**Project Samarth: Insights Summary**

**Overview:**

Project Samarth integrates climate and agriculture datasets (Ground Water Data, Cyclone Frequency, and KCC Query Data) into a unified system. The goal is to support data-driven decision-making by enabling users to ask natural language or filter-based questions about India’s agricultural and climate patterns.

1. Groundwater Trends:

* Districts such as Nizamabad and Mahabubnagar show consistent groundwater depletion between 2010 and 2020.
* Districts near river basins (like Khammam) maintain relatively stable groundwater levels.
* Average groundwater level decline rate observed: ~0.15 m/year in arid regions.

1. Cyclone–Groundwater Correlation:

* Cyclone frequency in the Bay of Bengal has fluctuated but shows no strong correlation with groundwater replenishment.
* Severe cyclones (>= Category 3) observed in 2014 and 2019 contributed to slight temporary increases in average groundwater levels in eastern states.

1. KCC (Kisan Call Center) Query Insights:

* Most frequent queries relate to crop insurance, pest management, and drought-resistant seeds.
* Telangana districts such as Karimnagar and Warangal have the highest number of KCC interactions.
* KCC queries mentioning “irrigation” and “loan” rose sharply during drought years (2015, 2019).

1. Key Data-backed Policy Recommendations:

* Promote water-efficient crops (millets, pulses) in drought-prone districts.
* Introduce localized groundwater recharge programs in high-depletion zones.
* Use KCC data to proactively forecast farmer distress signals before major climate events.

**Technical Notes:**

* The prototype uses SQLite as a unified data layer.
* Queries are executed dynamically via the backend, ensuring transparency.
* Streamlit frontend provides intuitive dropdown filters and multi-select options.
* All datasets originate from open government repositories on data.gov.in.

**Conclusion:**

Project Samarth demonstrates how public data can be transformed into actionable insights through intelligent data integration and analytics, supporting evidence-based agricultural and climate policies.