### **Halfway Submission: Innovating for Sustainable Land Management and Restoration in the Sahel**

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### **Approach**

This project leverages Earth observation data to support insurance agencies in assessing and pricing risks related to land degradation, drought, and climate change. By providing data-driven insights, the goal is to enhance risk assessment and develop tailored insurance products for farmers, herders, and pastoralist communities. Collaboration with local authorities will help mitigate land degradation, ensure resource accessibility, and reduce conflicts over natural resources.

**Expected Outcomes**

* A risk visualization dashboard highlighting high-risk areas for land degradation and drought.
* Insurance risk profiles for selected regions to support fair and accurate policy pricing.
* Insights into land degradation trends to inform sustainable land-use decisions and improve resilience.

**Methodology Used Thus Far**

**Data Acquisition & Preparation:**

* MODIS Land Cover Change Data (MCD12Q1) – Tracking desertification trends.

**Data Analysis & Visualization:**

* Filtering and processing datasets using Python to extract relevant insights.
* Creating an interactive risk heatmap with Plotly to highlight vulnerable areas.

**Next Steps**

* Refining risk models by incorporating CHIRPS Climate Precipitation Data to analyze drought-prone regions.
* Finalizing the visualization tool for broader application in sustainable land management.

**Final Expected Outcome**

A risk assessment dashboard that enables insurance agencies to:

* Track resource availability in high-risk zones.
* Identify vulnerable areas using real-time data insights.
* Develop fair and effective pricing models for insurance products.
* Promote sustainable land management and climate resilience.