Geospatial Data and Borders:
Some Lessons Learnt From Fragile Borders

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Boko Haram crisis

2,564 Boko Haram incidents between 2010 and 2017

More than 30,000 fatalities

4 to 9% of GDP lost

Borderlands = 28% of the territories
41-49% of the incidents
53-75% of the fatalities
WHAT HAPPENS BETWEEN THE POINTS?
a questioning from 8 fieldworks in fragile borderlands

What Happens Between The Points?
What Happens Between The Points?

A Customs culture in « one dimension »
What Happens Between The Points?

A necessary shift from
« being alerted on what we know »
to
« being able to discover what we ignore »
MAPS FOR COOPERATION
and (a more) open governance
Maps For Cooperation (& Open governance)

Maps enable different kinds of people to discuss together (example of COMPSTAT in Police)

Space is concretely common to all of us
Maps For Cooperation (& Open governance)

Natural data (elevation, waterways, vegetation,...)
Maps For Cooperation (& Open Governance)

- Satellite imagery (nighttime light series...)
- Satellite imagery (evolution of no go zones...)
- Natural data (elevation, waterways, vegetation,...)
Maps For Cooperation (& Open Governance)

- Settlements, demography
- Paths and ways, borders
- Satellite imagery (nighttime light series...)
- Satellite imagery (evolution of no go zones...)
- Natural data (elevation, waterways, vegetation,...)
Maps For Cooperation (Open governance)

Economic data (markets, infrastructures...)

Settlements, demography

Paths and ways, borders

Satellite imagery (nighttime light series...)

Satellite imagery (evolution of no go zones...)

Natural data (elevation, waterways, vegetation,...)
Maps For Cooperation (& Open Governance)

- Events, incidents (reports, sensors...)
- Economic data (markets, infrastructures...)
- Settlements, demography
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Maps For Cooperation (& Open Governance)

Border agency A

- Events, incidents (reports, sensors...)
- Economic data (markets, infrastructures...)
- Settlements, demography
- Paths and ways, borders
- Satellite imagery (nighttime light series...)
- Satellite imagery (evolution of no go zones...)
- Natural data (elevation, waterways, vegetation,...)

Border agency B

- Patrons tracks
- Roadblocks location
- Fraud cases with route data
- Trade flows
Maps For Cooperation (& Open governance)

Border agencies cooperation

...but not too much
Maps For Cooperation (& Open Governance)

Border agencies cooperation

Participation of border communities, trade & transport communities

Enabling people to «say» what is important for them

(it is not science fiction, it exists in some developing countries)
WHERE IS THE BORDERLAND?
The way we represent space determines the way we will act within it

(important for Customs)

Where is the borderland?
Buffer zones?

Where is the borderland?
Where is the borderland?

Administrative delineation?
Administrative delineation?

Where is the borderland?
Insurgents and smugglers can «use» the administrative delineation but...

they do not respect it

**Where is the borderland?**
Where is the borderland?

Customs vision made concrete to advocate the economic dimension of border security

the extent to which space is structured by the border economy
SPATIAL ANALYSIS FOR BORDERS
Trade off between:

- providing information to officials operating in the field (and collecting it from them)
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- providing information to officials operating in the field (and collecting it from them)

- providing information for the public (and crowdsourcing data)
Spatial Analysis
For Borders

Trade off between:

- providing information to officials operating in the field (and collecting it from them)

- providing information for the public (and crowdsourcing data)

- providing tools for analysts
Spatial Analysis For Borders
Spatial Analysis For Borders
Spatial Analysis
For Borders
Spatial Analysis For Borders

An operational representation of space for an analysis based on border economy
Spatial Analysis
For Borders
Spatial Analysis For Borders
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Spatial Analysis
For Borders
Spatial Analysis
For Borders

\[ y = \rho W y + X \beta + \varepsilon \]
Spatial Analysis For Borders

Variable to be explained (rate of incidents, frauds, ...)

\[ y = \rho Wy + X\beta + \varepsilon \]
Spatial Analysis
For Borders

$y = \rho W y + X\beta + \epsilon$

Variable to be explained (rate of incidents, frauds,...)
Explanatory variables
Spatial Analysis
For Borders

Variable to be explained (rate of incidents, frauds, ...)
Explanatory variables

\[ y = \rho Wy + X\beta + \varepsilon \]
Spatial Analysis for Borders

\[ y = \rho W y + X\beta + \varepsilon \]

the « geographical factor »
(the weighting matrix defining the notion of contiguity and neighboring)
Spatial Analysis for Borders

\[ y = \rho W y + X\beta + \epsilon \]

for counterintuitive purposes (role of roads nodes, markets and Customs posts in Boko Haram strategy)

very cautious with predictive capabilities of modelling
conclusions

Customs corporate culture about to change:
- from « one dimension » to (at least) two dimensions
- from deploying technology to be alerted to deploying technology to discover what is ignored

Customs work with « numbers », they should also work with « maps »:
- to advocate the economic dimension of border security policies
- to foster border agencies cooperation
- to generate a profitable State-society dynamic relationship

Customs constraints:
- to adopt new technologies but not too much
- to develop internal capacities in data analytics in general (not only spatial analytics)
Thank you for attention

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