Livelihoods and land degradation Dynamics in the Sahel

Professor Vijay Modi

Quadracci Sustainable Engineering Lab

Columbia University

My observations in the field

- Sahel (Senegal, Mali, Nigeria) and Ethiopia
- Livelihood/nutrition connections to land degradation are important
- Small plots of land for productive activity
- In turn start to add crop residue to the soil
- Some key issues
- Data: Sustainable affordable water and energy
- Policy, national scale: markets, transport

Context, Senegal

Sub-soil storage, near river Niger

Kaduna, Nigeria

Thursday, April 7, 2011

← Groundwater
(Potou- Senegal)

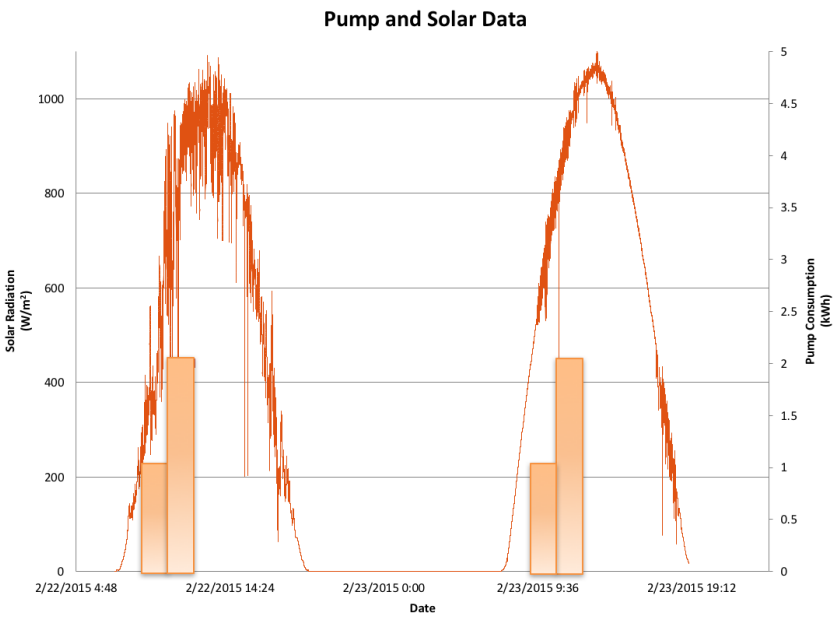
Spring Protection
(Ruhiira-Uganda)

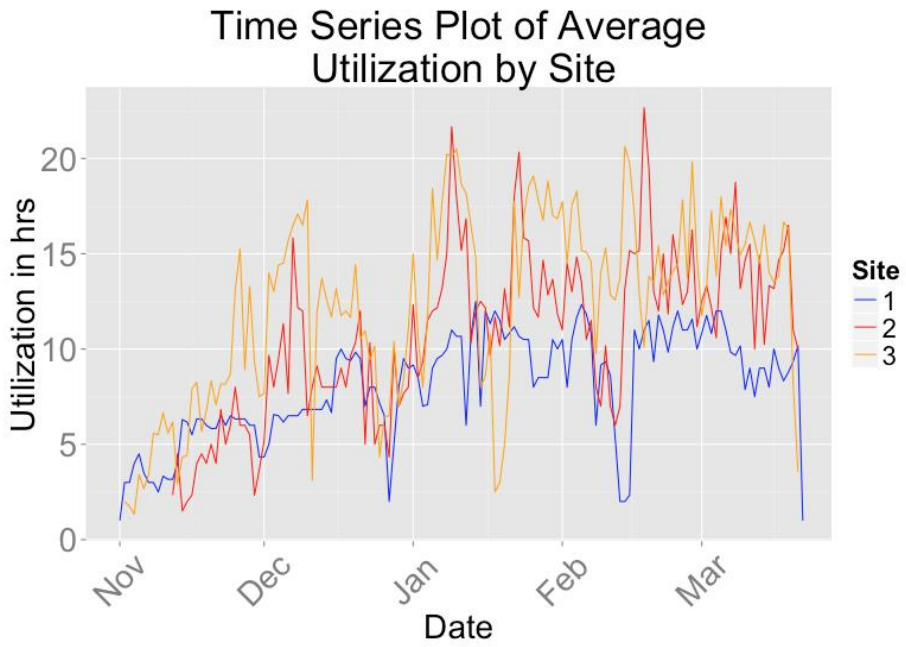
← Sub-soil infiltration, Koraro, Ethiopia

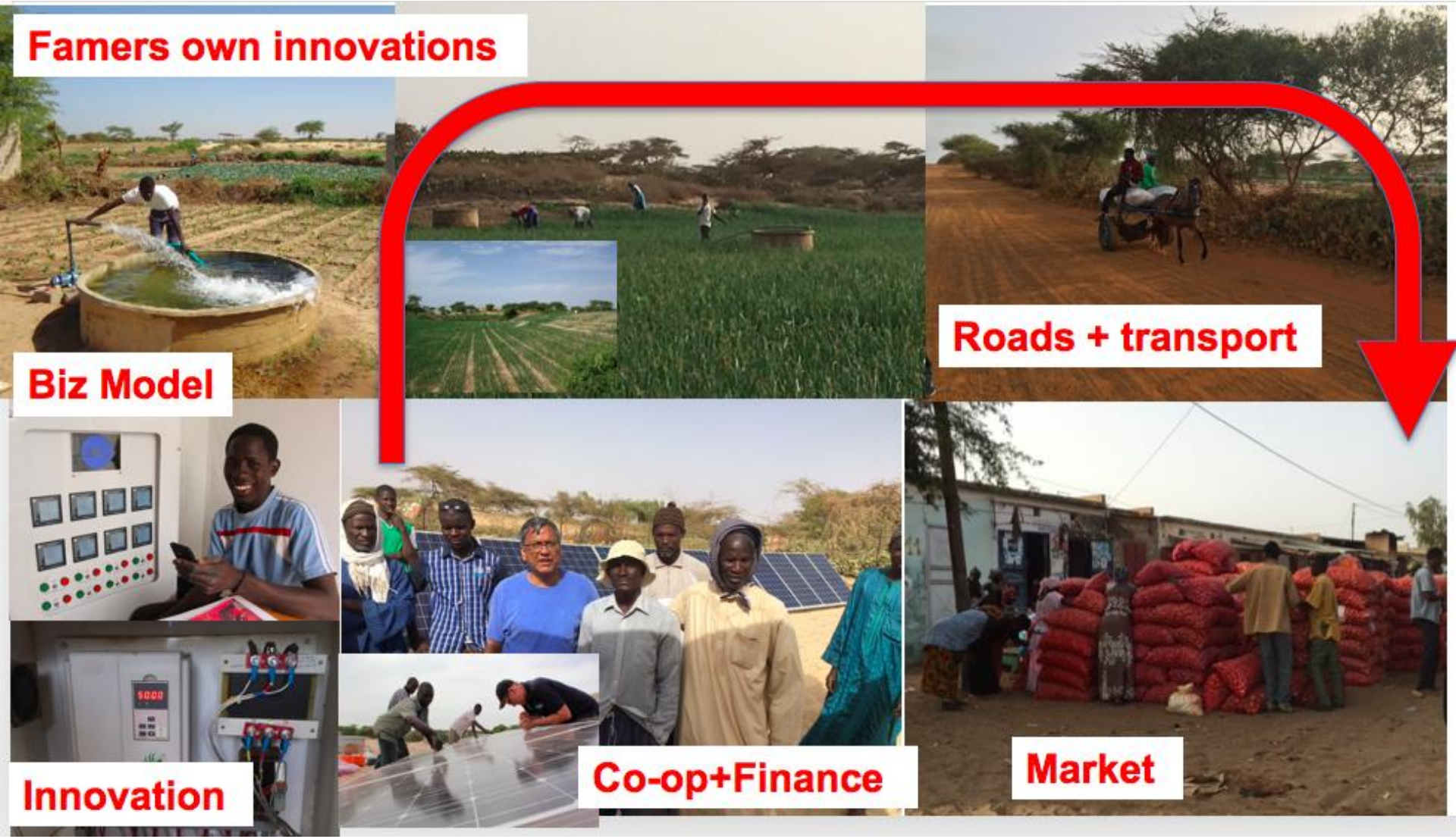
A public tap staffed 2 hrs/day; users pay 2 KSh/20L jerrycan; goes to pay staff, fuel, maintenance

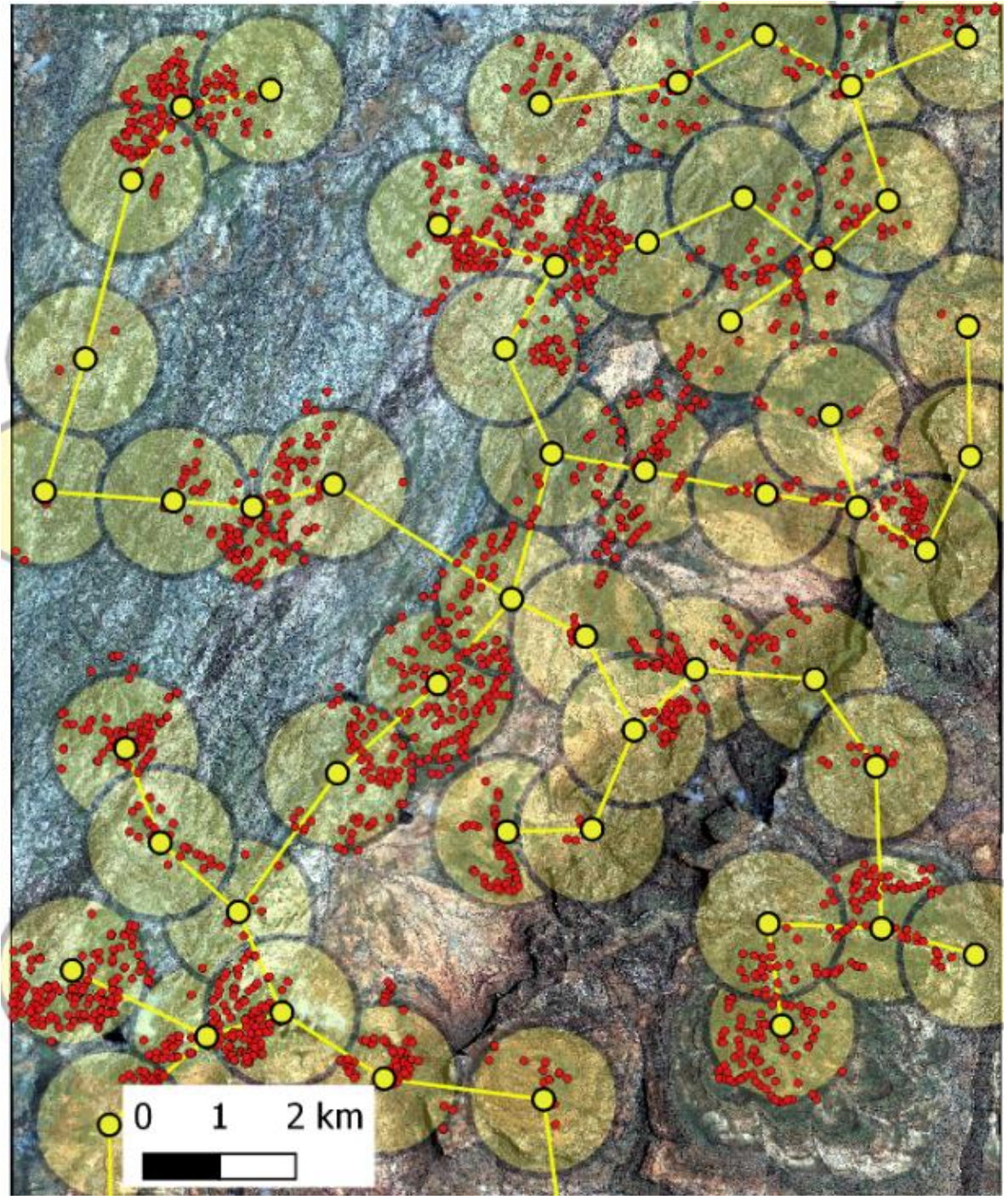
Distributed Irrigation System Topology

Wells & Pumps






Famers own innovations
Roads + transport
Biz Model
Innovation
Co-op+Finance
Market



Koraro (ETH, dispersed)

- MV/HH: 38.8 m
- LV/HH: 67.8

- 30% drop in line costs by removing 5-10% of households from grid (providing off-grid solutions)

Rural Ethiopia (Tigray Region, Koraro village area, full 10 km x 10 km area): 2,096 rooftops (red points) identified in satellite imagery (~2,100 HHS) in 54 clusters with 1000 m radius (yellow points and circles) connected by ~83 km MST (yellow line).

One pragmatic way out of quandry

- Focus on few areas where it all can work
- Equivalent of a “special economic zone”
- Ethiopia calls them “agriculture clusters”
- ensuring “market access” for these off-season products,
- How to identify opportunity, prioritization, investment, equity?