

NATIONAL CONCLAVE

SUSTAINABLE FOOD SYSTEMS

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Anil Agarwal Environment Training Institute, Nimli, Rajasthan



Hyperlocal Weather Forecasting and Its Impact

- Precision Weather Insights for Every Kilometer
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What is Hyperlocal Weather Forecasting?

- Weather prediction at fine spatial resolution (1–3 km or sub-km).
- Integrates high-resolution models, IoT sensors, radars, satellites, and AI/ML.
- Focus on short-range forecasts (next few minutes to 24 hours).
- Example: Forecasts for a specific neighborhood or highway stretch.



Core Technologies Behind It

- High-resolution Numerical Weather Prediction (WRF, ICON, GFS downscaling)
- Nowcasting systems using Doppler radar and lightning networks
- IoT & Citizen Sensors for ground-level data
- AI/ML for model bias correction and rainfall detection



Advantages and Applications

- Agriculture: Farm-level rainfall & pest advisory
- Disaster Management: Early warnings for lightning & flash floods
- Aviation & Transport: Route-level visibility and wind forecasts
- Smart Cities: Flood control, traffic management, power grid protection
- Media: Personalized alerts and local updates



Future Scope and Challenges

Opportunities:

- Integration of AI + Satellite + IoT in real time
- District and panchayat-level forecast networks
- Citizen-driven data sharing
- Challenges:
- Sparse sensor network in rural India
- Data standardization and validation
- High computation cost



Thank You



NATIONAL CONCLAVE ON **SUSTAINABLE FOOD SYSTEMS**

