

## Improving reuse in block-level agromet advisory system

- India Meteorological Department (IMD) has introduced the Integrated Agromet Advisory Service (IAAS) with 130 Agro-Meteorological Field Units (AMFUs) since 2008.
- In IAAS, each AMFU prepare agromet advisories for crops and livestock based on MRF on every Tuesday and Friday. The process of AAS preparation is shown in Fig.1.

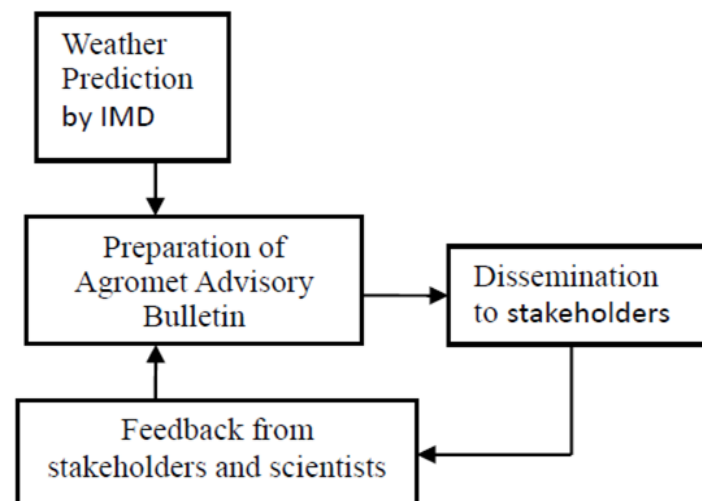


Fig. 1: Steps for AAS preparation

- IMD has taken up the block-level AAS based on block-level MRF since 2015 and it is currently operating in a few blocks of each district.
- To improve the coverage, IMD is planning to provide block-level AAS to 6500 blocks across 660 districts all over India through District Agromet Units (DAMUs).

### Issue:

- Preparation and dissemination of agromet advisory for several blocks and crops within the stipulated time may require many number of human resources.

### Basic Idea:

- For a given period (year/season), if the weather situation of the current block is similar to weather situations of nearby blocks, then there is a scope to reduce human effort by reusing the advisory.

### Proposed Framework:

Given weather data of current year, category-based weather conditions (CWCs) are formed by considering the weather categories defined by IMD.

### Steps:

- Computation of CWCs for the past weather (n-1) years weather data
- Computation of CWC for the current year weather data and extracting similar CWCs

### Experiments (Rice Phenophases)

- Temporal Reuse
- Spatial Reuse
- Temporal and Spatial Reuse

Years: 2015-2019

**Temporal reuse:** For a given block, given CWCs of a sequence of periods (years/ seasons/ phenophases), once the agromet advice is prepared for a CWC for the given period (year/season/phenophase), it can be reused for similar CWCs in subsequent periods.

**Spatial reuse:** CWCs of the current block are compared with the CWCs of nearby blocks for the given period (year/season/phenophase). Once agromet advice is prepared for the current block CWCs for the given period (year/season/ phenophase), it can be reused for similar CWCs of nearby blocks for the same period.

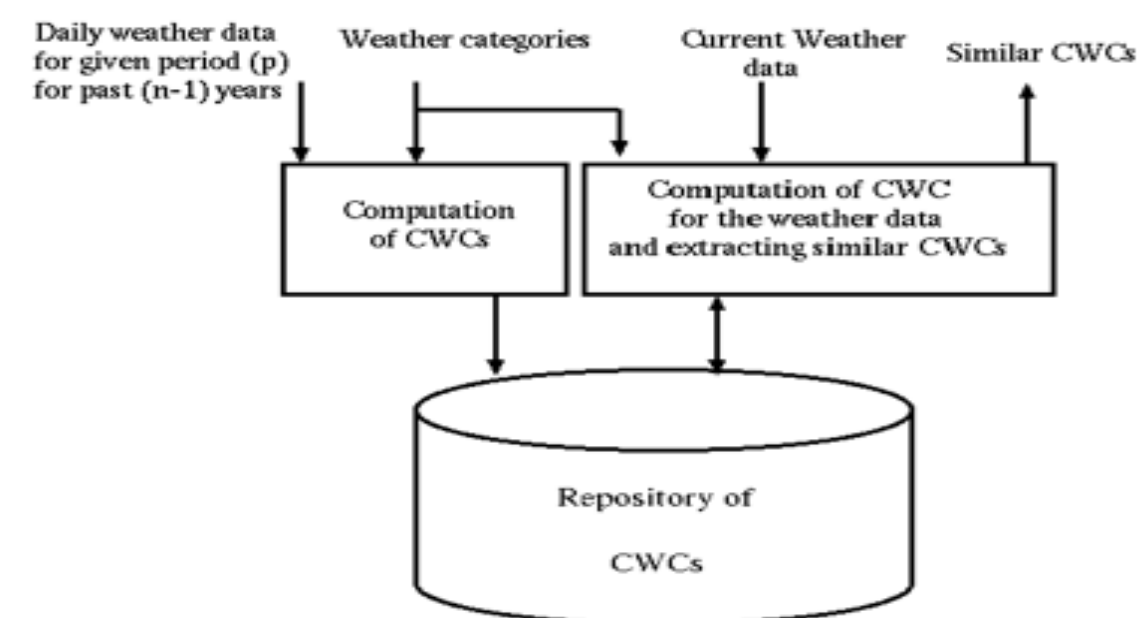


Fig. 2: Components of the proposed framework

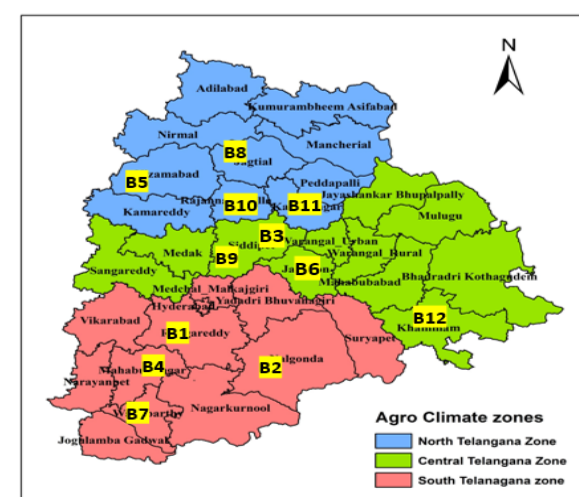


Fig. 3: Zone-wise block distribution of Telangana

Table 1: Rice crop phenophases

Period	Kharif (start week#-end week#)	Rabi (start week#-end week#)
Sowing	W27-W32(6)	W50-W1(4)
Transplanting	W32-W36(5)	W1-W4(4)
Maximum Tillering	W35-W38(4)	W5-W9(5)
Panicle Initiation	W39-W44(6)	W9-W12(4)
Flowering	W43-W48(6)	W12-W16(5)
Maturity	W48-W52(4)	W16-W20(5)

### Results:

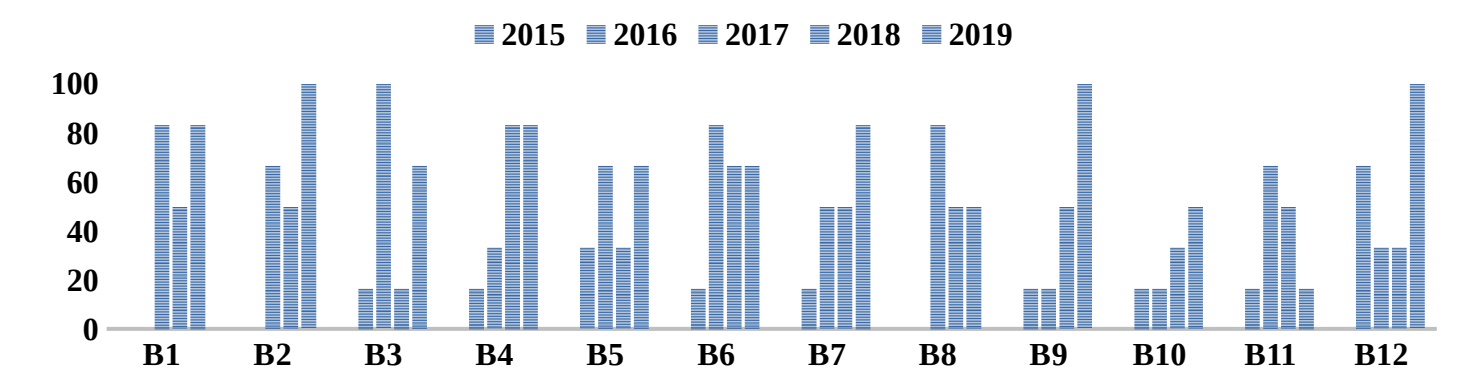


Fig. 4: Block-wise temporal reuse from year 2015 to 2019 for pt=Maturity (Kharif season)

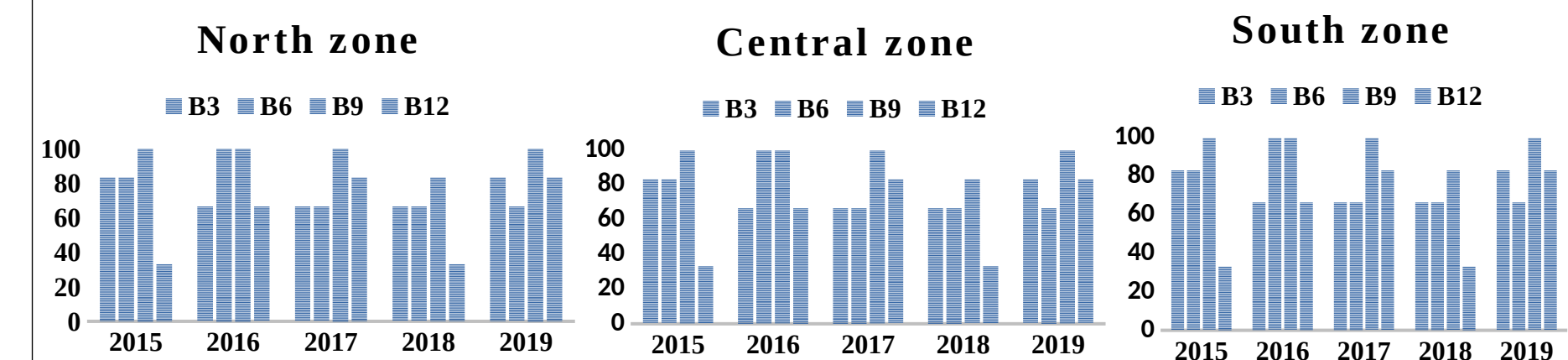


Fig. 5: Zone-wise spatial reuse from year 2015 to 2019 for pt=Maturity (Kharif season)

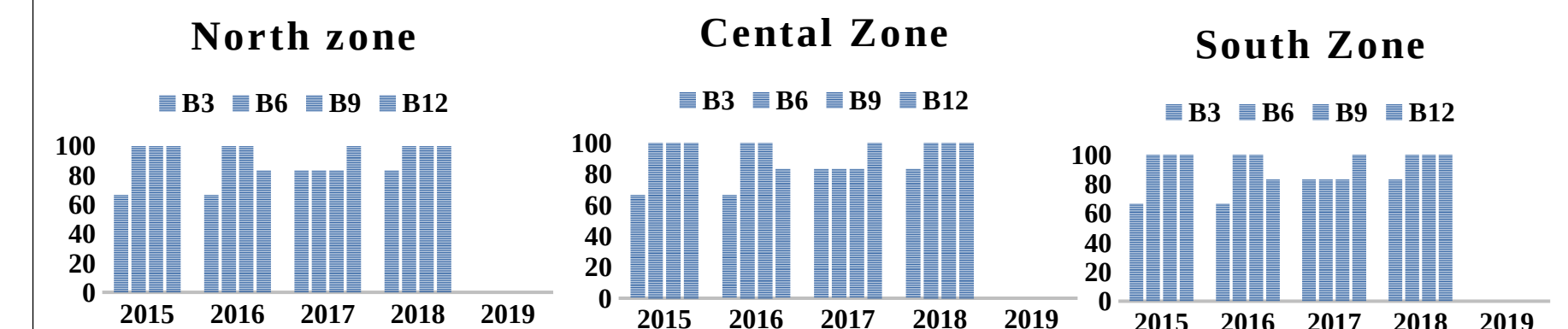


Fig. 6: zone wise temporal and spatial reuse from year 2015 to 2019 for pt=Maturity (Kharif season)

**Summary:** The experimental results on the weather data from 2015 to 2019 on 12 blocks of three zones of Telangana state show that, there is a scope to improve agromet advisory preparation process by exploiting reuse **both spatial and temporal reuse (both Kharif and Rabi seasons)**

### Publications:

- Alugubelly Mamatha, Polepalli Krishna Reddy, Gade Sreenivas, BalajiNaik Banoth, "IT-based Framework for Block level Agro-meteorological Advisory System", 12th International Conference on Computing for Sustainable Global Development, IEEE conference, 2018.
- Alugubelly Mamatha, Polepalli Krishna Reddy, BalajiNaik Banoth and Sreenivas Gade, " Blocklevel Agrometeorological Advisory System by Exploiting Reuse," National Seminar on Agrometeorological Interventions for Enhancing Farmers Income, 2020. (Abstract submission)