ASIAN EVALUATION WEEK 2024

Innovations for Influential Evaluation

2–5 September | Conrad Hotel Shanghai, People's Republic of China

#AsianEvaluationWeek #AEW2024

Independent Evaluation ADB

亚太财经与发展学院
Asia-Pacific Finance and Development Institute

The Geodata Decision Tree

A Guiding Framework for the Use of Geodata in Evaluation

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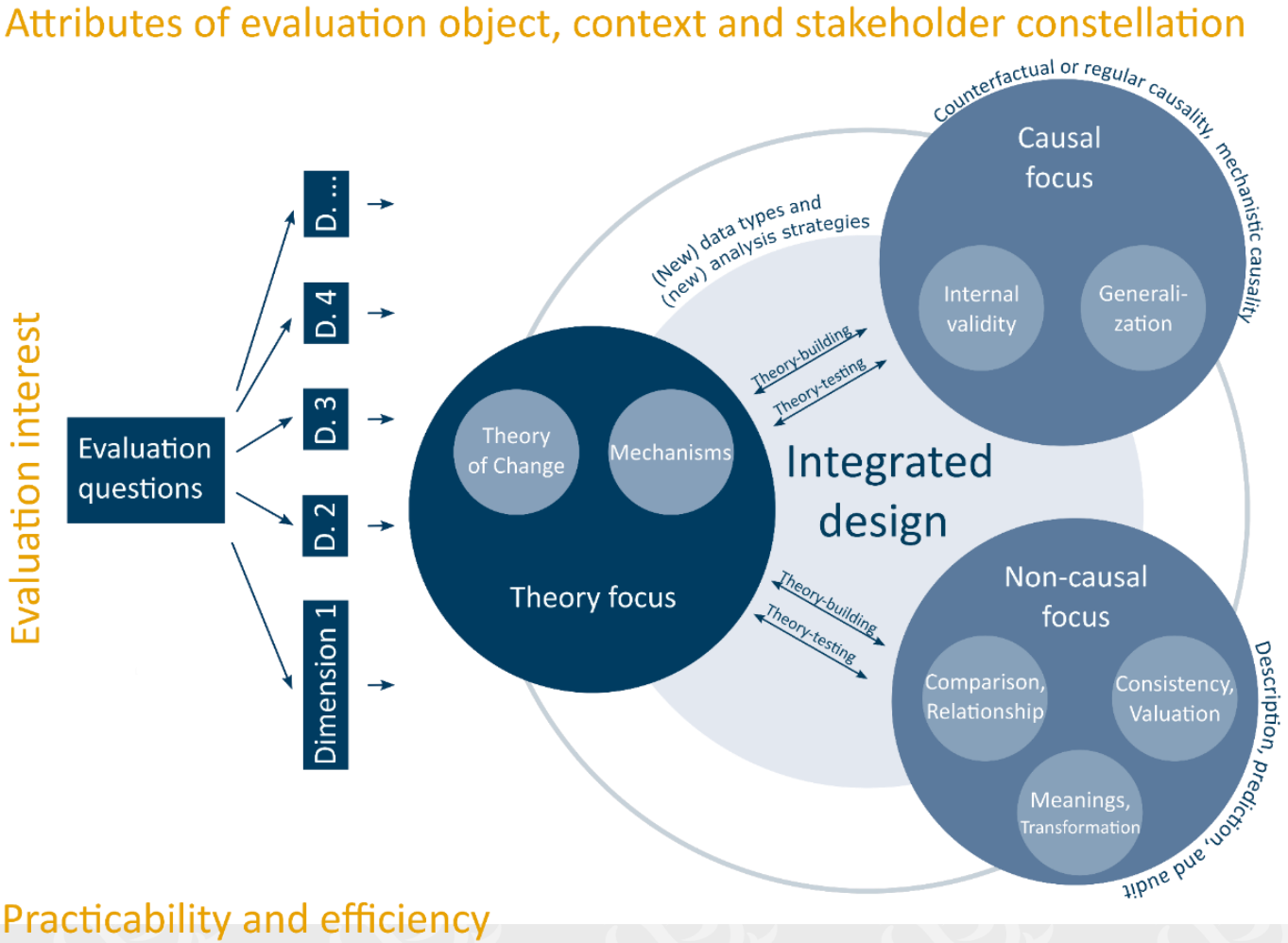
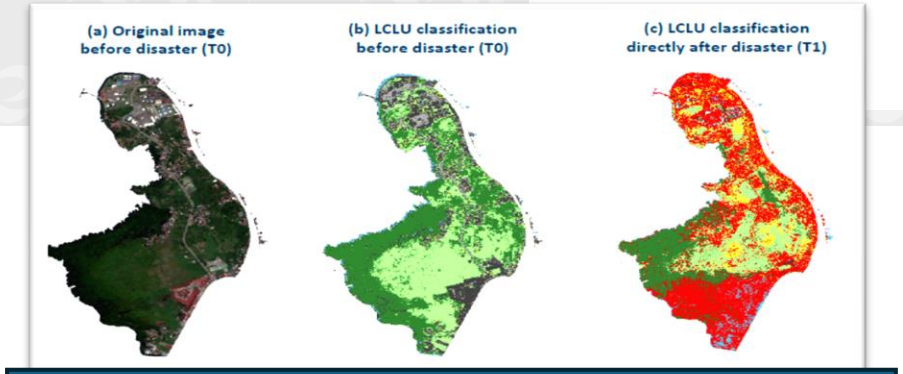
Integrating geospatial analysis in complex Evaluation Designs



Can we use geodata?

Descriptive Mapping

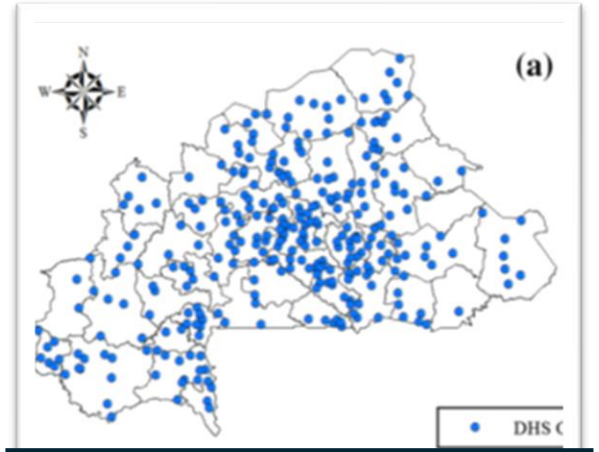
Deforestation in Cameroon – (Global Forest Watch 2023)



Geospatial correlation

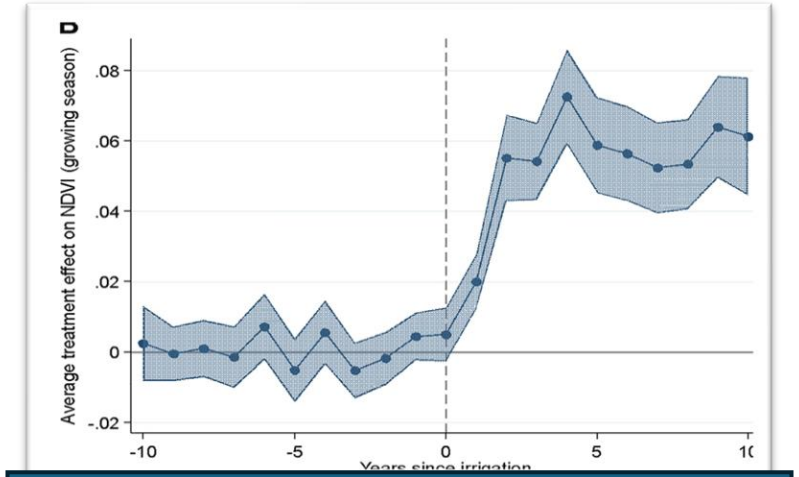
Machine learning based approach for land-use and land-cover classification after typhoon Hayan on the Phillippines (Lech, 2020)

Can we use geodata?



Data integration

DHS Cluster Points Burkina Faso (Nawrotzki 2016)



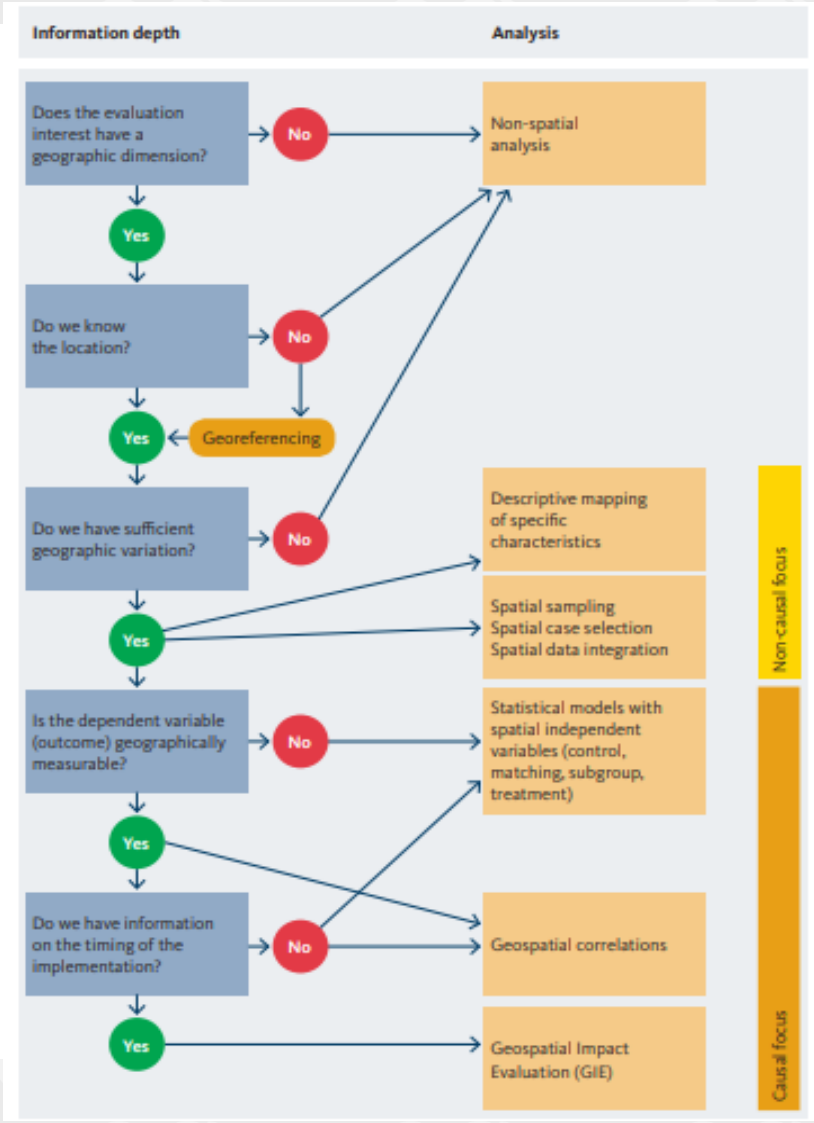
Geospatial Impact Evaluation

Effects of irrigation projects in Mali (NDVI) (BenYishay et al., 2024)

Can we use geodata?

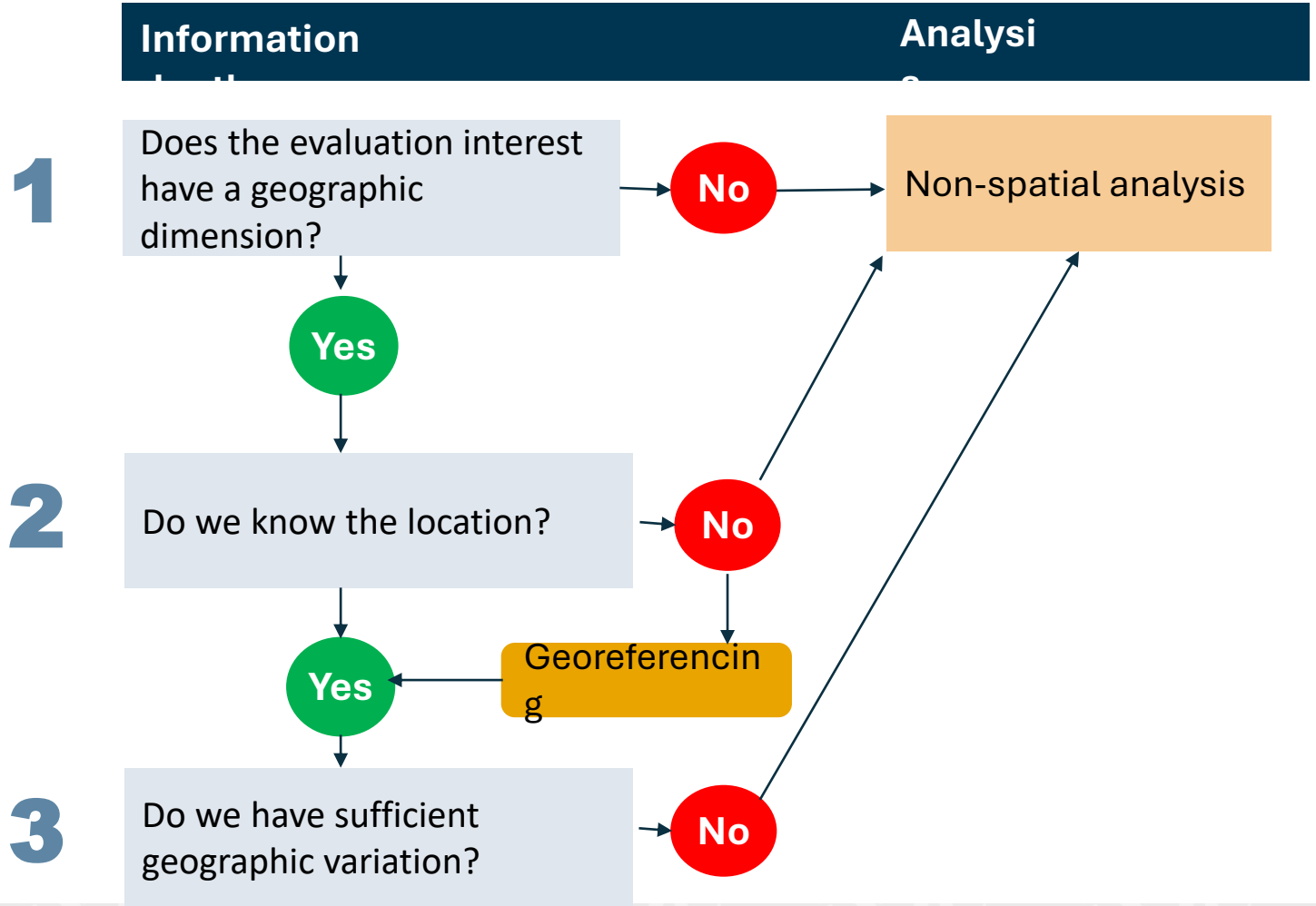
The Geodata decision tree

- An orientation framework
- 5 guiding questions
- Depending on the depth of information in the geodata
- Recommendations for analysis types



Nawrotzki 2019

When we cannot use geodata



Georeferenced data

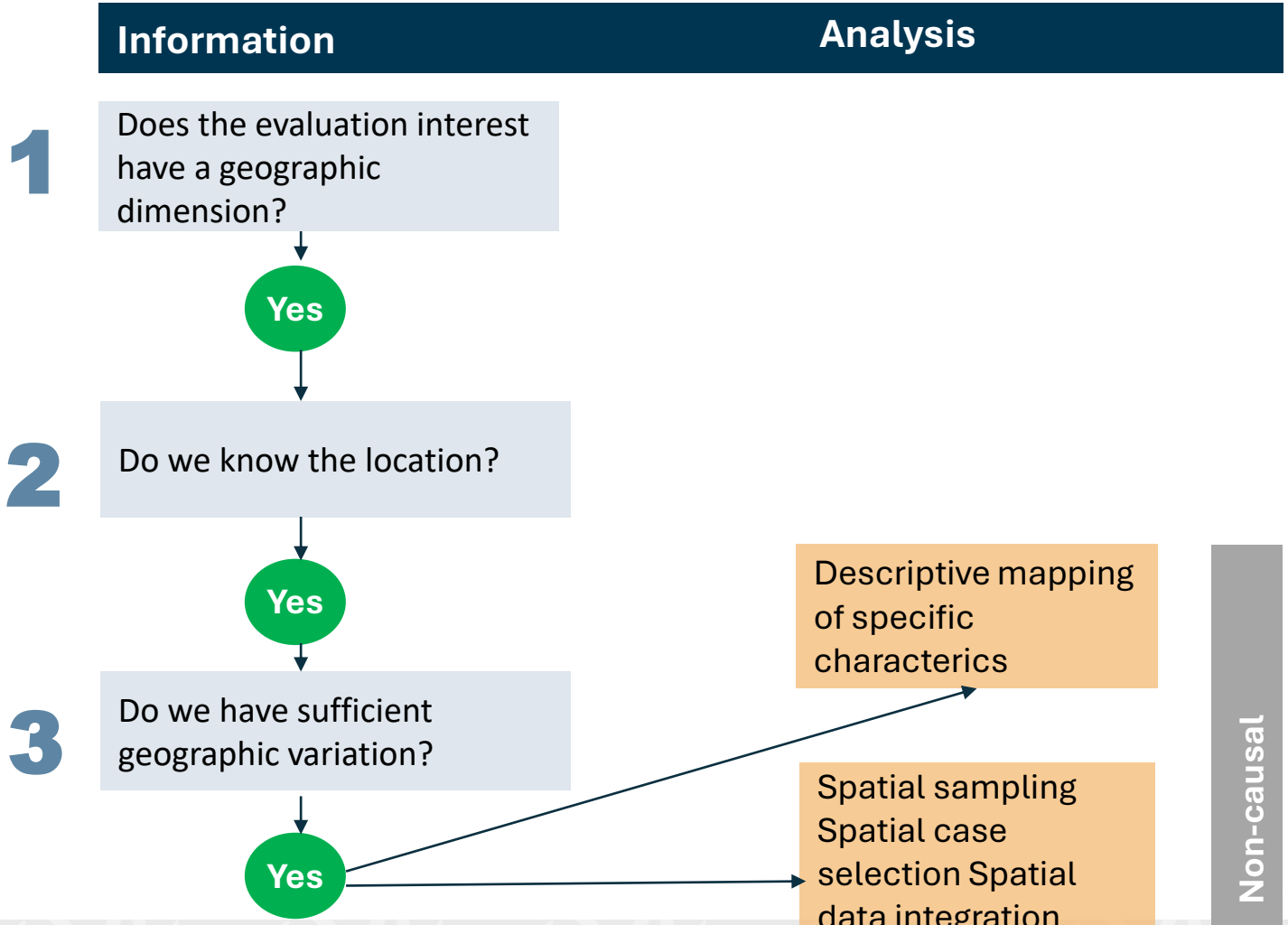
Georeferenced data can be sourced from a variety of origins.

- Manually georeferencing
- Incorporating geocoding in the data collection process
- Gathering data that include geospatial information
- Databases with georeferenced information

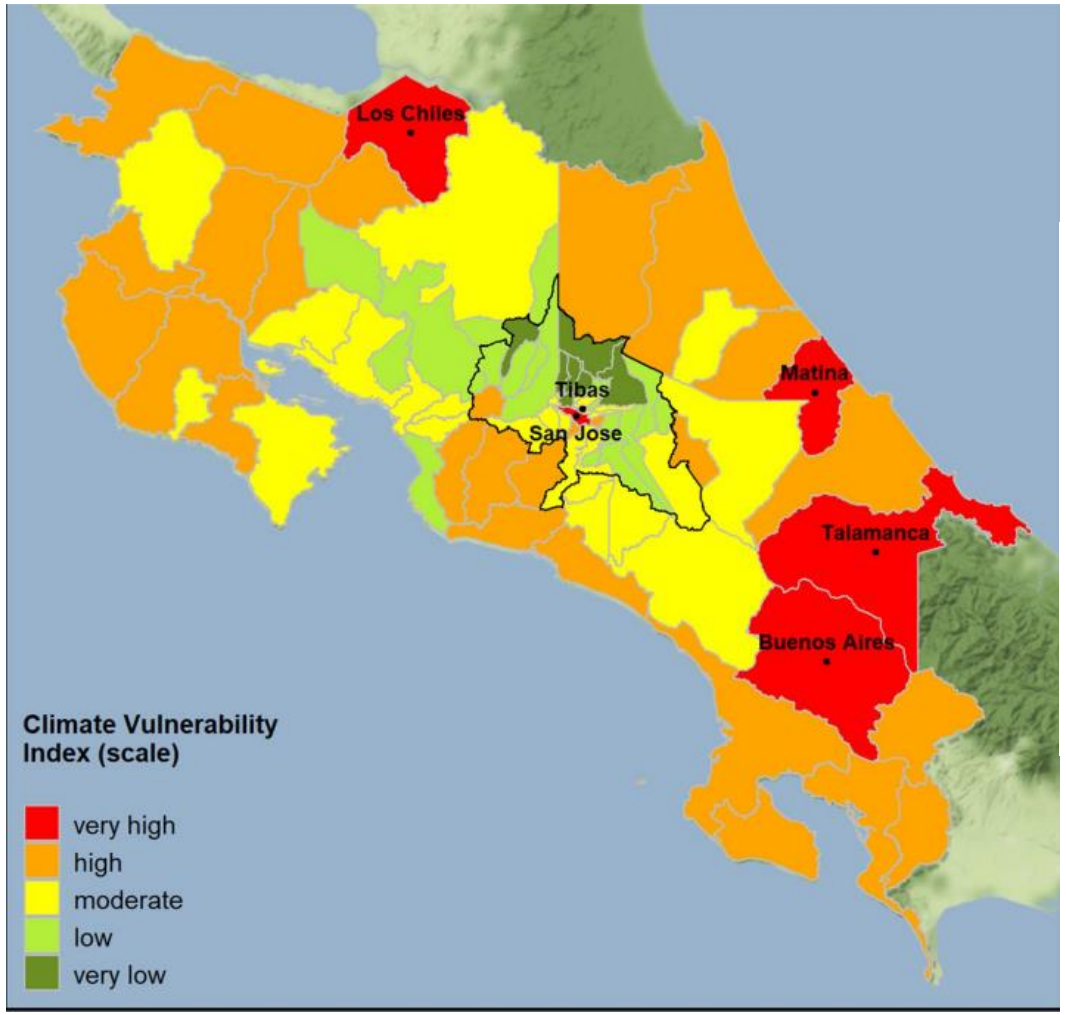
Georeferenced data

- Survey data
- Social media
- Mobile phone data
- Public media
- Event data
- Observational data/ground truth
- Satellite data
- Project data
- Photos

Analysis with non causal focus



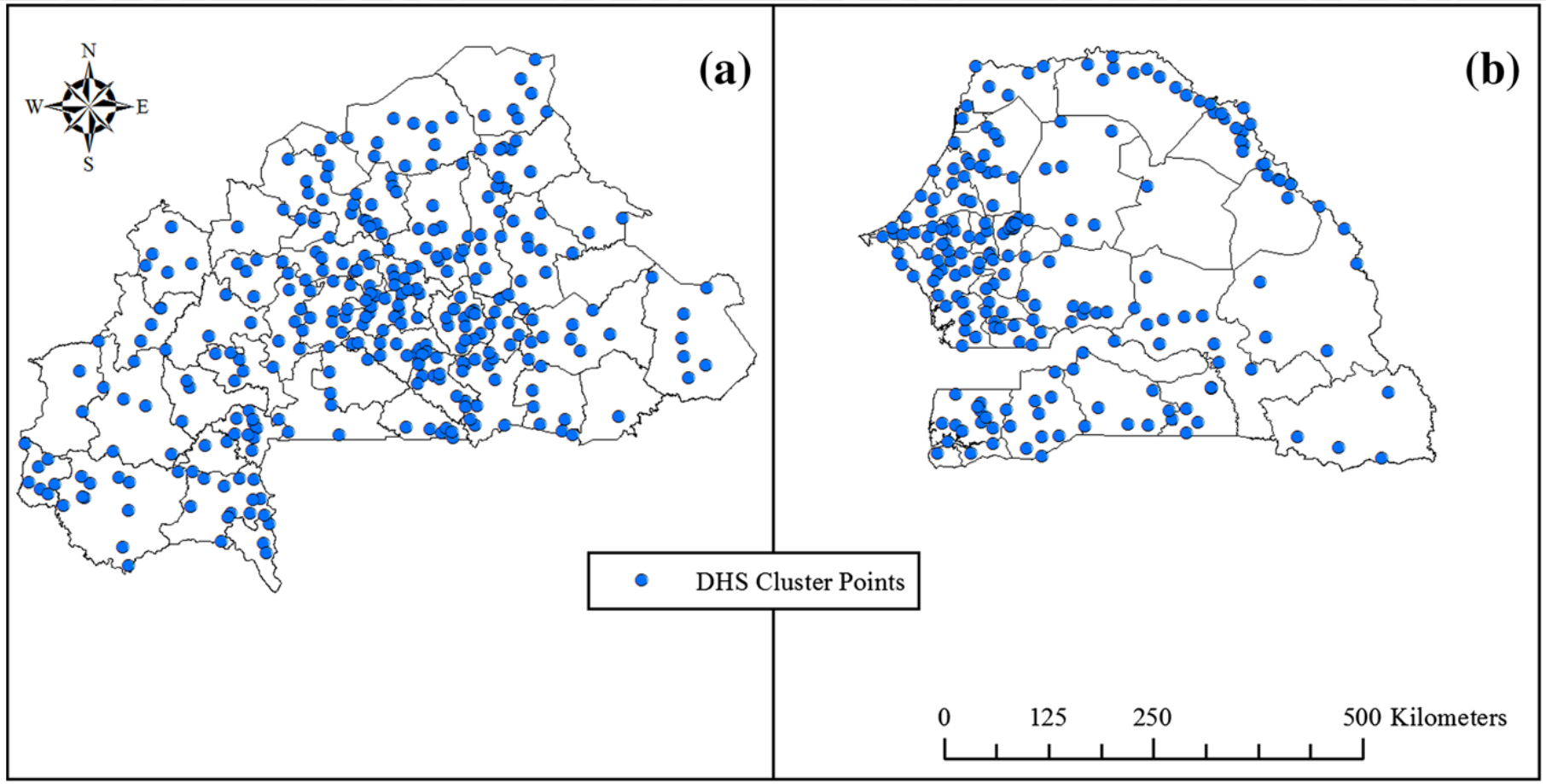
Descriptive Mapping



Dimension	Component	Relationship
Exposure	Heat months	+
	Drought months	+
	Flood risk	+
Sensitivity	Asset index	−
	Work in climate sensitive industry	+
	Population density	+
	Tree cover	−
Adaptive capacity	Employment	+
	Literacy	+
	Remittances received	+
	Infant mortality	−
	Road density	+
	Distance from health center	−

Nawrotzki et al. (2023)

Integrating Different Data Sources

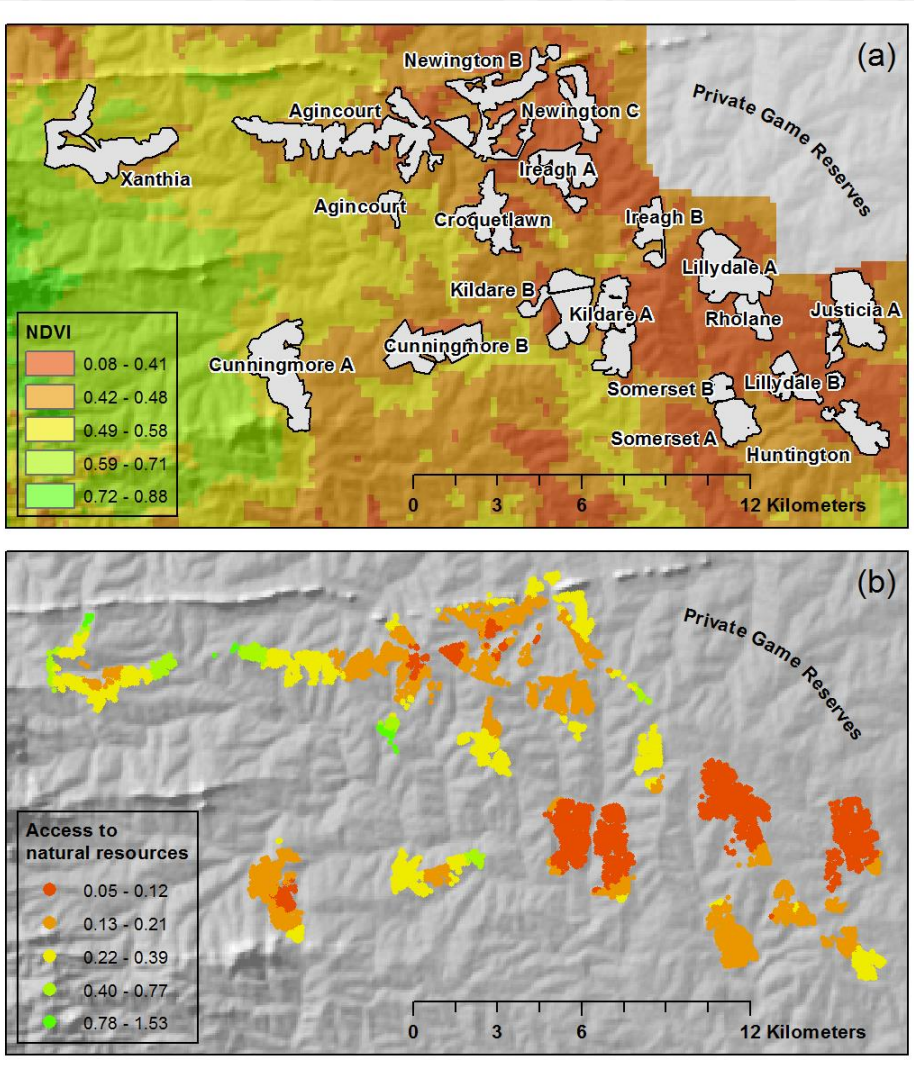


Burkina Faso

Senegal

Nawrotzki et al. (2016)

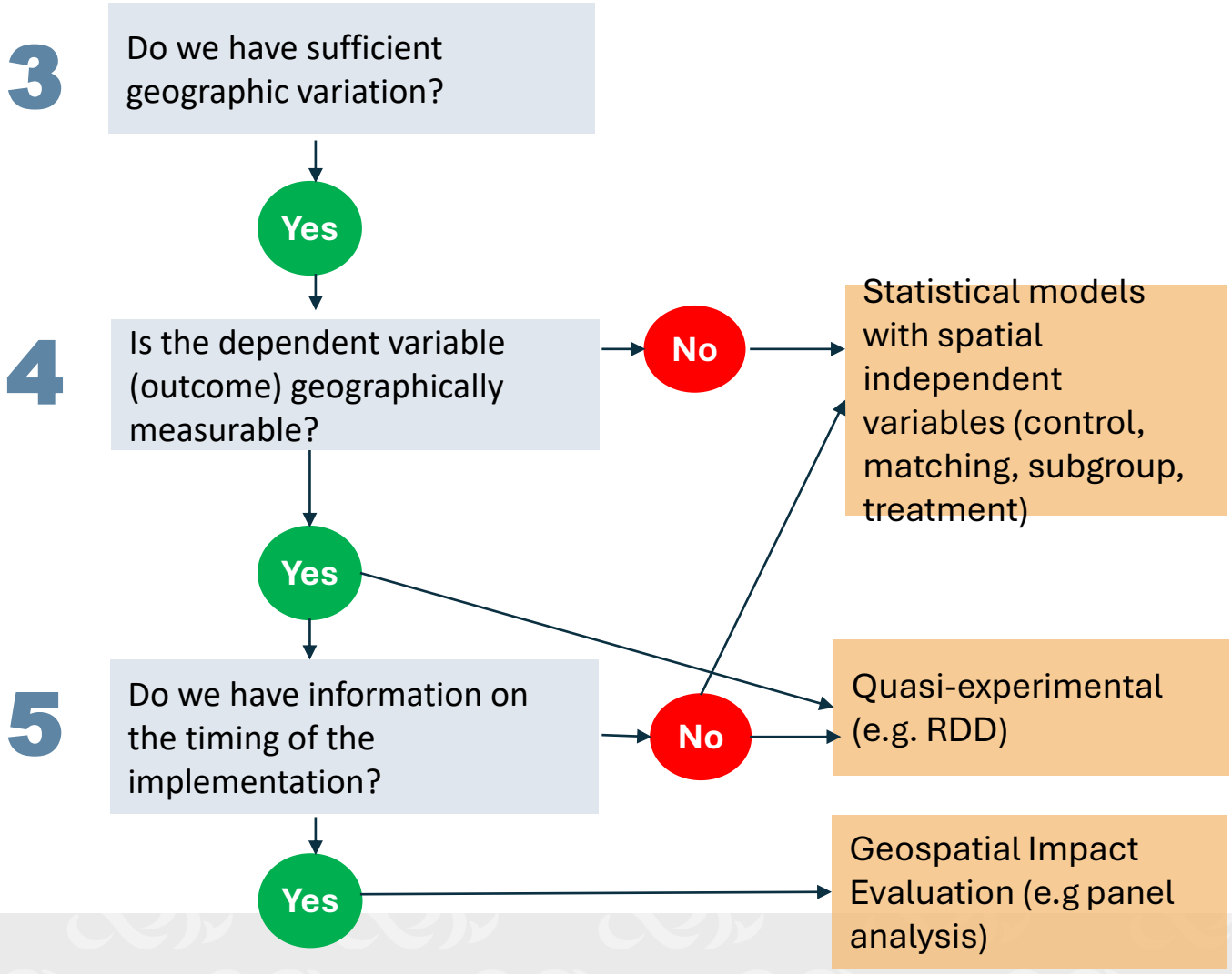
Case selection



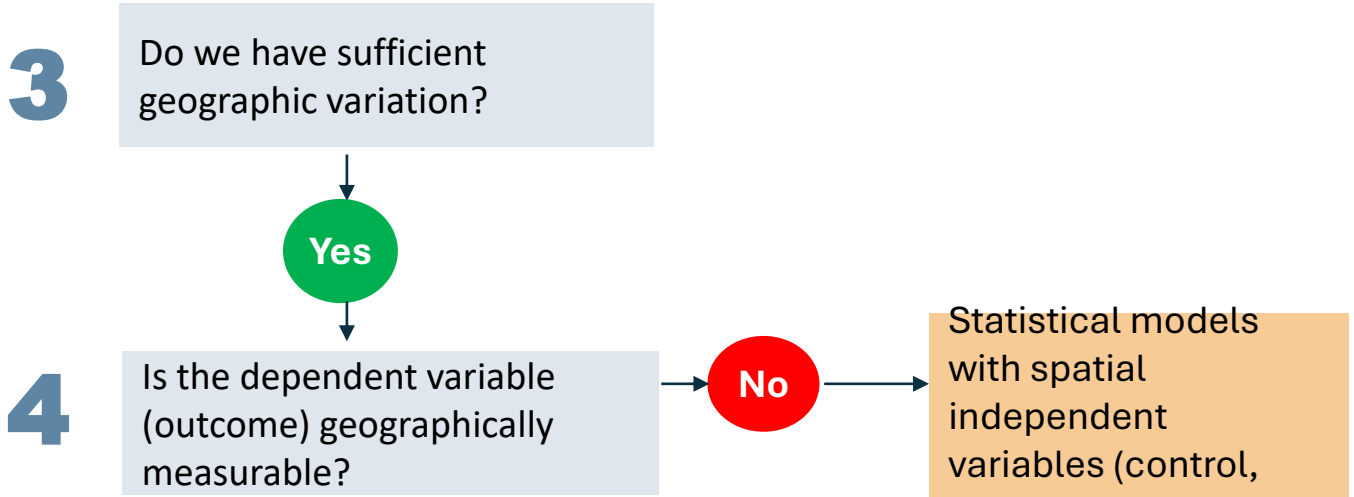
Nawrotzki et al. (2014)

NDVI , South Africa

Analysis with causal focus



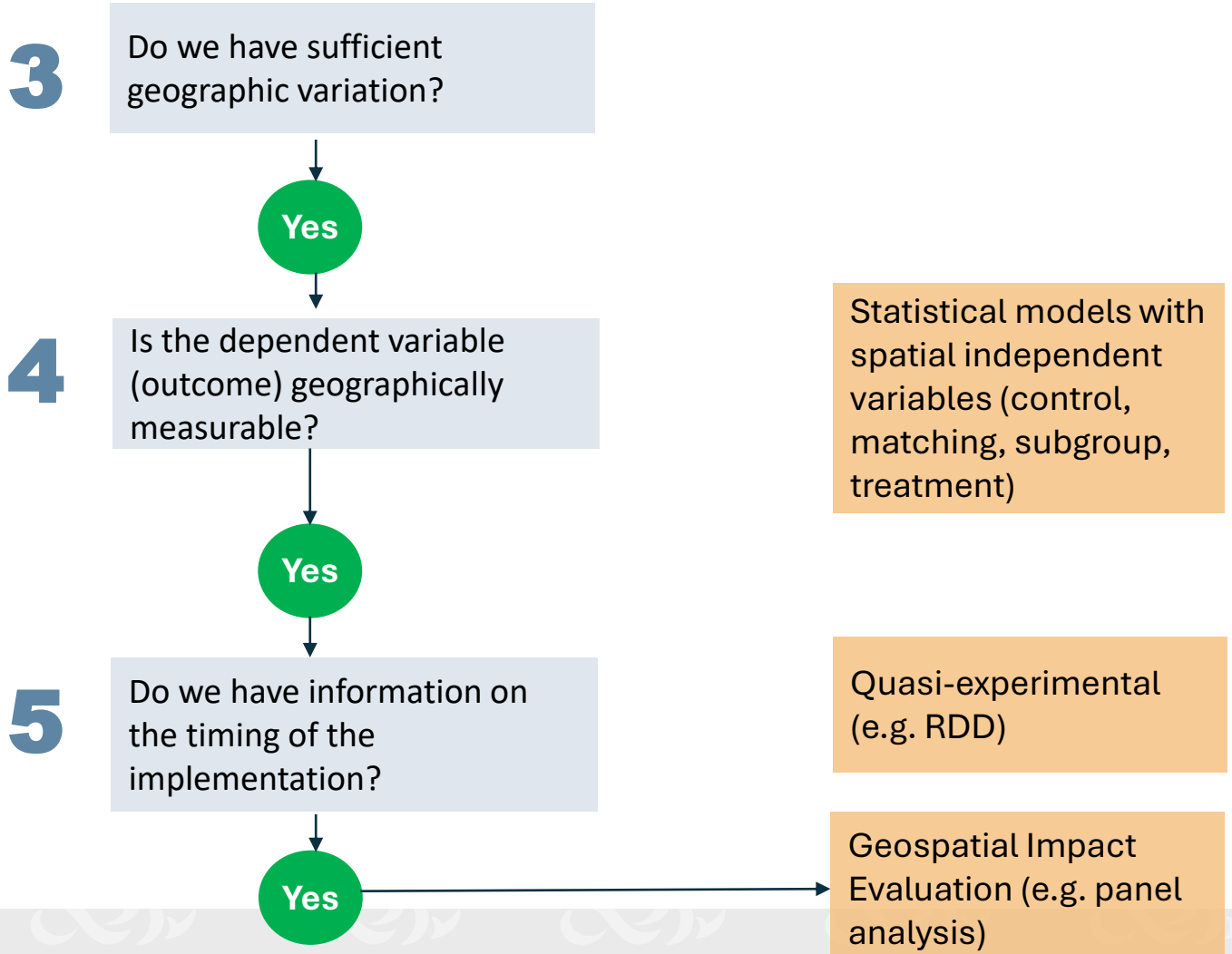
Analysis with causal focus



Spatial independent variables

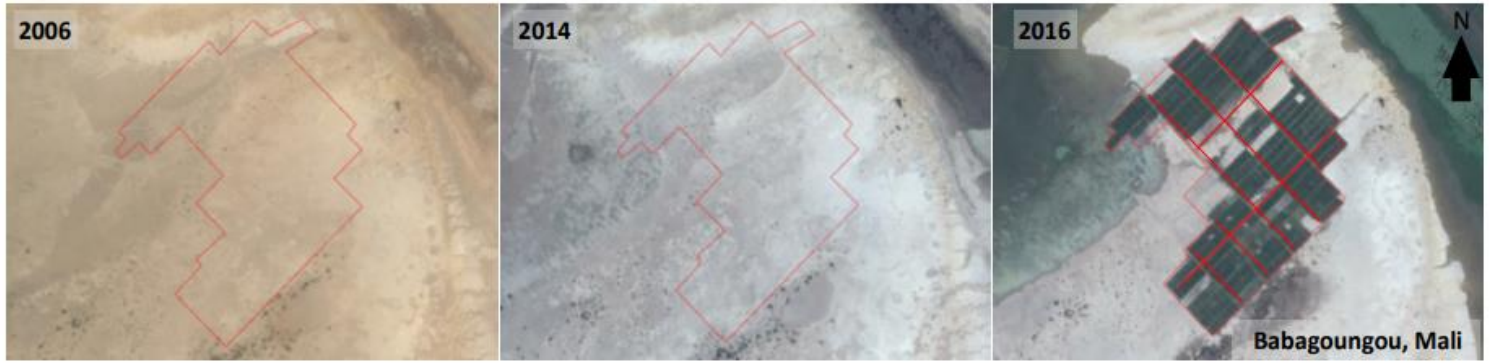
- Rural vs. Urban
- Country
- District
- Climate zones
- Proximity to next school
- …

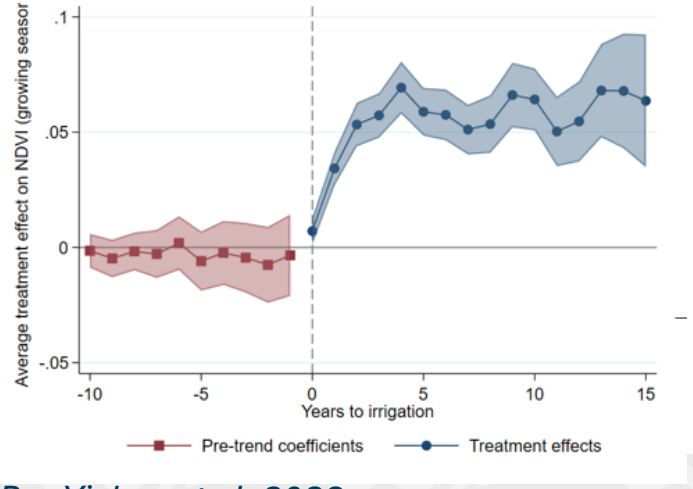
Analysis with causal focus

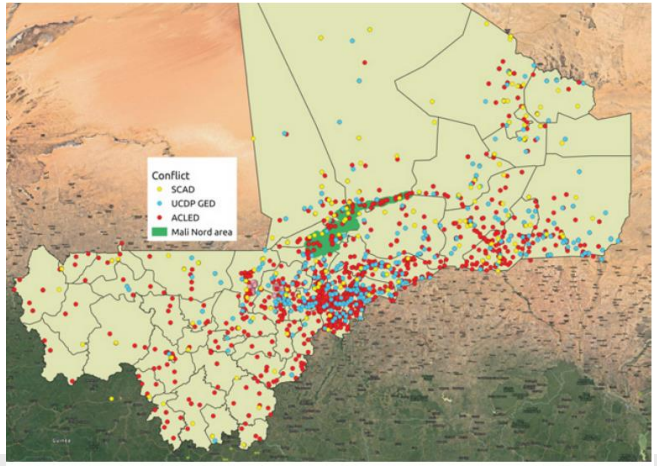


Geospatial impact evaluation

"A GIE attempts to causally connect the intervention with geographically measurable changes in the environment (BenYishay 2017)







BenYishay et al. 2023

Effects of Irrigation in Mali

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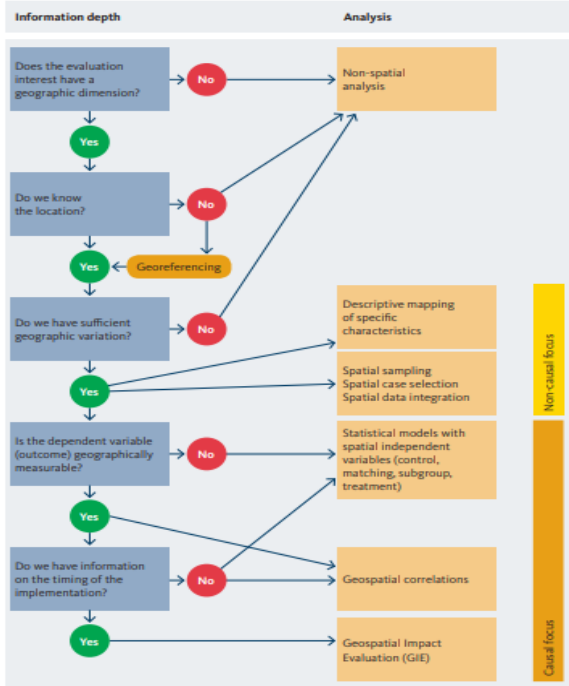
Conlusion

The geodata decision tree

- An **orientation framework** in the inception phase
- Determine wether the evaluation question has a **geographic dimension**
- Ascertain the **availability** of the necessary geographic data
- Where feasible, utilize and support **georeferencing**
- Geodata can enhance both causal and non-causal evaluation questions, demonstrating its strength in **method integration**



References

BenYishay, Ariel, Daniel Runfola, Rachel Trichler, Carrie Dolan, Seth Goodman, Bradley Parks, Jeffery Tanner, Silke Heuser, Geeta Batra, and Anupam Anand (2017), A Primer on Geospatial Impact Evaluation Methods, Tools, and Applications. AidData Working Paper #44. Williamsburg, VA: AidData at William & Mary.

BenYishay, A., Sayers, R., Singh, K., Goodman, S., Walker, M., Traore, S., Rauschenbach, M., Noltze, M. (2024), Irrigation strengthens climate resilience: Long-term evidence from Mali using satellites and surveys, PNAS Nexus, Volume 3, Issue 2.

Lech, M. et al. (2020), "A Proof-of-Concept of Integrating Machine Learning, Remote Sensing, and Survey Data in Evaluations. The Measurement of Disaster Resilience in the Philippines", *DEval Discussion Paper 1/2020*, German Institute for Development Evaluation (DEval), Bonn.

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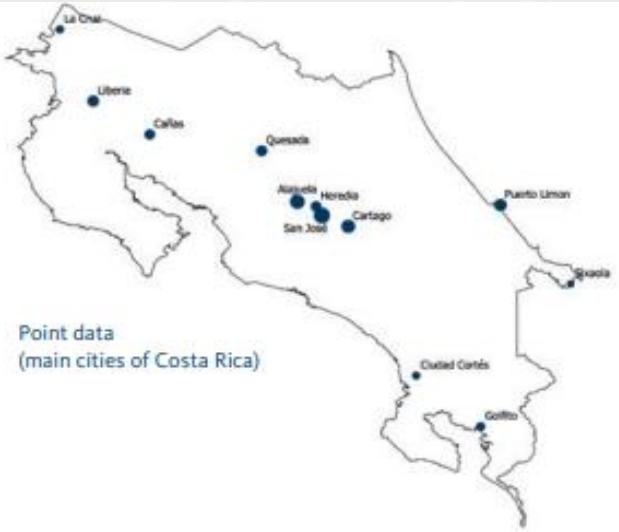
Nawrotzki, R. J. et al. (2023), "Climate change vulnerability hotspots in Costa Rica: constructing a sub-national index", *Journal of Environmental Studies and Sciences,* Vol. 13, No. 3.

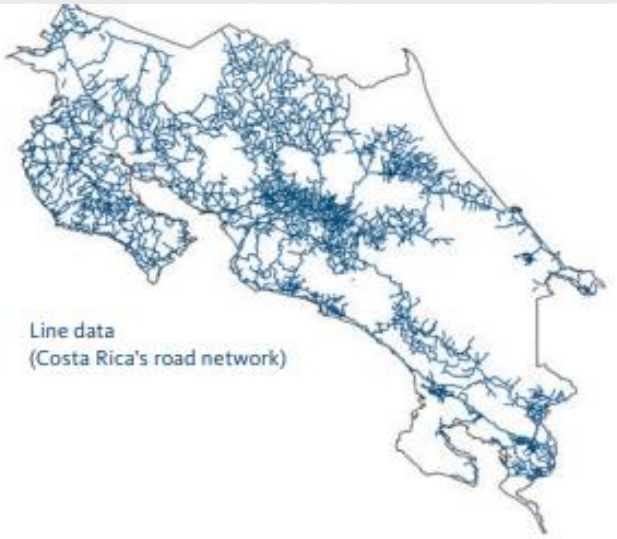
Schustereder, G. (2016), "Donor-Assisted Land-use Planning in the Philippines: Insights from a Multi-Level Survey", German Institute for Development Evaluation (DEval), Bonn.

BACKUP

Types of geodata

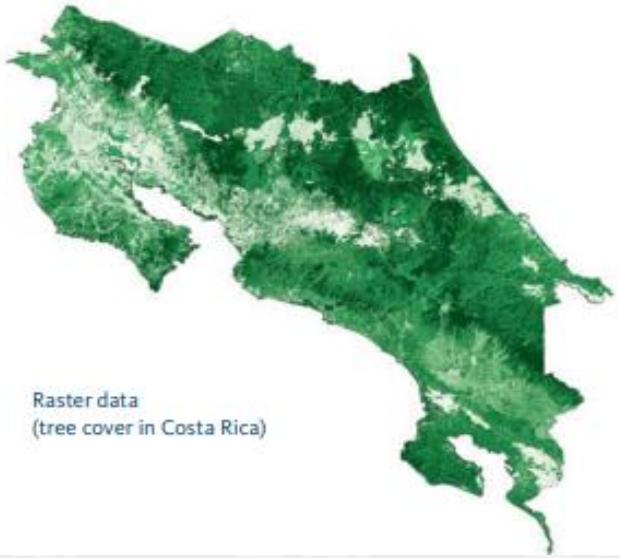


Point data
(main cities of Costa Rica)



Line data
(Costa Rica's road network)

Polygon data
(Costa Rica's protected areas)



Raster data
(tree cover in Costa Rica)