

**Recommendations of the
Sub-Group - 2**

on

**Decision Support Systems, Crop Modelling
& Integrated Approaches**

Under

The Task Force on Use of Technology for Agriculture Insurance

Constituted by

**NITI (National Institution for Transforming India) Aayog
Government of India**

Key Recommendations

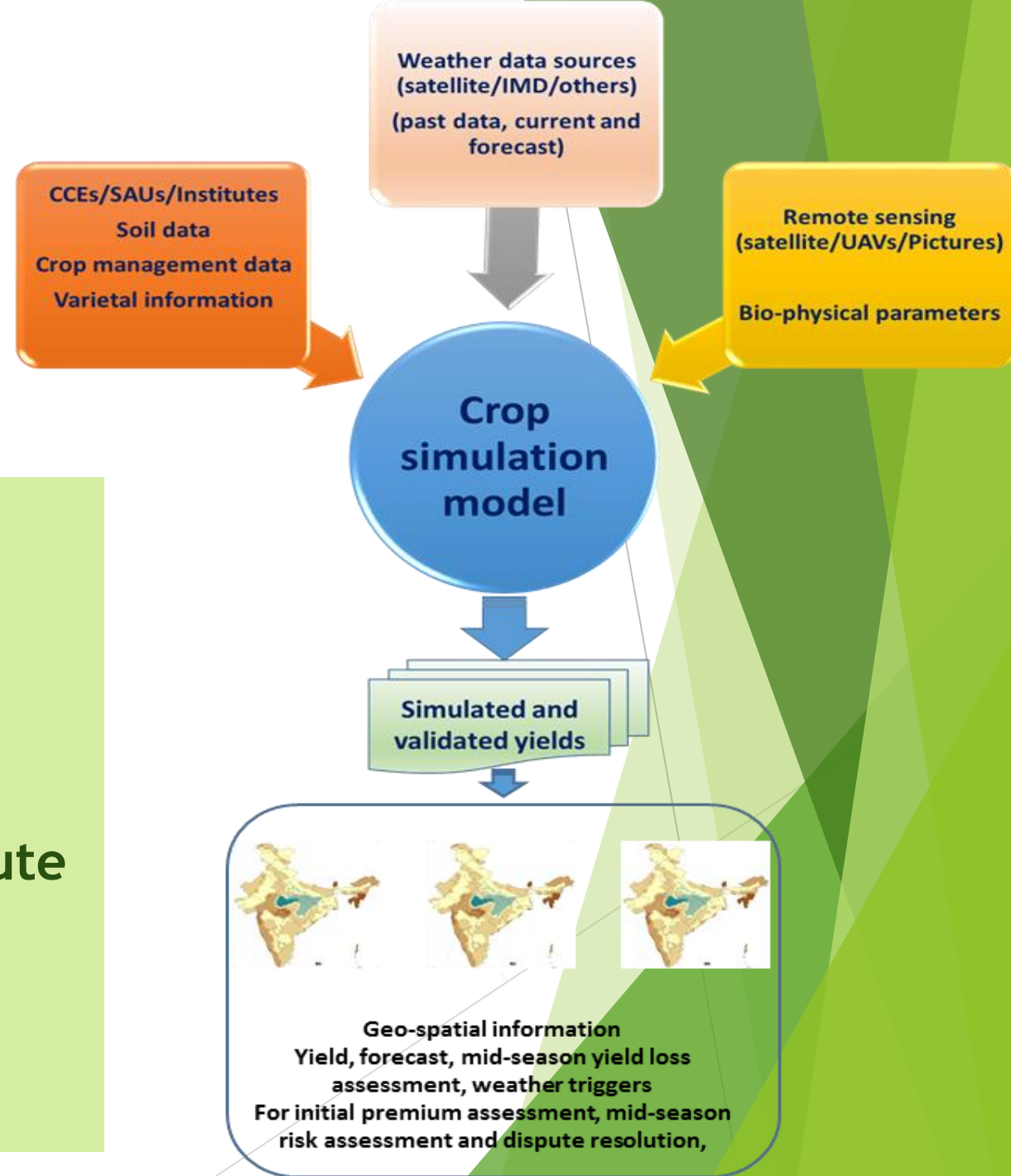
- ▶ The integrated approach is a more reliable alternative than existing methods used for various aspects of crop insurance.
- ▶ Pilot projects may be initiated in Rabi, 2016-17 onwards for taking a final call on nation-wide operationalization.
- ▶ Setup a National Agency, Develop operationalization prerequisites of technology by earmarking 0.5% of the premium collected for crop insurance.

Recommendation 1:

The integrated approach is a more reliable alternative than existing methods used for various aspects of crop insurance.

For addressing the current constraints

1. Rapid yield forecast
2. Mid-season on-account payments
3. Optimization of CCEs
4. Reduction in moral hazards and dispute resolution
5. Weather indices: Defining thresholds



Addressing the current constraints through technology

1. Rapid yield forecast

2. Mid-season on-account payments

► Constraints:

- Currently statistical models, CCEs data and yield guide pre-season yield forecast.
- Large uncertainty as seasonal weather forecast is not considered.
- Mid-season climatic stress related crop yield loss estimation is difficult and subjective.

► **Suggested solution:** Use integrated technology to forecast yield and estimate mid-season climatic stress related yield loss for on-account payments.

► **Resolution:** Insurance Unit level (Village / Village Panchayat)

Addressing the current constraints through technology

3. Optimization of CCEs

- ▶ **Constraints:** Large number of CCEs, cumbersome, expensive, time taking, and labour intensive associated with moral hazards.
- ▶ **Suggested approach:**
 - ▶ **Approach 1**, downscaling of simulated yields:
 - Simulate past yield and estimate production at a unit level.
 - Crop area weighted redistribution of production to each village.
 - Management strata based few benchmark high quality CCEs
 - Village level yields are fine-tuned using RS, weather and crop model.
 - ▶ **Approach 2**, Management strata based targeted yield estimation:
Targeted and reduced number of CCEs at management strata based 'bench-mark sites' to improve overall efficiency, quality and reliability.

Addressing the current constraints through technology

4. Reduction in moral hazards and dispute resolution

- ▶ **Constraint:** No mechanism to challenge over or under reporting of crop yields.
- ▶ **Suggestion:** Use of integrated technology (RS+CSM) to check the disputed yields.
 - ▶ Use crop models to delineate the hotspots for crop production losses with respect to climatic stresses.
 - ▶ Models, IT and ICTs should be used judiciously for rapid, robust, easy and efficient dissemination, implementation and monitoring.

5. Creating weather indices

- **Constraints:** Determining accurate weather triggers and term sheets to improve farmer satisfaction
- **Suggestion:** Use integrated (CSM + Statistical indices) tools to develop 'triggers' or weather thresholds for crops to structure pay-outs

Recommendation 2:

Short-term: Pilot projects may be initiated

Purpose: To examine the performance of the technology and gain more confidence before taking a final call on nation-wide operationalization.

Provides opportunity to fine tune implementation steps, corrections, infrastructure and manpower requirement and cost-benefit assessment

1. Two districts for major crop(s) in selected states from rabi 2016-17 for one year. May require ~Rs. 1.5 crore/district (cover rabi, kharif and summer seasons)
2. State governments may also fund, involve the SAUs, ICAR, CGIAR Institutes, MNCFC, ISRO, IMD, etc.
3. The expertise of IARI, ISRO, IMD and MNCFC to develop a simulation modelling and RS based geo-spatial DSS for wider-operationalization

Recommendation 3:

Setup a National Agency for Monitoring the Crop Insurance

Medium term (2018-2020): Setup a National Agency in 2018 to facilitate

- Institutional and manpower infrastructure built-up and linkages for implementation of technology at National level.
- Data flow, technical expertise and training
- Stake-holder feedback based technology fine-tuning
- Operationalization at National-scale

Long-term (2021 onwards): Technology is used for multiple crops at National level.

- Development of geo-spatial database and other pre-requisites.
- Operationalization of technology by earmarking 0.5% of the premium collected for crop insurance.

Pre-requisites for technology operationalization at National scale.

- ▶ A 48 hour interval satellite data on crop condition
- ▶ Increase AWS density, create an integrated database of all weather stations
- ▶ CCEs and soil surveys, soil health card sampling sites may be geo-tagged
- ▶ Digitization of revenue plots on a GIS platform and updating cadastral maps
- ▶ Data harmonization and database development in integrated DSS for real-time crop monitoring and forecasting of yield for major crops.

- ▶ **Capacity Building for use of RS data and crop modeling.**
 - ▶ FASAL programme: A network of scientists of ISRO, ICAR-Institutes, SAUs, State Agriculture Departments, IMD and MNCFC.
 - ▶ The MNCFC, using RS and CCEs along with statistical models for yield forecast.
 - ▶ IARI, IMD, MNCFC may provide capacity building

Costs associated in implementing technology

A broad estimate

- As per the new guidelines, 4 CCEs/village or village panchayat for major crops and 8 for other crops (~total CCEs ~ 40.0 lakh).
- Total estimated cost for CCEs = 40 lakh * ₹ 1000 = ₹ 400 crores/ year

Cost of implementation for proposed approach at all India level

Item/component	Cost (In ₹)
Onetime cost	
Development of an integrated system for large scale operationalization	₹ 5 crores (one-time investment)
Institutionalizing state level yield estimation/ yield loss estimation setup (infrastructure)	₹ 200-300 crores (one-time investment)
Operational expenditure	
Remote sensing data	₹ 10 crores/ year
Weather data	NIL
Data collection/ processing / model running	₹ 50 crores/ year

Sub group

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- ▶ Dr. S. S. Ray, MNCFC, Member
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