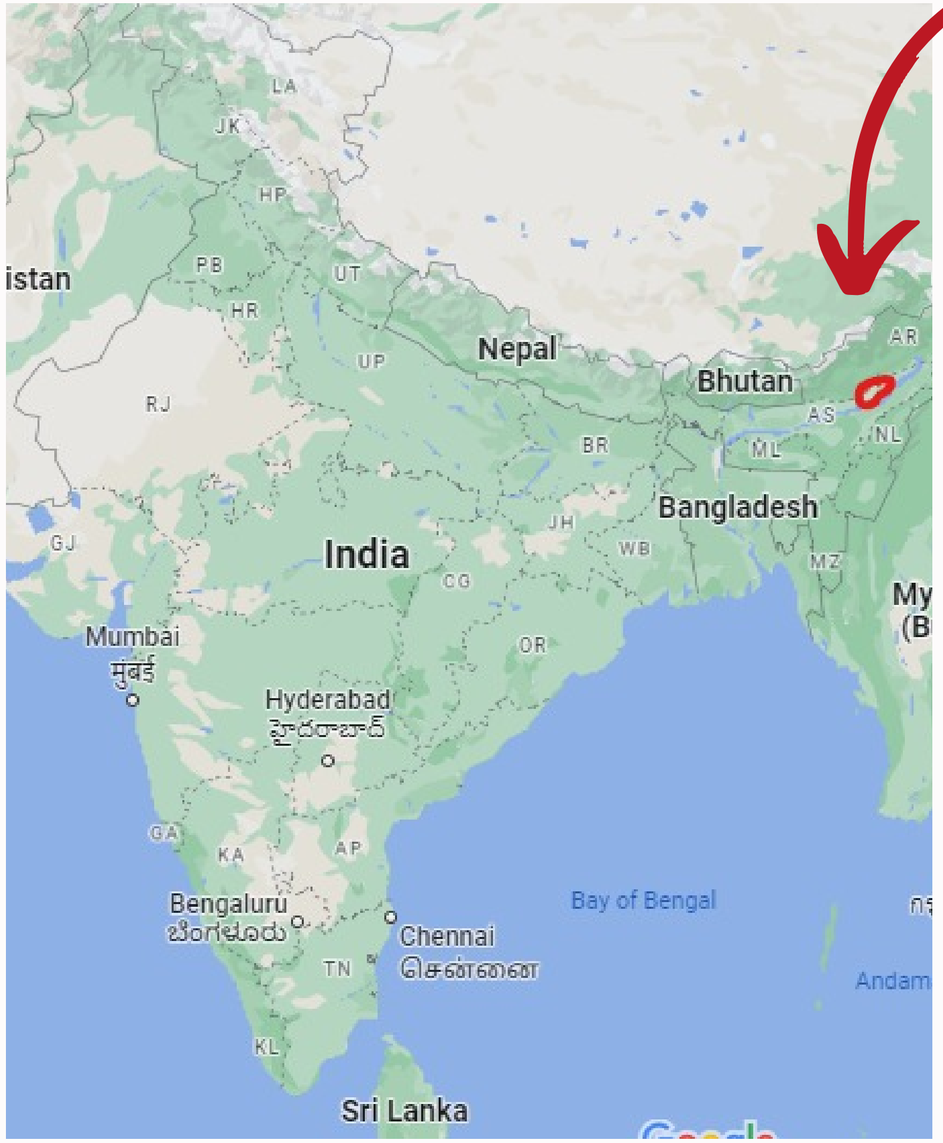
JAVA LAGGED

Udanthika B V
Adharsh Gurudev
Aditi Rajesh
Jessica Pragalathan

CHAUMA VILLAGE



Chamua is a small village in Lakhinmpur district in Assam. It was observed that during May, 2015, the actual daily rainfall recorded in the village and daily rainfall forecast (for Lakhimpur district) received from IMD was almost matching. Medium range forecast shows that most of the days in May 2015. rainfall forecast were issued to the Lakhimpur district. Total rainfall forecast during the entire month for the district is 285 mm.

Fig. 1. Heavy rainfall during May, 2015 affected the maize crop in village Chamua

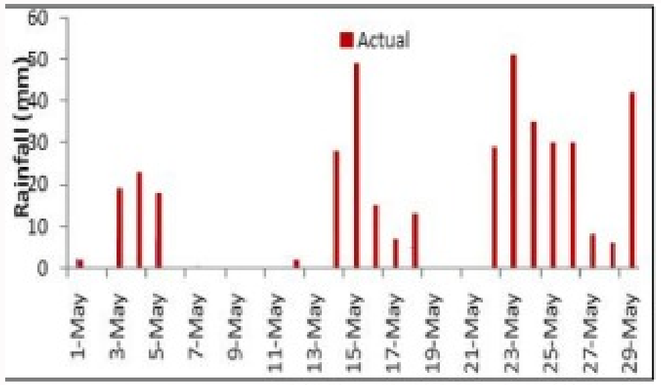


Fig. 2. Actual rainfall recorded in the village Chamua during May 2015

Thus, the rainfall forecast is in consonance with the observed rainfall in one of the Chamua village in Lakhimpur district. The weather information (weather forecast) available at that time was very much useful in managing the situation arising due to the excess rainfall through real time agro-met advisories. Farmers were benefited with different agro-met advisories issued and displayed in the village

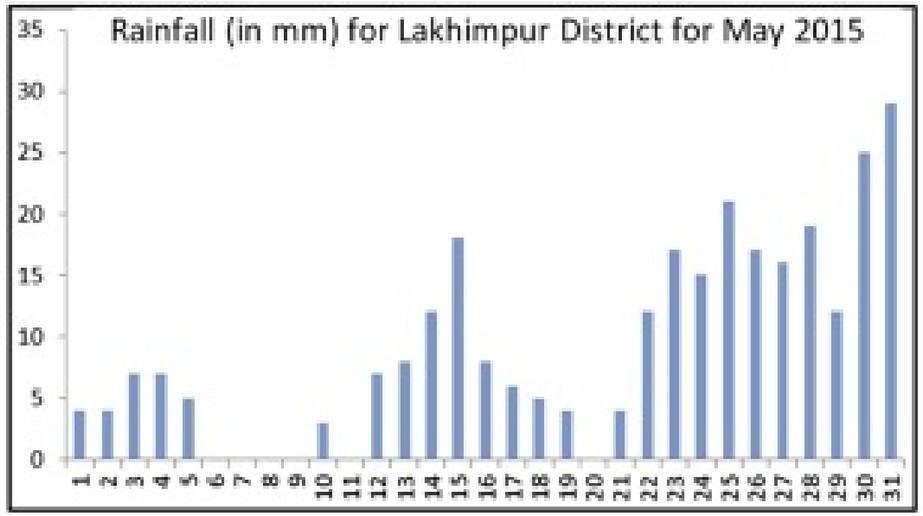


Fig. 3. Medium range weather forecast in May 2015 for Lakhimpur District

Fig. 6. Impact of Agromet Advisory Services on performance of potato (Variety: Kufri Jyoti) at Chamua, Village, Lakhimpur, Assam 2015-16

STATISTICS

- In South Asia, **more than 70%** of the people (approximately 1.1 billion) live in rural regions dominated by agriculture, and almost **75%** of these people are poor.

- Studies reveal that increasing temperature and the changing pattern of rainfall have a substantial impact on food production. A recent study anticipates that the wheat production of **South Asia will decline by 50%** by 2050 —**equal to almost 7%** of the global crop production

- The Peterson Institute states that agricultural production in developing countries will further **fall between 10% to 25%** and global warming will **decrease the agricultural capacity of India by 40%** if it continues unabated

From activesustainability.com

OUR IDEA

Objective 01

To accumulate and process the weather data of a given location for a period of time

Objective 02

To create a data model that uses this weather data and other inputs from the fuser to devise optimal advising

Objective 03

To implement this model to help optimise the production and give suggestions based on factors like soul,precipitation,global radiation and wind.

CLIMATE AND ENVIRONMENT GOALS

Improve the conditions of farmers.

Support organic based sustainable farming which reduces land degradation.

Increase the yield of farming of different crops hence reducing the imports for crops which are highly emissive

Reduce farming waste. More waste causes more wastage of energy which can be saved by implementing agromet advisory.

TARGET AUDIENCE

Target Audience #1

FARMERS

Target Audience #2

FARMING PROFESSIONALS

TECH STACK

1. **Programming Languages:**
   - Python
2. **Machine Learning and Data Processing:**
   - TensorFlow or PyTorch
   - scikit-learn
   - NumPy and Pandas
   - OpenCV
3. **Web Development:**
   - Flask
   - HTML, CSS, and JavaScript
   - Bootstrap or other frontend frameworks
4. **Databases and Storage:**
   - MySQL
5. **Data Visualization:**
   - Matplotlib

We are going to use weatherbit API to get weather data for a given location :


```
{
   "data":[
      {
         "date":"2018-01-02",
         "bulk_soil_density":1390,
         "skin_temp_max":34.5,
         "skin_temp_avg":26.5,
         "skin_temp_min":13.5,
         "temp_2m_avg":22.1,
         "precip":0,
         "specific_humidity":0.0032899952493608,
         "evapotranspiration":0.925,
         "pres_avg":918.072,
         "wind_10m_spd_avg":2.877,
         "dlwrf_avg":350.53,
         "dlwrf_max":600.53,
         "dswrf_avg":473.555,
         "dswrf_max":870.555,
         "dswrf_net":-23.408,
         "dlwrf_net":416.075,
         "soilm_0_10cm":14.804,
         "soilm_10_40cm":53.016,
         "soilm_40_100cm":112.557,
         "soilm_100_200cm":200.732,
         "v_soilm_0_10cm":0.148,
         "v_soilm_10_40cm":0.177,
         "v_soilm_40_100cm":0.188,
         "v_soilm_100_200cm":0.201,
         "soilt_0_10cm":19.9,
         "soilt_10_40cm":15,
         "soilt_40_100cm":14.2,
         "soilt_100_200cm":14.6
      } ...
   ],
   "lat":34.035,
   "lon":-117.846191
}
```


Field Decriptions:

- `lat:` Latitude (Degrees).
- `lon:` Longitude (Degrees).
- `data: [`
  - `valid_date:` Date (YYYY-MM-DD).
  - `bulk_soil_density:` Bulk Soil Density (kg/m^3).
  - `skin_temp_max:` Max skin temperature (C).
  - `skin_temp_avg:` Average skin temperature (C).
  - `skin_temp_min:` Min skin temperature (C).
  - `temp_2m_avg:` Average 2 meter temperature (C).
  - `precip:` Accumulated precipitation (mm).
  - `specific_humidity:` Average specific humidity (kg/kg).
  - `evapotranspiration:` Reference evapotranspiration - ET0 (mm).
  - `pres_avg:` Average Surface pressure (mb).
  - `wind_10m_spd_avg:` Average 10 meter wind speed (m/s).
  - `dlwrf_avg:` Average hourly downward long-wave solar radiation (W/m^2 · H).
  - `dlwrf_max:` Maximum hourly downward long-wave solar radiation (W/m^2 · H).
  - `dswrf_avg:` Average hourly downward short-wave solar radiation (W/m^2 · H).
  - `dswrf_max:` Maximum hourly downward short-wave solar radiation (W/m^2 · H).
  - `dlwrf_net:` Net longwave solar radiation (W/m^2 · D).
  - `dswrf_net:` Net shortwave solar radiation (W/m^2 · D).
  - `soilm_0_10cm:` Average Soil moisture content 0 to 10 cm depth (mm).
  - `soilm_10_40cm:` Average Soil moisture content 10 to 40 cm depth (mm).
  - `soilm_40_100cm:` Average Soil moisture content 40 to 100 cm depth (mm).
  - `soilm_100_200cm:` Average Soil moisture content 100 to 200 cm depth (mm).
  - `v_soilm_0_10cm:` Average Volumetric soil moisture content 0 to 10 cm depth (fraction).
  - `v_soilm_10_40cm:` Average Volumetric soil moisture content 10 to 40 cm depth (fraction).
  - `v_soilm_40_100cm:` Average Volumetric soil moisture content 40 to 100 cm depth (fraction).
  - `v_soilm_100_200cm:` Average Volumetric soil moisture content 100 to 200 cm depth (fraction)
  - `soilt_0_10cm:` Average Soil temperature at 0 to 10 cm depth (C).
  - `soilt_10_40cm:` Average Soil temperature at 10 to 40 cm depth (C).
  - `soilt_40_100cm:` Average Soil temperature at 40 to 100 cm depth (C).
  - `soilt_100_200cm:` Average Soil temperature at 100 to 200 cm depth (C).
- `... ]`

MARKET DEMAND

Factors driving the market demand

Yield Optimization

Analyzes historical and current weather data, crop models, and agronomic practices to optimize irrigation schedules, fertilizer application, and planting decisions. By leveraging AI, these advisors offer personalized recommendations to enhance yields and profitability.

Climate Change Impacts

Helps farmers adapt to changing conditions by providing timely and accurate information on weather forecasts, crop growth, pest and disease management, and irrigation requirements.

Risk Management

Assists in risk management by assessing climate-related vulnerabilities, providing early warnings, and suggesting appropriate mitigation strategies when exposed to various risks, including weather-related risks such as droughts, floods, and extreme temperatures.

THANK YOU

Any Questions?