

RCC product and service requirements for agrometeorological services

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भारत मौसम विज्ञान विभाग
INDIA METEOROLOGICAL DEPARTMENT



Present Status & Use of Climate Forecast in Agriculture

Processes for utilization of seasonal forecasts: Monsoon 2015

- SASCOF forecast on seasonal rainfall
- IMD's forecast on seasonal rainfall (LRF)



Monitoring and Preparedness at Policy level

- ✓ Prime Minister and other Ministers including Agriculture
- ✓ Crop Weather Watch Group (every Friday) by Ministry of Agriculture
 - Weather and climate
 - Water resources- reservoir position
 - Agriculture input and tools availability for enabling micro irrigation system
 - Credit availability
 - Insurance mechanism
- ✓ Provinces likely to be affected by deficient / excess rainfall forecast for coordination at province level to enhance action oriented preparedness.



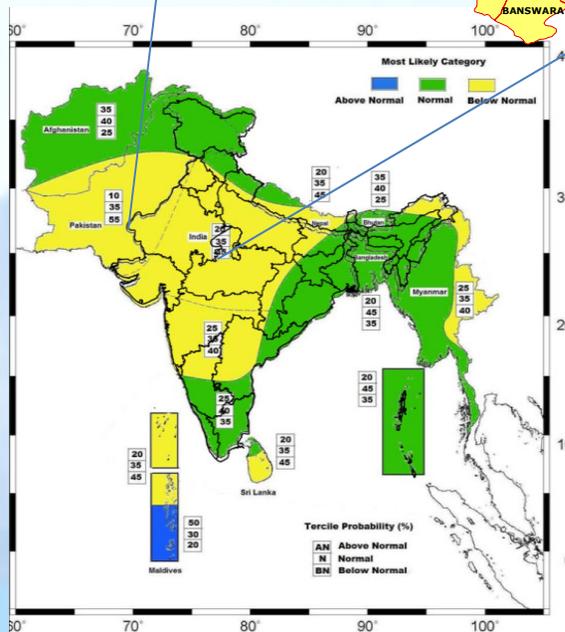
operational forecast issued by IMD for the 2015 southwest monsoon rainfall

Region	Period	Forecast (% of LPA)		Actual Rainfall (% of LPA)
		22 nd April	2 nd June (Update)	
All India	June to September	93 ± 5	88 ± 4	86
Northwest India	June to September		85 ± 8	83
Central India	June to September		90 ± 8	84
Northeast India	June to September		90 ± 8	92
South Peninsula	June to September		92 ± 8	85
All India	July		92 ± 9	84
All India	August		90 ± 9	78
All India	August to September		84 ± 8	77



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

- Using the available forecast ICAR generated state specific maps and shared with state government authorities.



Seasonal rainfall probability for Rajasthan state –

Above normal	20%
Normal	35%
Below normal	45%



Enhancing the Preparedness for Agricultural Contingencies in monsoon 2015



Overall objectives of this meeting in April –

- Karnataka, Maharashtra, Telengana, Gujarat States
- sensitizing the various stakeholders on the ensuing monsoon season.
- revising district contingency plans in the eventuality of likely deficient rainfall.
- planning for –
 - Irrigated / Rainfed areas
 - Method of Cultivation
 - Varieties, Seeds availability and other resorces



Interface Meetings for Crop Planning

National



Telangana



Gujarat



Maharashtra



Updating of contingency plans with Universities/KVKs

CRIDA/AICRPDA Research outputs

Agri. Universities



District based Contingency Plans
Contingency Plans prepared for 600 Districts



MP



Rajasthan



Karnataka



UP



Monthly and Seasonal forecast at State level

Methodology

Forecast From GCM/AOGCM

Evaluation & Bias Correction

Multi-Model Ensemble

Deterministic

- 1.Simple Mean (MME1)
- 2.Superensemble(MME2)
- 3.Supervised PCR (Sup-PCR)
- 4.Canonical Correlation Analysis (CCA)

Combined Forecast

Probabilistic

Validation in Hindcast

Final Forecast



Summer monsoon (JJAS) Monthly and Seasonal Rainfall

JJAS

Month/ Season	No. of subdivisions having the ERFs skill more than 60%
JJAS	31 (91%)
June	32 (94%)
July	30 (88%)
August	26 (76%)
September	24 (71%)



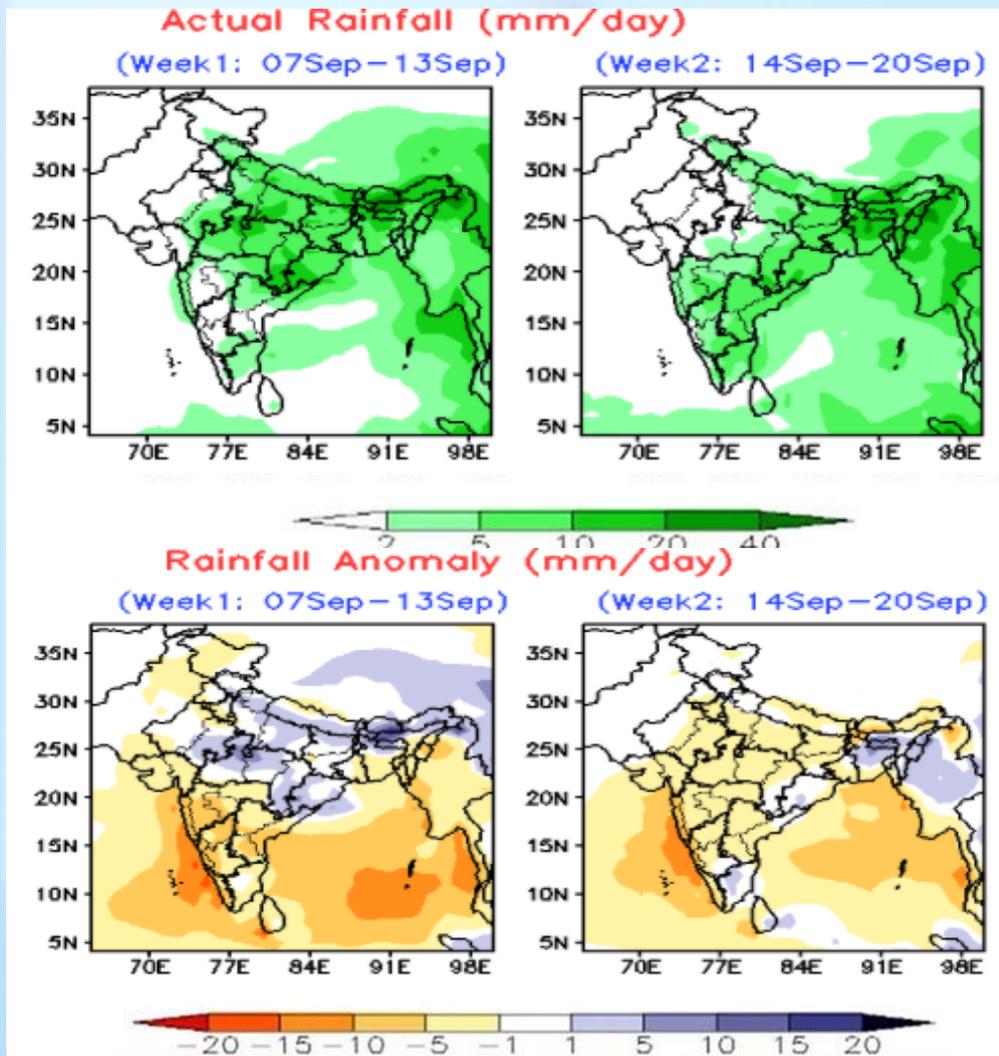
Climatic risk management in Agriculture

- ✓ **Climatic risk matrices (CRM) for different crops**
- ✓ **Desegregation of seasonal forecast to station level**
- ✓ **Linking with crop simulation model to identify the viable management practices against target yield**
- ✓ **Decision support based on CRM for the crop**
- ✓ **Communicating to selected farmers group**



Use of sub-seasonal forecast in Agriculture

- ✓ Based on this forecast advisories for tactical decisions on agricultural operations are prepared
- ✓ Issued on every Friday
- ✓ Disseminated to National/ State level planners and Field Units



Automation and ICTs in regulation of irrigation water in KLI Command area of Telangana State, India

Stake holders

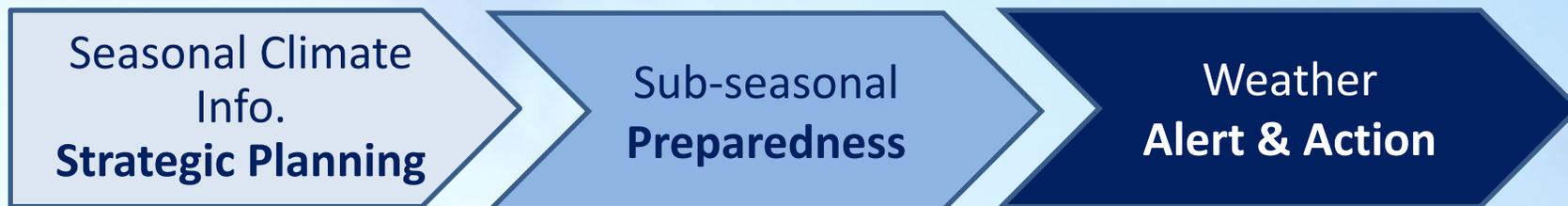
1. State Agricultural University, Hyderabad
2. Department of Irrigation. Govt. Telanagana
3. IIT, Kandi, Sangareddy
4. IIIT, Hyderabad
5. IMD

Deliverables

- Regulation of Irrigation water based on **Extended Range** Weather Forecast
- Precise water delivery based on soil moisture condition and crop water demand
- Efficient irrigation water delivery system through Automated valve regulation
- Increased irrigation water distribution and use efficiency through centralized canal control system
- Capacity building to the stakeholders on recent advancement in irrigation water management and Water Use Efficiency in command area



Deptt. Of Agriculture at National level



- ❖ Pilot locations, timing and logistics of DSS design and development – training and capacity development plans and schedule
- ❖ Review – data collection – system development
- ❖ Top down and bottom up approach for capacity building at **pilot sites** –
India - *Tamil Nadu, Bihar, Odisha;*
Other countries – Bhutan, Myanmar and Sri Lanka



Forecast Application for Risk Management (FARM) School in Agriculture as part of International Research Applications Program (IRAP)

Top-down Approach

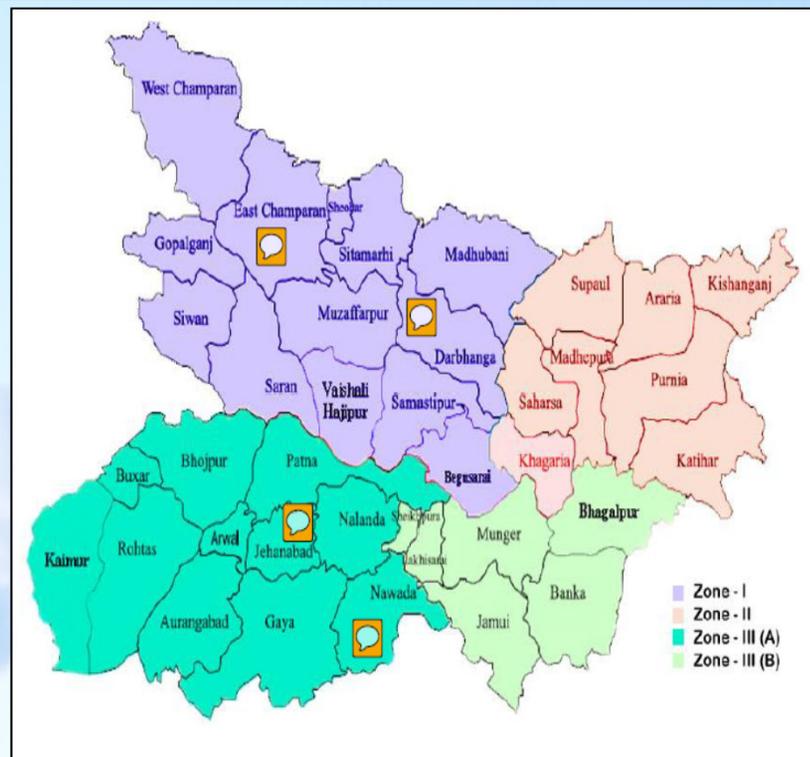
- ❖ Translating forecast into crop-relevant information
- ❖ Providing easy access to best available forecast products
- ❖ Facilitating feedback

Bottom-up Approach “FARM School”

- ❖ Enhancing farmers’ receptivity and capacity in ingesting multi-timescales information into plans and decisions
- ❖ Understating crop weather interaction, analyses on climate events,
- ❖ understanding weather forecast information and its translation into farm actions,
- ❖ Understanding domain climate, water resources, pest and disease outbreak in relation to weather and monsoon



Bihar state (India) – Rural Livelihoods



Forecast Application for Risk Management (FARM) School in Agriculture as part of International Research Applications Program (IRAP)



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FARM – Implementation in Bihar, India



Farmers group

FFS + Text

Only FFS

Only Text

Control

Darbhanga
Adhikar NGO

East Champaran
SLM Foundation

Nawada
Mahila Vikas
Samiti

Jehanabad
Kaushalya
Foundation



Six Integrated Strategic Objectives

1. Determine Vulnerabilities and User Needs
2. Co-Produce Climate Information
3. Produce and Provide Relevant Decision Support Tools
4. Build Local Capacity
5. Improve System Through Evaluation
6. Integrate Social Science Research in Design of Climate Services



Support to GFCS Implementation in South Asia

- ❖ **Capacity Development of Users: Enhance use of climate information – profiles, gaps, needs, training**

Farmer Field Schools being conducted by RIMES and local institutions - Tamil Nadu and Myanmar



Source: RIMES

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Sri Lanka – water sector

- ❖ The Department of Irrigation (DoI) and Department of Agriculture (DoAg) are regular and active participants in the NCOFs organized by the DoM.
- Irrigation Department of Sri Lanka received this message in **October 2015** at the **South Asian Climate Outlook Forum**. These forecasts were reviewed during the **Monsoon Forum** organized by DoM.



Collaborating Institutions: DoM, DoI and DoAg, Sri Lanka, RIMES, IIT Madras



Source: RIMES

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Use of Climate Information for Irrigation Planning – Sri Lanka

- ❖ After careful assessment of current water levels in the reservoirs,
- ❖ Irrigation Department issued special instructions to the Irrigation engineers in-charge of reservoir operations, to maintain reservoir water levels 1m below the full capacity level,
- ❖ allowing flood detention and also for smooth operation of radial gates in the spillways.
- ❖ It was a relief to the Irrigation Department and to the government, the ability of minimizing the flood damage
- ❖ and also keeping the farming community alert over the possible inundation due to excess drainage based on the weather forecast.



Source: RIMES

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Product and service requirement

- Development of map room and tools for climatic analysis of various parameters at different spatial and temporal scales
- Seasonal forecast (Deterministic and probabilistic) at National and Cluster of province for larger Nations
 - **Rainfall : amount, no. of rainy days, dry / wet spell**
 - **Temperature : Max., Min., Mean, frequency of events of heat / cold waves**
 - **Humidity : Max., Min., Mean**
- Development of various climate indices based on realized and Forecast data
- Sub-seasonal forecast (Deterministic and probabilistic) at National and province for larger Nations
 - **Rainfall : amount, no. of rainy days, dry / wet spell, start and cessation of rain**
 - **Temperature : Max., Min., Mean, frequency and length of events of heat / cold waves**
 - **Humidity : Max., Min., Mean**
 - **Wind : Speed**



Product and service requirement (Contd....)

- Capacity building of NMHS personnel to analyse and interpret various climate products
- Guidance to organize NCOF
- Capacity building of NMHS personnel to generate / extract and interpret various climate forecasts at province, cluster of districts and district level for application and planning in Agriculture
- To guide in developing Capacity building programme of intermediaries (Agricultural Scientists / Agrometeorologists) in forecast application for risk management in agriculture and FARM School training to enhance decision making ability of farmers.

Thank You



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