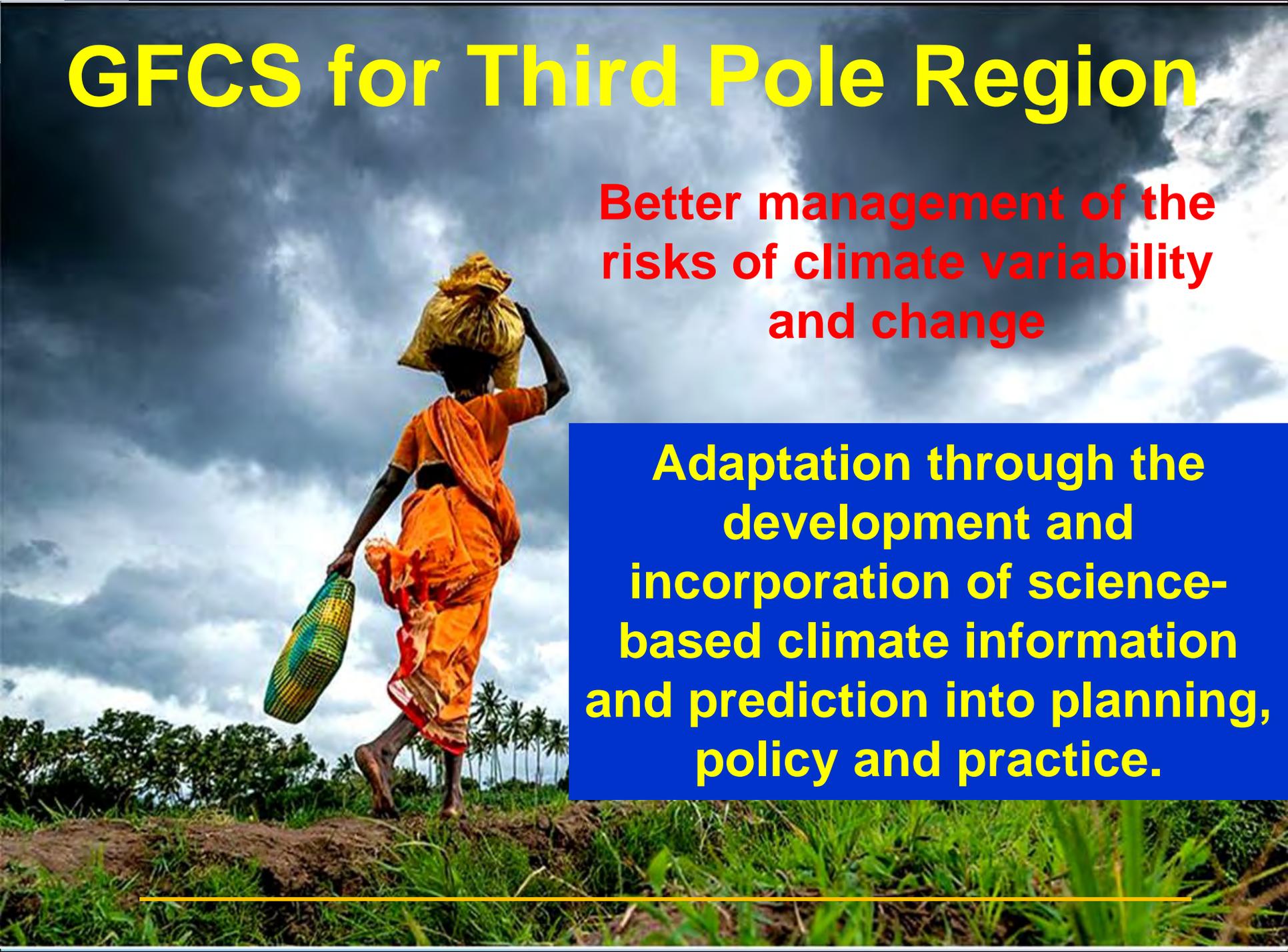
- There is substantial commonality in challenges in climate related issues on agriculture.
- Climatic Variability & Climate change is expected to affect all of the components that influence food security: availability, access, stability and utilization.
- Increases in extreme weather, such as floods and drought, as a result of climate change, would exacerbate this trend.
- All these could have a negative impact on livelihoods that depend on climate-sensitive activities such as rain-fed agriculture.



# **GFCS for Third Pole Region**

**Better management of the risks of climate variability and change**

**Adaptation through the development and incorporation of science-based climate information and prediction into planning, policy and practice.**



# Bhutan

- **In Bhutan**, Rice in some part of Central district was affected and damaged by the storm just ahead of harvest season in 2010. Also, maize, the staple food in eastern Bhutan was swept away by storm in 2010. Infestation of cash crops by the pest.
- On 12<sup>th</sup> April 2012, the heavy wind and rain damaged acres of maize crops and many makeshifts and cowsheds. Storm occurred just as it was time for the villagers to harvest betel nut, their main cash crop.



## Recent Climate: Aberrant and Extreme Events

Year	All India SWM Rainfall Departure (%)
2000	-8
2001	-15
2002	-19
2003	-2
2004	-13
2005	-1
2006	-1
2007	-5
2008	-2
2009	-23
2010	-2
2011	-1
2012	-8
2014	-12

10 of 14 years experienced deficient rainfall (72%)

- 2002 drought
- 20 day heat wave during May 2003 in AP
- Extremely cold winter in the year 2002-03
- Drought like situation in India in July 2004
- Abnormal temperatures during March 2004 and Jan 2005
- Floods in 2005
- Cold wave 2005 - 06
- Floods in arid Rajasthan & AP and drought in NE regions in 2006
- Abnormal temperatures during 3<sup>rd</sup> week of Jan to 1<sup>st</sup> week of Feb 2007
- All India Severe drought 2009
- 2010 – One of warmest years
- 2011 – Failure of September rains in AP
- 2012 – early season drought
- 2014 -43% deficiency in June



**Recent Example of Extreme Events and crop damage**

Hailstorm in Maharashtra and North and Central India in 2014 & 2015

## Components of Variability in Weather & Climate

- ❖ Heat/Cold Wave
- ❖ More variable R/F
- ❖ Increased Extremes Weather Events
- ❖ Erratic Onset, advance and retrieval of Monsoon
- ❖ Shift in Active/break cycles
- ❖ Intensity and frequency of Monsoon lows/depressions

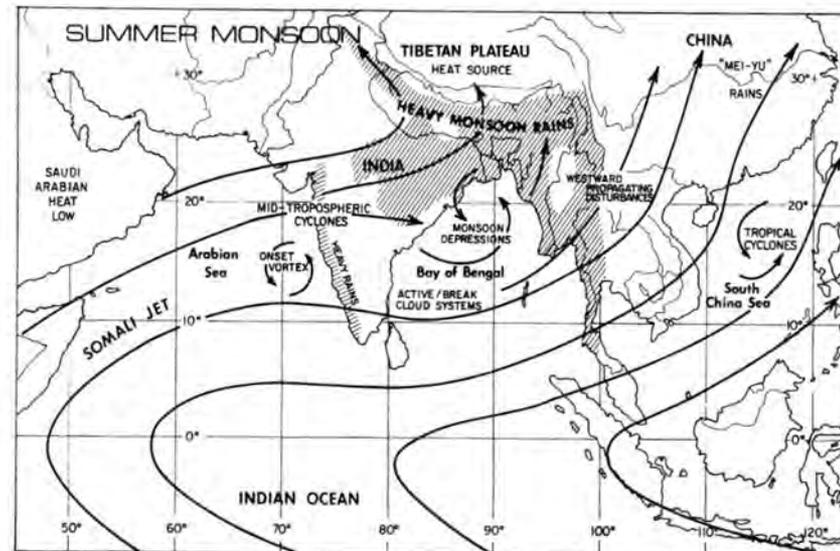
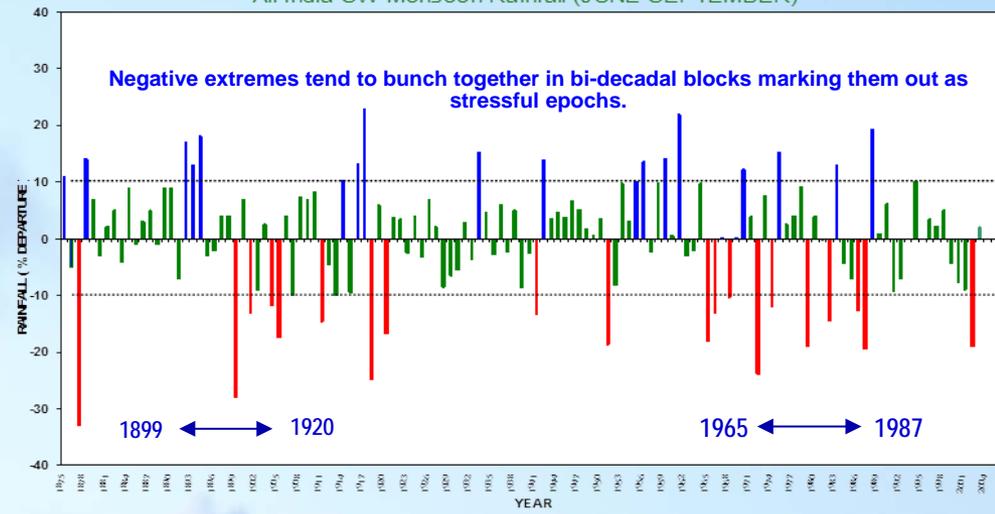
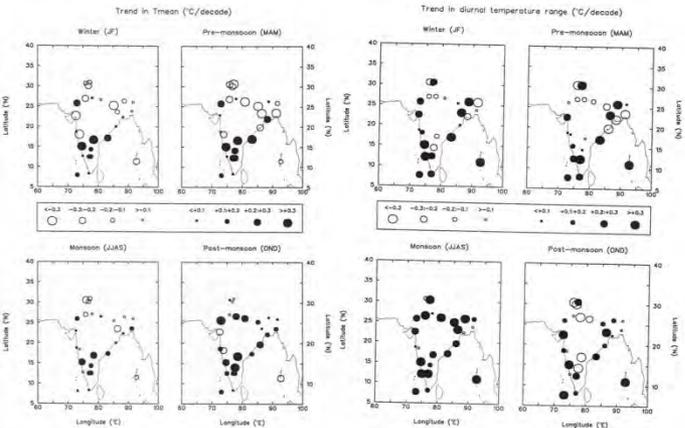


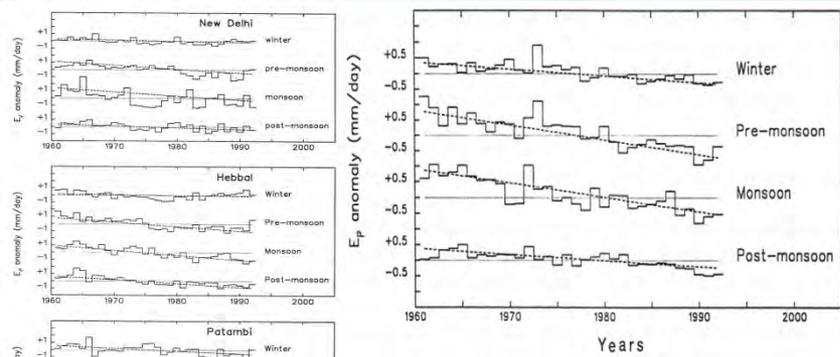
Fig. 10.30. Primary synoptic- and smaller-scale circulation features that affect cloudiness and precipitation in the region of the summer monsoon. Locations of June to September rainfall exceeding 100 cm over the land west of 100°E associated with the southwest monsoon are indicated (from Rao 1981). Those over water area and east of 100°E are omitted.



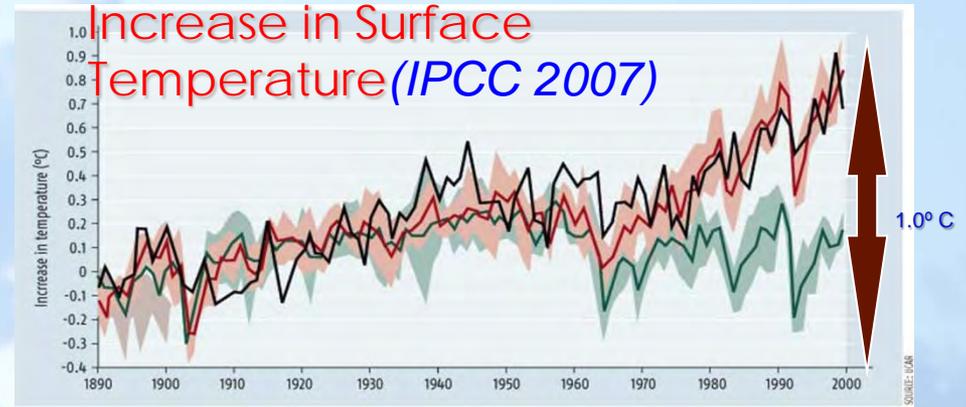
Monsoons - a relatively regular Phenomenon interspersed with large extremes  
 All India SW Monsoon Rainfall (JUNE-SEPTEMBER)



Linear trend( $^{\circ}\text{C}/\text{decade}$ ) in mean and diurnal temperature (Long term analysis different seasons over India based on 27 stations (dots) Dot size is related to trend

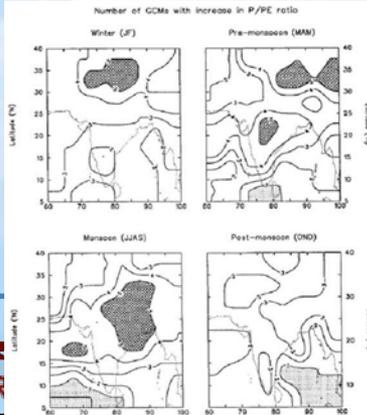


Regionally averaged annual  $E_p$  anomalies(mm/day) for the period 1961-92 wrt the 1976-90 mean for different seasons over India. Number of stations is ten between 1961-75 and 1991-92 and 19 between 1976 &1990 . Dashed lines show best-fit linear trend



Annual  $E_p$  anomalies (mm/day) between 1961 & 1992 wrt to the 1961-92 mean for three stations & for four seasons. Dashed lines show best-fit linear trend

Number of GCM experiments & P/PE ratio



For the monsoon season, all six GCMs agree that P/PE ratio becomes more favourable over north-eastern India. Five out of six agree that this ratio increases, apart from the extreme south, over the rest of the country. Changes in this ratio are less favourable in the post-monsoon season and in the extreme south of the country

Chattopadhyay & Hulme, 1997



# Why do farmers need climate services

**Ready!**

## Seasonal

- Select cultivars
- Purchase appropriate seeds
- Choose alternative livelihoods
- Sensitize Community

## Farmer Early Actions Across Time Scales

**Set !**

## Mid-range

- Anticipate wet/dry spells variations in temperature
- Manage risk in harvest operations
- Plant/clear fields
- Warn community on hazards

**Go!**

## Short range

- Determine right harvest time
- Decide timing of pesticide/fertilizers application
- Evade crop losses
- Evacuate community

**Access to relevant climate information can empower farmers to anticipate and confront climate related risks and opportunities**



# Tools: Observation, forecast, data & products.

## Conventional Observational Network

- Surface Observatories – Class I and Class II - (559)
- Pilot Balloon- (71)
- Agrometeorological Observatories- (219)
- Hygrometeorological Observatories - (701)
- Non-Departmental Raingauge Stations
- ✓ Reporting- (3540)
- ✓ Non-reporting- (5039)
- Extreme Weather reporting – Storm surge,
- Frost, Heat wave, Hail storm etc.

675 Automatic Weather Stations

127 Agro-AWS

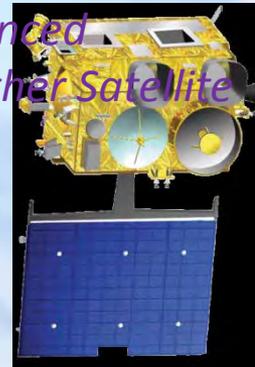
548 AWS

Type of Observatory	Installed	Proposed
AWS	675	400
ARG	1350	2000
DWR	16	42



INSAT-3D  
INDIA's

India's advanced weather satellite INSAT-3D launched in the early hours of July 26, 2013 from Kourou, French Guiana, and has successfully been placed in Geosynchronous orbit.



It carries four payloads  
 ➤ Imager (Six Channels)  
 ➤ Sounder (Nineteen Channels)  
 ➤ Data Relay Transponder (DRT)  
 ➤ Satellite Aided Search and Rescue (SAS & R)

## IMD-DWR Network



Doppler Weather Radar  
16 DWRs are installed  
Products are

- \* Rain intensity
- \* Cumulative rain
- \* Cloud motion winds
- \* Vertical profiles of Temperature, humidity etc.

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(Res. 0.5x0.5 km)



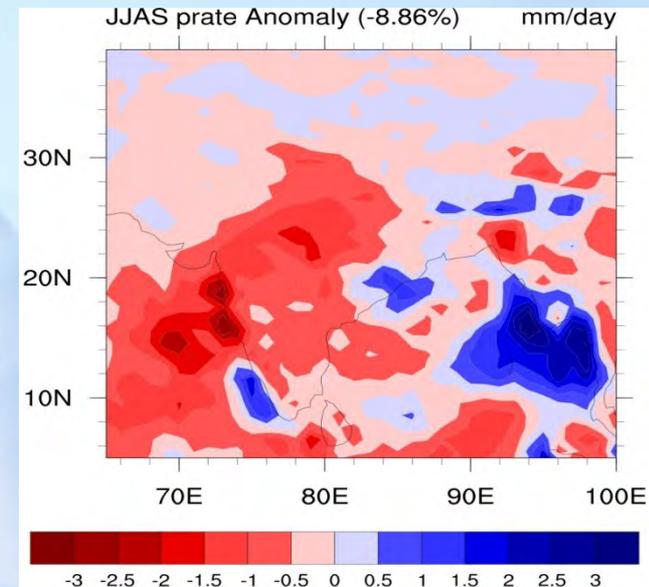
# Graduated Response to Disaster Risks



# Preparedness under Kharif Crop Campaign based on Seasonal Rainfall Forecast

## Operational Seasonal Rainfall Forecast for Monsoon 2015

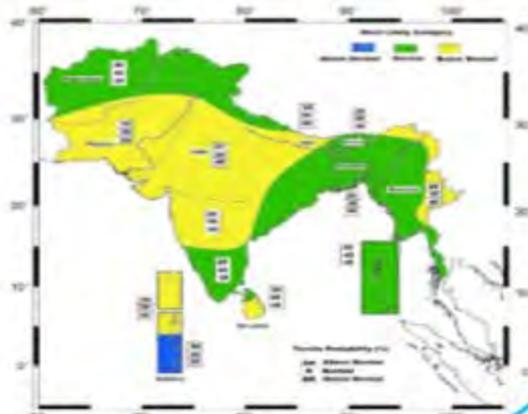
- The forecast indicates below normal rainfall for the country as a whole with a quantitative value of 93% of its long period average with a model error of  $\pm 5\%$ .
- The experimental seasonal rainfall forecast during JJAS 2015 based on the coupled model CFSv2 run at MoES-IITM, Pune indicates below normal rainfall over many parts of India.
- **Below normal** rainfall over **Uttar Pradesh, East Rajasthan, Madhya Pradesh, Gujarat, Marathwada, Interior Karnataka, Telangana, Rayalaseema and Coastal Andhra Pradesh.** Remaining subdivisions may experience normal or above normal rainfall.



# Interpretation of seasonal forecast at district level and organizing state level monsoon preparedness meetings

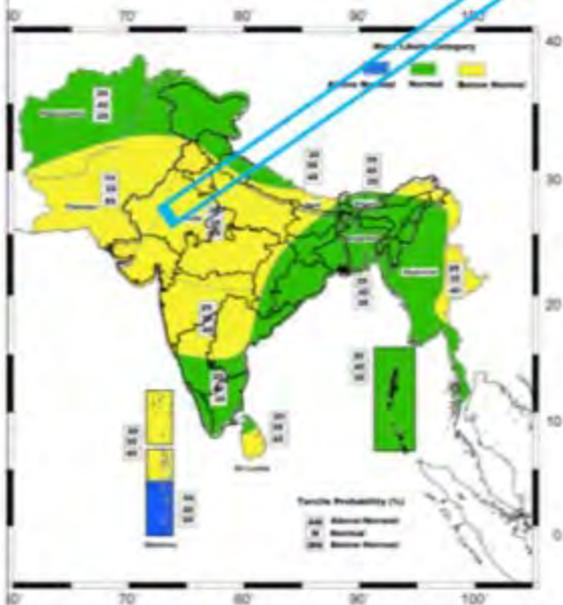
## SASCOF – 6

### Southwest Monsoon Rainfall over South Asia Consensus outlook for 2015 and Rajasthan state



#### Seasonal rainfall probability for Rajasthan state

Above normal	20%
Normal	35%
Below normal	45%



- The available forecast has been overlaid by district map to generate state specific maps
- State wise maps are generated and shared with state government authorities
- Good appreciation from state level authorities

#### •Requirement:

- If month wise distribution on spatial scale is available with probabilities, better planning could be made with reference to contingencies that need to be initiated

# District based Contingency Plans

National- CRIDA



Telangana-CRIDA



Gujarat-Anand



Maharashtra-Pune



Updating of contingency plans with Universities/KVKs

+ AP, Haryana, Chhattisgarh and Jharkhand

District (with state government authorities)

Taluq/Mandal (AICRPDA/AICRPA M network)

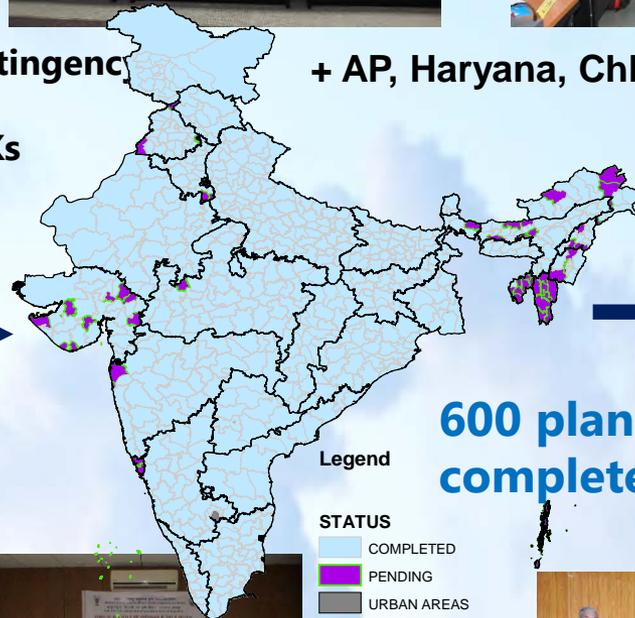
Villages (through KVKs under NICRA-TDC)

CRIDA/AICRPDA Research outputs

Agri. Universities

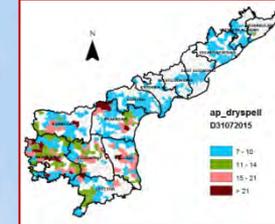


NMSA



600 plans completed

Implementation of DCPs



MP- Bhopal



Rajasthan-Jaipur



Karnataka- Bengaluru



UP-Lucknow

GKMS positions

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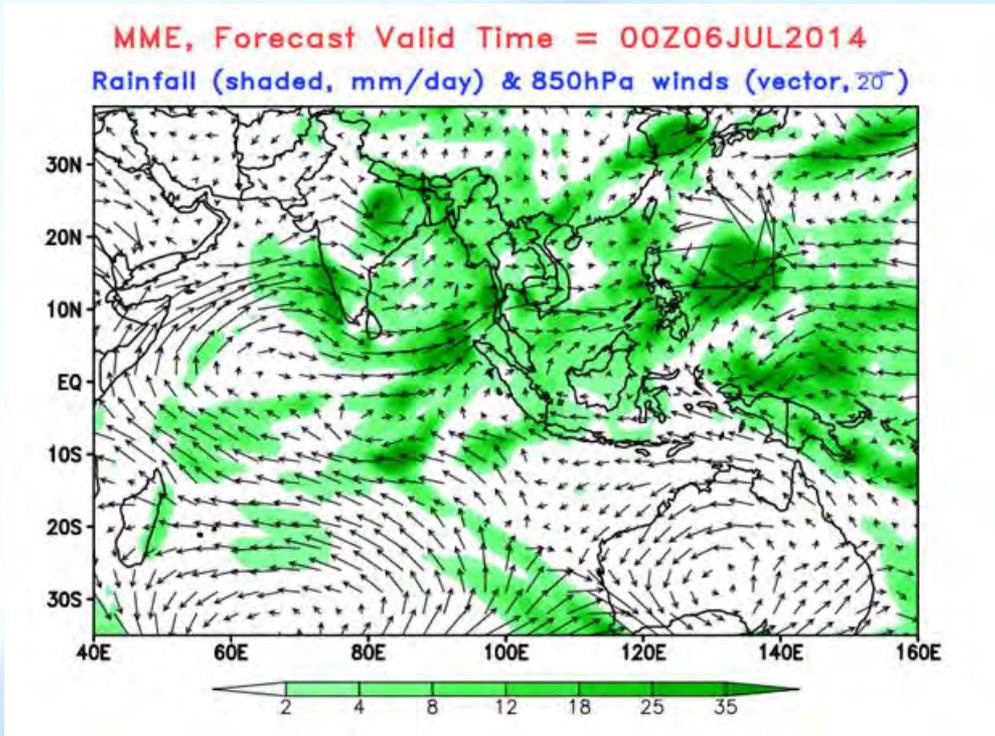
IMD

वेभाग  
DEPARTMENT

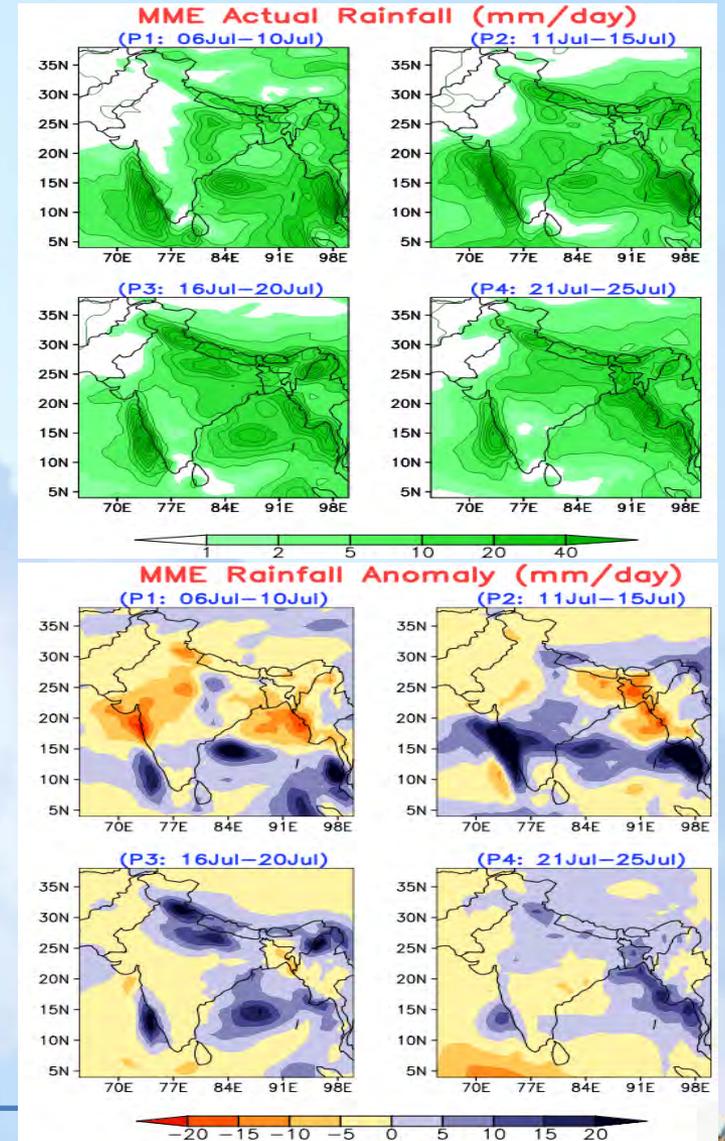


# CFS based Grand Ensemble Prediction System (CGEPS) for Extended Range Prediction (for next 20 days) (IITM, Pune)

Daily evolution of rainfall and wind at 850hPa



Pentad wise rainfall predicted by MME

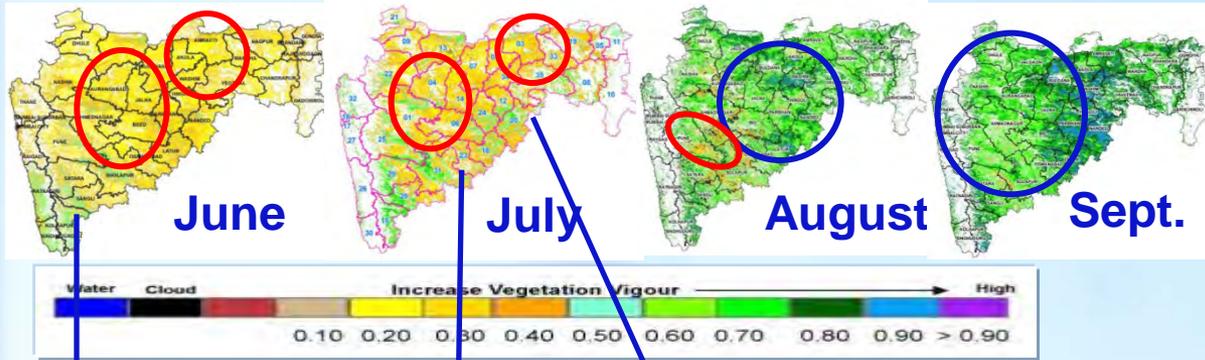


27-Apr-16

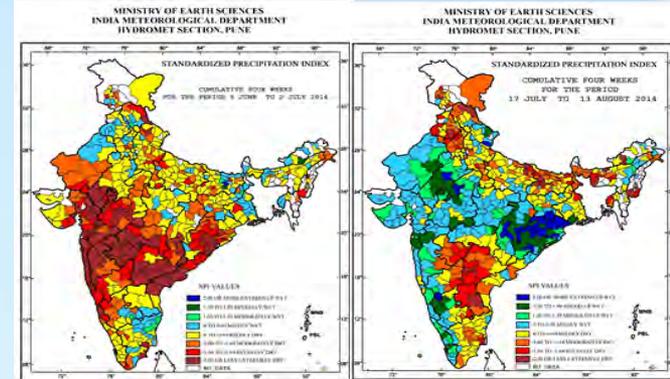
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# Use of Extended Range Weather Forecast: Marathwada & Vidarbha



5th June – 2nd July    17th July-13th August



## ❖ Madhya Maharashtra

Sunflower, soybean, cotton, hybrid jowar, hybrid pearl millet, redgram and sesame

### ❖ Intercropping of -

- Pearlmillet+redgram
- Sunflower+ redgram
- Soybean+ redgram
- guar + redgram

## ❖ Vidarbha

(Buldana, Chandrapur, Yeotmal: 3 districts: Worst affected)

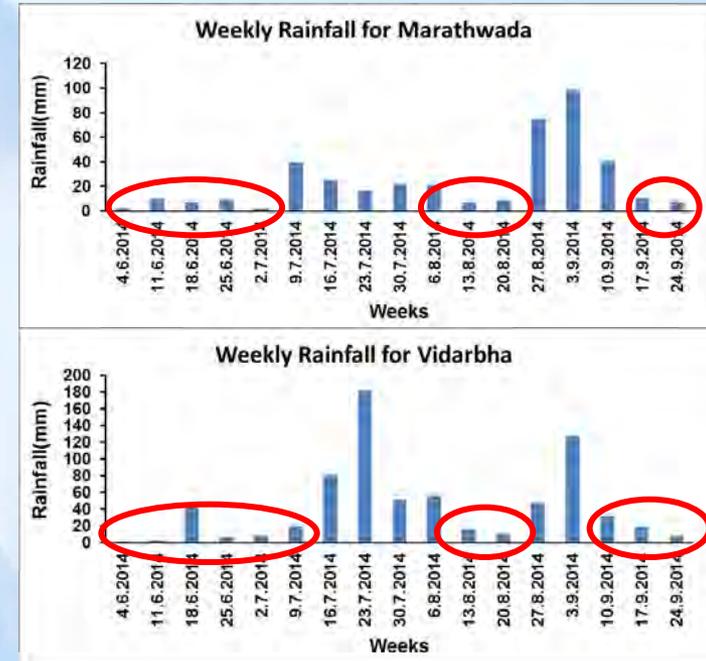
- Bt. Cotton
- American/Desi cotton
- Intercropping cotton:sorghum:pigeonpea:sorghum
- Short duration pigeonpea
- Intercropping of sorghum with pigeonpea
- In eastern parts of Vidarbha,
- Rice
- direct sowing of early maturing and mid late maturing rice varieties by wet seeding method

## ❖ Marathwada

(Aurangabad, Beed, Jalna, Osnamabad, Parbhani, Hin goli, Nanded, Latur: 8 districts Worst affected)

Cotton, soybean, red/black gram, sorghum, sunflower, sugarcane

- Intercropping of cotton+pigeon pea
- pigeon pea+ sunflower or bajra
- Short duration varieties of soybean.



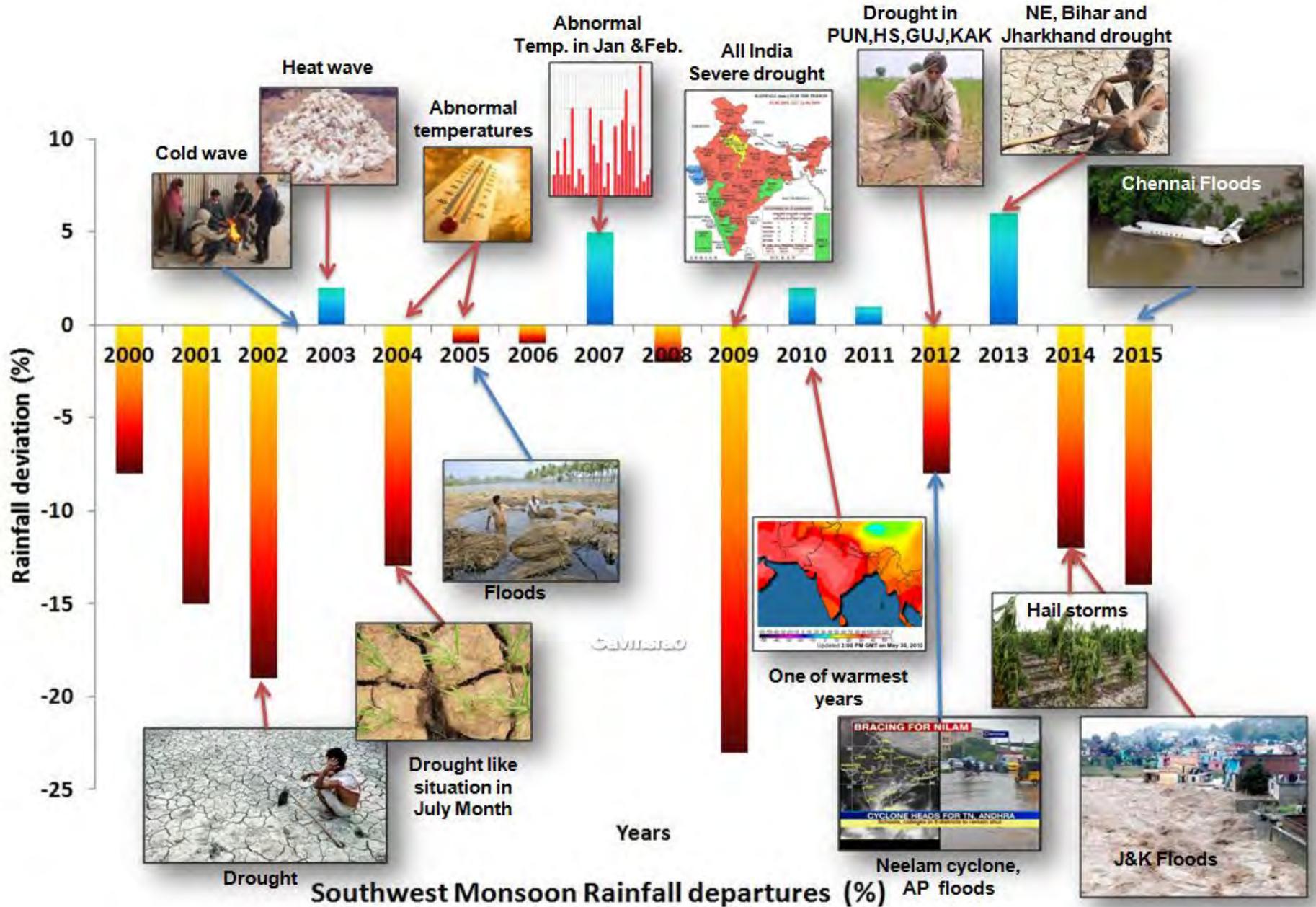
**Our advisories on sowing short-duration, less water requiring crops, such as pulses, were followed by farmers in a big way.**

### Crop Situation in Andhra Pradesh (Kharif-2015)

District	Actual area sown in Kharif (ha)		Original crop in the area
	2015	Normal	
<b>Pearl millet</b>			
Kurnool	8273	7095	Cotton, Castor, Rice
YSR Kadapa	2377	2035	Rice
Chittoor	2403	2134	Groundnut
Anantapur	2421	1782	Groundnut
<b>Black gram</b>			
Guntur	1066	359	Cotton, Rice
Prakasam	5181	1466	Cotton, Rice
Kadapa	1279	327	Rice
<b>Green gram</b>			
Anantapur	12380	618	Groundnut
YSR Kadapa	2069	342	Rice

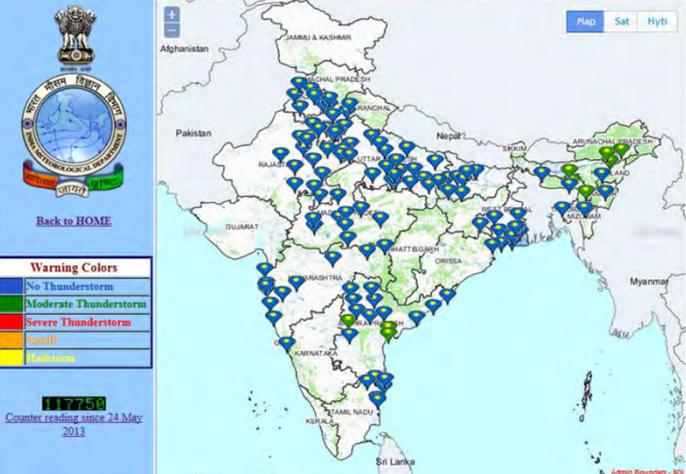


# Climate during the recent past

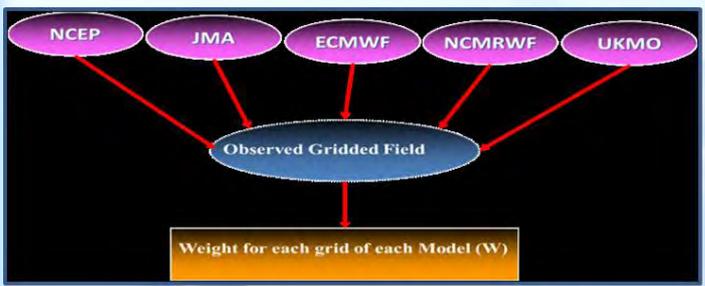
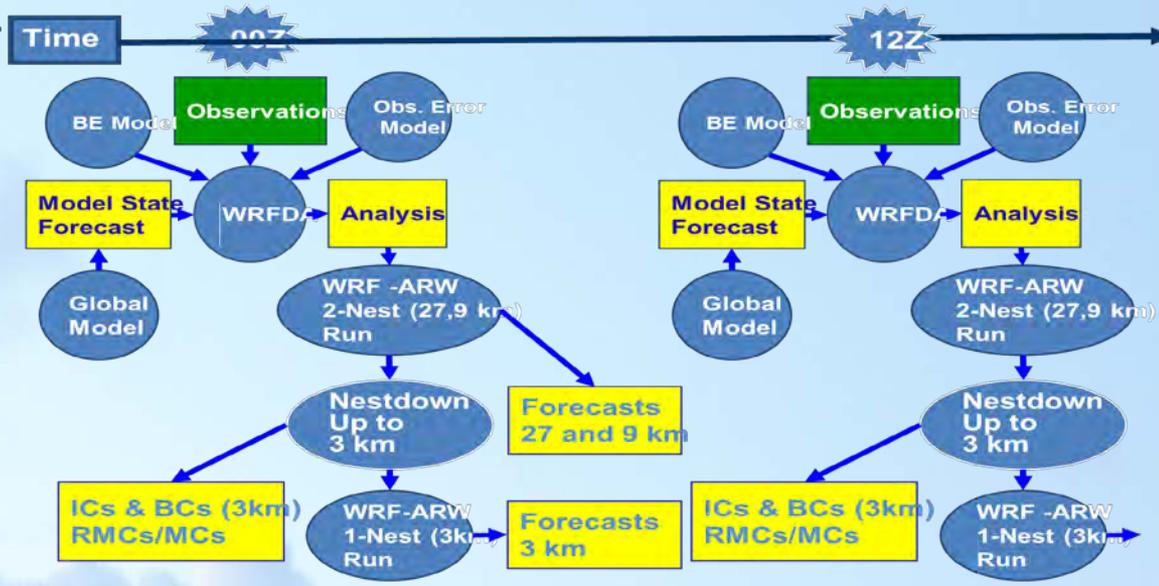




ALL INDIA NOWCAST  
WDSSII REFLECTIVITY FORECAST FOR DELHI AND NEIGHBOURHOOD



Generation of WRF-ARW Forecast with WRFDA Assimilation



- Parameters:**
- Rainfall
  - Max and Min temperature
  - Total cloud cover
  - Surface Relative humidity
  - Surface Wind

**DISTRICT LEVEL FORECAST**

The same was started since June 2008

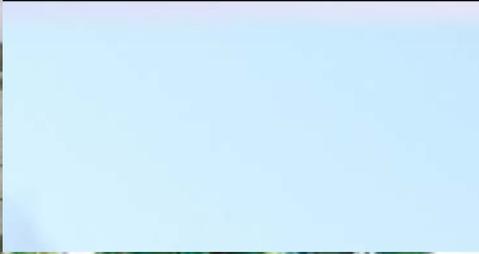
INDIA METEOROLOGICAL DEPARTMENT  
MULTIMODEL ENSEMBLE BASED DISTRICT LEVEL WEATHER FORECAST  
ISSUED ON: 13-11-2009  
VALID TILL 08:30 IST OF THE NEXT 5 DAYS

DISTRICT : PUNE STATE : MAHARASHTRA

PARAMETERS	ENSEMBLE FCST				
	DAY-1 14/11	DAY-2 15/11	DAY-3 16/11	DAY-4 17/11	DAY-5 18/11
Rainfall (mm)	0	8	15	15	6
Max Temperature ( deg C)	29	26	26	26	27
Min Temperature ( deg C)	19	20	20	21	21
Total cloud cover (octa)	7	8	8	7	8
Max Relative Humidity (%)	98	99	98	99	99
Min Relative Humidity (%)	93	92	92	87	82
Wind speed (kmph)	004	005	006	004	002
Wind direction (deg)	90	80	110	120	90

NOTE: -99.0 ..... NO DATA

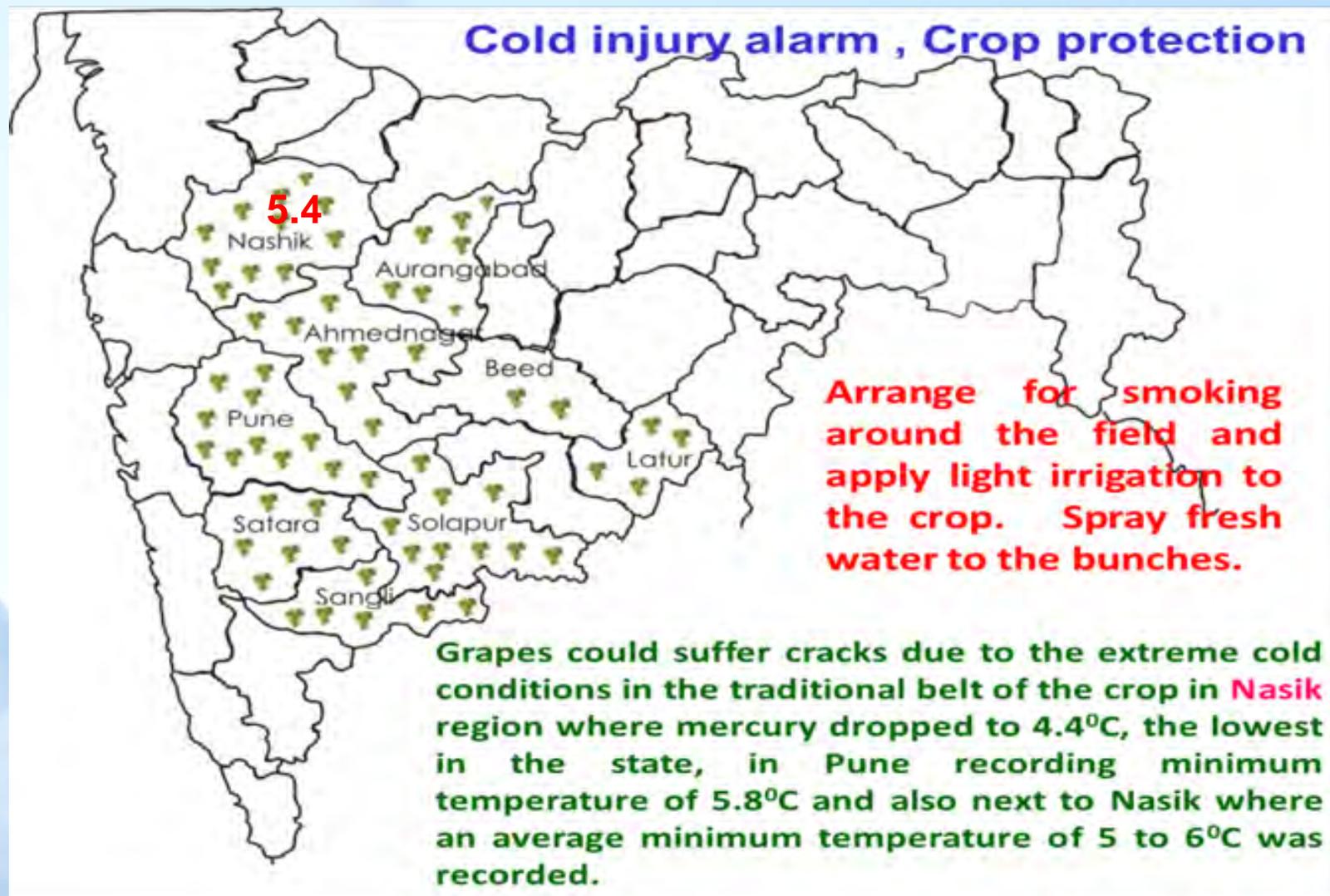




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## Cold injury alarm , Crop protection



STATE : MADHYA PRADESH CROP : WHEAT VARIETY : WH-147, LOK-1, C-306, HDM-1553, N-4 SOIL : SANDY LOAM, CLAY LOAM, BLACK COTTON, ALLUVIAL  
 DISTRICTS : GWALIOR, DATIA, SHIVPURI, GUNA IRRIGATED/NON-IRRIGATED DURATION : 110-145 DAYS

Weather warnings	Rain	< 50 MM/DAY	50-100 MM/DAY	> 100 MM/DAY																							
	Duration of wet spell	< 50 MM FOR 3-4 DAYS	75-100 MM FOR 3-4 DAYS	> 100 MM FOR 3-4 DAYS																							
	Cloudy weather	20 DAYS	CLOUDY WEATHER	CLOUDY WEATHER																							
	Drought	20 DAYS	20 DAYS	20 DAYS																							
	High winds	< 50 KM/HR	50-80 KM/HR	> 80 KM/HR																							
Weather conditions favourable for incidence of pests and diseases	Temperature	MAX. TEMP. < 30°C, MIN. TEMP. < 15°C	MAX. TEMP. < 30°C, MIN. TEMP. < 15°C	MAX. TEMP. < 30°C, MIN. TEMP. < 15°C																							
	Hail Storm	STEM BORER, APHIDS, TERMITES, ARMY WORMS, CUT WORMS	STEM BORER, APHIDS, TERMITES, ARMY WORMS, CUT WORMS	STEM BORER, APHIDS, TERMITES, ARMY WORMS, CUT WORMS																							
	Posts	CLOUDY WEATHER	CLOUDY WEATHER	CLOUDY WEATHER																							
Weather conditions favourable for incidence of pests and diseases	Humidity	HIGH HUMIDITY, CLODNENESS	HIGH HUMIDITY, CLODNENESS	HIGH HUMIDITY, CLODNENESS																							
	Leaf Blight	BUNT, LEAF SPOTS, LEAF BLIGHT	BUNT, LEAF SPOTS, LEAF BLIGHT	BUNT, LEAF SPOTS, LEAF BLIGHT																							
Normal phase wise water requirement(mm)		47	128	77	137	39	TOTAL = 428																				
Weekly normal weather	Rainfall(mm) total	1.8	3.2	4.2	6.5	7.2	1.8	3.8	5.1	3.8	3.7	2.1	1.2	4.7	3.9	3.9	1.2	0.7	1.3	0.4	1.1						
	Max. temp. °C	28.4	29.8	28.4	25.5	24.9	22.8	23.3	23.2	23.0	24.0	24.3	25.3	26.8	27.6	28.0	31.2	32.7	33.8	33.0	30.3						
	Min. temp. °C	12.2	11.3	9.8	8.2	7.8	7.3	6.7	7.4	7.3	7.9	8.1	8.2	10.3	10.9	12.2	13.7	15.1	16.3	17.9	19.0						
	Sunshine hours	8.3	8.4	7.1	5.6	5.9	5.8	5.2	6.3	6.3	6.4	6.9	6.1	9.0	9.8	9.4	9.1	8.8	8.4	9.8	9.7	10.0					
Life history and mean dates of important epochs of crop growth																											
	Standard weeks	44	45	46	47	48	49	50	51	52	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Months	NOVEMBER				DECEMBER				JANUARY				FEBRUARY			MARCH			APRIL								

D.D.G.M.(AGRIMET),I.M.D:PUNE 2005

### PEST WEATHER CALENDAR

STATE: KERALA CROP:RICE SEASON:SUMMER RICE  
 STATION:PATTAMBI PEST:STEM BORER

Weather warnings	Max. temp. °C	32.7 to 34.5°C (48wk)														32.7 to 34.5°C (2wk)			
	Min. temp. °C	19.1 to 22.4°C (48wk)														19.1 to 22.4°C (2wk)			
	Morning RH%																		
	Afternoon RH%	31 to 48% (48wk)														31 to 48% (2wk)			
	Sunshine hours	9.8 to 9.1 hours (48wk)														9.8 to 9.1 hours (2wk)			
Weekly normal weather	Total rainfall																		
	Total rainfall(mm)	51	39.5	28	10.8	12.5	8.3	0.8	3.8	0	0	0.1	0.2	1.3	0.7				
	Max. temp. °C	32.1	32.4	32.2	32.5	32.6	32.6	32.8	33	33.1	33.5	33.8	34	34.6	35.2	35.4			
	Min. temp. °C	22.4	22.2	21.9	21.7	21.4	21.1	20.9	20.8	20.4	20.5	20.5	20.8	20.9	21.2	20.8			
	Sunshine hours	7.5	7.7	7.7	8.1	8.1	8.6	9.1	8.9	9.4	9.5	9.8	9.6	9.7	9.9	9.9			
	Morning RH%	90	89	87	85	83	84	79	81	78	78	76	78	80	80	80			
Afternoon RH%	59	57	57	51	50	48	45	44	39	38	35	35	35	33	33				
Mean dates of important epochs of crop growth and development																			
	STANDARD WEEKS	45	46	47	48	49	50	51	52	1	2	3	4	5	6	7			
MONTHS	NOVEMBER			DECEMBER			JANUARY			FEBRUARY									



# Tactical Decisions

In Farm operations



Seed Management,  
Irrigation,  
Fertilizer Application,  
Pesticide spraying,  
etc...

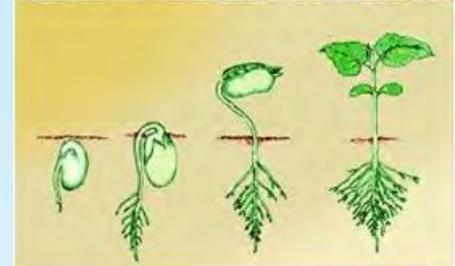
Weather forecast  
Applications

Sowing  
Transplanting  
Vegetative  
Grain formation  
Harvesting, etc...

**Strategic Decision:**  
**Contingent Planning**

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In different stages of crops



# மா.சா. சுவாமிநாதன் ஆராய்ச்சி நிறுவனம்

கிராமவள மையம், திருவையாறு.

தனியொரு குடும்பத்தின் தேவை மற்றும் விபரங்கள் கணக்கெடுப்பு

- படிவ எண் : கணக்கெடுப்பு நாள் : கணக்கெடுப்பு செய்தவர் :
- கிராமம் : மாவட்டம் :
- குடும்பத்தலைவர் பெயர் :
- கதவு எண் : தெரு :
1. பாலினம் : ஆண்  பெண்
2. வயது [கடைசி பிறந்தநாள்] : வருடம்
3. தகுதிகள் : திருமணமாகாதவர்  திருமணமானவர்  விதவை
4. மதம் : இந்து  கிறிஸ்தியன்  முஸ்லீம்  பிறமதத்தவர் [குறிப்பிடுக]  
வகுப்பு :
5. கல்வித்தகுதி :
6. குடும்ப உறுப்பினர் விவரம் : ஆண்கள்  பெண்கள்   
குழந்தைகள்  மொத்த எண்ணிக்கை
7. குடும்ப உறுப்பினர்கள் கல்விநிலை  
பள்ளி சென்றவர்கள்  தொடக்கப்பள்ளி   
உயர்நிலைப்பள்ளி  கல்லூரி   
முதியோர்கல்வி பயின்றவர்   
13 லிருந்து 17 வயது பள்ளிக்கு சென்றவர்கள்   
பள்ளிக்கு செல்லாதவர்கள்
8. விடலைப் பருவத்தவர் பற்றிய விபரம் [13 லிருந்து 15 வயது]  
1. பள்ளிக்கு சென்றவர்கள் :  
2. செல்லாதவர்கள் :  
3. அவர்கள் கலந்து கொண்ட பயிற்சிகள் :  
4. அவர்களின் தேவை :  
5. பெண் குழந்தைகள் இரும்பு சத்து  
மாத்திரை சாப்பிடுகிறார்களா? :
9. குடும்பத்தின் ஆண்டு வருமானம்

	தொழில்	வருமானம்
1. குடும்பத்தின் ஆதார வருமானம்	:	ரூ. ....
2. குடும்பத்தின் இதர வருமானம்	:	ரூ. ....
3. குடும்பத்தின் மொத்தஆண்டு வருமானம்	:	ரூ. ....
4. ஒரு ஆண்டில் எத்தனை மாதங்களுக்கு வேலை கிடைக்கும் :		

# Need Assessment Survey



விவகார அமைச்சு

INDIA METEOROLOGICAL DEPARTMENT



# Farmers' feedback

## Shri Narayan Bhai Chawda (Krishi Pandit), Village–Gomchi,Raipur

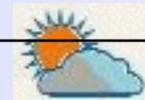


- Since 1992, I have been getting these weather-based agro-advisories regularly on the evening of every Tuesday and Friday. Although, we have been involved in agriculture since last 30 to 35 years, these agro-advisories are certainly playing very important role in planning our agriculture activities. Vegetables and the cereals are the major crops grown in my agriculture farm.



# Few examples of benefits / savings obtained by the farmers through AAS in Karnataka State

Details of Farmer	Forecast provided	Forecast used for	Benefits/ savings
Mr.Shivaji Dege, Aheri (2007), Bagalkot District	No rainfall in next 3-4 days	Spraying was deferred	Saved one spray costing Rs.4000/- per acre.
Devanayak, Honawad (2008), Bijapur District	Rainfall expected within 24 hr	Immediate spraying for disease	Saved losses to the extent of Rs.60,000/- per acre. Others who had no forecast failed.
Krishnappa Inchur, Shivanagi (2009), Bijapur District	Routine forecasting	Sowing, spraying and harvesting	The good forecasts helped him and his co-farmers in timely management without tension of the coming weather
Shivalingappa Mareguddi, Mugalkhod (2009), Bagalkot District	Rainfall is expected to occur only after two days	Completed the harvesting operation of soybean crop before commencement of rain	Got Rs.1900/- per quintal of produce (since the produce was not damaged by rain) as against Rs.1400 of others who had no idea of the coming rain.
Mahadevappa Neze, Nidoni Village (2009), Bijapur District	Rainfall would occur in the evening/night time	Completed spraying in morning hours	He could control shoot up of downy mildew disease on grape, as well as save from washout of the chemical by providing sufficient drying time, whereas others could not benefited.
Maruthi Marathe, Shivanagi Village (2010), Bijapur District	Rainfall is expected after 2 to 3 days	Took up dry sowing	This helped in good establishment of crop due to subsequent rains as per forecast.
Sanjeev Nandrekar, Sawalgi Village (2011), Bagalkot District	Extended dry spell expected	Curtailed sowing of rainfed maize from the planned 10 acres to only two acres	Even to this crop, he had to provide irrigation as the forecast met out true



# Economic Impact National Council of Applied Economic Research (NCAER)

- ❖ **95% of the farmers (surveyed) have been experiencing an improved reliability of the service in recent years.**
- ❖ **The incremental profit due to Agromet Advisory Services is assessed to be 25% of their net income.**
- ❖ **The Annual Economic Profit of 24% of the community, cultivating 4-principal crops (wheat, paddy, sugarcane and cotton), after using the Agromet Advisory Service in 2010, was assessed at Rs. 38,463 crs and this has raised to Rs. 42,000 crs in 2015.**
- ❖ **Gramin Krishi Mausam Seva has the potential of generating net economic benefit up to Rs. 3.3 lakh crores on the 4-principal crops alone when Agromet Advisory Service is fully utilized by 90.3 million agriculture-dependent households.**



# The User Interface Platform

## Flow of Information from NMHS to Farmers

- ❖ Ensure that farmers and the agricultural sector have ownership and an effective voice in development of climate information products and services.



**Develop the capacity to use and effectively demand AGROMET ADVISORIES**



**Climate Information services from NMHS should be Supply driven and their should be full understanding of its usability in action**



**Farmer should receives information what farmer wants**

- Collective information on weather farm management advisory should be provided.**
- Climate information services to transform climate risk agriculture to climate smart agriculture.**





Television

# New Technologies for Dissemination of Agromet Information to the User Community



News Paper



Mobile



Internet



FM Radio

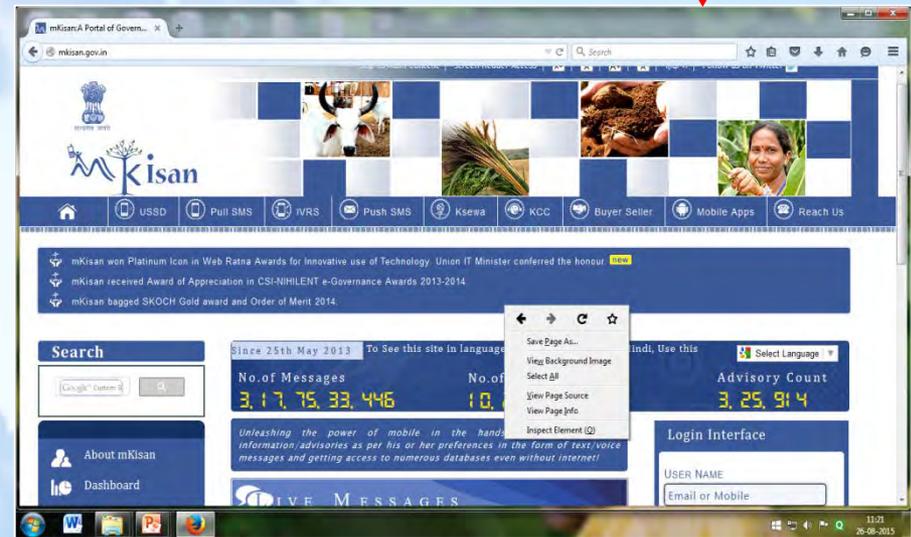


Kisan Call Centres

E-Agromet  
Bulletin  
Generation



- Dissemination
1. Abridged Advisories
  2. Extreme Weather Warnings



# Mobile Advisory in regional language



The number of farmers receiving SMS Agromet Advisories increased from 500 to 11.5 millions as on today

पावसाचा अंदाज-बारामती परिसरामध्ये दि. ५,६ व ७ जून रोजी वादळी वा-यासह पाऊस होण्याची शक्यता असून यापासून बचावासाठी आपल्या पशु व पिकांची योग्य ती काळजी घ्यावी-केव्हीके बारामती



# Farmer's Registration for SMS advisory through Ministry of Agriculture

Agricultural Meteorology x imdagrimet.gov.in/farmer/ x

← → ↻ imdagrimet.gov.in/farmer/Form.php ☆ ☰

## Farmer Registration Form

Farmer Name\*

Mobile No\*

State\*

District\*

Block\*

Crop 1

Crop 2

Crop 3

Crop 4

Other Crop

Enter Image Text\*



The form is overlaid on a background image showing a farmer in a field and a weather station. The form fields are: Farmer Name (text), Mobile No (text), State (dropdown), District (dropdown), Block (dropdown), Crop 1 (dropdown), Crop 2 (dropdown), Crop 3 (dropdown), Crop 4 (dropdown), Other Crop (dropdown), a button labeled 'cd02f', an 'Enter Image Text\*' label, a text input for image text, and 'Submit', 'Reset', and 'Home' buttons.

# Touch Screen Kiosk at block level

- Information on different Crops, diseases, recommendations.
- Crop advisory in Marathi language is made available to farmers.

**Interactive voice response technology**



# Touch Screen Information Kiosk (TSIK) initiative for farmers by Central Research Institute of Dry Land Agriculture (CRIDA) Hyderabad, India

Touch screen kiosks , provide one stop access to information needs of individual or group of farmers with minimum literacy standards

Kiosk allows users to navigate for information on

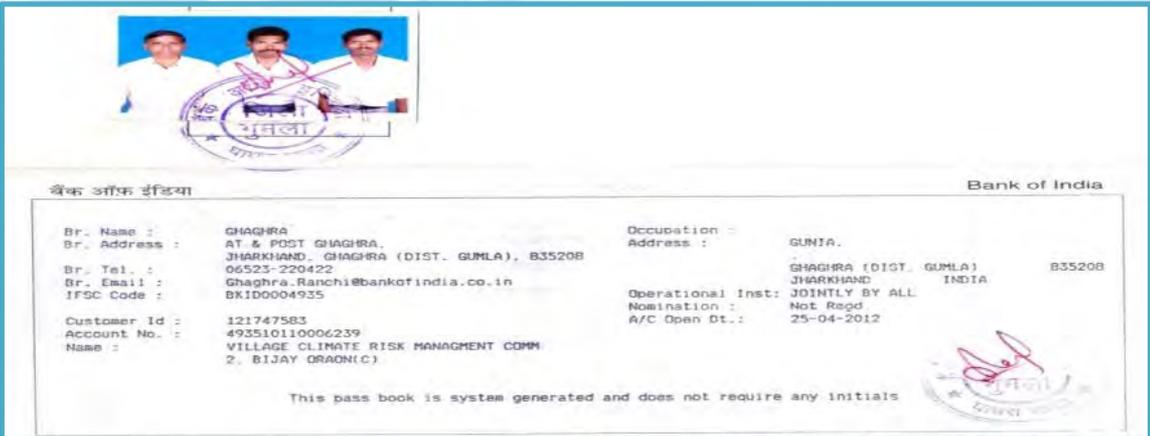
- Crops cultivation practices,
- Agriculture inputs
- Crop diagnostic kit
- Management time table
- Farm machinery and
- market information etc.,



# Village Climate Risk Management Committee



- Comprises of **12-20 members**, represent the community
- Elected President, Secretary and Treasurer
- Manages the **custom hiring centre** for farm machinery
- Under takes repair, maintenance of equipment
- Mobilizes fellow farmers for capacity building programs
- Collectively decide the **implementation of interventions** & pass appropriate resolutions
- **Operates bank account**, deposits include hiring charges and farmers share towards critical inputs like seed, breeds & other inputs



Name of the VCRMC	Village name	No. of members	Bank details	
			A/C no.	Amount
VCRMC, Gumla	Gumla	12	493510110006239	44000



## Enabling Farmers to collect climate data



- Engaging Farmers in determining information packages via participatory platforms.
- Intermediaries to support data collection & Provision at the farmer level.
- By getting involved in the observation of weather data, farmers can help to produce location-specific agromet advisories.



Farmers are provided with rain gauges by the programme  
**Simple rain gauges for collecting rainfall data in the field.**

In addition to provision of rain gauges to farmers, also provide thermometers for monitoring both rain and temperature, in support of better agricultural modeling and zoning exercises.

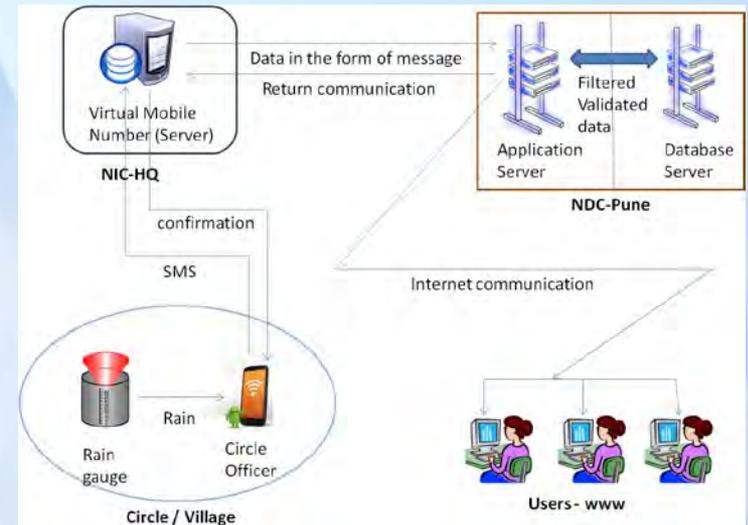


# Strengthening of Agromet observatories at Block Level

- IMD in collaboration with Ministry of Panchayati Raj (at Panchayat level) will work for effective delivery of Agromet Advisories for the farmers and installation of rain gauge in each Panchayat to record rainfall data under Gramin Rainfall Monitoring Mission (GRMM).
- IMD shared list of blocks with the ministry. On pilot mode, 100 blocks have been identified to install rain gauges.
- **Addresses submitted for 2 blocks of Karnataka to SI Division. Contacted to Kerala Nodal Persons. Decision has to be taken for installation of rain gauges in the blocks. Collection of contact information for panchayat functionary is in progress).**
- Proposed to install Mini Observatory at Panchayat level.



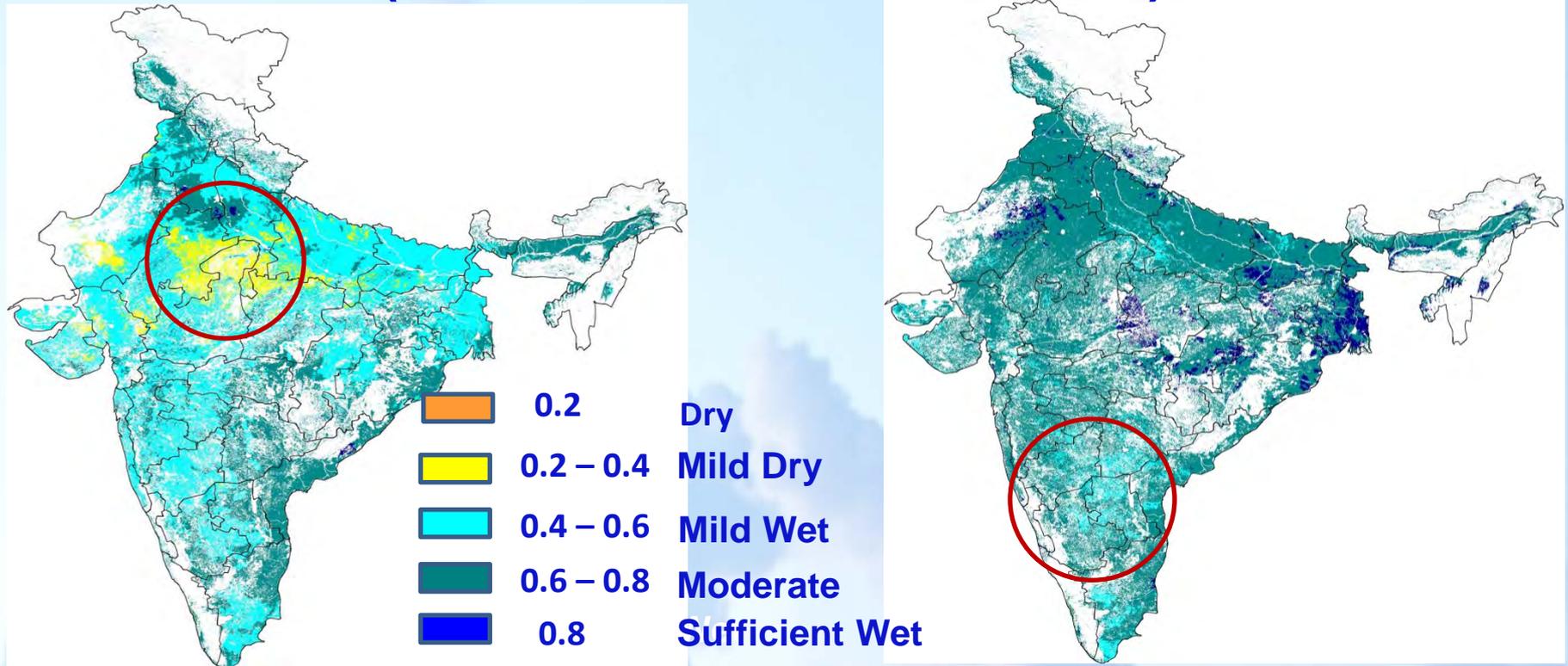
Rain gauge will be installed at Panchayat Level



Collection and transmission of rainfall data from Panchayat Level



# Available Surface moisture Monitoring using Satellite LSWI (Southwest monsoon of 2015)



. Some part of Rajasthan, Uttar Pradesh and Madhya Pradesh shows mild dry moisture status start of June.

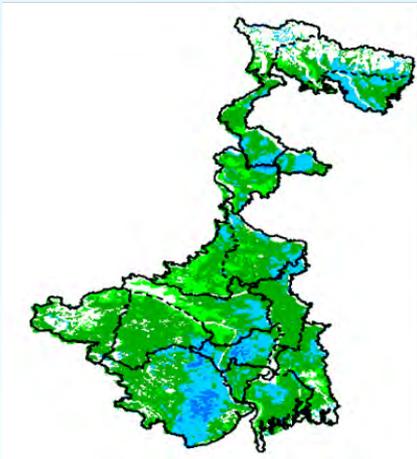
The affected states of Maharashtra and Karnataka show mild wet conditions throughout the season.

The moisture status in the states of Punjab, Haryana, Uttar Pradesh, Bihar, Rajasthan and Madhya Pradesh was moderately wet in the month of August.

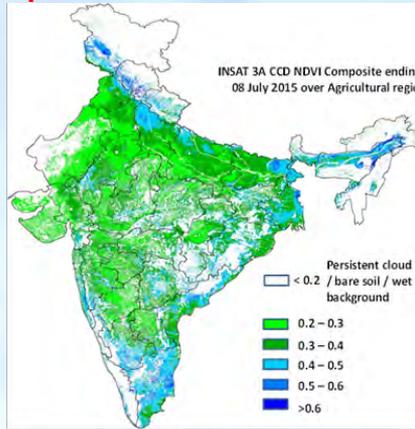


# Satellite Products used for AAS

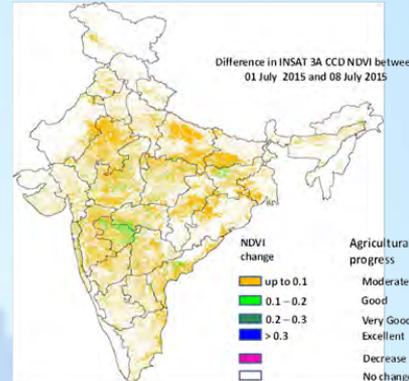
NDVI maps at State, National and Progress during the week



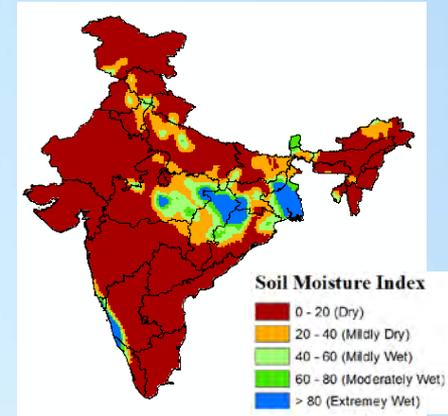
**Sowing Suitability of crops**



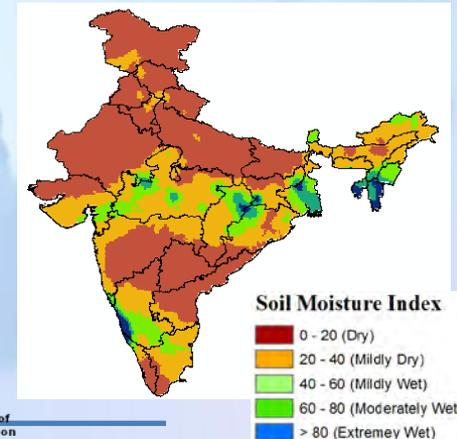
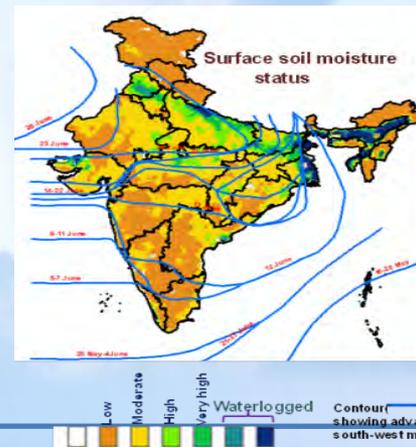
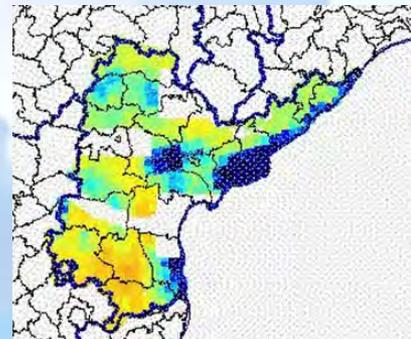
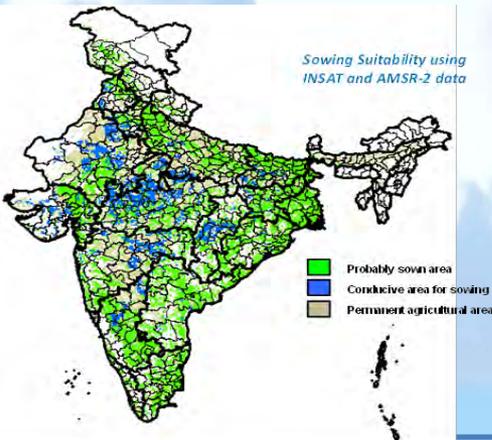
**Surface Soil Moisture from SMOS**



**Surface soil moisture estimation by passive microwave sensor**



**Surface soil moisture estimation by water balance method**



# Operational Agrometeorological Services

The Agromet services provide a very special kind of inputs to the farmer as advisories that can make a tremendous difference to the agriculture production by taking in time actions against extreme weather events. This has a potential to change the face of India in terms of food security and poverty alleviation.

Network of AAS units in the



**TIER 1**  
Apex Policy Planning Body,  
Delhi

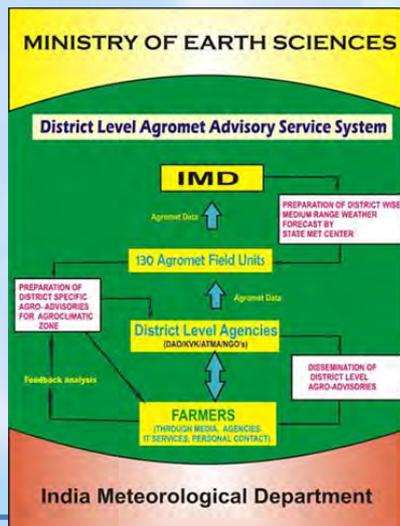
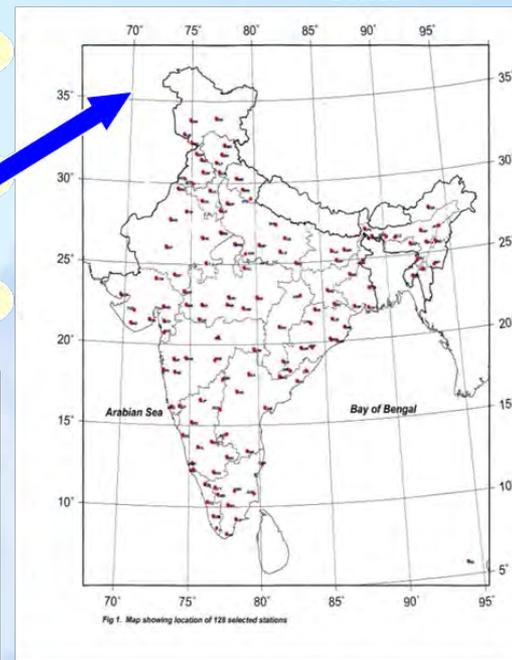
**TIER 2**  
National Agromet Service HQ  
Execution, Pune

**TIER 3**  
State Agromet Centres (28)  
Coordination/Monitoring

**TIER 4**  
Agromet Field Units  
Agroclimatic Zone Level (130)

**TIER 5**  
District Level Extension and Training  
Input Management as advisory~612

Network of 130  
Agromet Field  
Units

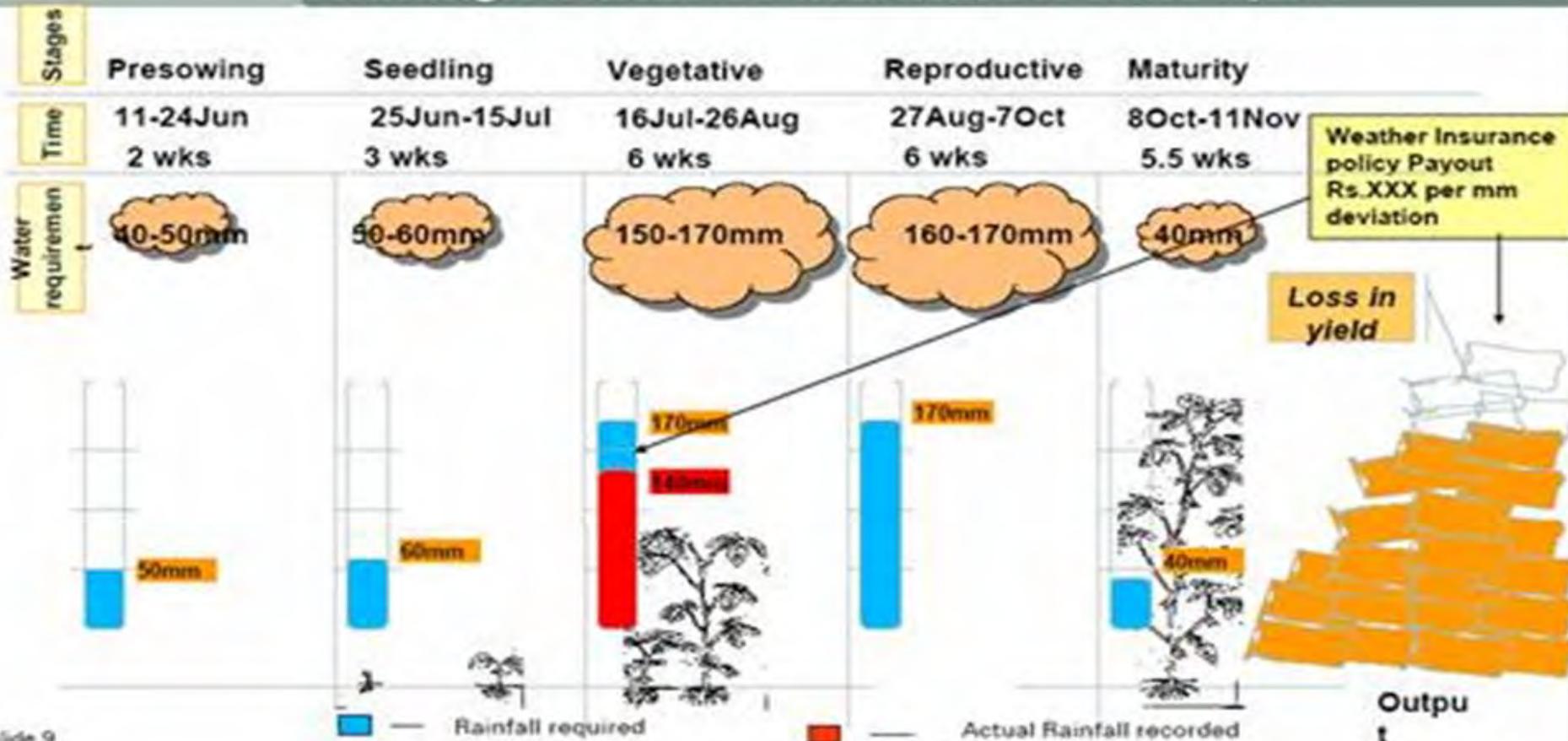


# Weather Risk Insurance for Agriculture

Swiss Re



## Deviation in rainfall and risk management through Weather Insurance - Example



# Regional consultation meetings on GFCS

- Ibero-American Regional Climate Services Workshop
- Regional Consultation on GFCS in the Indian Ocean
- Regional Consultation meeting on climate services in the North-Eurasian countries
- Central Asia GFCS Observation Workshop
- GFCS workshop and national consultation in conjunction with Training of trainers (ToT) of Climate Field School (CFS) for Asia-Pacific
- Regional Consultation on Climate Services at the National Level for South East Europe
- Regional Workshop on Climate Services at the National Level for Latin America
- Regional Consultation on GFCS for Small Island Developing States in the Pacific
- Regional Workshop on Climate Services at the National Level for Small Island Developing States in the Caribbean
- Regional Workshop on Climate Services at the National Level for the Least Developed Countries (LDCs) in Asia



# Key gaps and needs in in Third Pole region

1. Capacity development of professionals and communities to assess, manage and monitor risks of climate variability and change on agriculture better.
2. Capacity development of professionals and communities to access, understand, interpret and use climate information and products appropriately.
3. Improved, standardized, and quality controlled agricultural monitoring data that is compatible with environmental and climate information.
4. Monitoring and evaluation of the appropriate, effective, and cost-effective use of climate information for agricultural decisions.



# continued

## Key gaps and needs

5. Research and prediction of agricultural impacts associated with climate variability and climate change, in collaboration with the climate research community.
6. Development and deployment of early warning systems appropriate to the agriculture sector, and other interface tools that help professionals and communities access climate related information;
7. Sustainable financial and technical support.
8. Better collaboration with the climate community for interdisciplinary policy, practice and research.



# Implementation approach in the in the third pole region

1. Establishing the leadership and management capability to take the Framework forward, including creating the structures needed to coordinate the technical work of the Framework, and to monitor its success.
2. Identifying objectives and targets to address current deficiencies in the provision of climate services in priority areas.
3. Creating and successfully delivering a range of projects to address the key shortcomings in the provision of climate services, ensuring they are timely, reliable, useful, properly communicated and easily understood.



# continued

## Implementation approach

4. Developing in the third pole region capacities to enable the implementation and integration of new initiatives in emerging areas and priority sectors.
5. Encouraging all countries in the third pole region and partners to the Framework to undertake actions to address the gaps and priorities identified in this plan, its annexes and exemplars, and inscribe these actions in a centrally-managed catalogue of activities.



One rain gauge for One village



*Thank you all*

S. NIMBALKAR

