

# FARM-LEVEL WEATHER MONITORING & FORECASTING USING PHYSICS, DATA AND AI/ML

## Agriculture

**Pilot District**  
Washim, Maharashtra

**Geospatial Innovation Accelerator**  
SINE, IIT Bombay

### Technology Summary

We deploy our IoT based automatic weather stations (AWS) on the field. Using data from the AWS and other sources, we provide accurate hyperlocal weather forecasts and agro advisories for the specific farm.

**Technology Readiness Level 8**

#### Value Proposition

Our VUP is in our highly granular forecast with a reliable accuracy of 95% which is done using our patented hybrid weather model that combines physics of meteorology with data and AI/ML and update every 30 minutes to 3 hours.

#### Market Potential / Deployment Plan

Weather's growing vagaries - unpredictable rains, prolonged dry spells, unseasonal heat or cold - directly impact agriculture because farming depends on climate stability. Unpredictable weather means unpredictable livelihoods. That's why accurate, localized forecasts and data-driven decisions are now essential for resilient farming.

At WeatherCast Solutions, we combine advanced weather intelligence with actionable insights to empower farmers and agri-businesses to plan better and adapt faster. Adopting our technology - a combined solution of hardware and software that delivers reliably and quickly is essential for smarter way of farming.

With over 10,000 FPOs and more than 140 million farmers in India, and even more across South-East Asia, the potential for technology-driven transformation is immense. Our solutions can truly empower farmers, strengthen communities, and contribute to national resilience.

#### Applications

Weather has become increasingly erratic over the years - a reminder that climate variability is no longer a distant concern but a present reality affecting every sector. Our solution is customizable and provides actionable insights for any sector. Each sector - renewable energy, defence, agriculture, disaster management, logistics - face challenges due to the changing weather patterns. Hence adoption of technology and

- solutions such as ours can help businesses and entities be better prepared.

#### Environmental / Social Impact

Adoption of our accurate weather forecasts, agro advisories and insights in farming, leads to tremendous environmental and social impact.

#### Environmental impact:

##### Efficient resource use:-

Data-driven weather insights help optimize irrigation, fertilizer, and pesticide use - reducing water wastage and chemical runoff.

##### Climate resilience:

Timely forecasts and advisories enable farmers to adapt cropping patterns and protect soil health, mitigating long-term climate risks.

##### Reduced carbon footprint:

Smarter planning means fewer failed crops and less re-sowing, which lowers emissions from farm operations and input use.

##### Sustainable ecosystems:

When agriculture is guided by accurate forecasts, it reduces environmental stress on land and local biodiversity.

#### Social Impact:

##### Farmer empowerment:

Access to accurate weather intelligence enables small and marginal farmers to make informed, confident decisions.

##### Income stability:

Minimizing weather-related losses directly improves livelihoods and reduces debt cycles in rural communities.

##### Community resilience:

Gram Panchayats (GPs), FPOs and cooperatives using shared data platforms foster collective decision-making and knowledge sharing where not only the farmers but the entire community in a GP is benefitted.

##### Food security:

Reliable yields and efficient resource management ensure steady food supply - strengthening both rural and national stability.

#### Contribution to Sustainable Development Goals (SDGs)

**SDG 2, 12, 13 & 17**

