

GEOSPATIAL WORLD FORUM

Mapping Transhumance in Central Africa



United Nations DPPA Innovation Cell

Our role within the UN system

We are the innovation
engine/ "thinktank"
supporting UN entities



Project Origins

environmental security dashboard for UNOCA



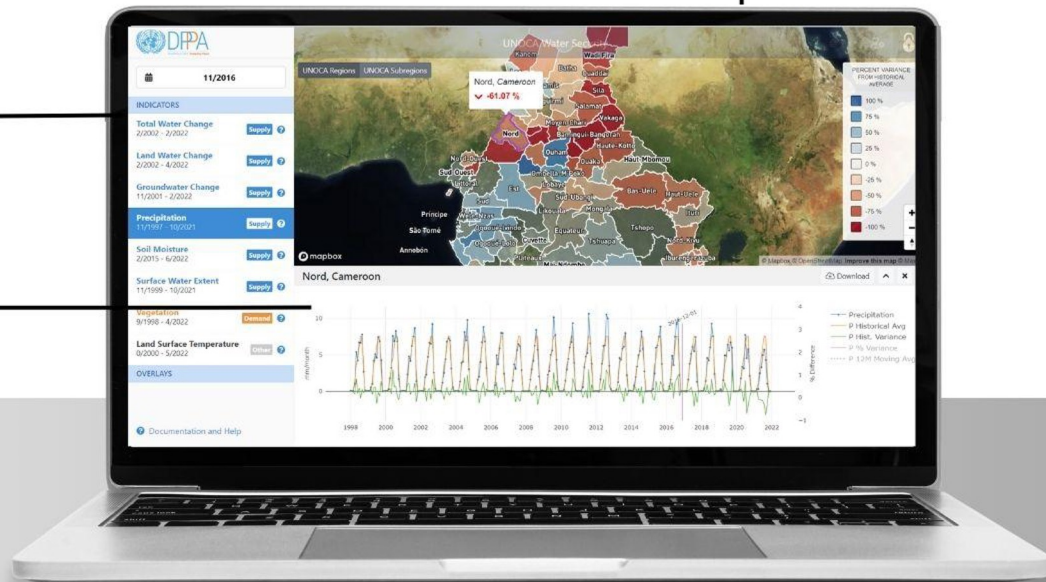
Project Origins

environmental security dashboard for UNOCA

Aggregation to subnational
admin boundaries across 11
countries

Water availability
indicators

Graph of historical
averages & variances





Incorporating transhumance

seasonal pastoral migration

From relative predictability to uncertainty & insecurity

- Urbanization and land privatization
- Resource depletion
- Militant activity & physical threats
- Administrative borders restrictions and tariffs
- Climate Change & natural disaster
- Livestock market volatility



Aggravating conflict at local to regional levels

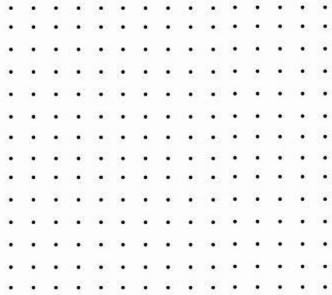
farmer-herder tensions, unsustainable resource depletion, cross-border disputes, narrative weaponization, economic insecurity, etc.



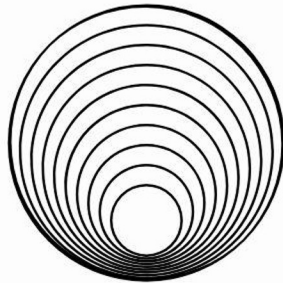
**Can't we just add
transhumance overlays?**

Not so much...

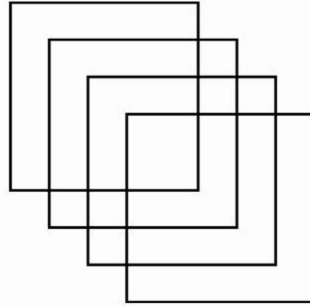
These routes are forever changing, and often informal. And after an initial macroanalysis on transhumance maps, we found they fell short on:



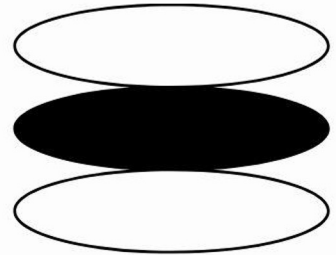
fidelity



scalability

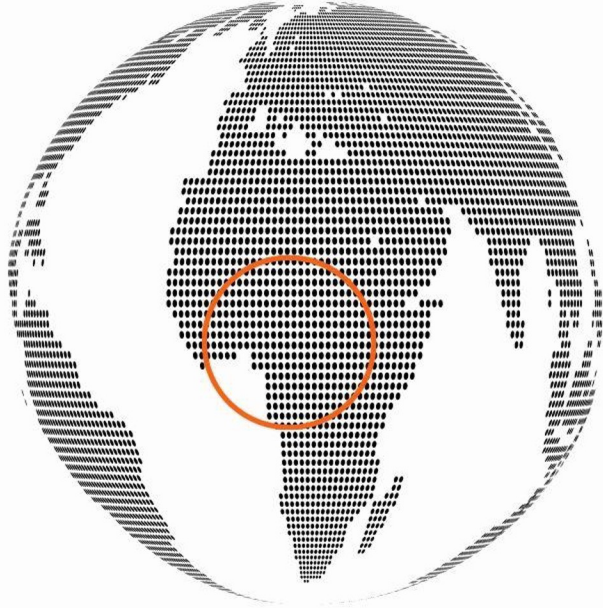


frequency



robustness

**We also
discovered a
paucity of data
in the region**



which is consequential for the Congo Basin & global climate action

Our Solution



We can start with satellite data, which gives us a unique geodetic vantage point

But running diagnostics on the earth from a binary
observer-observee, “doctor-patient” paradigm, doesn't
always give us the answers we're searching for



To build a first-of-its kind transhumance map for Central Africa, we built a methodology that is:

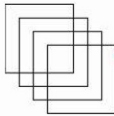
localized



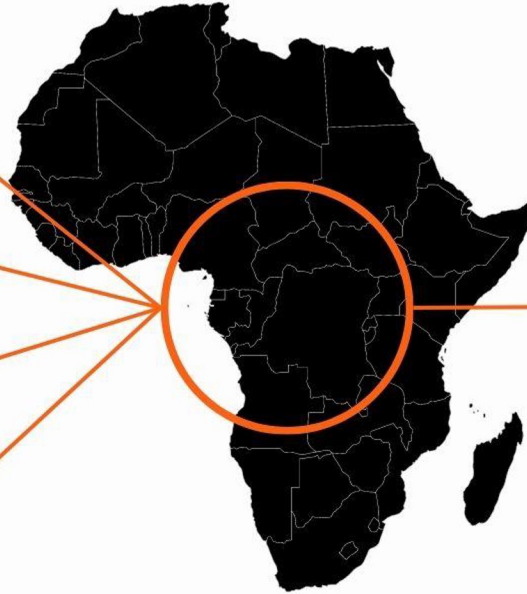
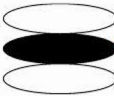
scalable



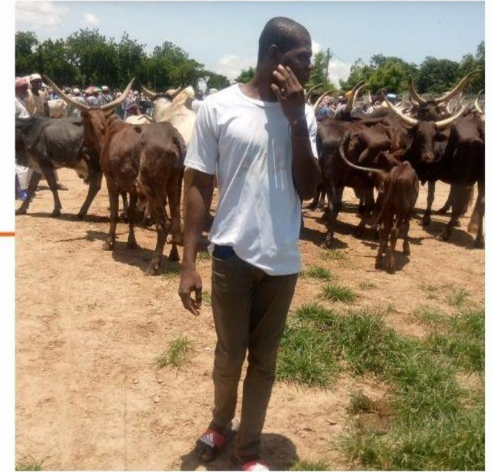
dynamic



holistic



and human-centered



A new GKI

To map **behavioral responses to environmental changes**, we must:

1. Understand socio-cultural, ontological relationships
2. Combine different data & knowledge streams



Because while our most advanced technology has been around for decades, indigenous knowledge has been built over **countless generations.**

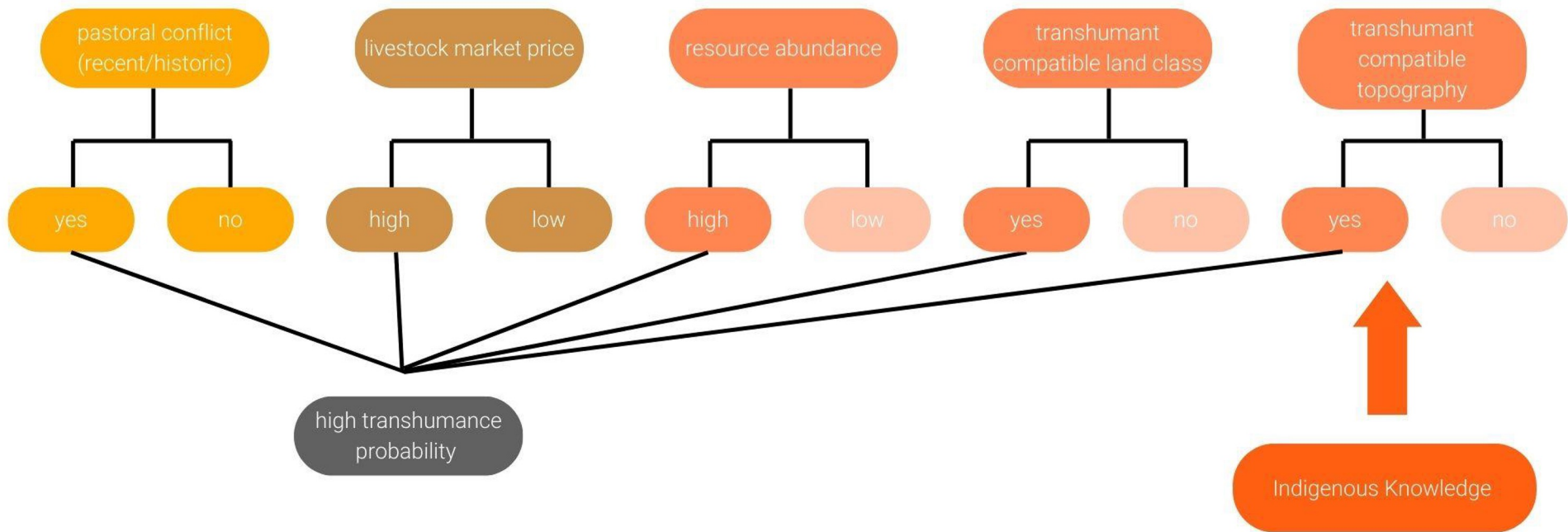


Our Prototype

Multivariate decision tree

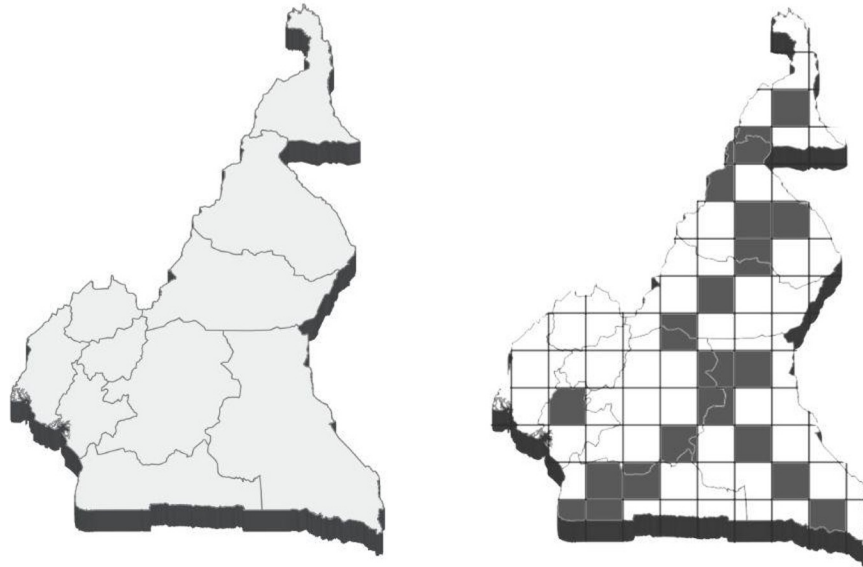
for each cell, each month

- media reports + OSINT
- crowdsourced data
- geospatial data



Mapping transhumance probabilities

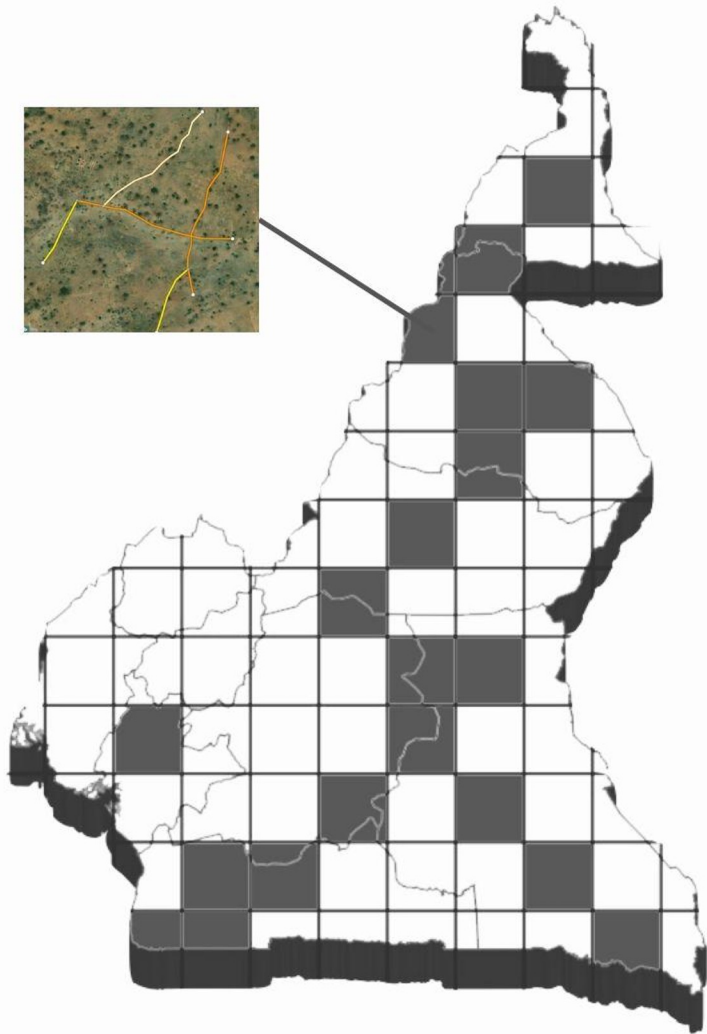
"High transhumance probability" can be determined through binary thresholding or dynamic scoring. Then, qualifying areas can be mapped:



■ high transhumance probability

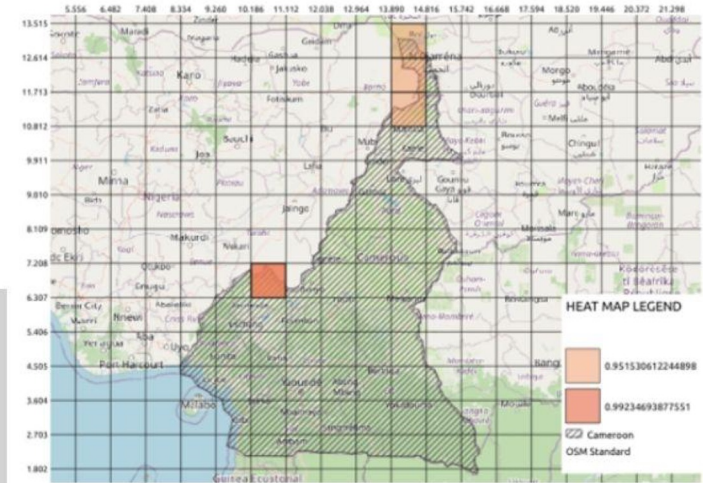
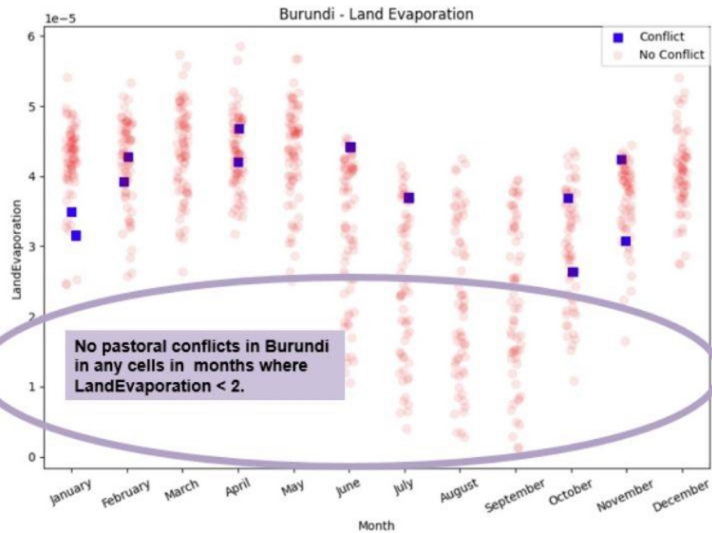
Granular & at scale

It could take years to fully map such a large expanse, but by selecting only green squares and leveraging crowdsourced verification, we can condense this effort & processing time



Leveraging ML

Spatiotemporally forecasting zones of high transhumance conflict risk to streamline coordination (In collaboration with Northwestern University)



Outcomes

- Supporting the mitigation of "preventable conflict"
- Filling critical data gaps
- Leveraging and legitimizing traditional knowledge within geospatial/scientific frameworks

Meaningfully "Embracing One and All"

Thank you

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futuringpeace.org