



ACC DAR Adapting to Climate Change in Coastal Dar es Salaam

International Workshop

TOWARDS SCENARIOS FOR URBAN ADAPTATION PLANNING

Assessing seawater intrusion under climate and land cover changes in Dar es Salaam, Tanzania



Sustainable Urban Environment : an Atlas for Sahelian Cities

Rome, April 22 2013



Maurizio TIEPOLO
DIST - Politecnico di Torino
maurizio.tiepolo@polito.it

The Atlas for Sahelian Cities' origins

Capacity building project

EuropeAid

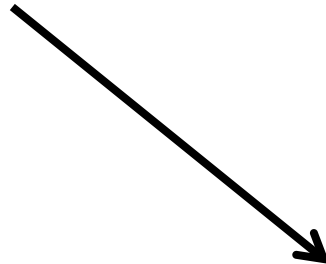
Provincial adm. Turin, Milan

Politecnico di Torino

Niamey & Louga Regions



- GIS for Local taxation
- Local tax assessment
- Surveys



Research project

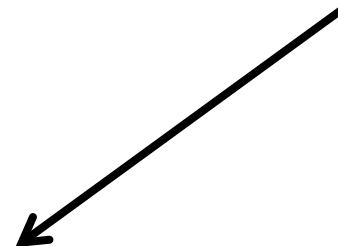
Italian Ministry

University & Research

Politecnico Torino & Sapienza University



- Environment assessment



**Atlas for Sustainable Environment
Sahelian Cities**

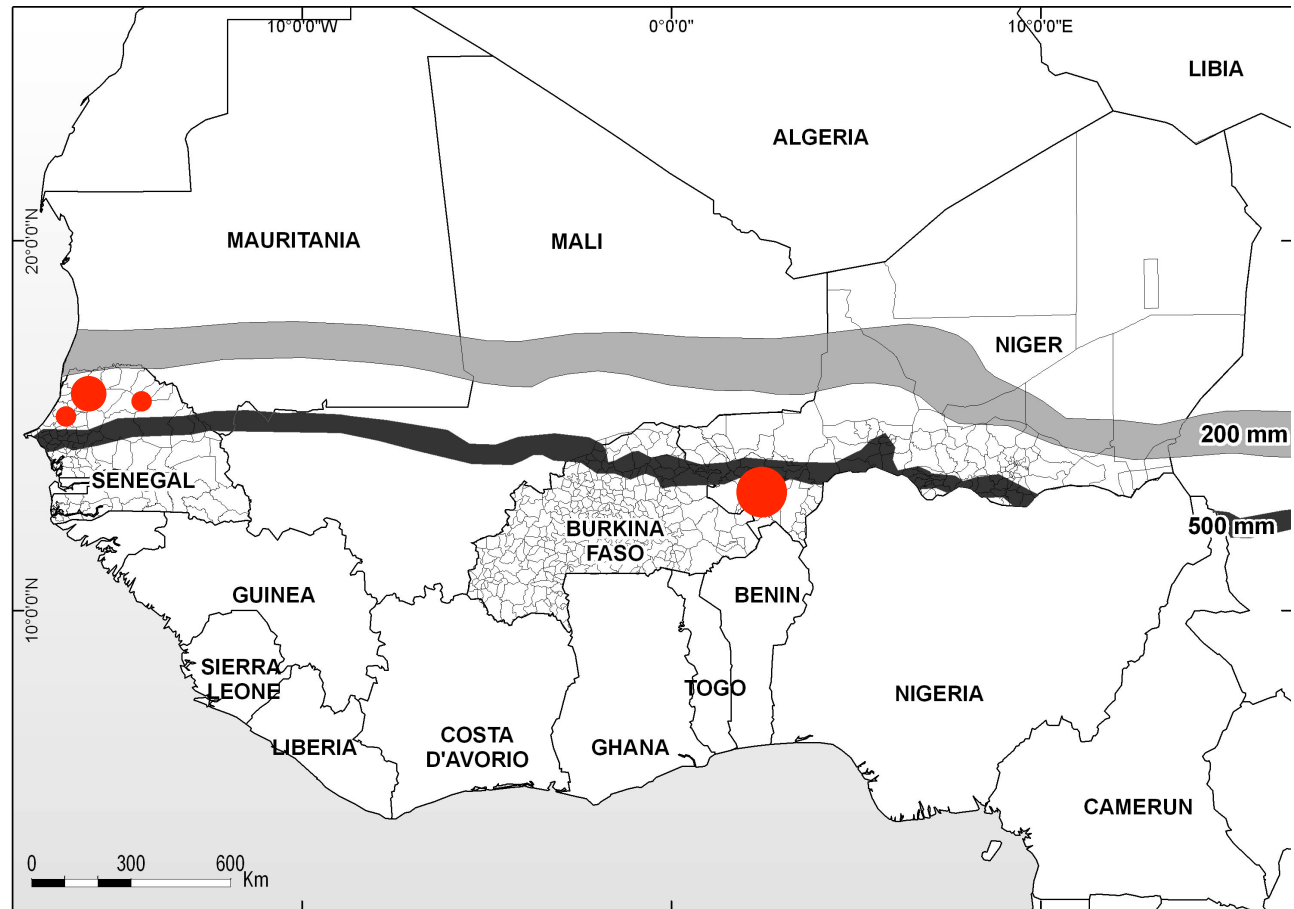
Urban Environmental Atlas

- Europe
 - France, Caen, Marseille 2010-13
 - Italy, Vicenza, Cremona, Perugia, Modena, Venice, Sovizzo 2000-11
 - Germany, Berlin 2010
 - Serbia, Beograd 2010
 - Spain, Madrid 2010
 - 305 EU cities > 100,000 inh., 2007*
- USA
 - New York
- Latin America
 - Argentina, Baires 2010
 - Brazil, *Porto Alégre 1996*, Sao Paulo, Londrinia, Florianopolis 2010
 - Colombia, *Bogotá 1997*
 - Ecuador, Quito 2008
 - Peru, Lima, Trujillo 2002-2010
- Middle East
 - Abu Dhabi 2011
- Asia
 - India, Pune 2008
 - Philippines, Manila 2013
- Africa
 - Addis Abeba 2003*, Ouagadougou*, Nairobi 2009**

*Urban focus with some envi elements. **As a Chapter of National Atlas

4 Sahelian cities

Niamey	1,400,000
Louga	100,000
Linguère	20,000
Kébémér	20,000



Atlas for Sahelian cities' aims

<i>Aim</i>	<i>Environment</i>	<i>Innovations</i>
To show municipal data base use MDG 7 in responding environmental impacts	W&S mainly according DPSIR Framework	<ul style="list-style-type: none">• open source, georeferred GIS created @ Niamey & Louga regions• Municipal revenue assessment for sustainable responses to environmental impacts



Excluded items

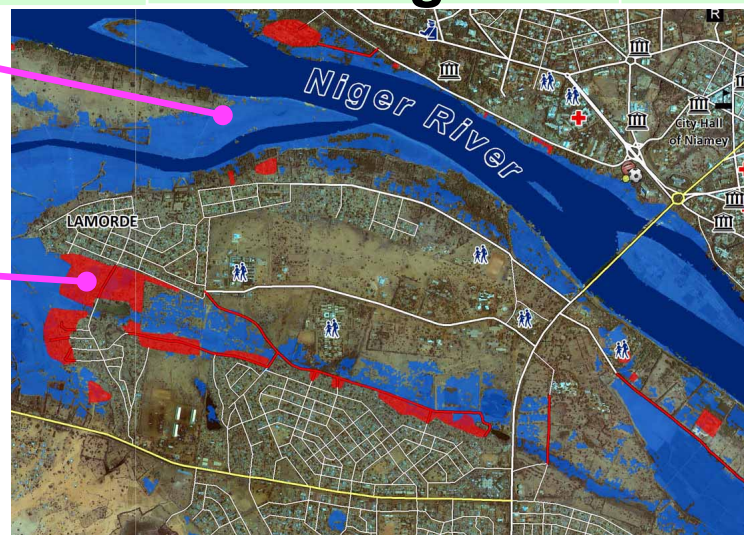
- Air, Water quality
- Electromagnetic radiation

Some environment facts from the 4 cities

Niamey

2012, **flood**
84,000 refugees
5,900 **dwelling**
collapsed

Suburban
water supply by
fountains only



Louga

Linguère

Kébémér

2012, flood

5 **dumping sites**
30 illegal

Latrine sludge empty
in the green belt

12% streets are paved

6% streets with drainage

No dumping site

No wooded area

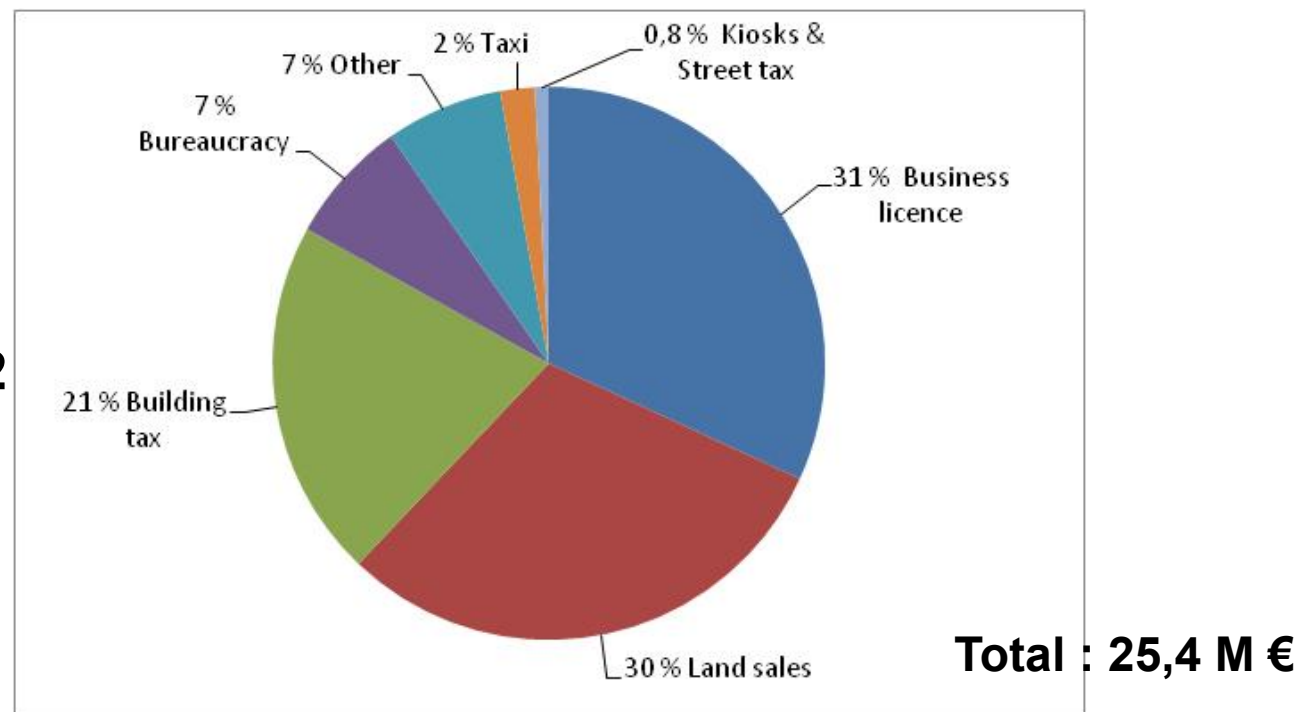
DPSIR framework

(since 1994 by OECD and UNEP, since 1995 by EEA)

Items	Drivers	Pressure	State	Impacts	Response	
Drainage	Population pressure	Extreme rains	Indicators	Floods	Resettlement	
Street paving		Urbanization		Homeless	Unpaved streets	
Sanitation	Poverty	Pop. density		No access	-	
Trash		Burning		Water pollution	-	
Water	Climate change	Wells		Air pollution	-	
Vegetation		Deforestation		Water pollution	-	
Landscape	Bad planning	Illegal settlements		Wind exposure	-	
				Run off	-	
				Landscape features loss	-	

No responses
Low revenue

Niamey revenue 2012



Local revenue	Rate increase	Recovery increase	Item change
Business license	no	no	no
Building tax	no	yes	no
Stamps, rights	no	no	no
Taxi	no	no	no
Land sale	no	no	yes
Kiosk tax	yes	yes	no
Street tax	yes	yes	no

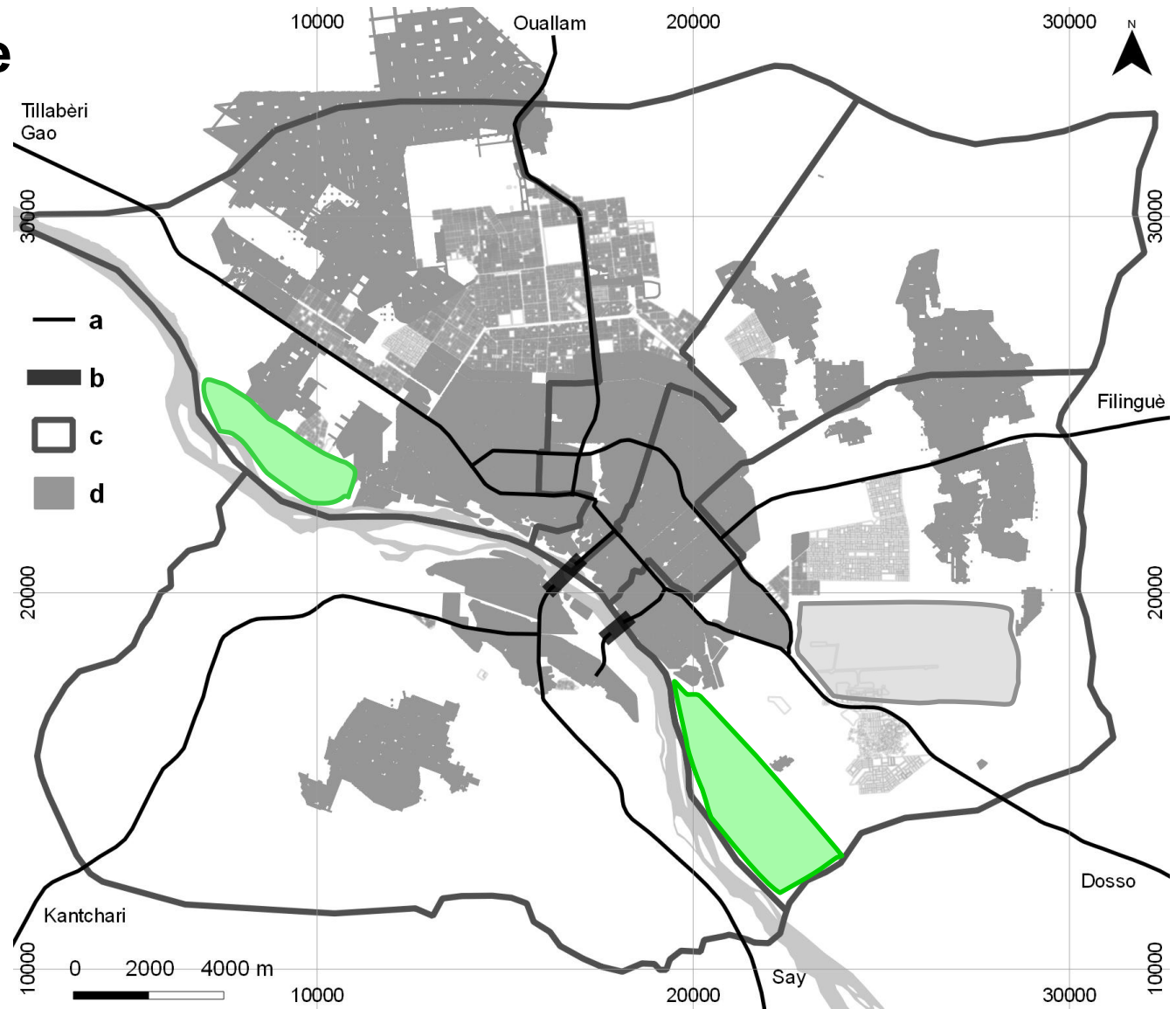
Niamey. Land sale

All municipal territory has been parceled - out

Municipal land with access to

- paved street
- drainage
- public lighting

still vacant



Niamey. Land sale



Public vacant land
> Land sale



Private vacant land
> Street tax



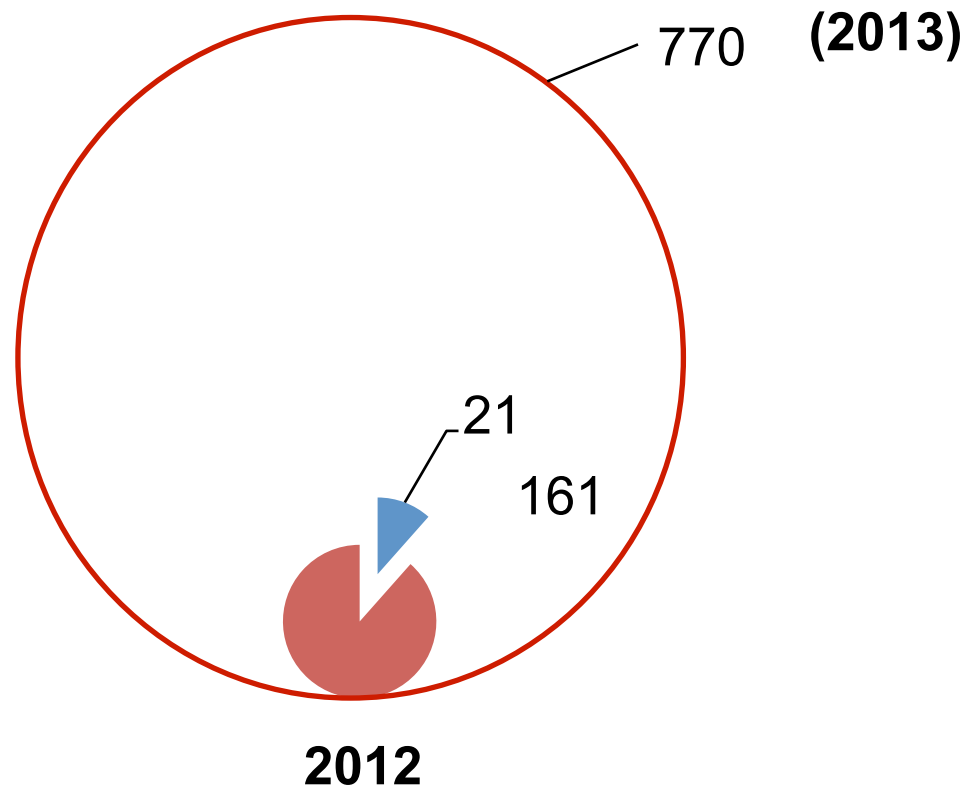
Kiosks
> Tax

Niamey, 2013. 13,420 Estimated kiosks



Niamey. Street tax revenue

Thousands taxpayers 15-60 years old (2 €/year)



Size of the work done

Item	Niamey	Louga*	Linguère	Kébémér
Built up area, sq km	114	4.7	7.3	8.7
Built-up plots, n°	90,000	5,600	3,000	5,600
Streets, n°	1,342 + ?	?	?	?
Streets paved, km	150	?	?	?



- GIS (building plots, infrastructure)
- Kiosk survey

Street
addressing

Plot survey to learn:

- Quality of streets
- Vacant plots
- Building quality > taxpayers
- Sanitation, trash

* 2003-2013 built up area only

Louga, Linguère, Kébémér, 2012. Street addressing



Niamey: Importance of improved local tax revenue

Scenario A: Only those who receive services pay

Scenario B: All pay

Yearly taxes

2012: < **1%** revenues

Scenario A: 3% revenues 2012

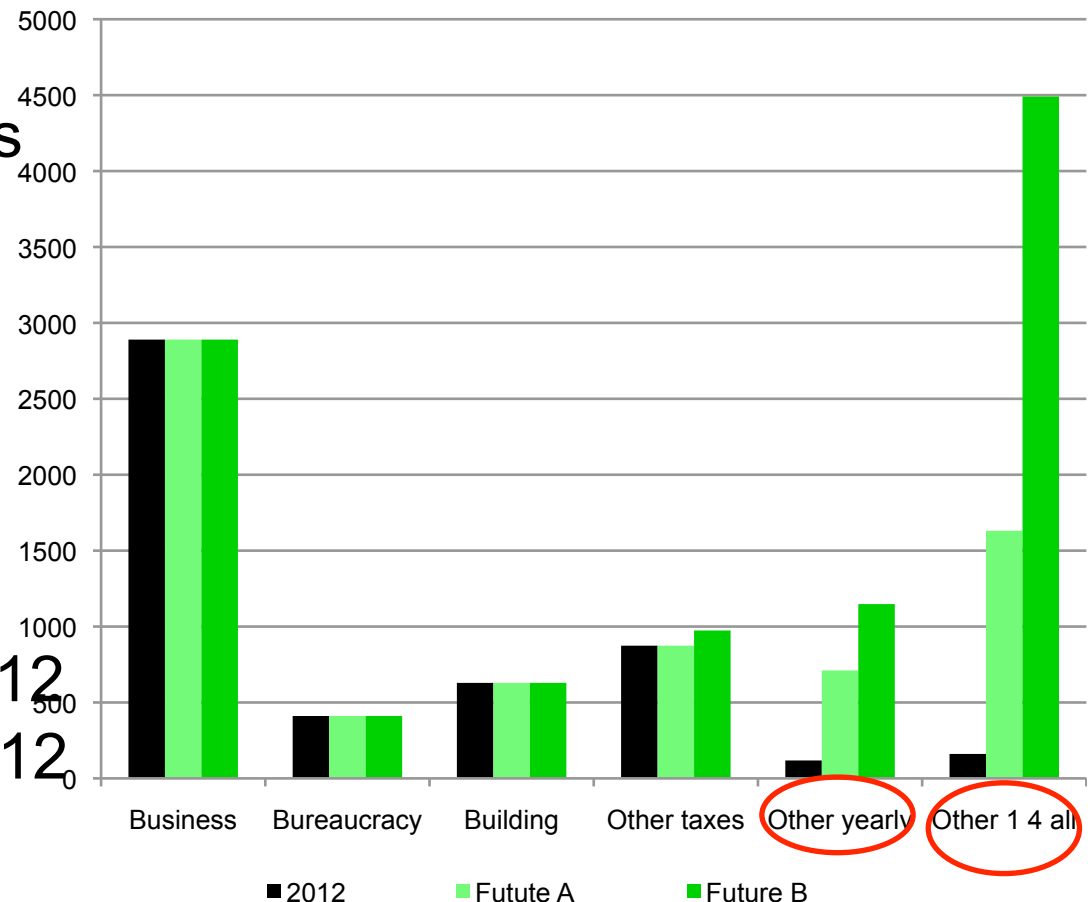
Scenario B: **7%** revenues 2012

Once revenues only

2012: 30% revenues (but no more land is available to sell)

Scenario A: 6% revenues

Scenario B: **8%** revenues 2012



Reformed local taxation support to MDG 7 attending paving streets and providing with asphalt & water drainage

Year	Yearly revenue		Streets to be improved	
	Scenario	Scenario	Scenario A	Scenario B
	A	B	Km	Km
	M FCFA	M FCFA		
1	1.046	1.556	9	14
2	711	1.221	6	11
1 to 5	3.890	6.440	33	58
Δ 2013+5	-	-	+ 19	+38

Conclusions

- 1) Within capacity building projects
an **Atlas** could be an useful tool
to show potential of a georeferred municipal data base if:
 - Response driven (Local taxation improvement)
- 2) Typical semi arid cities suffer from too much water:
 - climate change impact and territorial mismanagement
- 3) Taxing/selling vacant land is a value capture activity
Local taxation as a policy
should dialogue with physical planning
Physical planning define
 - land use (i.e. community services location) and
 - infrastructure prioritiesinfluencing land values

**Thank you
for your attention**