

# **NATURE-BASED SOLUTIONS FOR GREENER CITIES**

GGKP Webinar

The GGKP is a global community of organizations, research institutes, and experts committed to collaboratively **generating, managing** and **sharing** green growth knowledge and data to mobilize an inclusive green economy.

# The 5<sup>th</sup> Green Growth Knowledge Platform Annual Conference

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Leading researchers will explore key aspects of the infrastructure agenda, including the policy and regulatory framework, finance, climate change adaptation, low carbon pathways, energy, transportation, nature-based solutions and more.

27-28 November 2017  
Washington DC, USA





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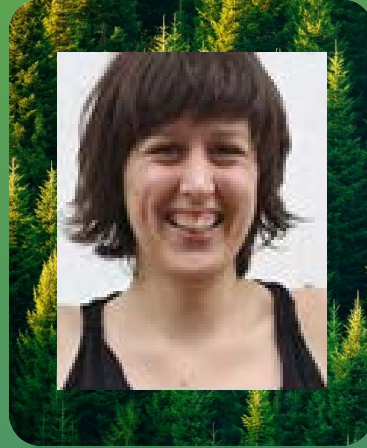
# INNOVATING WITH NATURE

**Nature-based solutions** are designed to bring more nature and natural features and processes to cities, landscapes and seascapes. These innovative solutions also support economic growth, create jobs and enhance our well-being.

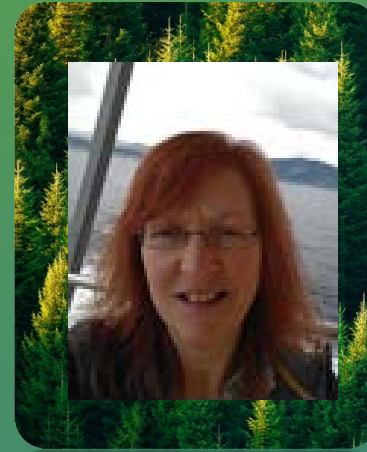




**Kevin Urama**, Senior Advisor  
African Development Bank



**Ania Rok**, Coordinator  
Governance & Social  
Innovation Team,  
ICLEI (Local  
Governments for  
Sustainability)



**Gillian Dick**, Principal  
Place, Strategy &  
Environmental  
Infrastructure,  
Glasgow City Council



**Juliano Assunção**,  
Professor  
Pontifical Catholic  
University of Rio de  
Janeiro

# **NATURE IN THE CITY**

## **NATURE-BASED SOLUTIONS & URBAN GOVERNANCE**

Ania Rok, Coordinator  
Governance & Social Innovation Team,  
ICLEI (Local Governments for Sustainability)



# Nature in the City

**Nature-based solutions & urban governance**

Ania Rok,  
Governance & Social Innovation Coordinator  
ICLEI European Secretariat

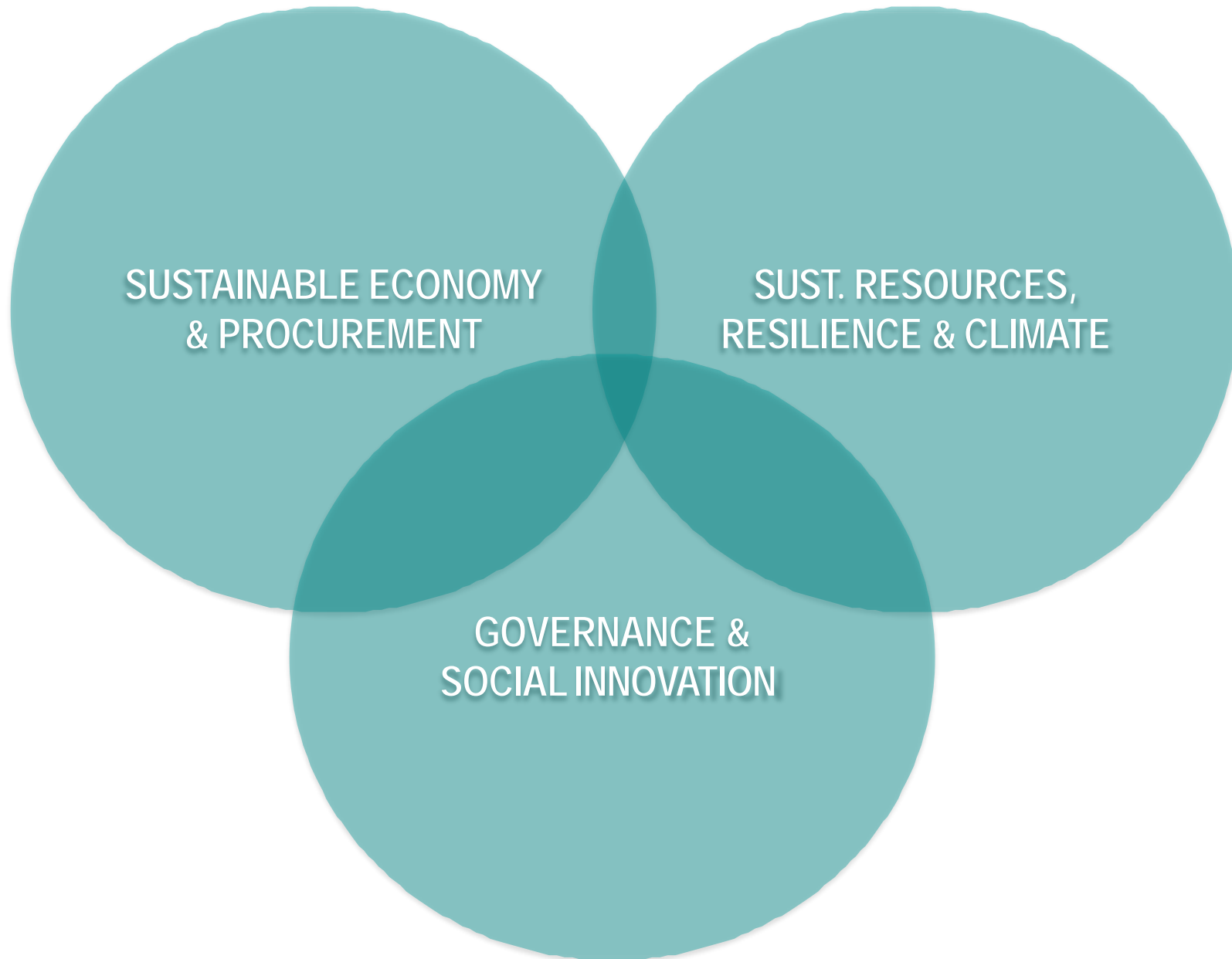




**Local Solutions to Global Challenges**

Connecting Leaders - Accelerating Action - Pioneering Solutions







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Barcelona / Gyor / Leipzig / Malmo / Newcastle /Utrecht



11 European cities, including Glasgow / Genk / Poznan

## The Natural Nexus

How Nature-Based Solutions Can Help Restore the Planet and Civil Society

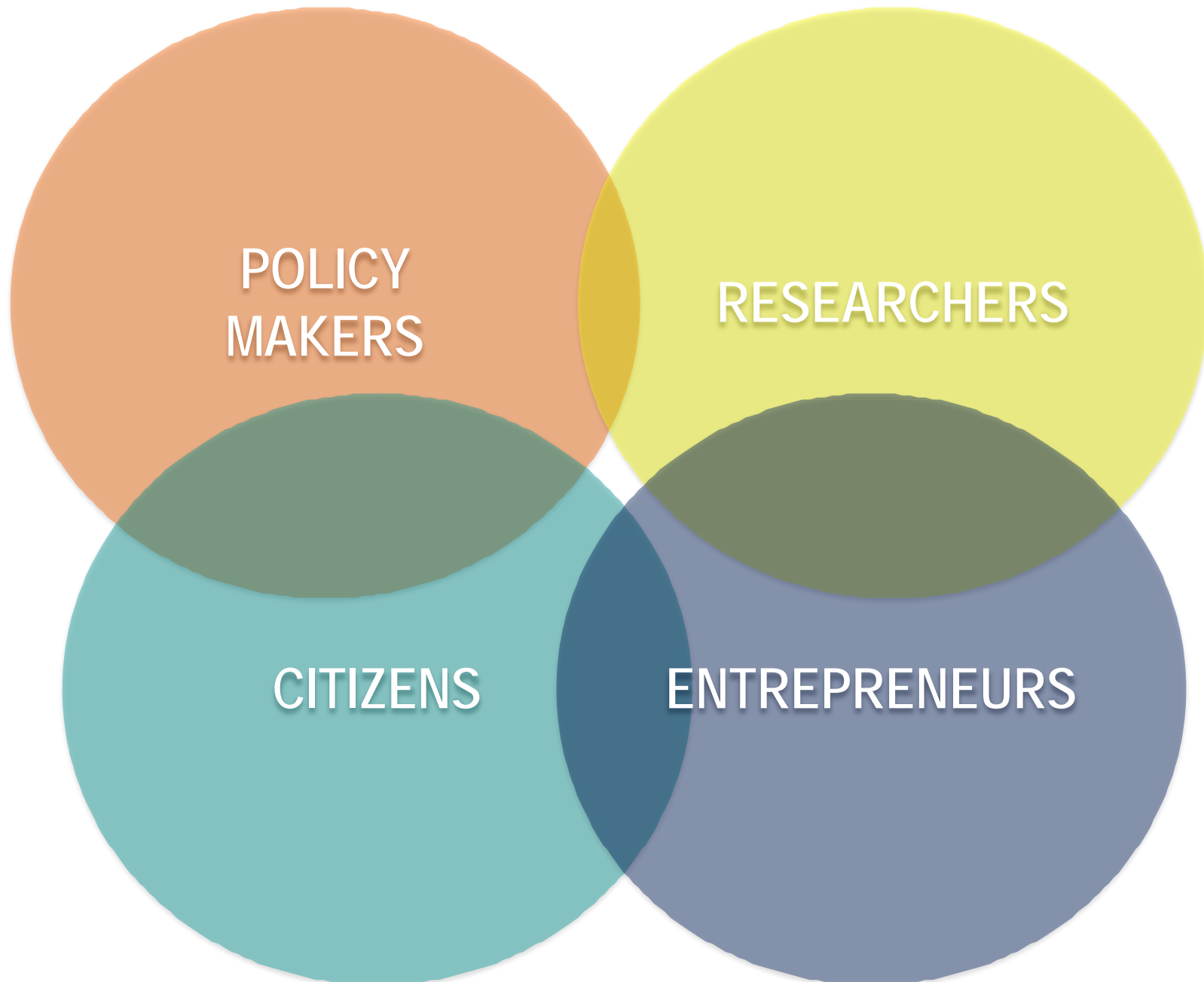
**In this Transition Read, we explore ways that nature-based solutions can have transformative social impact in cities, and how these solutions are being used by transition initiatives to strengthen and accelerate their work towards creating sustainable, low-carbon societies. Transition Reads are published as part of the ARTS project, an EU-funded research project which aims to benefit theory, policy and practice related to accelerating sustainability transitions.**

"Urban nature, when provided as parks and walkways and incorporated into building design, provides calming and inspiring environments and encourages learning, inquisitiveness, and alertness."

Take a look out of your window. If you're lucky, you'll see at least one tree. Do you ever think about what the tree does? It lets your eyes rest. It helps lower your blood pressure. It helps you breathe easier. It cools you and protects you from the effects of the changing climate, often cheaper and more effectively than most technical solutions will. It's also a home and resting place for hundreds of organisms, plants and animals and engineer of the "wood wide web", nature's predecessor of Internet. And that's just a few things from [a long list](#).

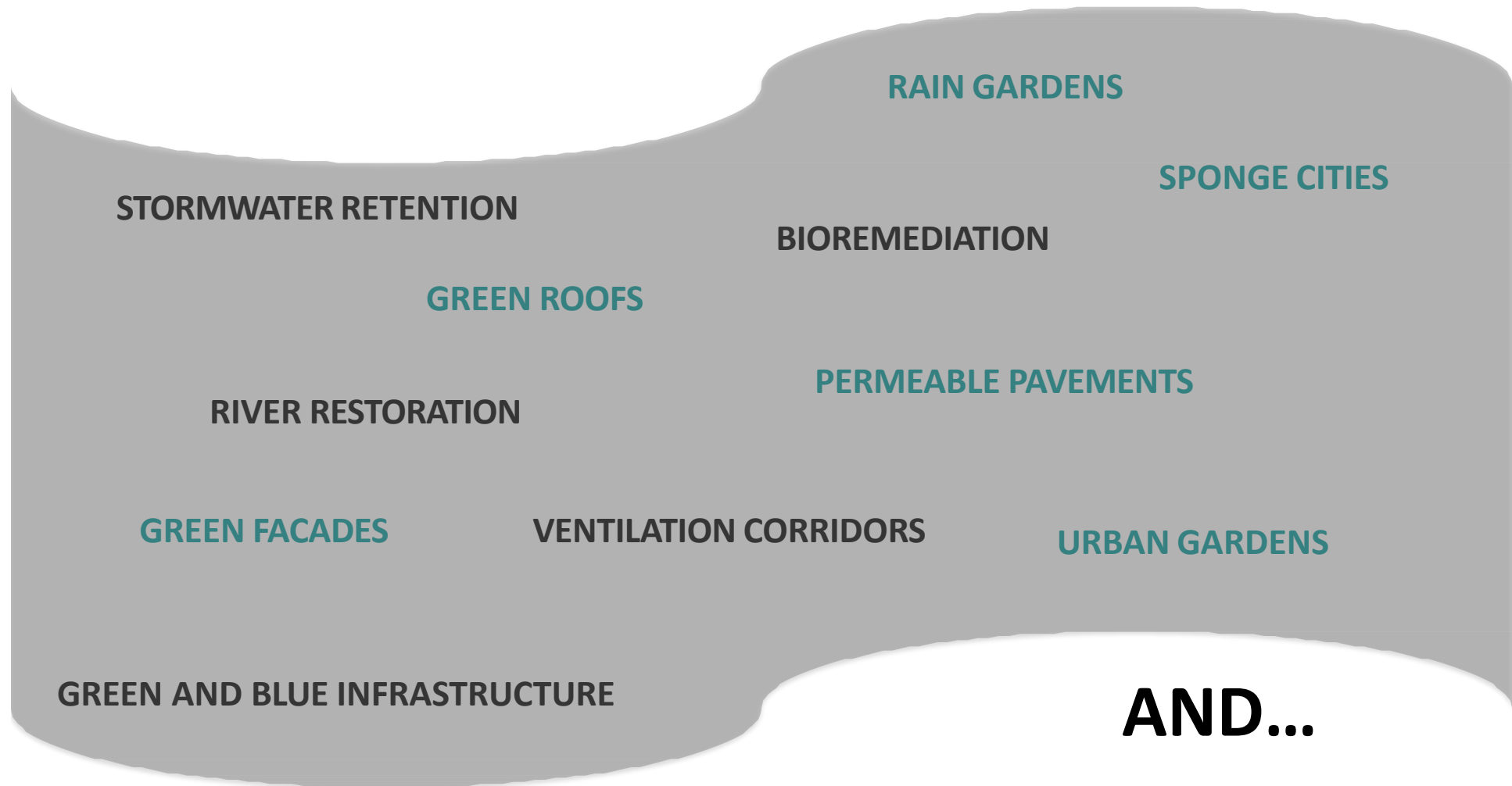
How much do you know about your tree? How old is it? Who decided to plant it there? Who takes care of it? Does your local government or is it the company that manages the nearby office block? Or maybe a group of neighbours who wanted to make their street greener? Do you feel responsible for it? Would you miss it if it one day simply disappeared?

The tree outside your window is a very simple example of how nature-based solutions are "living solutions" that shape the functions of healthy ecosystems to solve some of our most pressing problems. Nature in the city – be it trees or parks, urban wetlands, green roofs, beehives or grass-eating sheep – offers important benefits that





# WHAT DO WE TALK ABOUT WHEN WE TALK ABOUT NATURE-BASED SOLUTIONS?



Nature-based solutions are „living solutions” that shape, use or mimic nature and the natural functions of healthy ecosystems to solve some of the planet’s most pressing environmental problems. (Source: ARTS )

Nature-based solutions to **societal challenges** are solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide **environmental, social and economic benefits** and help **build resilience**. (Source: EC)

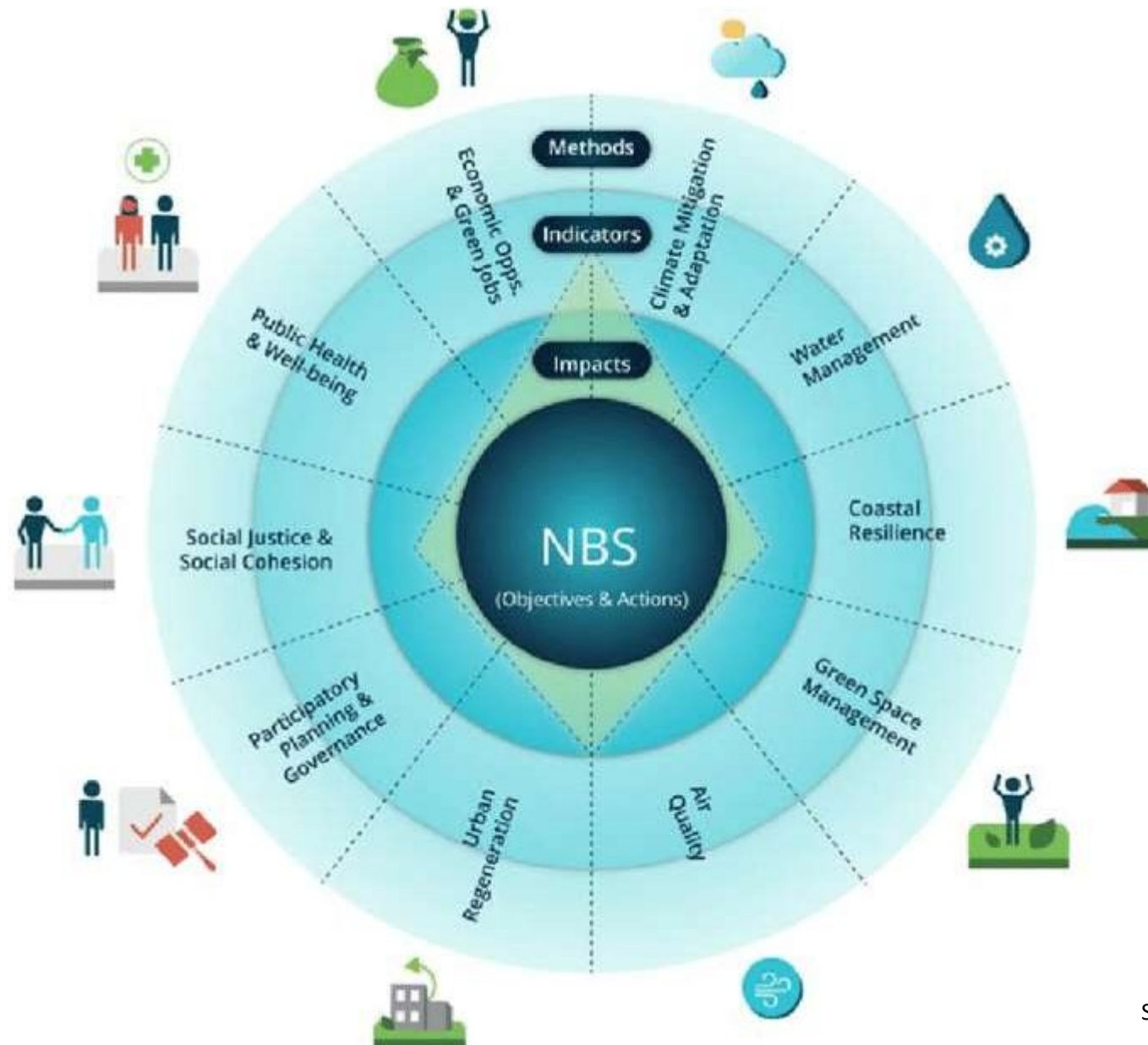
Nature-based solutions are actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits  
(Source: IUCN)

# INNOVATING WITH NATURE

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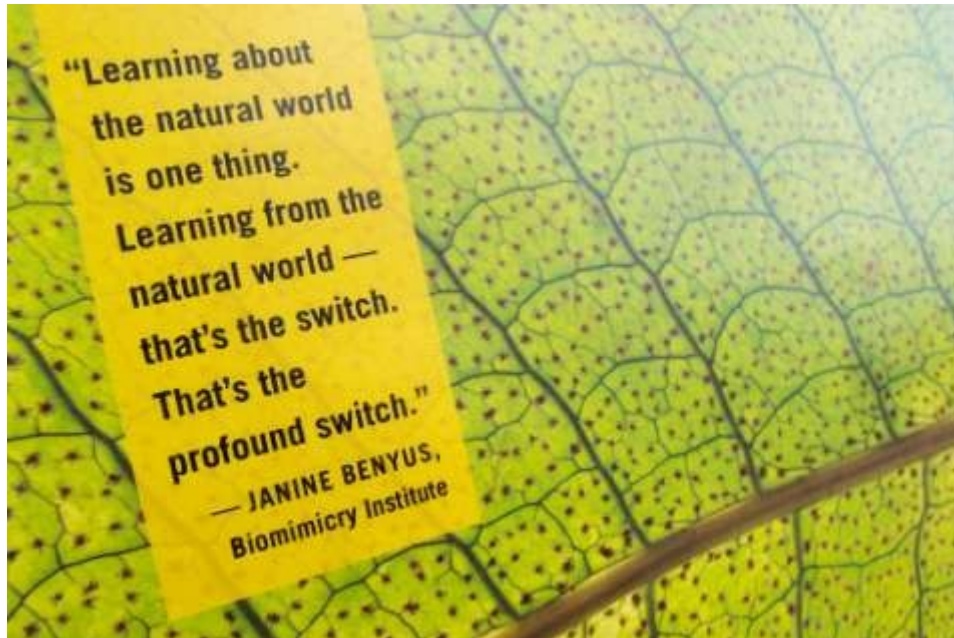


# NBS IMPACT EVALUATION FRAMEWORK





*The truth is, natural organisms have managed to do everything we want to do without guzzling fossil fuels, polluting the planet or mortgaging the future.*



**Janine Benyus**

3



**PROTECT**



## KNOWLEDGE & SKILLS

## PLACES





**CONNECT**



Fot. J.Ehlers



## AGENDAS

## PEOPLE



### GAIA — Green Area Inner-city Agreement to finance tree planting in Bologna



Source: © City of Bologna



<b>Name</b>	Bologna
<b>Country</b>	Italy
<b>Inhabitants</b>	386 633 (2015)
<b>Climate impact(s)</b>	HEAT ☀️

<b>Adaptation measures financed</b>	• Green spaces in urban areas • Tree planting
<b>Financing source(s)</b>	 Private investors  EU and municipal funds
<b>Financing type(s)</b>	Direct funding of measures that offset greenhouse gas emissions and, as a co-benefit, serve adaptation
<b>Financing mechanism(s)</b>	Greenhouse gas emissions compensation scheme, EU LIFE funding mechanism

Source: EEA 2017

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**Natural capital • Ecosystem services • Nature-based solutions**

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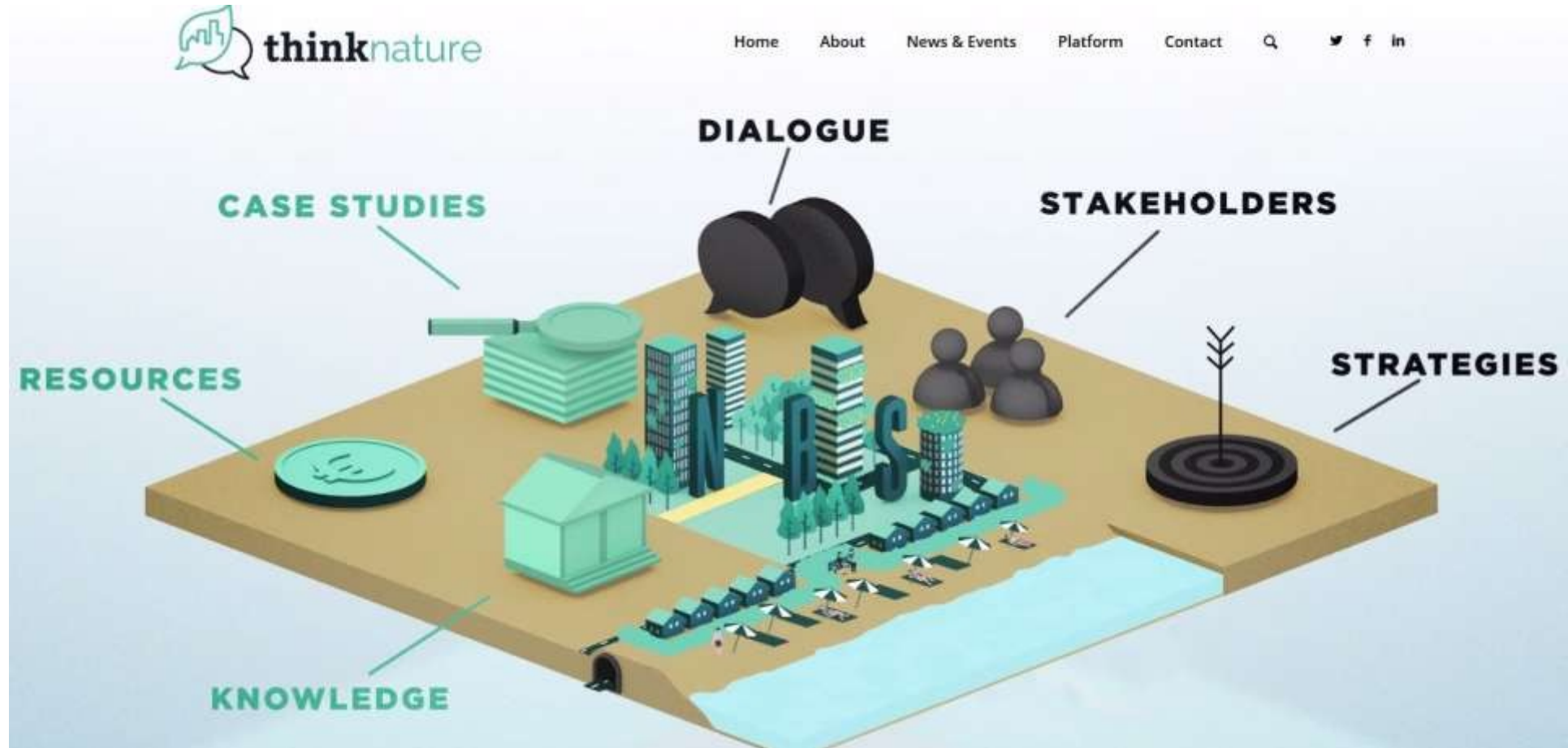
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<https://www.think-nature.eu/>



## Sustainable Land Use



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### What's New

LIBRARY ITEM

#### Orientation Paper

This orientation paper sets the background for the work of the Urban Agenda Partnership on Sustainable Use of Land and Nature-based Solutions (SUL\_NBS). It includes the specific challenges that...



William (Commun...)

🕒 24 October 2017 - updated 6 days ago

NEWS

#### Kick-off meeting of the Partnership on Sustainable Land Use and Nature-based Solutions, 13 July 2017, Warsaw

The new round of Partnerships launched within the framework of the Urban Agenda for the EU in summer 2017 completes the list of priority themes presented in the Pact of Amsterdam. One of these four...

### Subscribe to Urban Agenda for the EU

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### Latest comments

“ Please inform with a sample what you mean by the expressions : Sustainable Land Use and Nature-based Solutions? I am interesting about these topics. Thank you ”



# Thank you!

## Related projects

- [acceleratingtransitions.eu](https://acceleratingtransitions.eu)
- [connectingnature.eu](https://connectingnature.eu)
- [naturvation.eu](https://naturvation.eu)
- [greensurge.eu](https://greensurge.eu)

## ICLEI European Secretariat

- [iclei-europe.org](https://iclei-europe.org)

## Contact

- [ania.rok@iclei.org](mailto:ania.rok@iclei.org)
- @missrok



Further resources on financing:

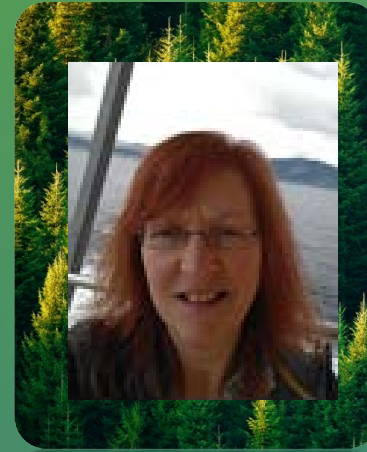
- <http://innprobio.innovation-procurement.org/home/>
- <http://www.eib.org/products/blending/ncff/index.htm>
- <https://www.eea.europa.eu/publications/financing-urban-adaptation-to-climate-change>



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University of Rio de  
Janeiro



# **CONNECTING NATURE: GLASGOW CITY COUNCIL**

Gillian Dick, Principal  
Place, Strategy & Environmental Infrastructure  
Glasgow City Council





## Glasgow City Council

Bringing  
cities to life,  
**Bringing life**  
into cities.



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## EU Goals for Nature based solutions.

- urban regeneration
- improved wellbeing
- building coastal resilience
- understanding ecosystem management
- sustainable use of materials & energy
- enhanced insurance value of IGI solutions
- carbon sequestration.



**The emphasis in this successful bid starts with nature based solutions**

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## Project Overview - GCC role

Complex problem to embed NBS in urban planning policy

**Glasgow** chosen as front runner city because:



- We're recognised as trying to understand the implications of a changing climate
- Collaborative & innovative in relation to NBS
- We try to deal with blue / grey / green spaces across departments, disciplines and partners. Working with MGSDP, CSGN, GCVGN, Greenspace Scotland, SNIFFER etc
- Our NBS projects are now at a scale that they are impacting positively on policy, however the project will allow us to iteratively improve our data; monitoring; policies and opportunity mapping
- We support bottom up / top down solutions – As spatial planning aligns more closely with Community Planning and budgets are squeezed this project will allow us to identify opportunities for social enterprise and community collaboration.

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**A new approach to  
Open Space**







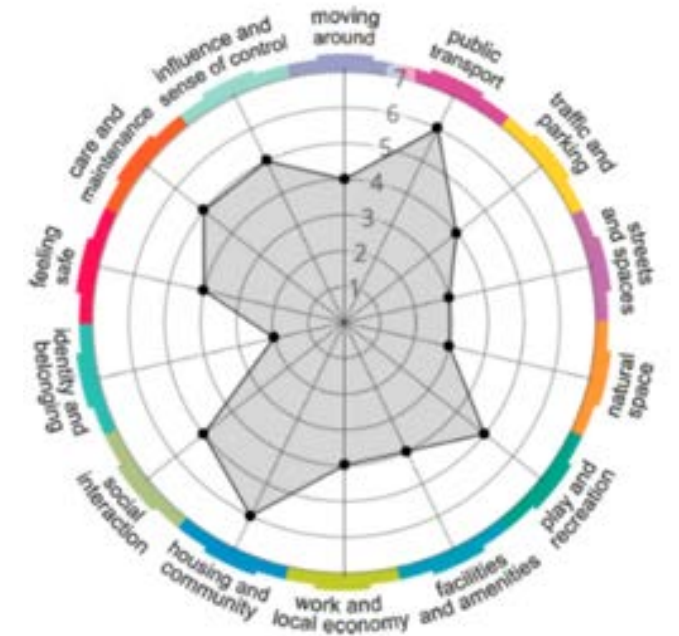
## Think about Place

“Dull, inert cities, it is true, do contain the seeds of their own destruction and little else. But lively, diverse, intense cities contain the seeds of their own regeneration, with energy enough to carry over for problems and needs outside themselves.”

*Jane Jacob*

"Town Planning is not mere place-planning, nor even work planning. If it is to be successful it must be folk planning. This means that its task is not to coerce people into new places against their associations, wishes, and interest, as we find bad schemes trying to do. Instead its task is to find the right places for each sort of people; place where they will really flourish

**Sir Patrick Geddes**

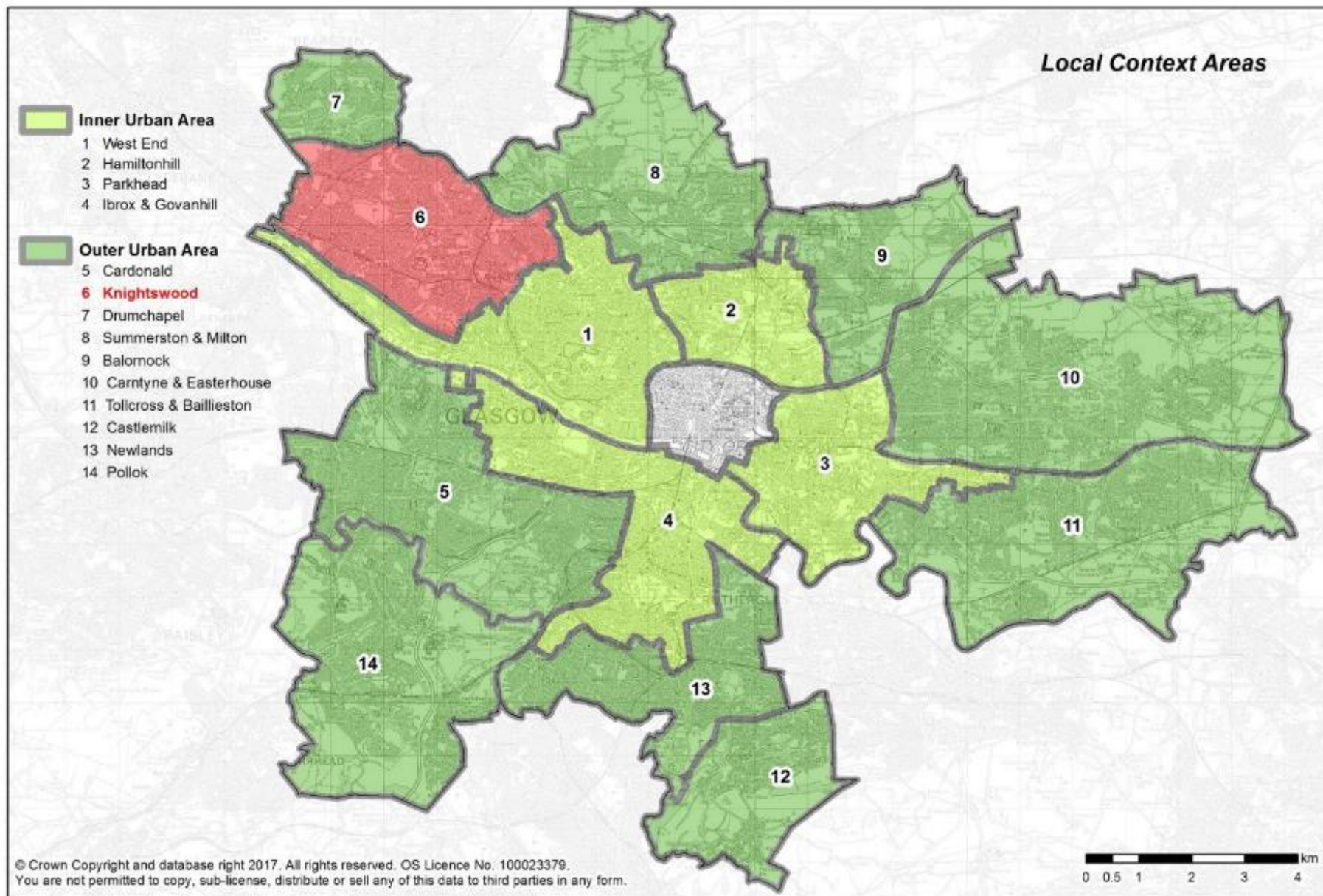


[Place Standard tool](#)

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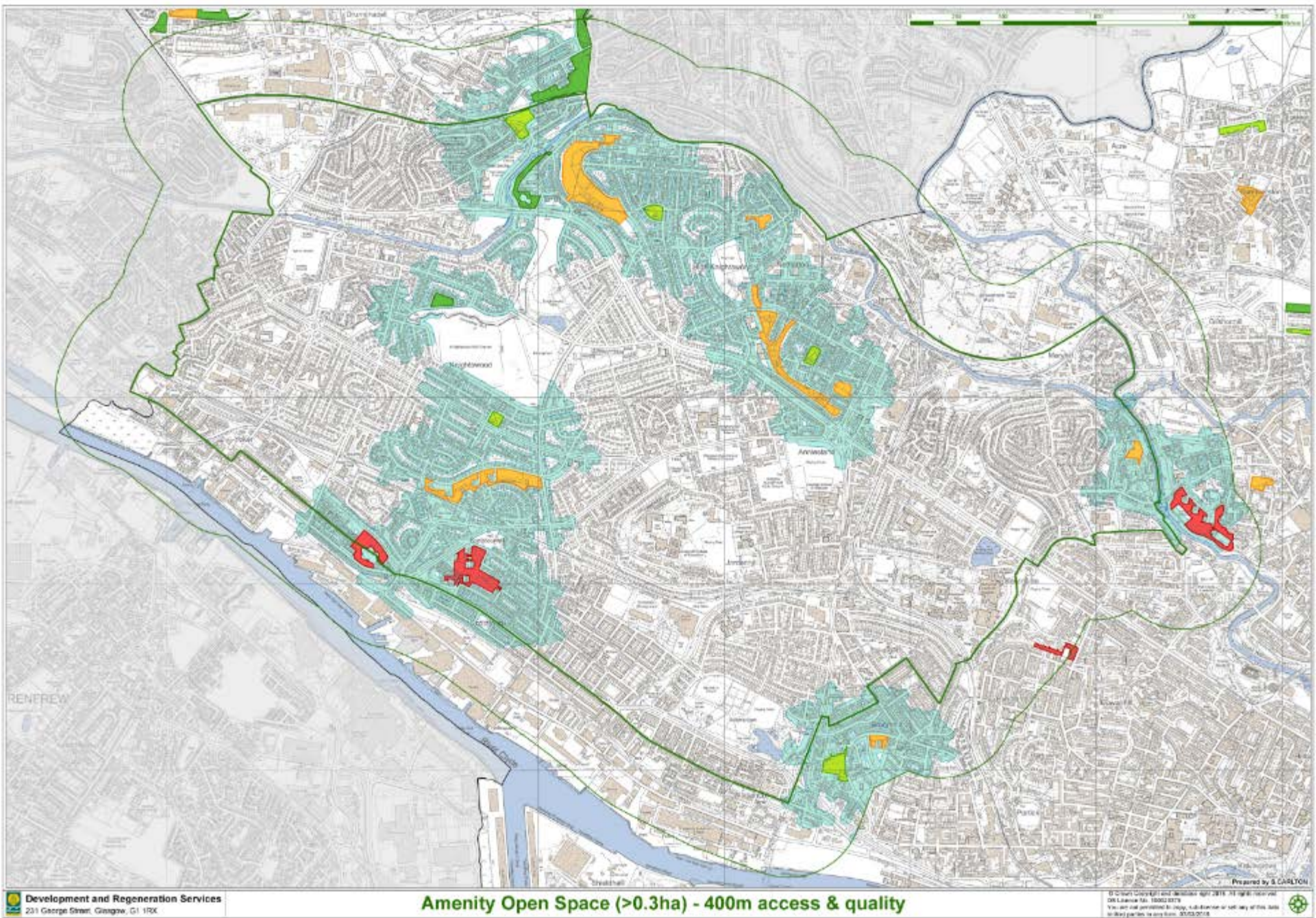




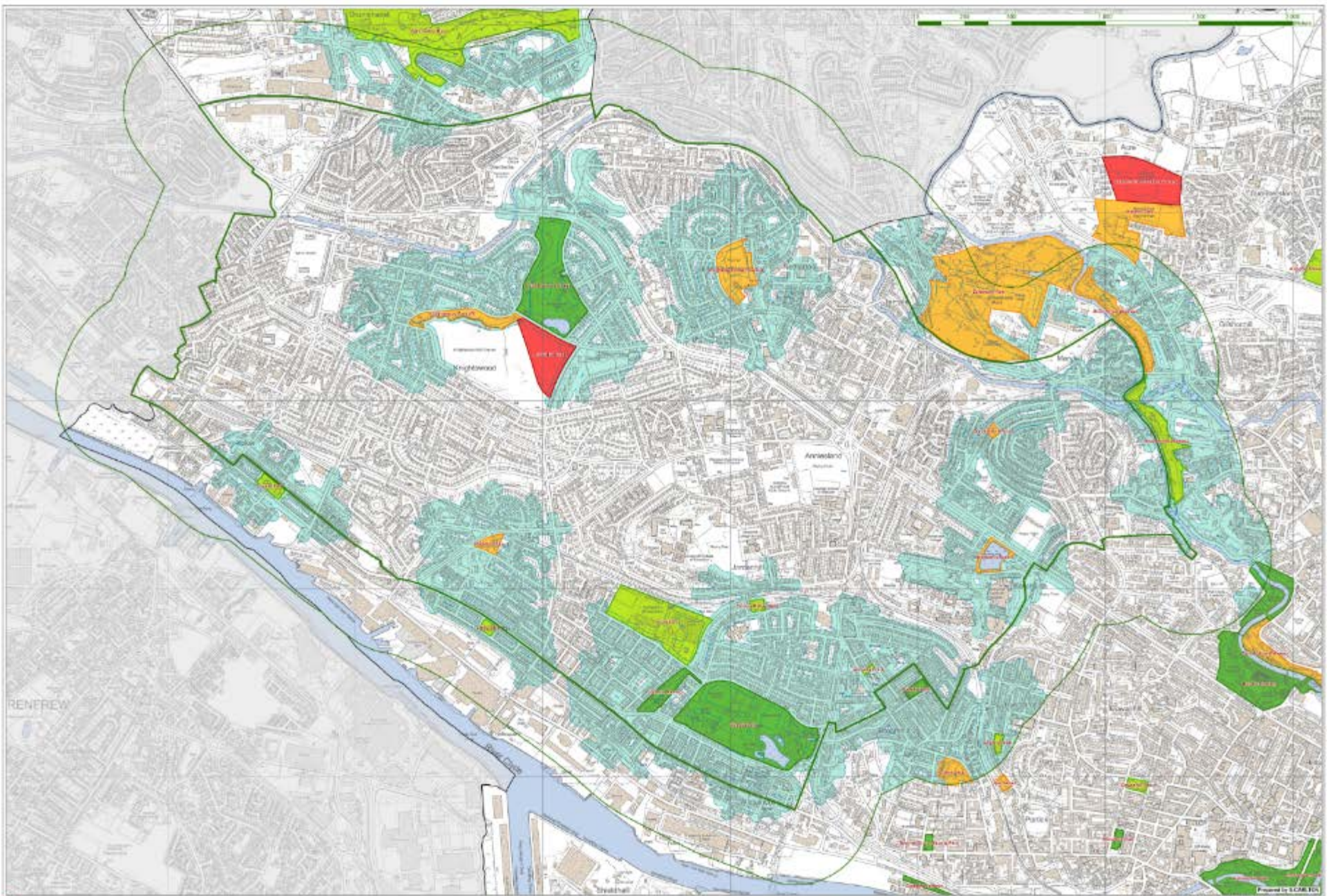
**Local Context Area - Knightswood**



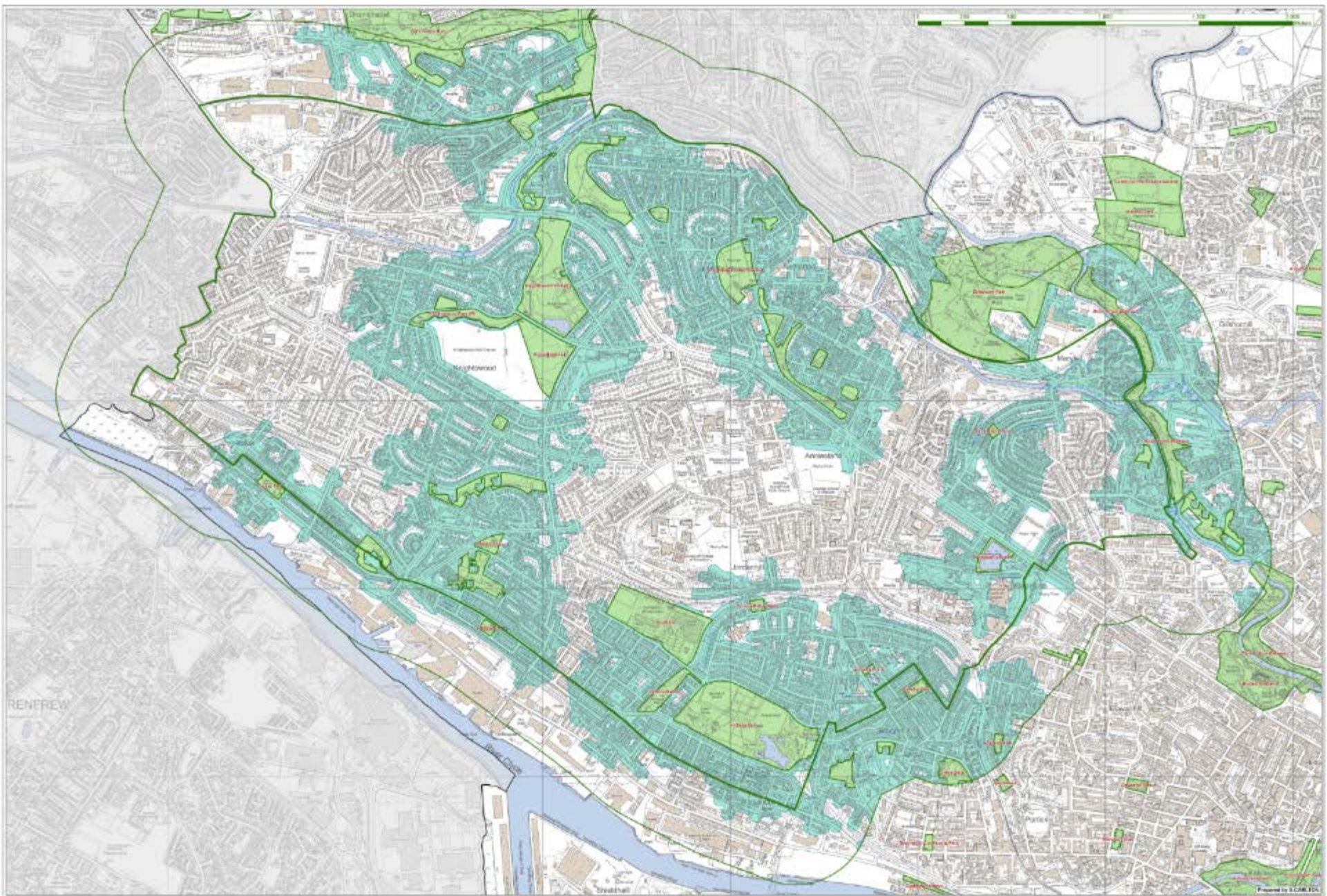














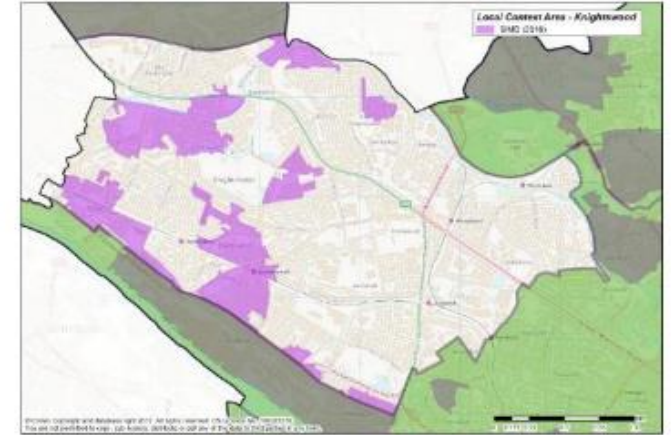


# Local Contexts ( Openspace masterplans) – Understanding areas better

2 Stages:

## Stage 1

- quality of the most publicly usable open spaces
- accessibility to these open spaces
- identification of “gaps” where residential areas not well-served and that will need to be met
- identification of key issues to be addressed to help meet the accessibility, quality and quantity standards, including any actions that the Council itself may have to deliver.
- will take account of the specific demographic, urban form and other characteristics of the area in determining how (or whether) the standards can be addressed.
- consultation through the OSS/SG6 will allow agreement on key actions with the community and other partners to help create better places.



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# Local Contexts ( Openspace masterplans) – Understanding areas better

## Stage 2

collaborative approach with partners to determine how best to enhance and manage the open space resource and ensure it delivers the functions the Council needs it to

will require an enhanced and dedicated staff resource, and close cross-service working

Focus on:

- managing surface water (liaison with MGSDP team);
- delivering enhanced connectivity in active travel networks (liaison with LES, Core Paths Plan);
- meeting gaps in accessibility to publicly usable open space and, where required, enhancing connectivity and quality of these spaces (with LES);
- identifying where it may be possible to release surplus open spaces for other purposes and use compensation for their loss/income generated by their sale for enhancing the remaining open space resource
- taking account of the views of the public in relation to where spaces should be retained/ created/developed for other purposes
- enhancing and connecting habitats and habitat networks; and
- enhancing a sense of place in existing communities, regeneration priority areas and new developments.

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## Challenges that the project will attempt to move forward

- Gathering Robust Evidence – from city activities
- Capturing data / exemplars etc. – to use for peer education; cost / benefit analysis; methodology / process description
- Monitoring – Identify the right type of monitoring that becomes proportionate & meets the needs of both academics & cities
- Methodology – Scalable to city wide; transferable to different contexts
- Demonstrator – Run in Glasgow, scale out city wide; Capture methodology and test replicability in different contexts
- Regulations – Economic, social & technical
- Sustainable data – Easy to collect; easy to use; easy to maintain; easy to share
- Fast moving Technology – new apps; Geospatial information communication technology ( G-ICT)



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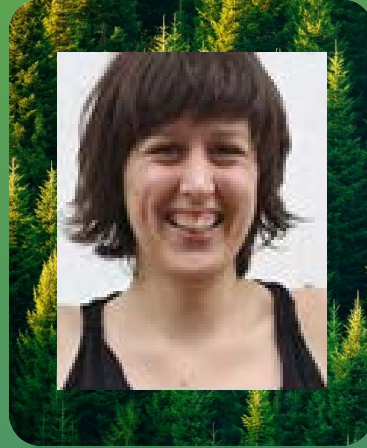


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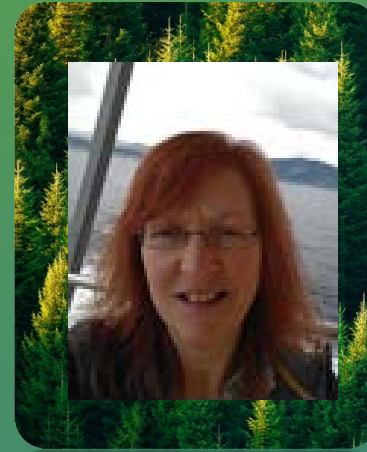




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Janeiro



# **FOOD AND FUEL CHALLENGES: EVIDENCE FROM BRAZIL**

Juliano Assunção, Professor  
Pontifical Catholic University of Rio de Janeiro

# FOOD AND FUEL CHALLENGES

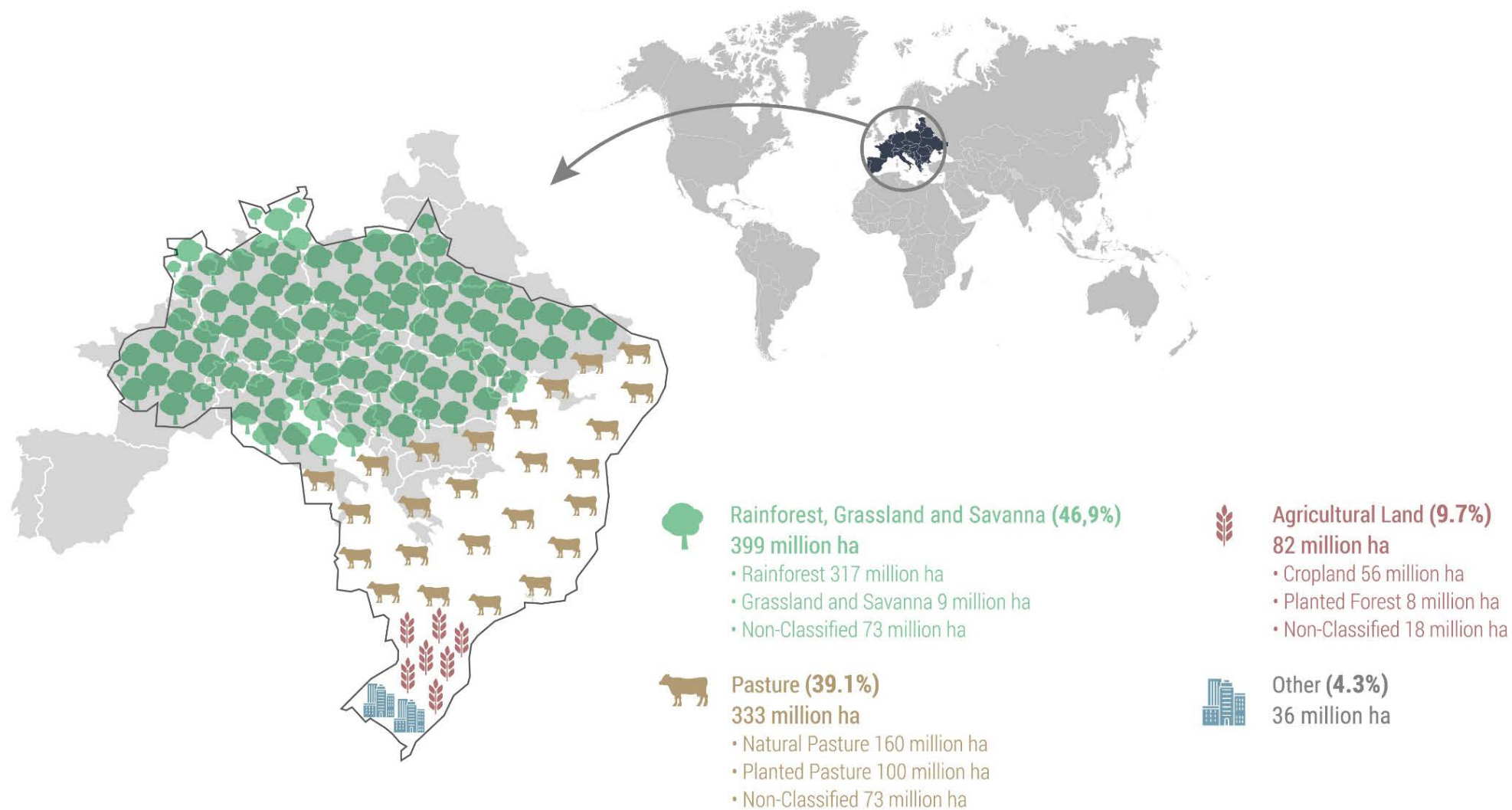
## EVIDENCE FROM BRAZIL

**JULIANO ASSUNÇÃO (JULIANO@CPIRIO.ORG)**

GGKP WEBINAR – NATURE-BASED SOLUTIONS FOR GREENER CITIES

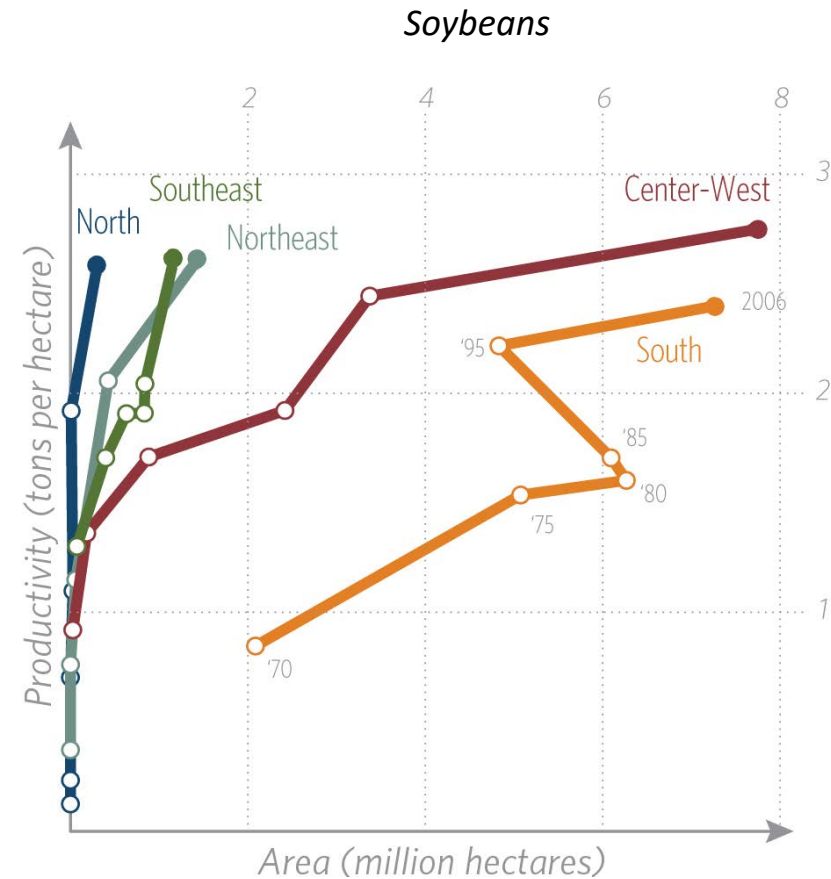
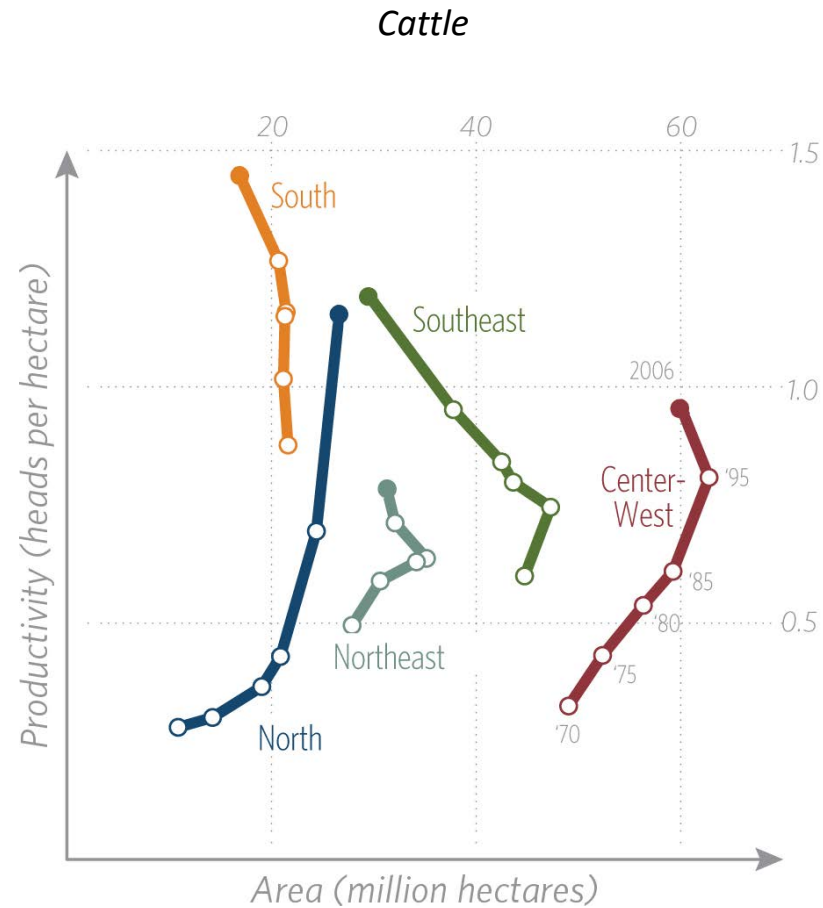
**FOOD**

# LAND USE IN BRAZIL





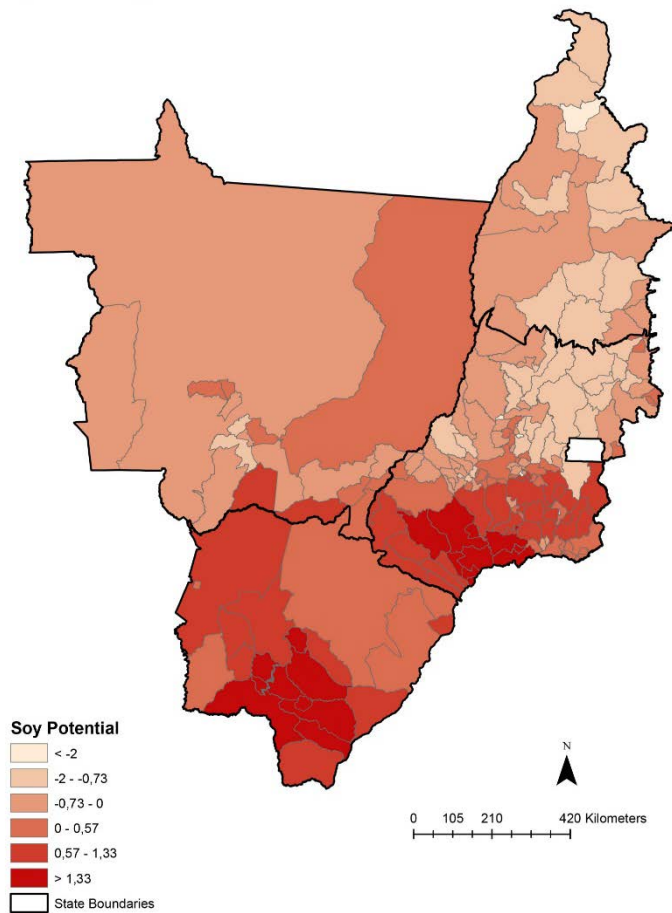
# CHANGE TRENDS IN AGRICULTURE



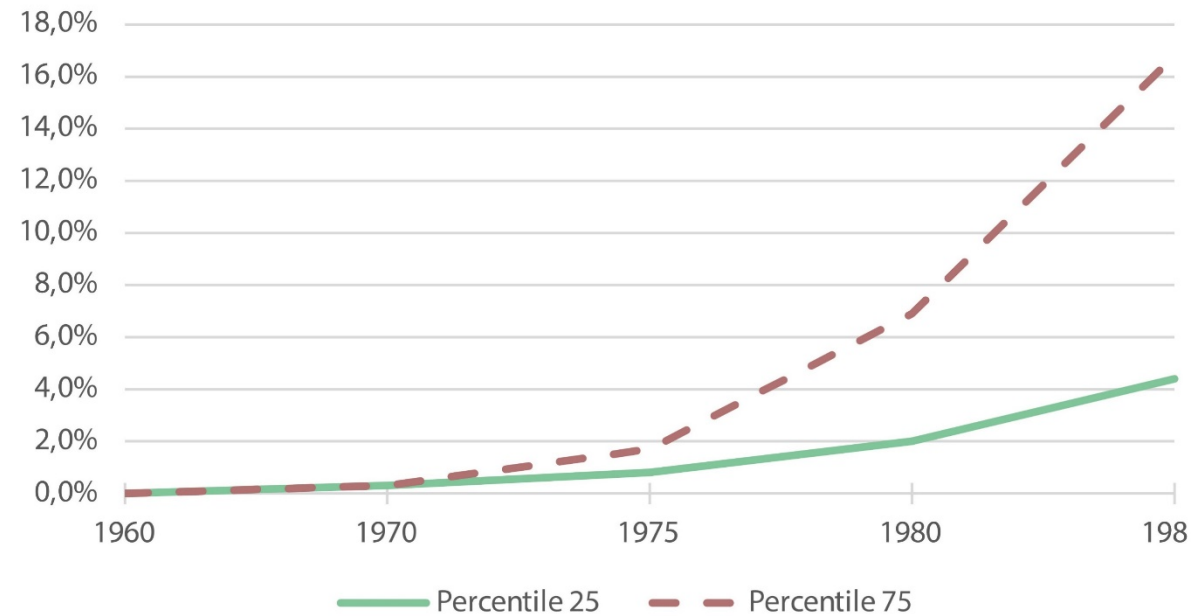
Reference: Assunção et al., *Production and Protection: A First Look at Key Challenges in Brazil*, December 2013

## INCREASING YIELDS SOYBEAN IN THE CERRADO REGION

*Soy Potential*

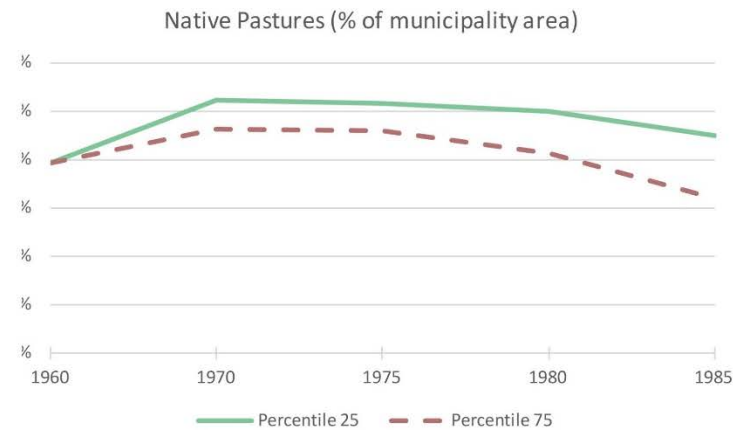
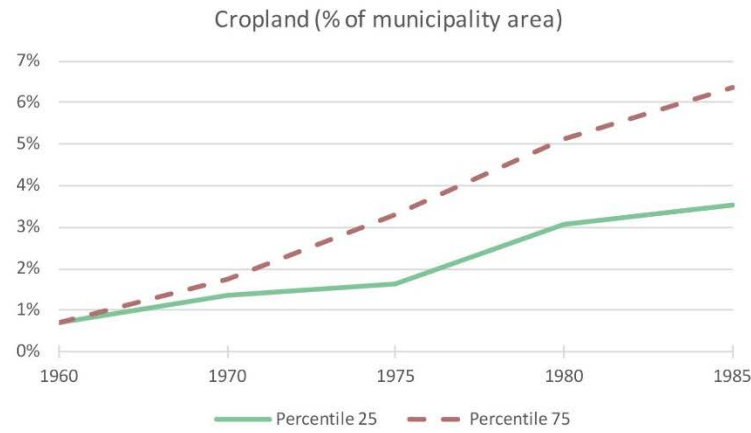
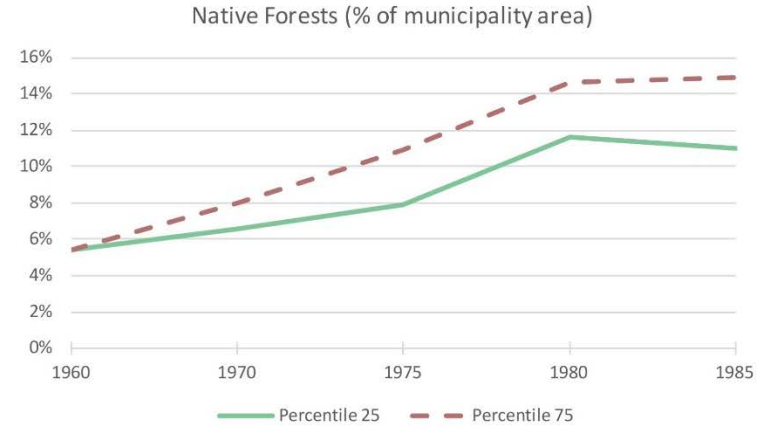
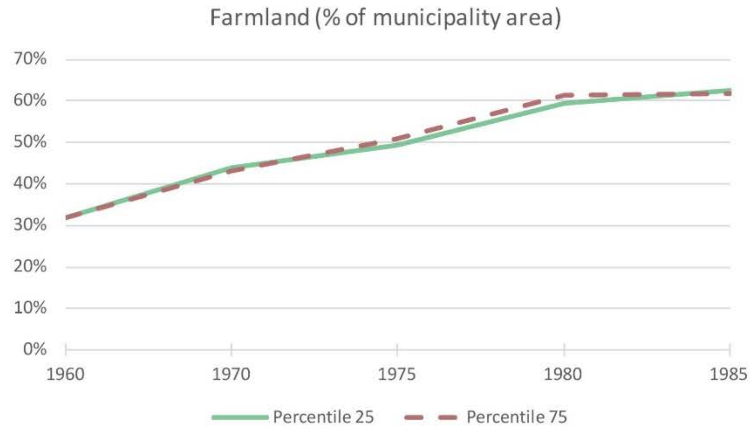


*Soybean Cultivation (% of cropland area)*



*Reference: Assunção J., Bragança A., Technological Change and Deforestation: Evidence from the Brazilian Soyben Revolution, August 2015*

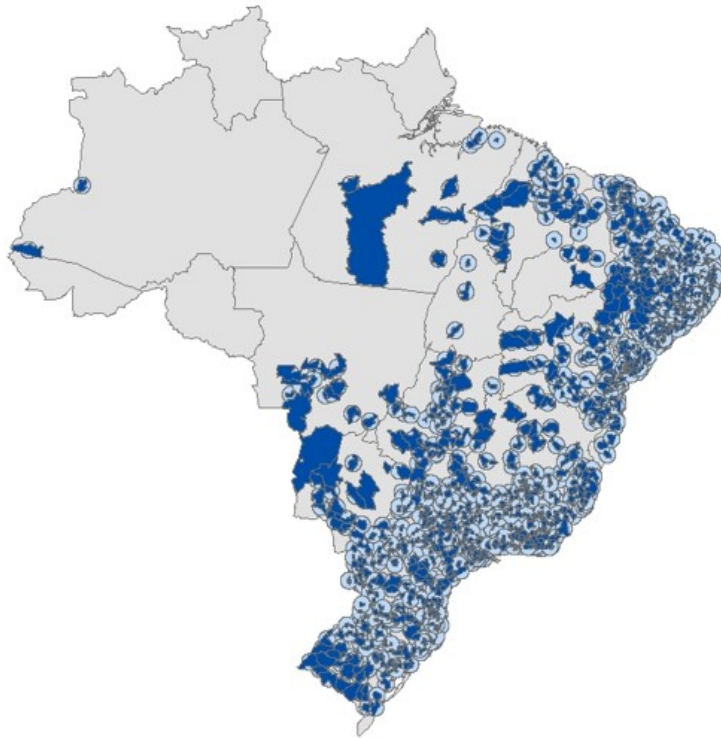
## INCREASING YIELDS SOYBEAN IN THE CERRADO REGION



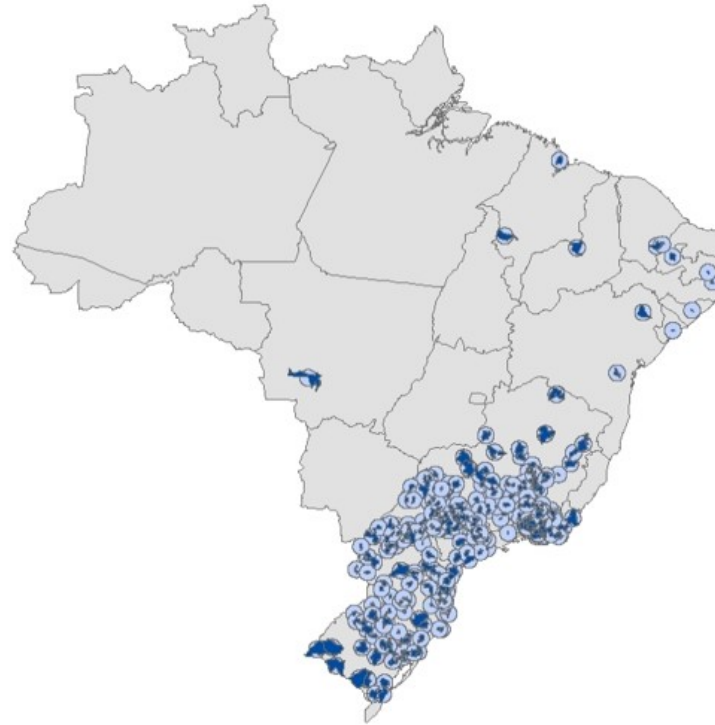
*Reference: Climate Policy Initiative, The Next Step Towards Climate Change Mitigation: Improving Productivity of Brazil's Agricultural Lands, April 2017*

## INCREASING YIELDS ELECTRIFICATION OF RURAL AREAS

### *Grid Expansion*



1960S

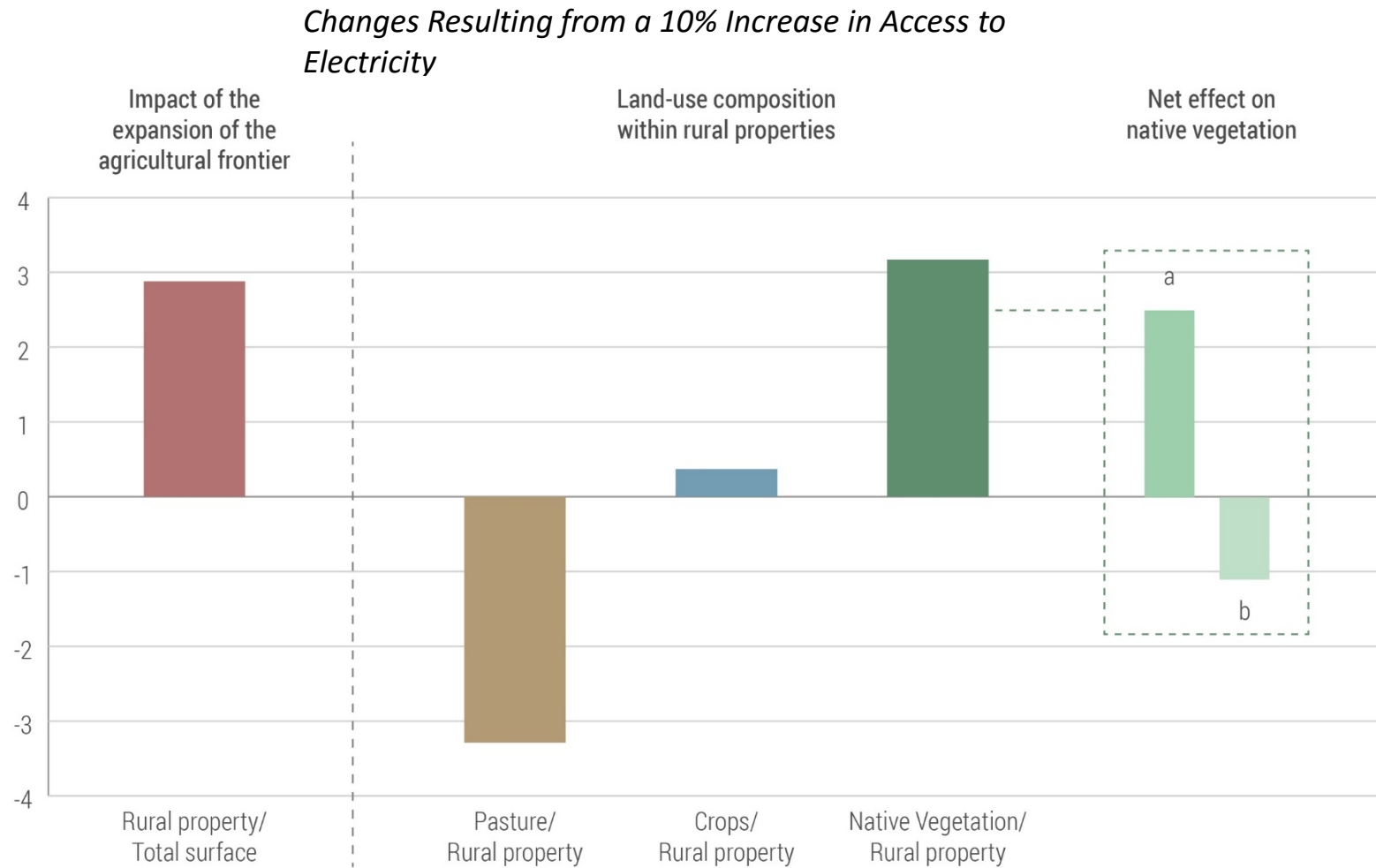


1990S

Source: Lipscomb, M., Mushfiq  
Mobarak A., Barham T.,  
Development Effects of  
Electrification: Evidence from the  
Topographic Placement of  
Hydropower Plants in Brazil, 2013



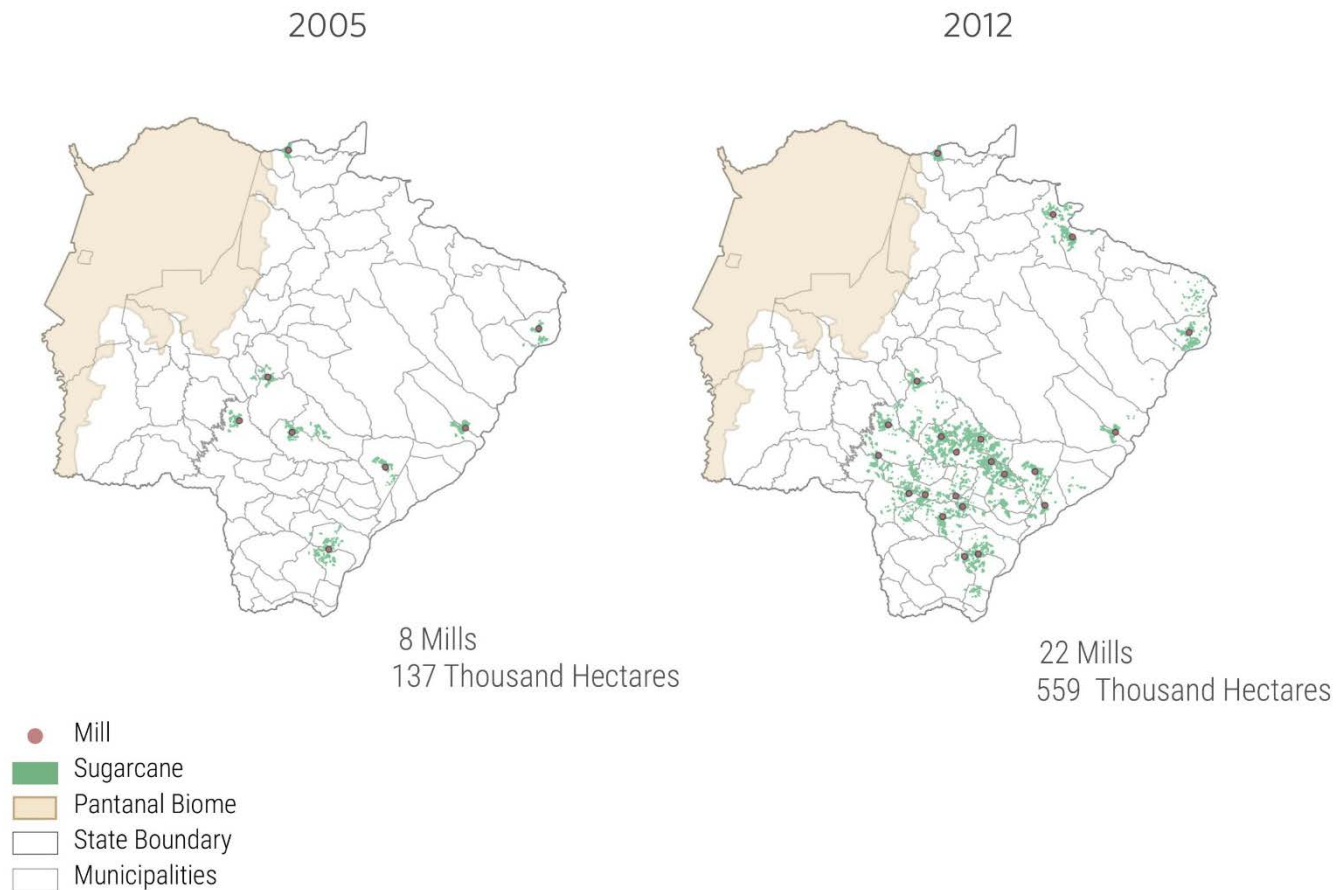
## INCREASING YIELDS ELECTRIFICATION OF RURAL AREAS



*Reference: Climate Policy Initiative, The Next Step Towards Climate Change Mitigation: Improving Productivity of Brazil's Agricultural Lands, April 2017*

## INCREASING YIELDS SUGARCANE EXPANSION IN MATO GROSSO DO SUL

### Growth in Mills and Sugarcane Crops in Mato Grosso do Sul



*Reference: Climate Policy Initiative, The Next Step Towards Climate Change Mitigation: Improving Productivity of Brazil's Agricultural Lands, April 2017*

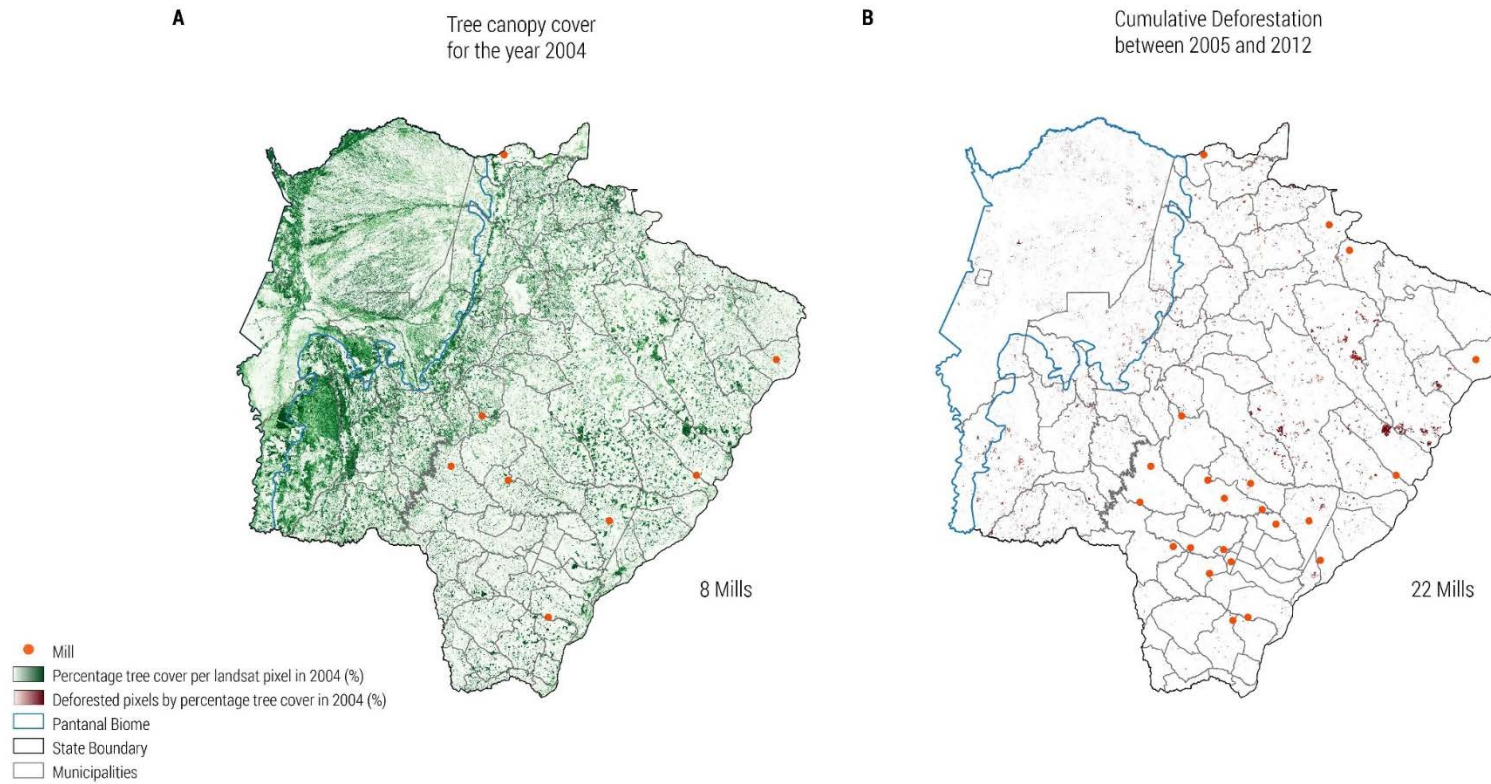
## INCREASING YIELDS SUGARCANE EXPANSION IN MATO GROSSO DO SUL

Many sectors were significantly impacted by the arriving mills and grew by the following percentages:	% of growth
<b>Agriculture, livestock and forestry</b>	<b>42</b>
Growing of sugarcane	400
Agricultural service activities	149
<b>Wholesale and retail trade and maintenance</b>	<b>60</b>
Repair and maintenance of motor vehicles	147
Wholesale of agricultural raw materials	94
Wholesale of agricultural machinery and equipment	157
Wholesale of fertilizers and agrochemical products	192
<b>Transport, storage and communications</b>	<b>154</b>
Freight transport by road	316
<b>Financial intermediation</b>	<b>43</b>
<b>Education</b>	<b>103</b>

*Reference: Climate Policy Initiative, Sugarcane's Role in Fueling Economy, July 2016*

## INCREASING YIELDS DEFORESTATION & SUGARCANE EXPANSION IN MATO GROSSO DO SUL

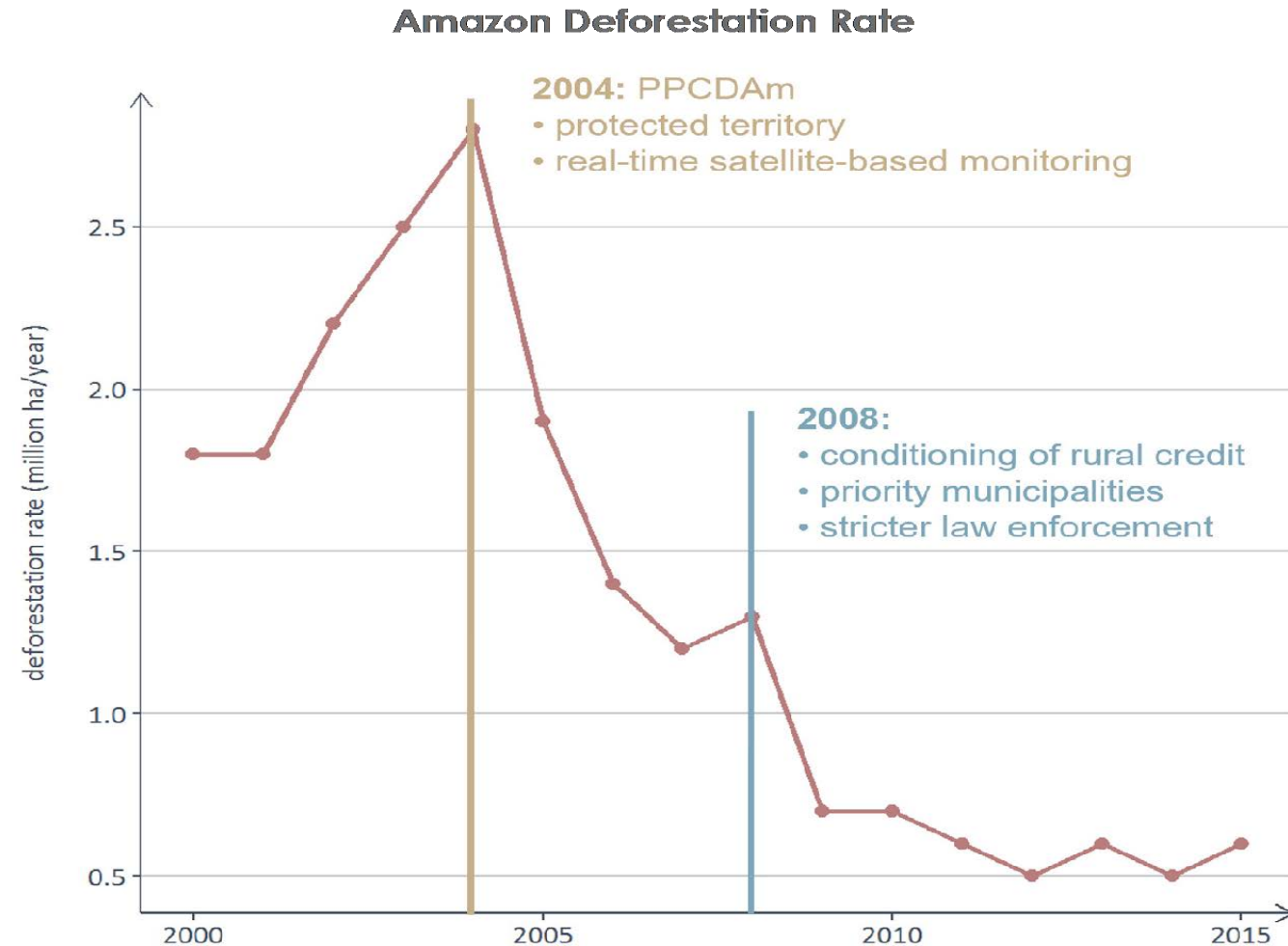
### *Mill Impact on Deforestation*



*Reference: Assunção J., Pietracci, B., Souza P., Fueling Development: Sugarcane Expansion Impacts in Brazil, July 2016*



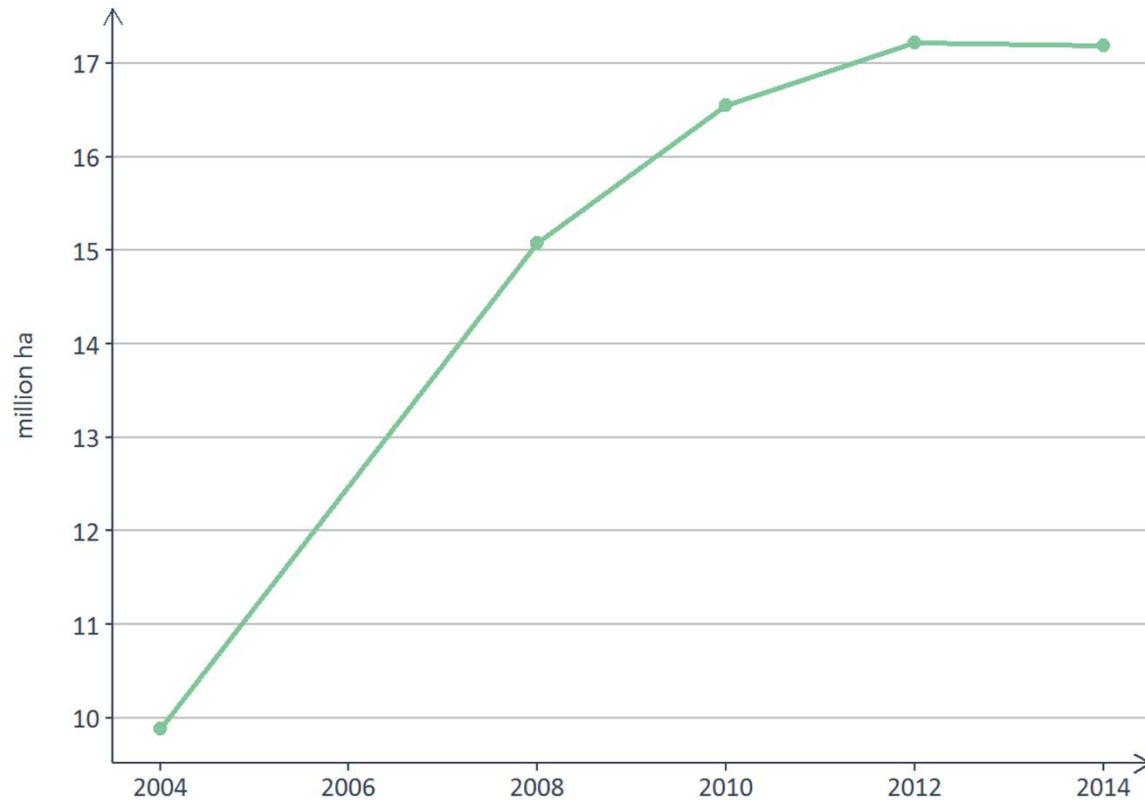
# AMAZON DEFORESTATION



**Reference:** Climate Policy Initiative elaboration using data from PRODES/ INPE, 2016

# NATURAL FOREST REGENERATION

Amazon Regrowth, 2004 – 2014



## HOW TERRACCLASS CLASSIFIES DEFORESTED LAND CATEGORIES



PASTURE



SECONDARY VEGETATION

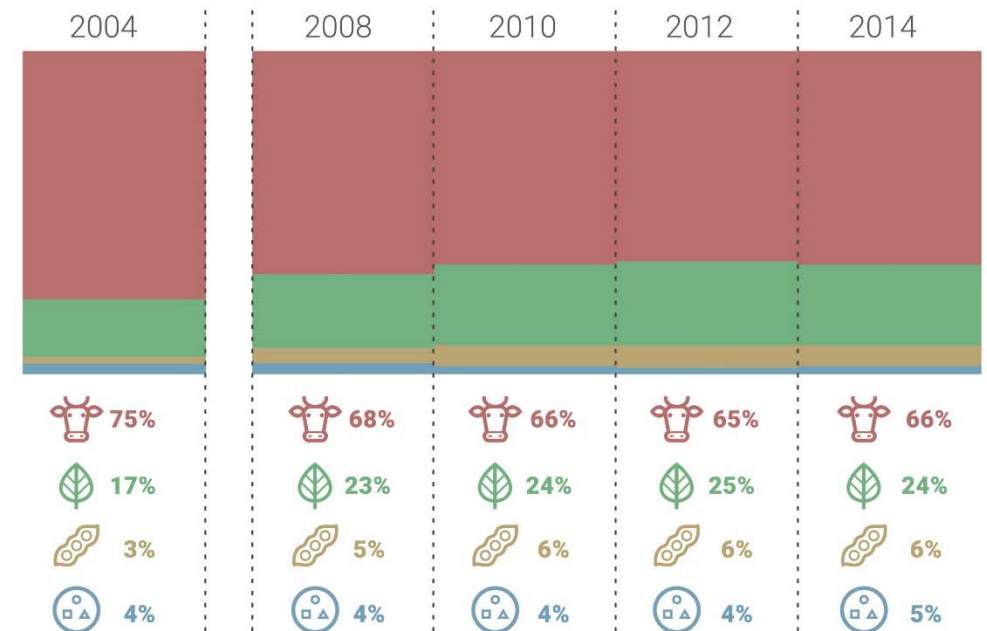


CROPLAND



MISCELLANEOUS

## AMAZON LAND USE IN DEFORESTED AREAS OVER TIME

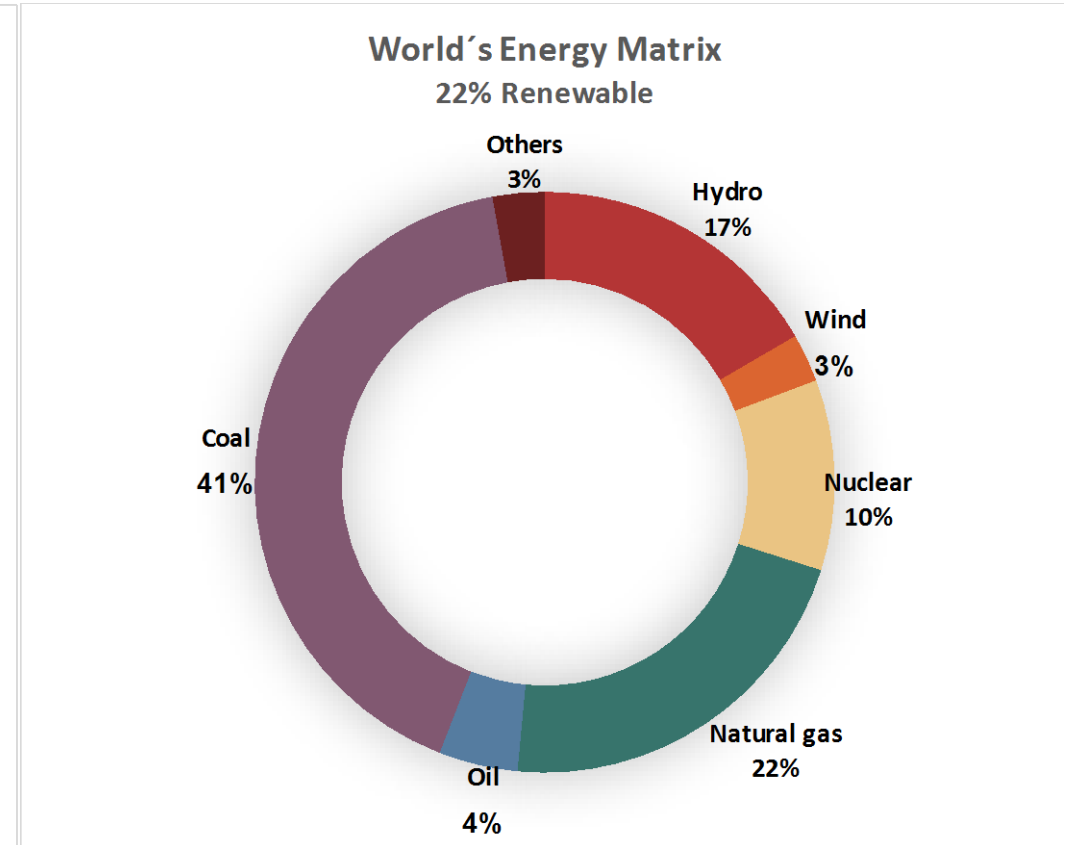
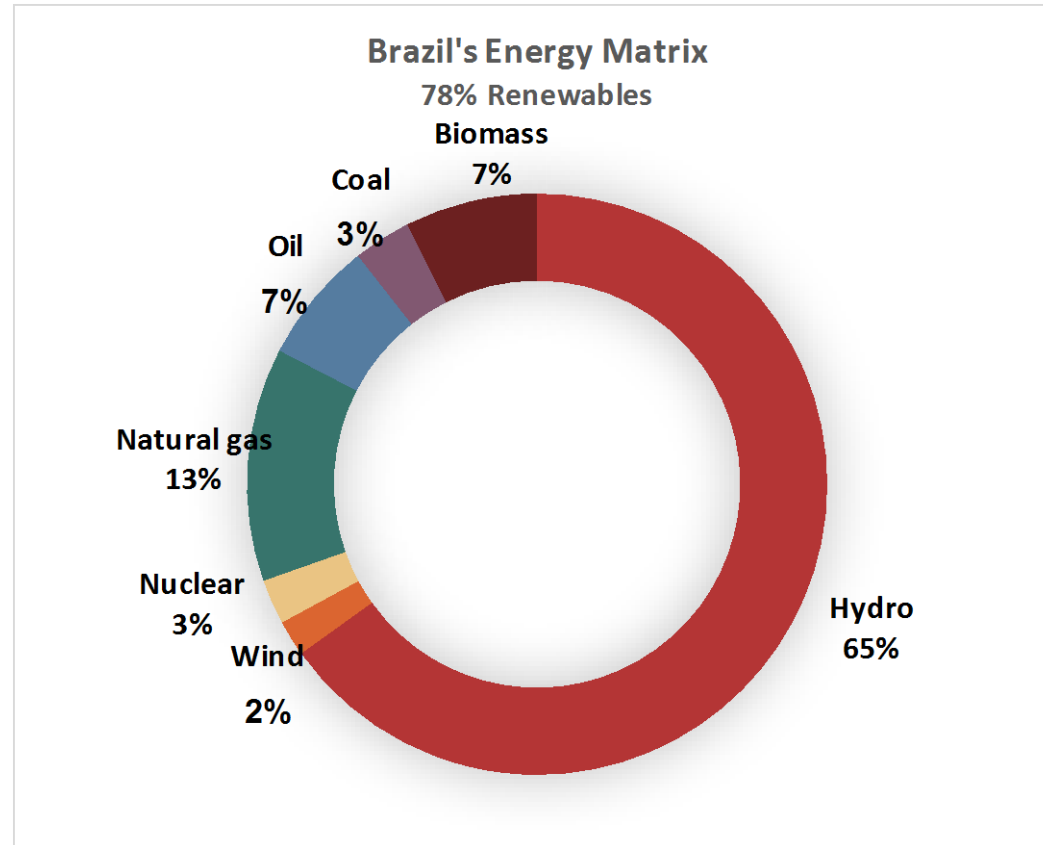


Source: TerraClass/ INPE, 2016

**FUEL**



# RENEWABLE ENERGY IN BRAZIL



Dams in the Amazon

# The rights and wrongs of Belo Monte

Having spent he  
Brazil risks gett

May 4th 2013 | ALT

Hydro-electricity

## Ethiopia opens Africa's tallest and most controversial dam

All latest up

The Gibe III dam has the capacity to double the country's electricity output at the flick of a switch

Peru and Brazil

## Messing around with dams

The Mekong river

First build a road, then flood it

Nov 19th 2009, 10:39 | From the print edition

JOSÉ CHÁVEZ, a farmer, is one of the fi  
huge hydroelectric dam where the depar  
eastern jungle.

## Damned if you do Full to bursting

Governments should stop building dan

Feb 13th 2016

9 de janeiro de 2011

29

O GLOBO

ECONOMIA

Desmatohrás

theguardian

## Three Gorges Dam risk to environment, says China

Wednesday 26 September 2007  
19.12 EDT

China's showcase hydro-engineering project, the Three Gorges Dam, could become an environmental catastrophe unless remedial action is taken, the state media reported yesterday.

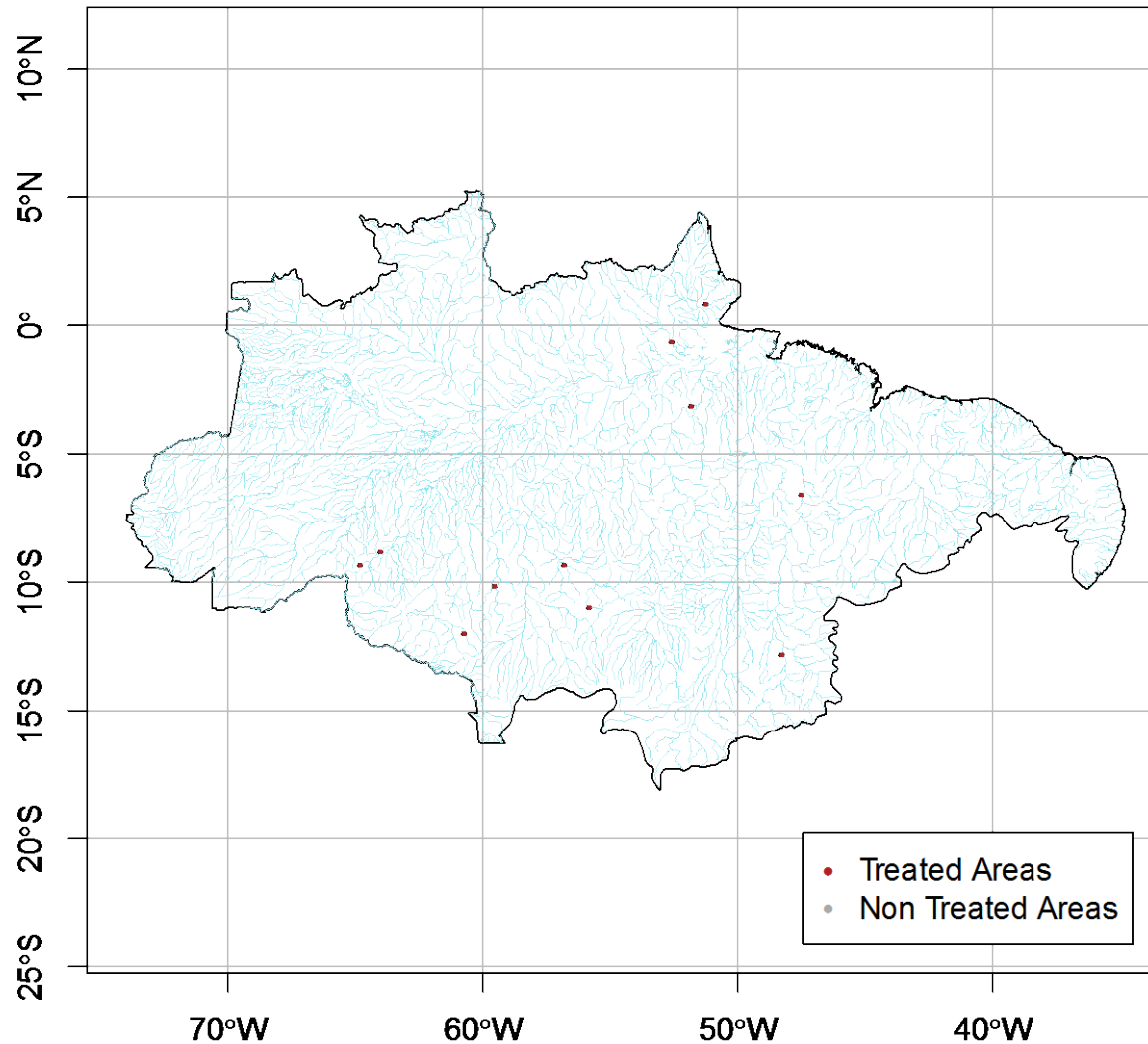
Hydropower in Vietnam

Hydro-electric projects can spell trouble for the rural poor

Jan 8th 2015, 14:26 | From the print edition

Farmer's friend or foe? ONE moment Dao A Phau was sitting in his riverside home in Ho, a mountain village not far from Vietnam's border with China; the next he was under three feet (a metre) of water.

# MEASURING THE IMPACT OF INFRASTRUCTURE ON DEFORESTATION

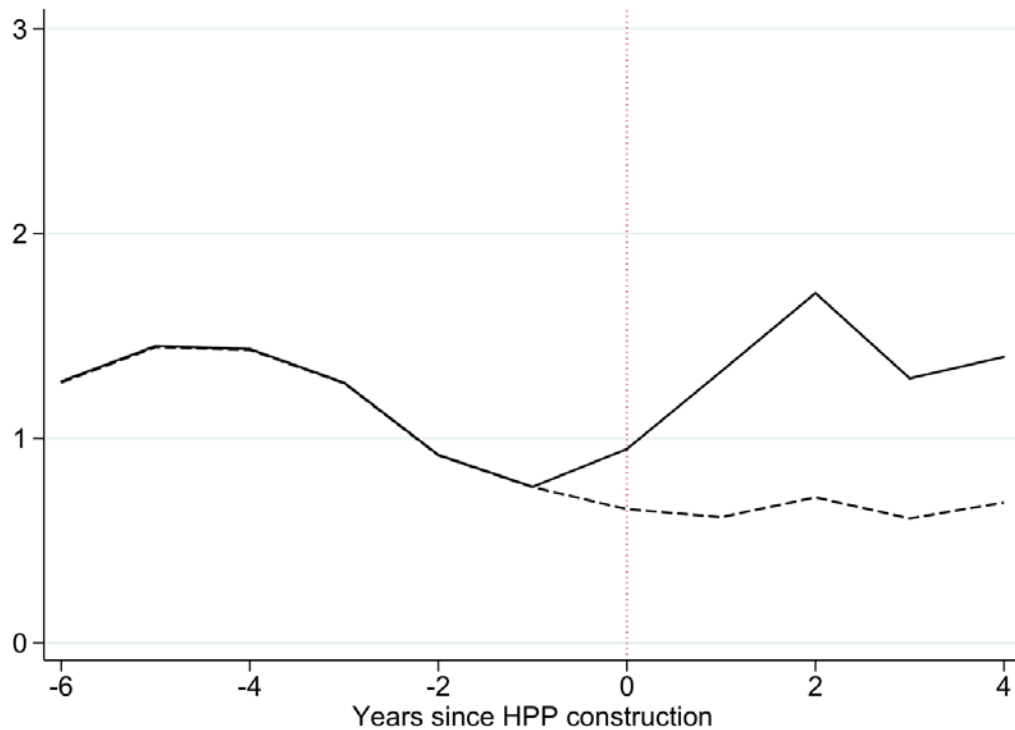


*Reference: Assunção J., Costa, F., Dimitri S., Impacts of the Construction of Hydropower Plants on Deforestation in the Amazon, January 2017*

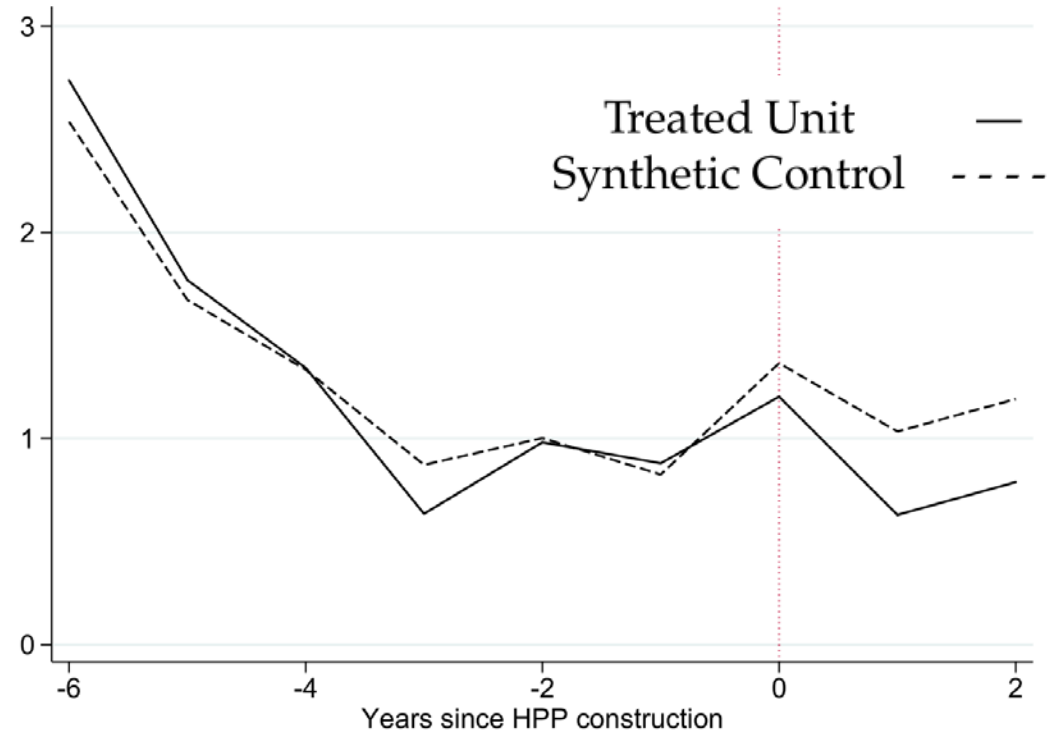


# MEASURING THE IMPACT OF INFRASTRUCTURE ON DEFORESTATION

JIRAU



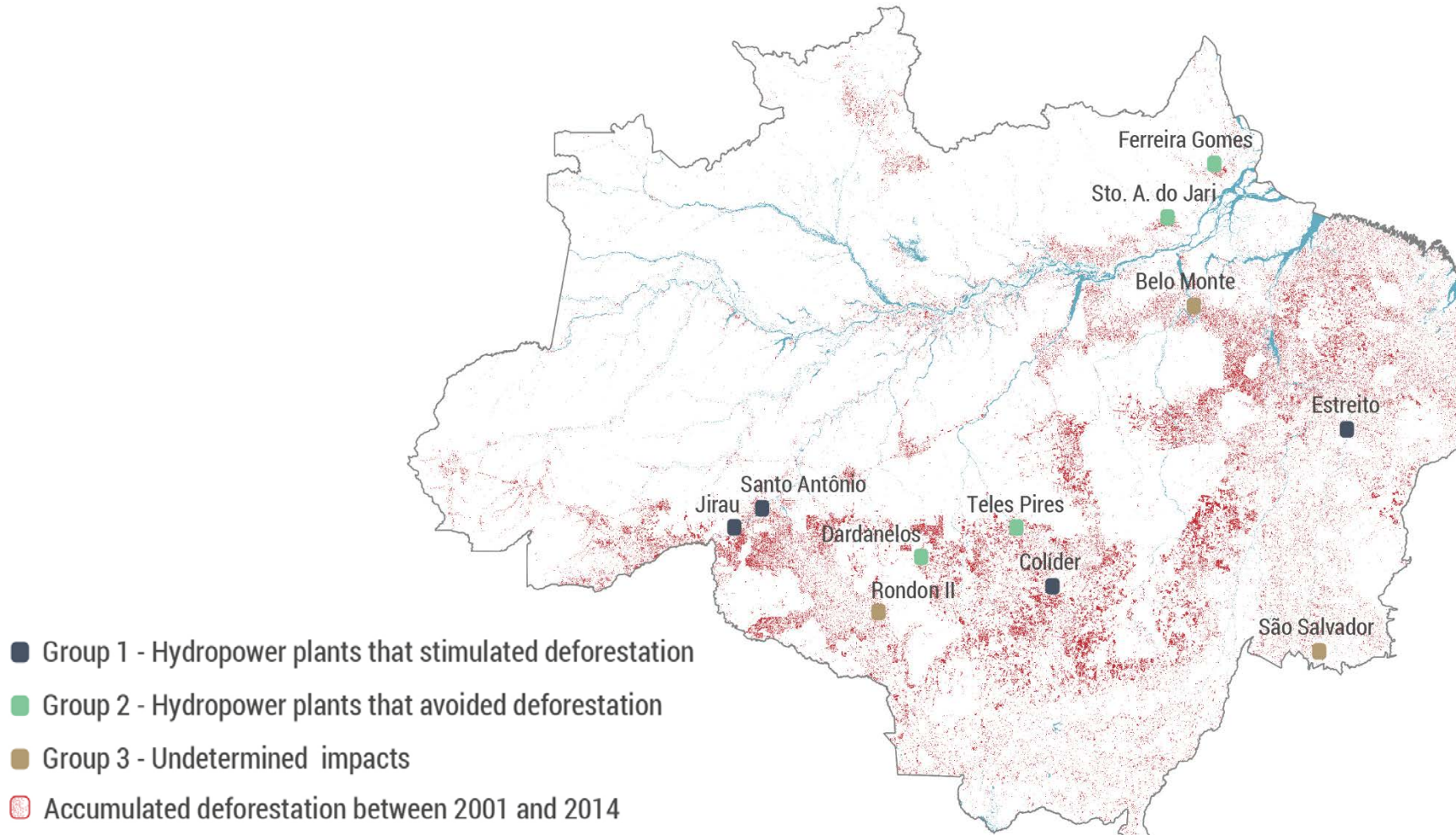
TELES PIRES



Reference: Assunção J., Costa, F., Dimitri S., Impacts of the Construction of Hydropower Plants on Deforestation in the Amazon, January 2017

# MEASURING THE IMPACT OF INFRASTRUCTURE ON DEFORESTATION

*Hydroelectric Plants Built between 2003 and 2011 in the Legal Amazon*

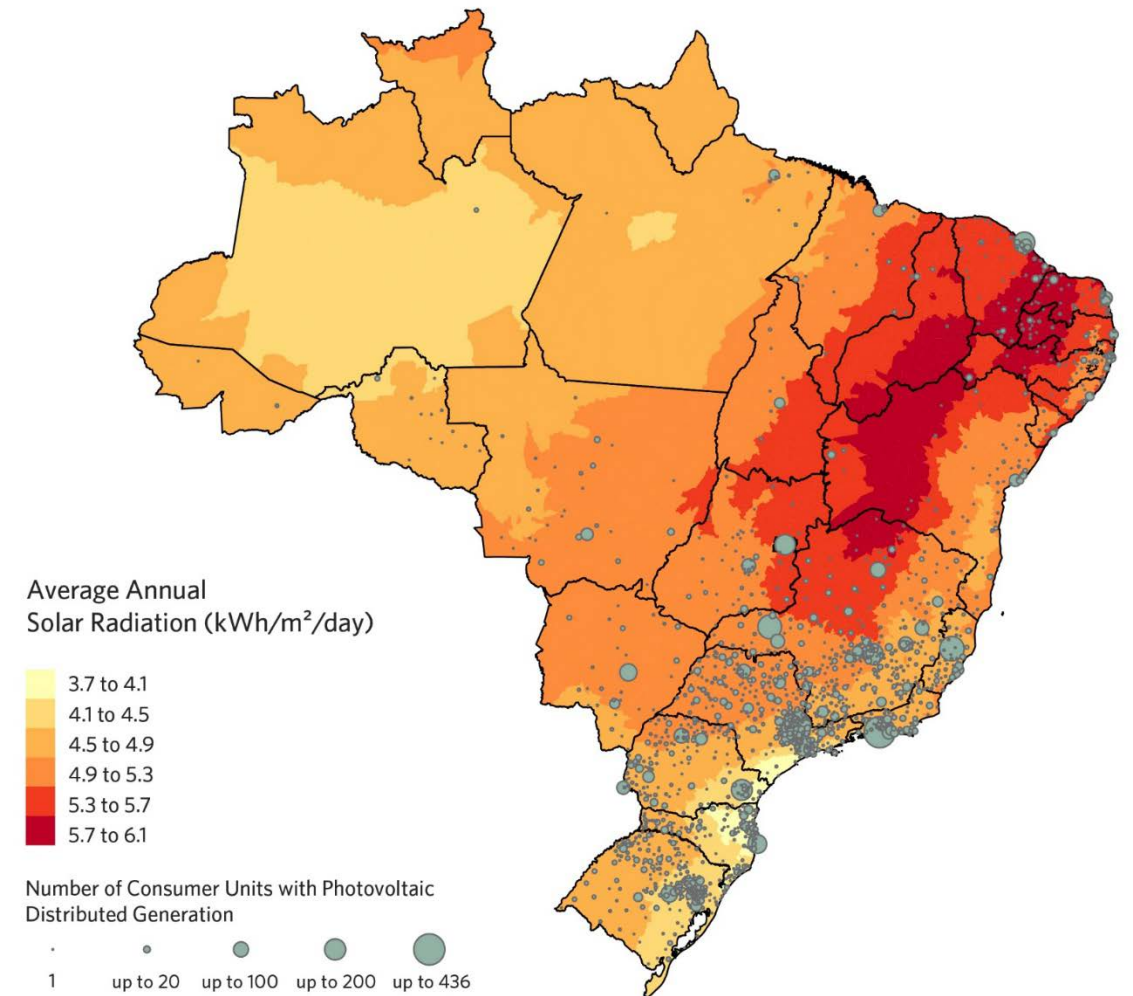


*Reference: Assunção J., Costa, F., Dimitri S., Impacts of the Construction of Hydropower Plants on Deforestation in the Amazon, January 2017*

# SOLAR PANELS

	Centralized			Decentralized		
	# Plants	Power (kW)	%	# Units	Power (kW)	%
Hydroelectric	219	93,216,340	61.1%	-	-	-
Thermal	2,926	41,021,055	26.9%	51	19,187	14.6%
Wind	439	10,701,743	7.0%	52	10,183	7.7%
Small Hydro Plant	434	4,976,230	3.2%	-	-	-
Thermonuclear	2	1,990,000	1.3%	-	-	-
Super Small Hydro Plant	613	546,491	0.4%	15	11,253	8.5%
<b>Solar Photovoltaic</b>	<b>50</b>	<b>144,214</b>	<b>0.1%</b>	<b>11,365</b>	<b>91,038</b>	<b>69.2%</b>
<b>Total</b>	<b>4,683</b>	<b>152,596,073</b>	<b>100.0%</b>	<b>11,483</b>	<b>131,661</b>	<b>100.0%</b>

Source: ANEEL, June 2017



Source: ANEEL, LABREN, CCST and INPE, 2017



Iniciativa para o Uso da Terra



# Audience Q&A

# Closing Remarks

*Thank you for attending the GGKP webinar*

## ***Nature-Based Solutions for Greener Cities***

This webinar is available in full on the GGKP website: [www.ggkp.org](http://www.ggkp.org)

Please kindly **complete the survey** you will receive following the webinar.

Please send any questions to: [contact@ggkp.org](mailto:contact@ggkp.org)