SCORE Initiative: Smart Climate Operation for Resilient Ecosystem

A Climate Resilience System for Kirinyaga (Mwea, Gichugu & Ndia)

Kirinyaga faces two extremes: floods in Mwea and drought/erosion in Gichugu and Ndia. SCORE connects water, soil, energy, and farming into one intelligent system.

Problem Statement

- Flood destruction in Mwea lowlands - Water scarcity in uplands (Gichugu & Ndia) - Soil erosion on slopes - Poor water storage and distribution systems

1. Water System (Mwea)

- Floodwater captured using farm-level retention dams and water pans - Arrow roots (nduma) introduced in flood-prone zones - Water stored instead of being lost

2. Soil Protection System (Gichugu & Ndia)

- Thara (Napier grass) on contour lines - Ngwaci (sweet potato) ground cover - Mbembe (maize) intercropping - Agroforestry trees for slope stabilization

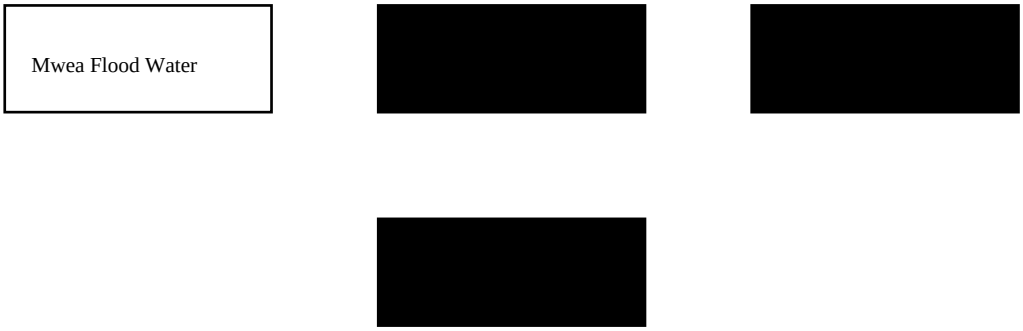
3. Energy & Water Mobility

- Solar-powered pumps move water uphill - Wind energy supports pumping in open zones - Water redistribution from Mwea to uplands

4. Algae & Circular System

- Wastewater treated using algae ponds - Water reused for irrigation - Algae biomass used as fertilizer (future biofuel potential)

System Flow Diagram



Conclusion

SCORE transforms Kirinyaga into a connected climate system where: - Floods become resources - Drought becomes managed supply - Soil is protected through living systems - Energy is renewable and distributed It is not just adaptation—it is redesigning how water moves across land.