
Example: Irrigation in Northern Mali

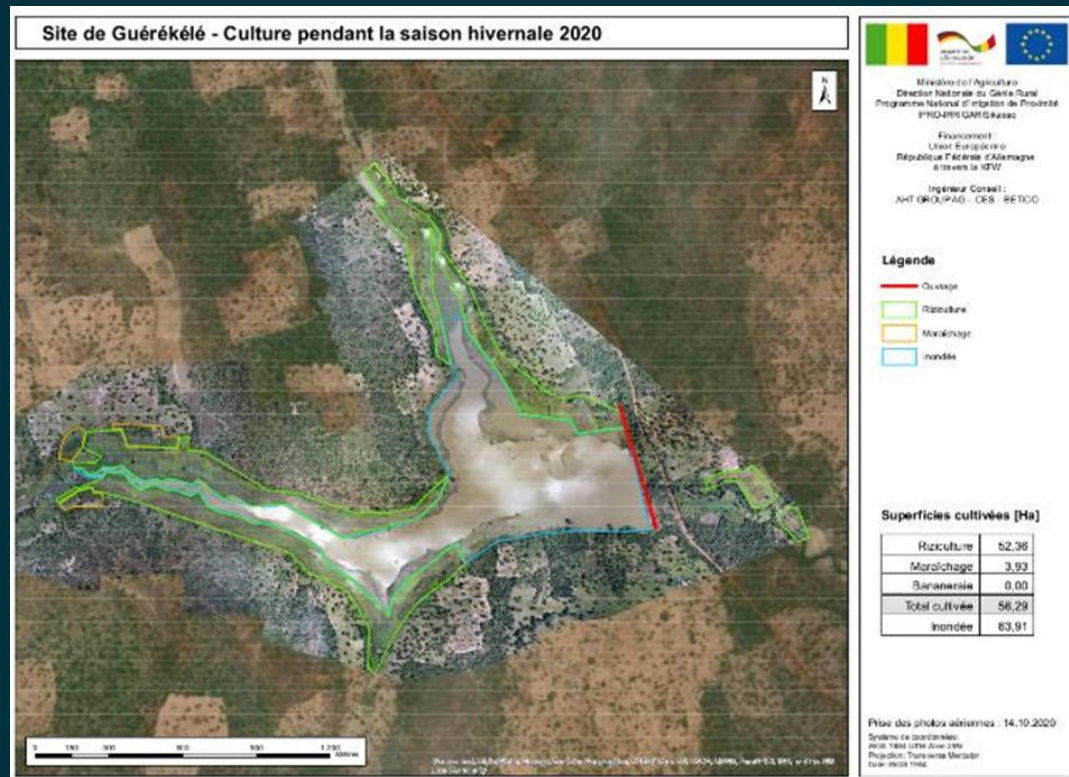
Intervention

- Series of irrigation projects in North Mali, 1999-2020
- Pump-based irrigation (PIV) using Niger River and tributaries onto nearby fields
- Staggered treatment over time
- Project sites are polygons with distinct treatment dates
- Assumption: outcome variables are not correlated with time of treatment (conditional on fixed effects)



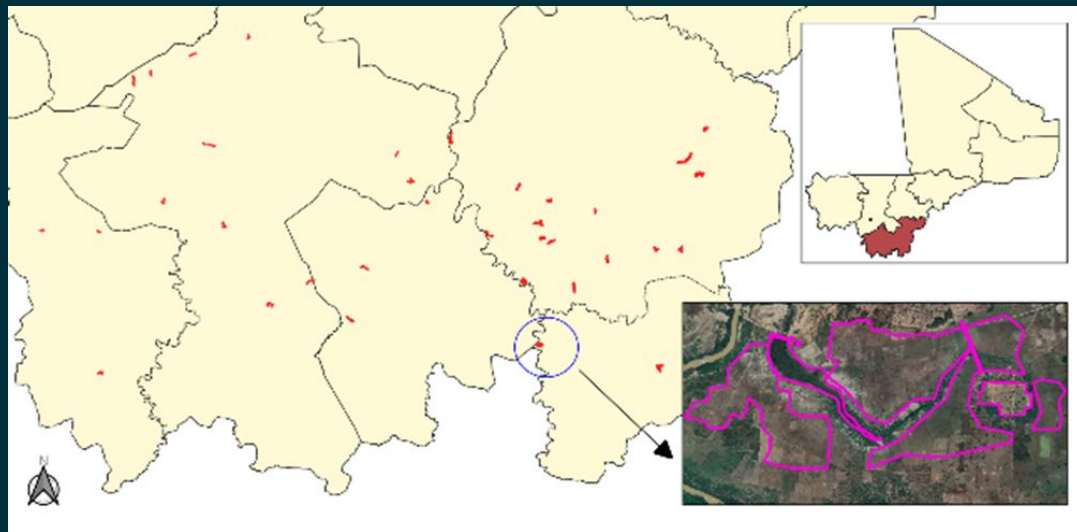
Data Processing

- DEval was involved in:
 - Framing research questions
 - Developing conceptual framework
 - Coordinating with consulting firms to obtain project information and shapefiles
- Data was received as:
 - Shapefiles
 - PDFs that were geocoded



Intervention

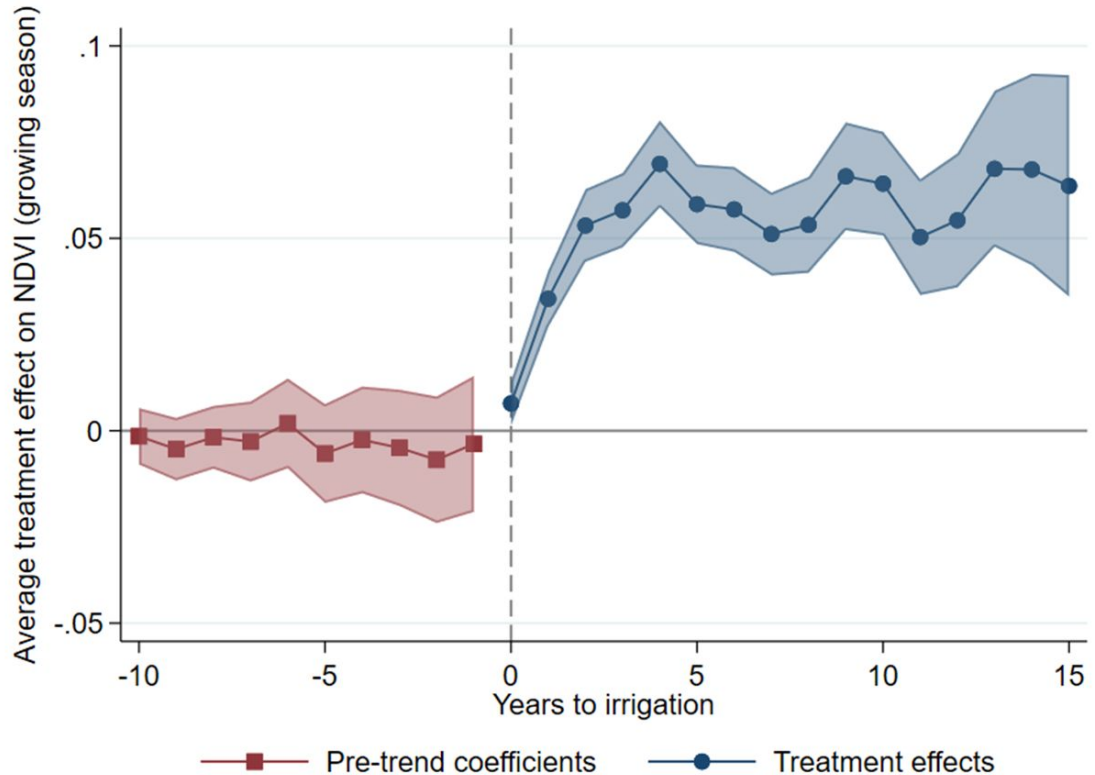
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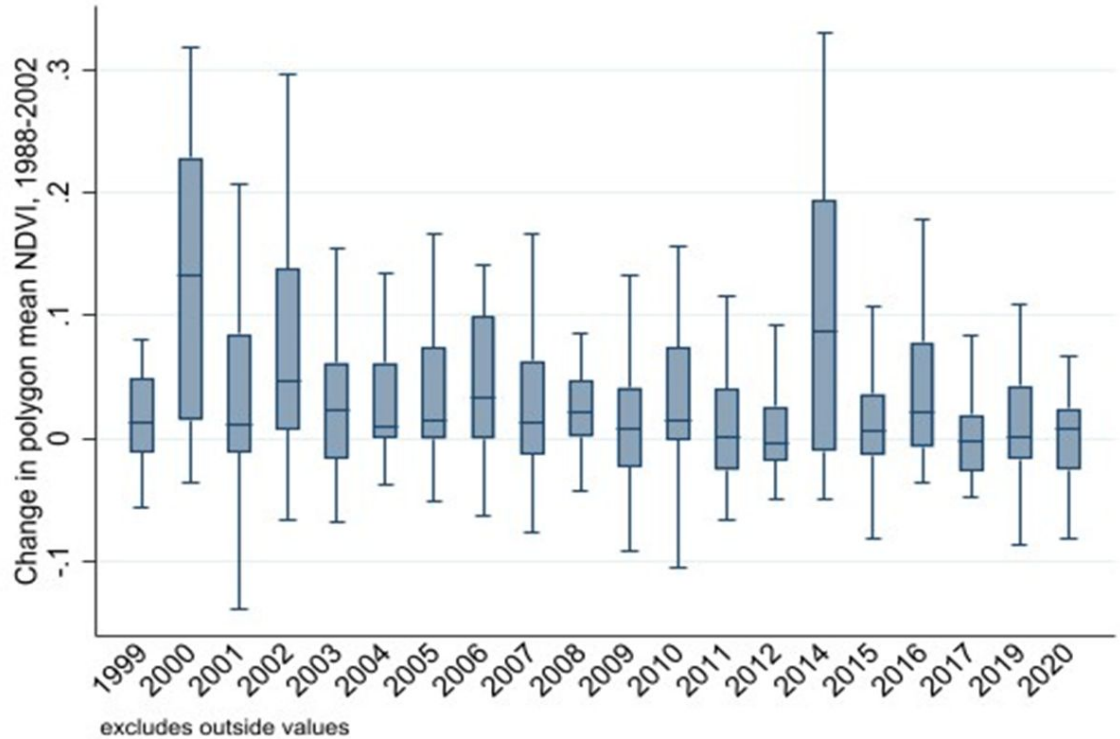
Effect on Agricultural Production (Satellite-based)

- Data source: Landsat series imagery (5, 7,8) via Google Earth Engine
 - 30 m resolution
 - 1986-2021
- Outcome measures
 - Water availability: Normalized Difference Water Index (NDWI)
 - Crop productivity: Normalized Difference Vegetation Index (NDVI)
 - Aggregated over 16-day periods to (1) rainy season (growing season) and (2) pre-rainy season
 - Weather controls

Effect on Agricultural Production (Satellite-based)

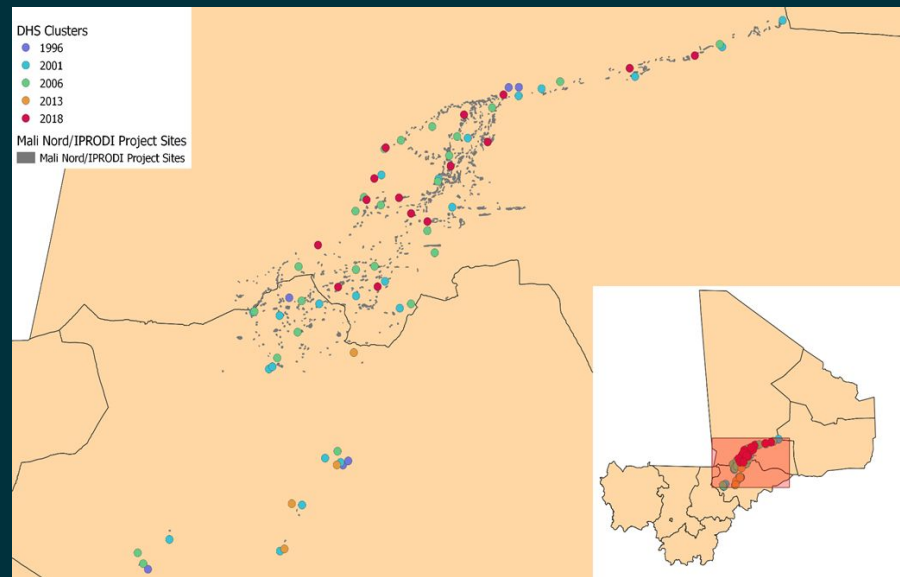


Pre-trends for Agricultural Production (Satellite-based)



Effect on Child Nutrition and Health (Survey-based)

- Data source: Demographic and Health Survey
 - Clusters matched to nearest project location
 - 5 waves: 1996, 2001, 2006, 2013, 2018
- Outcome measures
 - Objective measures: child stunting (height-for-age), child wasting (weight-for-age), anemia
 - Mother's recall: low birth weight, recent illness (diarrhea, fever/cough)



Effect on Child Nutrition and Health (Survey-based)

