

Sustainable Urban Development and Climate Crisis

Urban Expansion & Predatory Urbanization

Searching for the Sustainable City within a Context of Climate Change

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Content

Session for the Rotterdam Hogerschool's Sustainability Week

19 April 2022

1. The Sustainable Development Agenda: origins of sustainability
2. Sustainable Urban Development and Climate Change
3. A Municipal Agenda for Sustainable Urban Development
4. Examples of Mitigation and Adaptation Policies
5. Some Conclusions



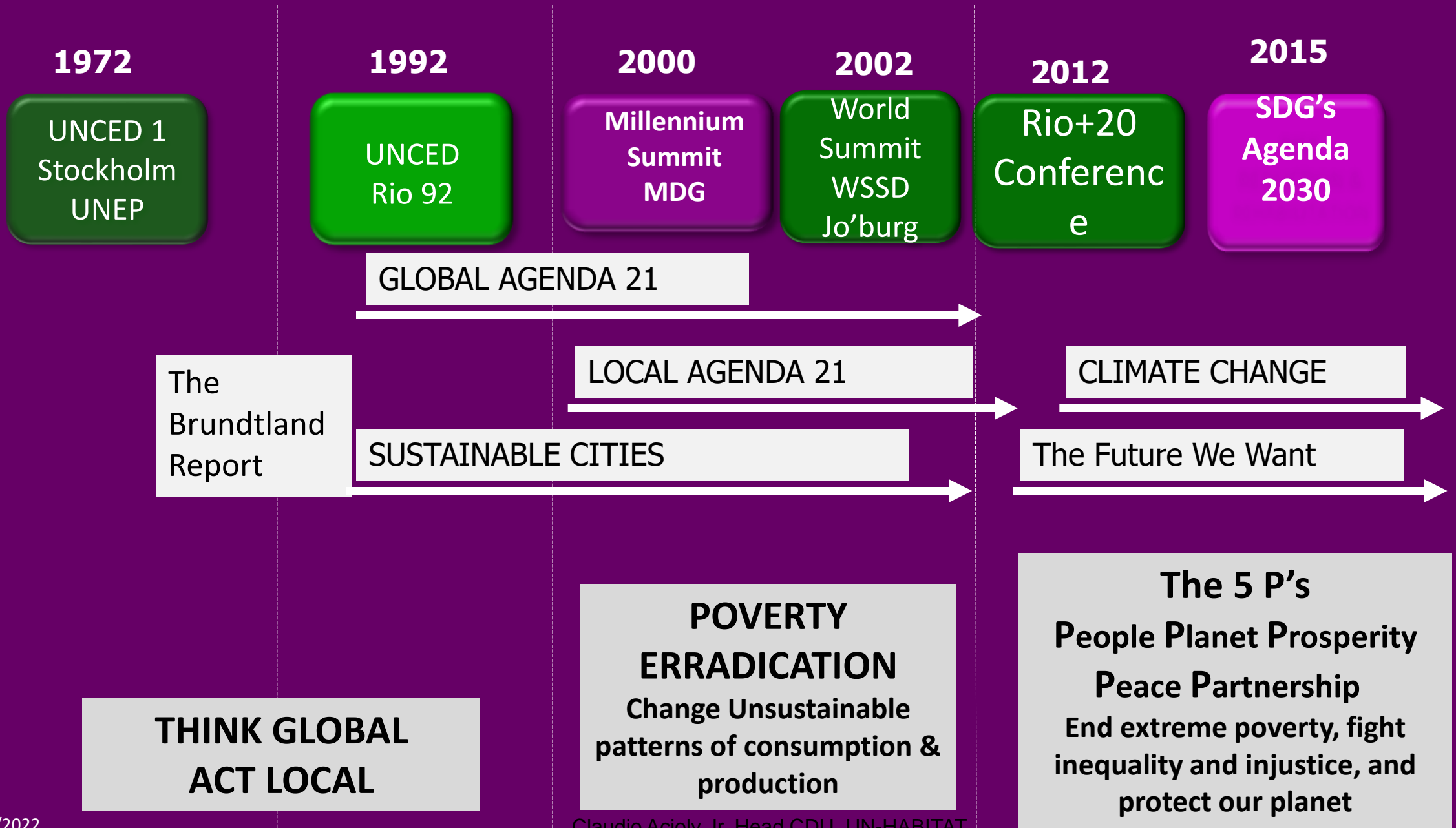
1.

Understanding Sustainable Development:

**Let's remember where we came from 20 years ago.
The evolution of our thinking & action**



The Sustainable Development Agenda



A Agenda do Desenvolvimento URBANO Sustentável

1976

HABITAT I
Vancouver
UNCHS

Rapid and chaotic urbanization as a Problem

SLUMS AS POPULAR SOLUTION
Access to Housing

1996

HABITAT II
Istanbul

HABITAT Agenda: local government and right to adequate housing.

THE SUSTAINABLE CITY
Governance
Land Tenure Regularization
Urban Environmental Management

2000

Millennium Summit
MDG's

SLUMS

Urban Poverty
Erradication

2001

HABITAT +5

2016

Habitat III

PLANNED URBANIZATION AS AN OPPORTUNITY

NUA: The City we Want

SPATIAL INEQUALITY
• Urban Design & Urban Plan
• Urban Legislation
• Financing
• Affordable Housing
• Urban Prosperity

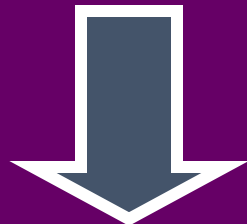
2015 - 2030

Agenda 2030
SDG 11

CITY AND CLILMATE CHANGE



Rio, 1992: 'Our Common Future'



Rio, 2012: 'The Future We Want'
Rio+20

What is sustainable development?

“Sustainable development meets the needs of the present generation without compromising the ability of future generations to meet their own needs”

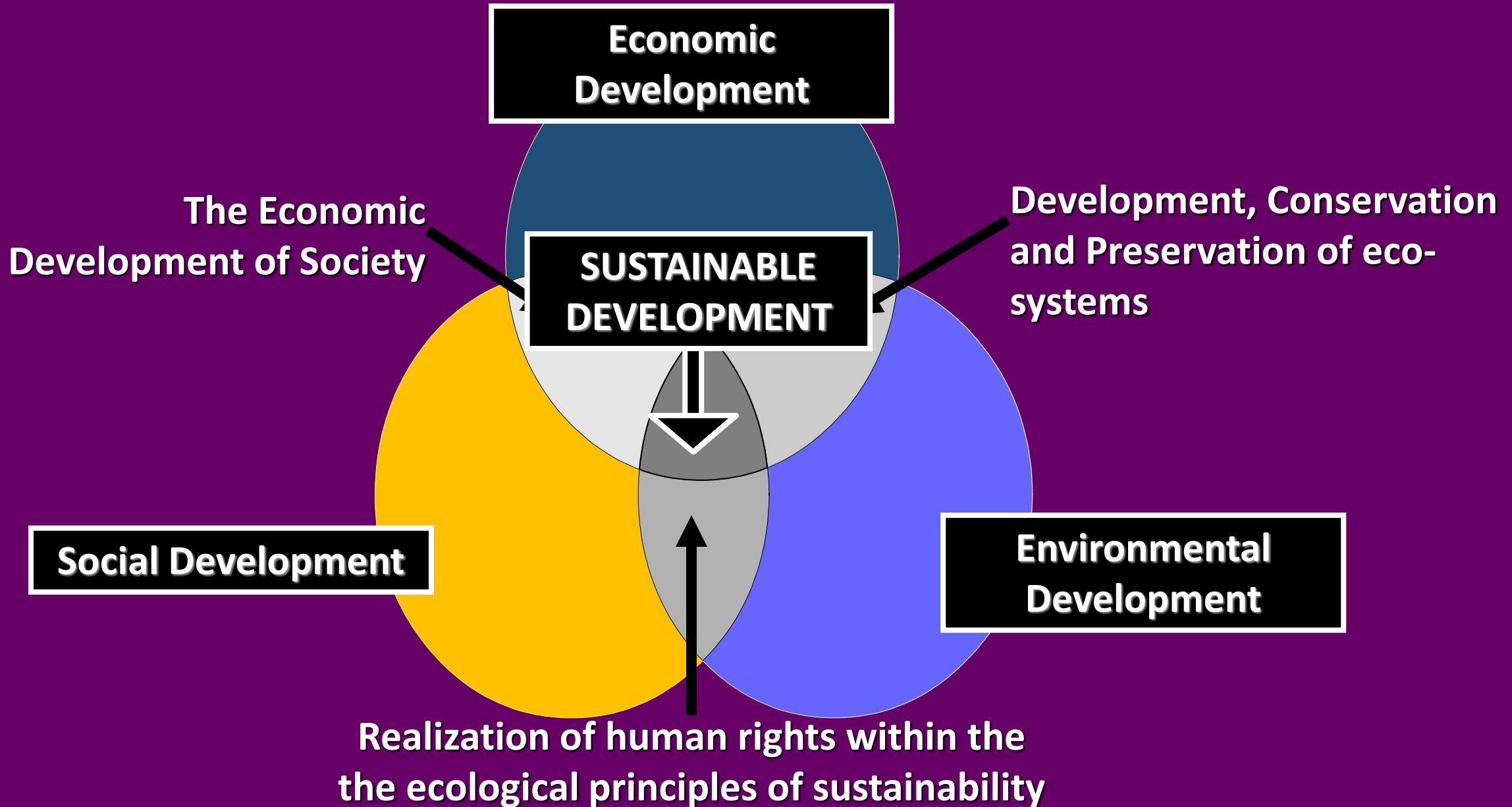
Source: The Brundtland Report, also known as *Our Common Future*, 1987. https://www.sustainable-environment.org.uk/Action/Brundtland_Report.php;

What does the Brundtland Report Says?

1. Publication released in 1987 by the World Commission on Environment and Development (WCED). It operated from 1984 to 1987.
2. It developed guiding principles for sustainable development as it is generally understood today.
3. The Brundtland Report stated that critical global environmental problems were primarily the result of the enormous poverty of the South and the non-sustainable patterns of consumption and production in the North.
4. It proposed the three main pillars of sustainable development include economic growth, environmental protection, and social equality.

Gro Harlem Brundtland, (born April 20, 1939, Oslo, Norway), Norwegian politician who was the first female prime minister of Norway, serving for three terms (1981, 1986–89, and 1990–96), and later was director general of the World Health Organization (WHO; 1998–2003). She was the chair of the WCED that issued the Brundland Report or Own Common Future

How to Reconcile Objectives and Practices?



How to Reconcile Objectives and Practices?

Objectives:

1. Maintain economic growth
2. Maximize private profits
3. Expand markets



SUSTAINABLE DEVELOPMENT

Objectives:

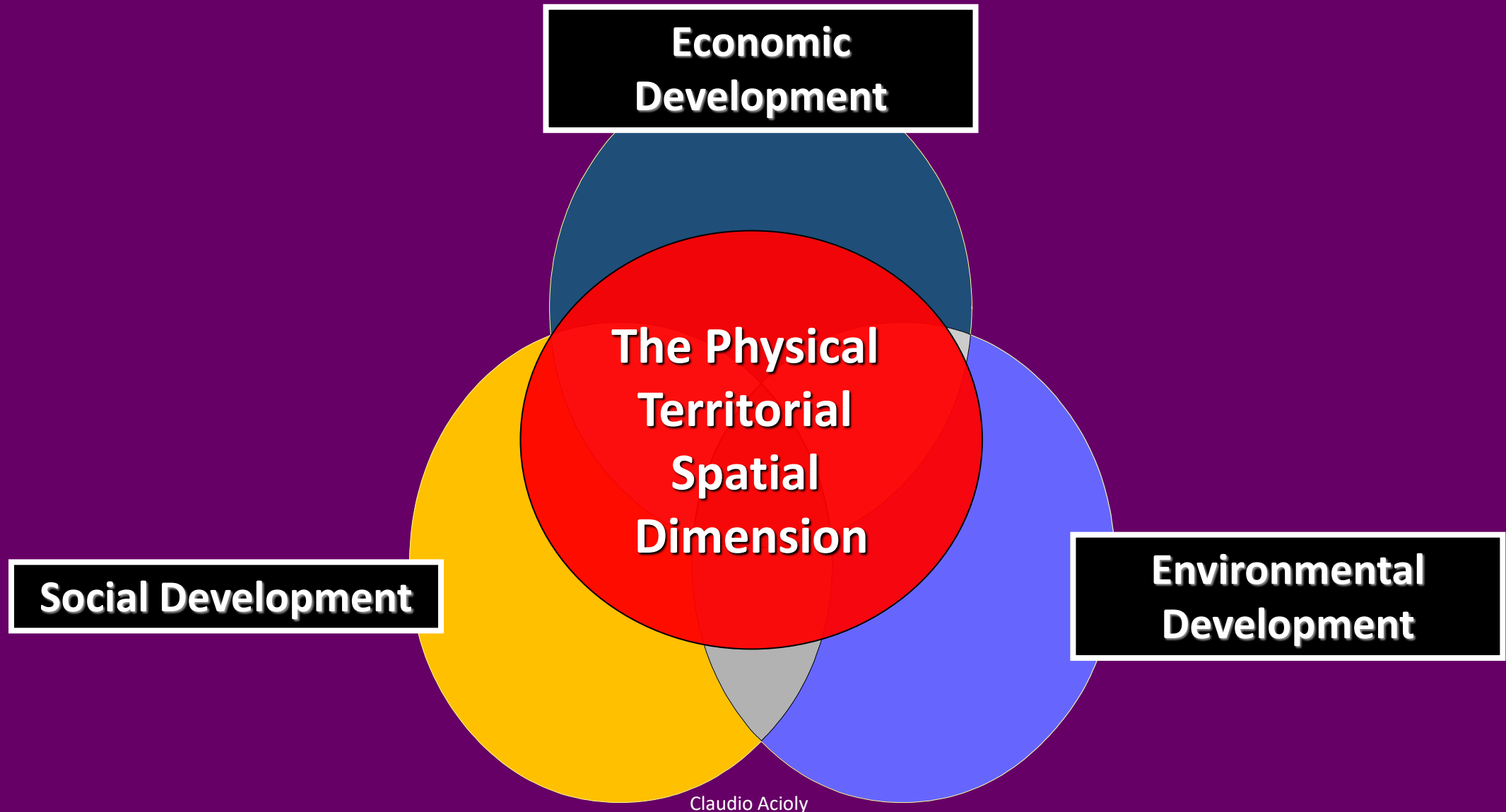
1. Increase self-sufficiency
2. Satisfy basic human needs
3. Guarantee participation and transparency
4. Use of appropriate technology

Objectives:

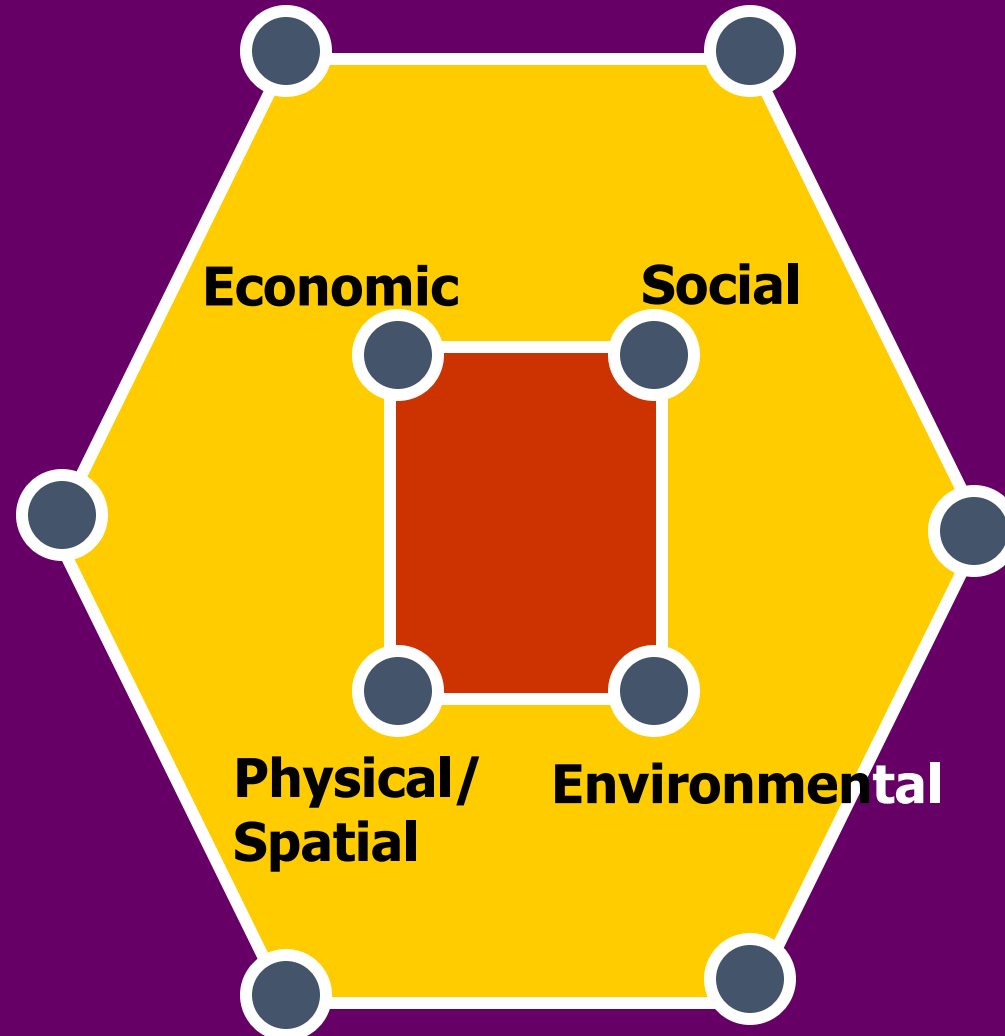
1. Preserve carrying capacity
2. Preserve and recycle resources
3. Reduce wastes

The Tripod of Sustainable Development

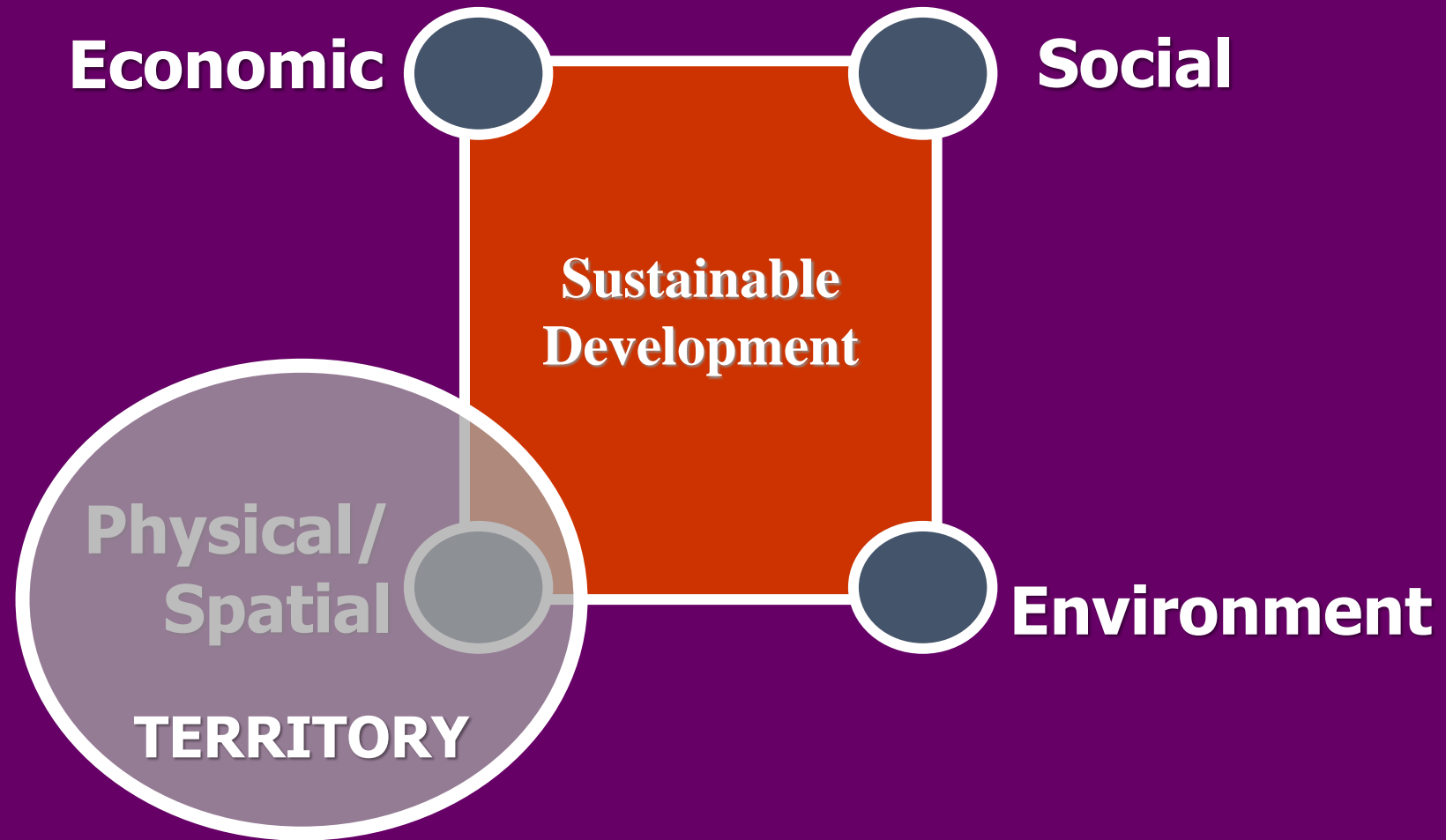
Are we underestimating or neglecting one dimension?



4th Dimension?



4th Dimension!



Sustainable Urban Development

Sustainable & Planned Urbanization

Urban Management
Instruments

Urban Policy
Instruments



Sustainable, Inclusive, Safe and Resilience

TERRITORIAL/SPATIAL

SOCIAL

ECONOMIC

ENVIRONMENTAL

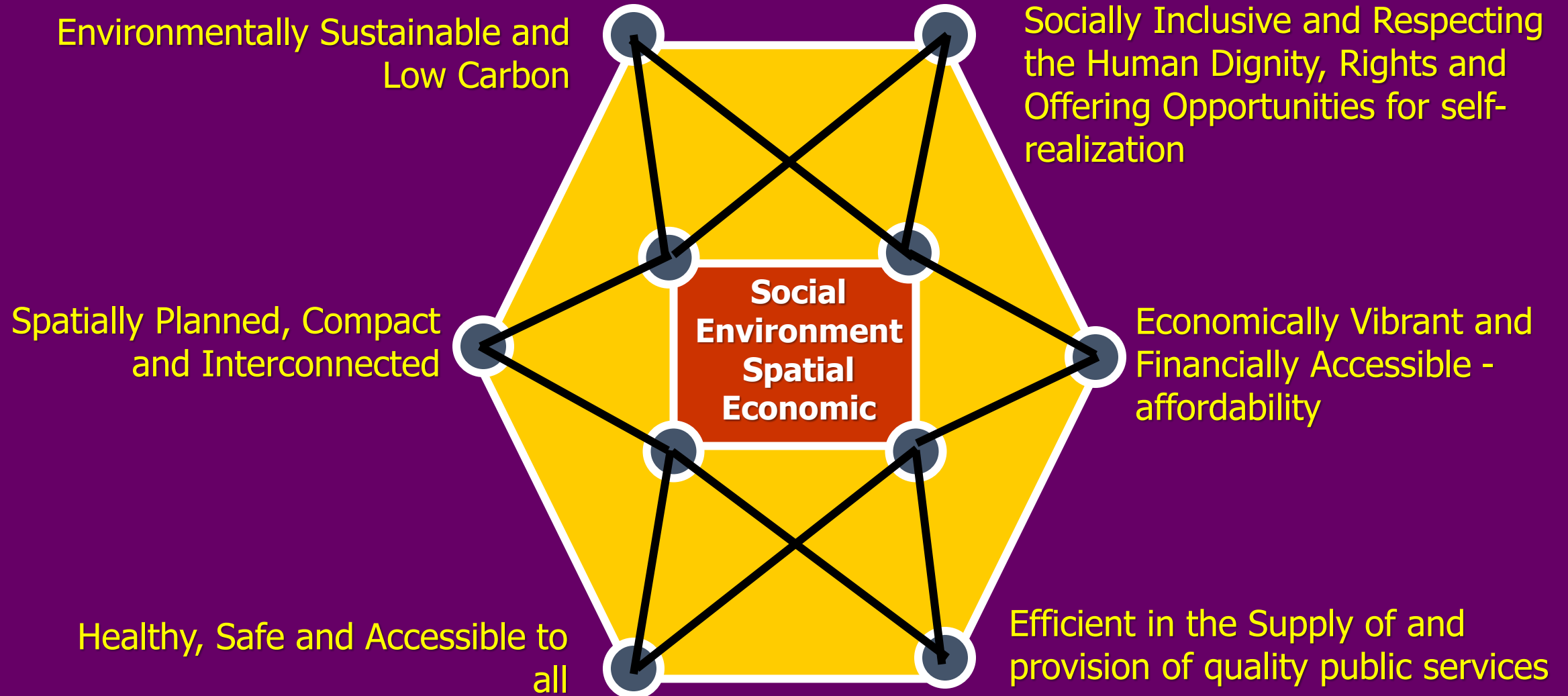
Urban Revitalization
Public Space
Urban Land Management
Compact Cities
Urban Project and Plan

Citizen Participation
Education & Employment
Public Health
Women & Youth

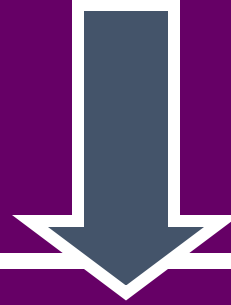
Entrepreneurialism
Small/Medium Enterprise
Fiscal health of LocGov
Foment to Production

Control of Emissions
Mobility
Solid Waste
Social Control

Sustainability



Rio, 1992: 'Our Common Future'



**AGENDA 21,
Chapter 7: Human Settlements
Chapter 28: Local Agenda 21**



Sustainable Cities

ACT LOCALLY, THINK GLOBALLY.



2.

The Agenda 2030:

A global commitment expressed in the Sustainable Development Goals – SDG's



2030 Agenda for Sustainable Development

1 Agenda

5 Main Areas

17 Goals

169 Targets

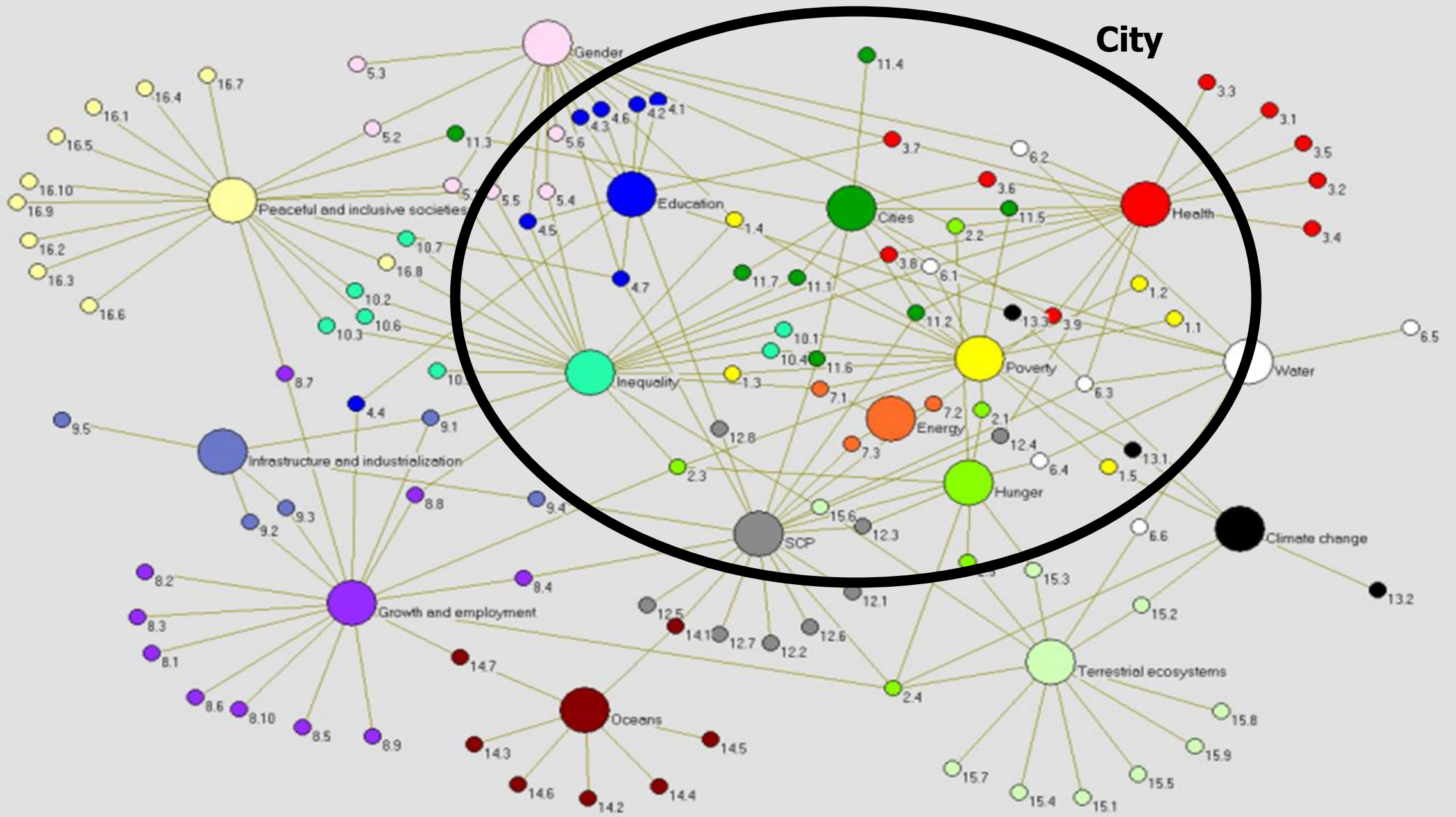
240 Indicators





**11 SUSTAINABLE CITIES
AND COMMUNITIES**

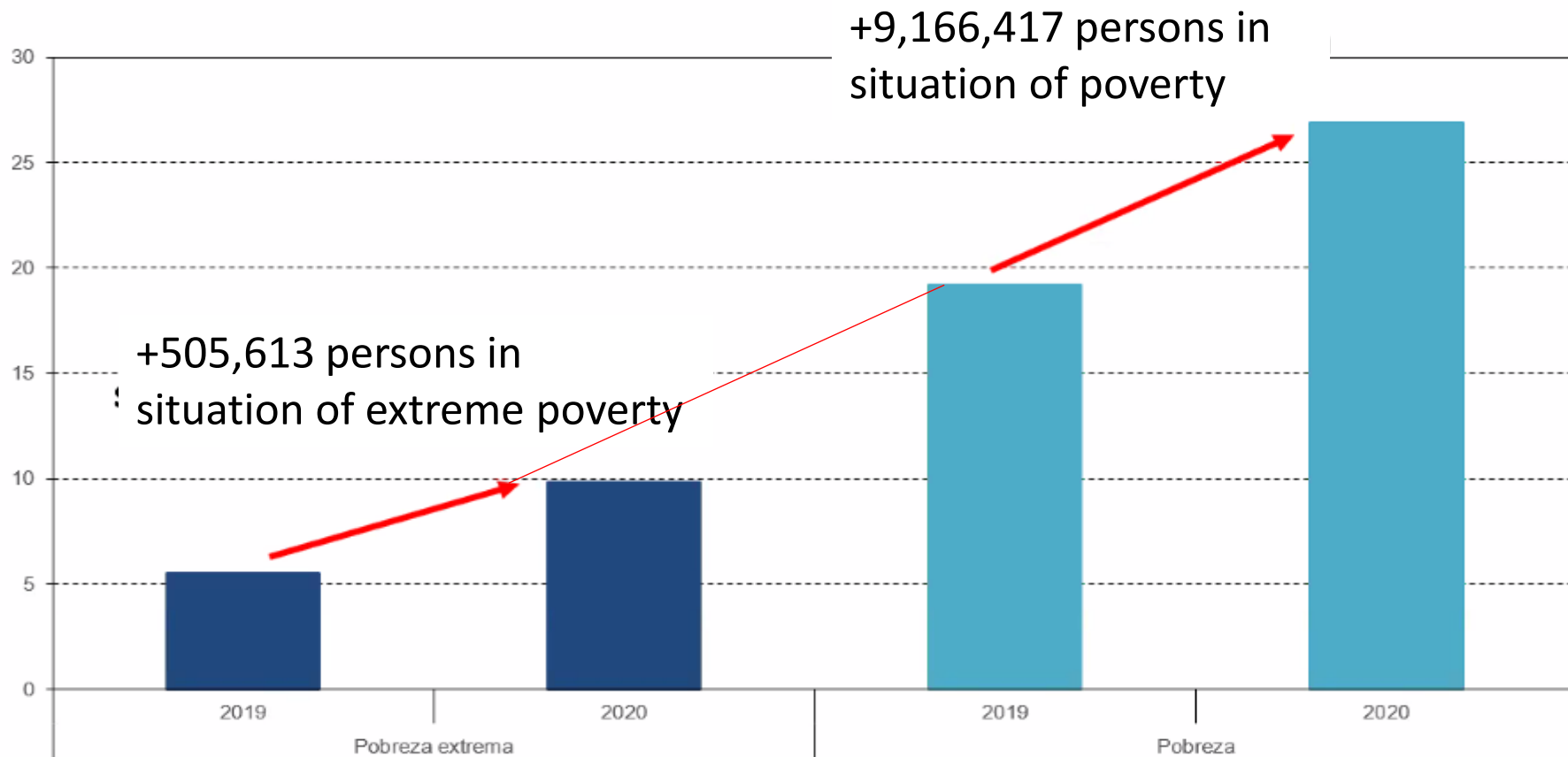






There will be more 5.9 Million in situation of Poverty

Brazil: persons in situation of poverty and extreme poverty, 2019-2020



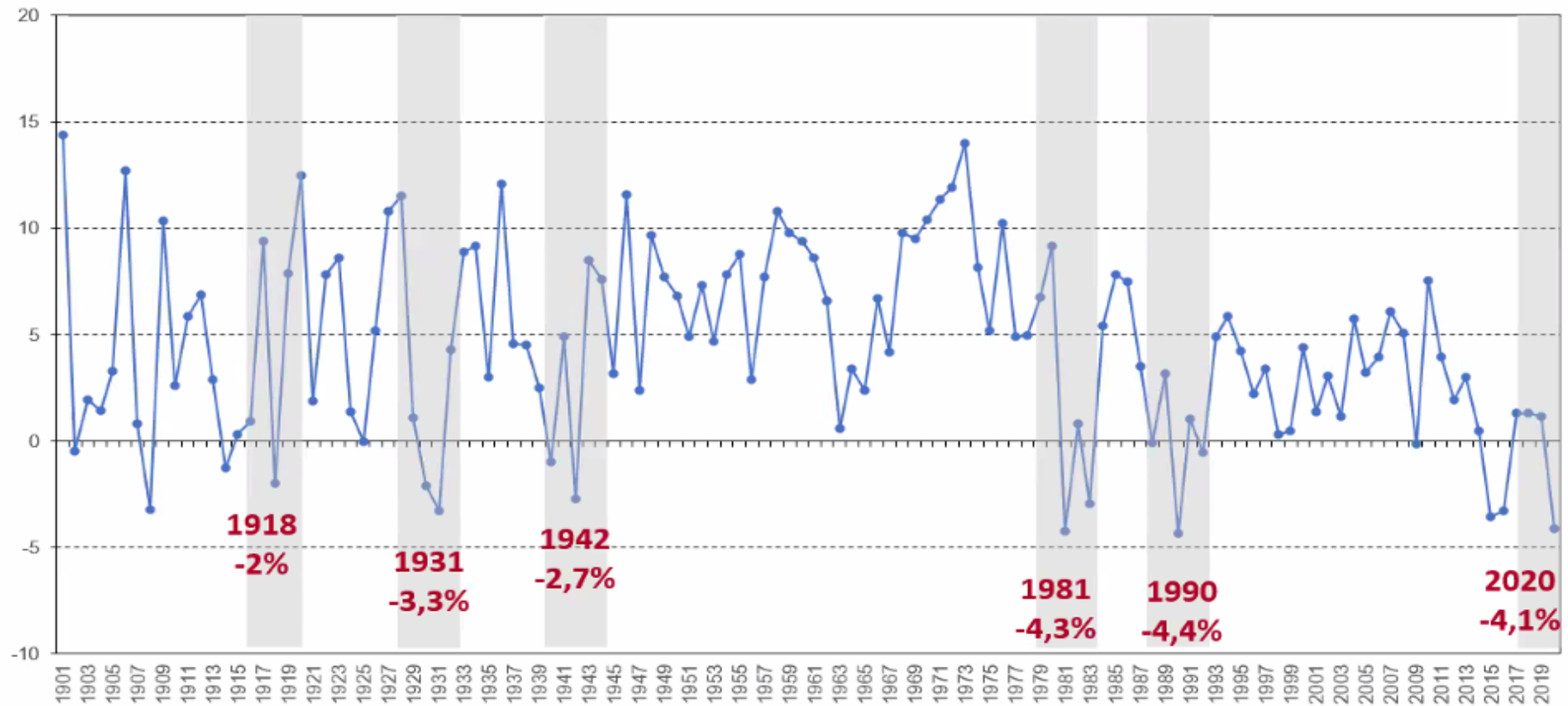
Fonte: CEPAL, com base em Informe Especial COVID-19 No.5 (Julho 2020).

Fonte: Apresentação feita por Camila Gramkow, CEPAL, Out 2020.



Brazil: the biggest downfall since the 90's

Brazil: rate of variation of the GNP, 1901 to 2020

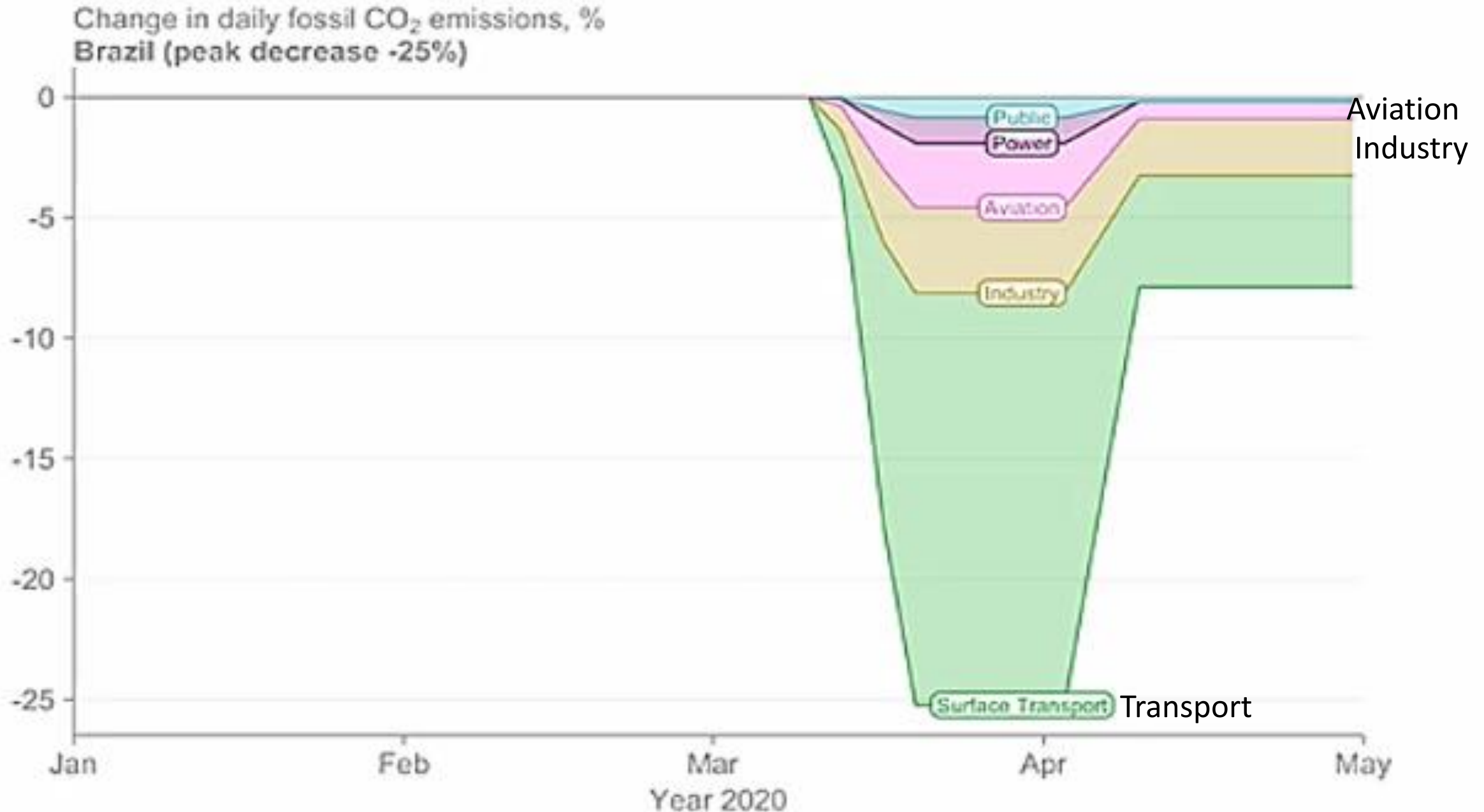


Fonte: CEPAL, com base em IPEADATA.

Fonte: Apresentação feita por Camila Gramkow, CEPAL, Out 2020.

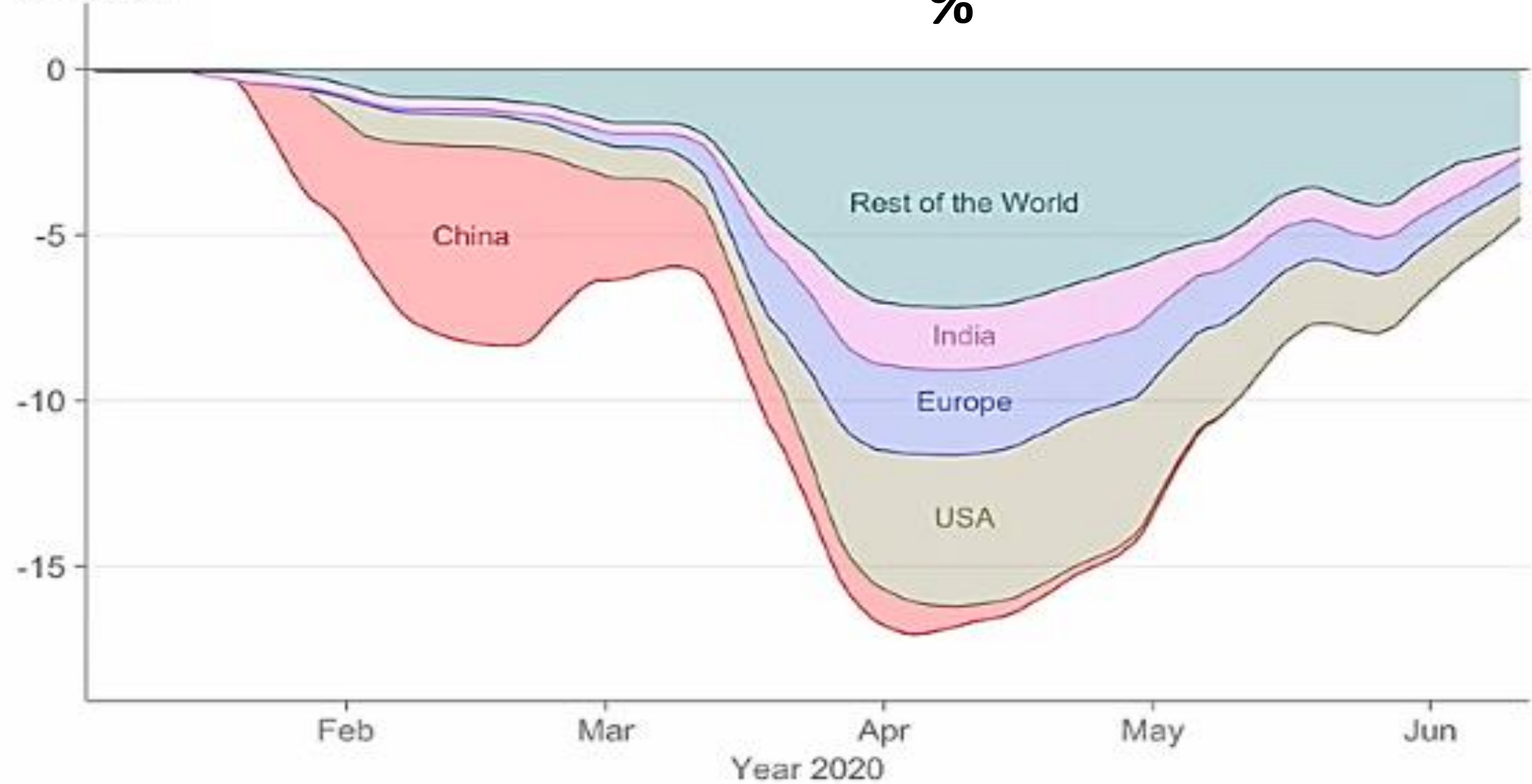


Change in the Daily Emissions of Fossil Fuels' CO2 in %



Change in the Daily Emissions of Fossil Fuels' CO₂ in %

Change in glo
MtCO₂ day⁻¹



Source: Le Quéré et al. Nature Climate Change (2020); Global Carbon Project

Figure: Jones, Matt

Fonte: Le Quere et al (2020), Temporary Reduction in Daily Global CO₂ during the Covid-19 Forced Confinement, in Nature Climate Change, Vol. 10. Apresentação feita por Camila Gramkow, CEPAL, Out 2020.

Urban Agglomerations x Climate Change

<https://population.un.org/wup/Publications/Files/WUP2018-Report.pdf>

<https://unhabitat.org/sites/default/files/download-manager-files/WCR-2016-WEB.pdf>

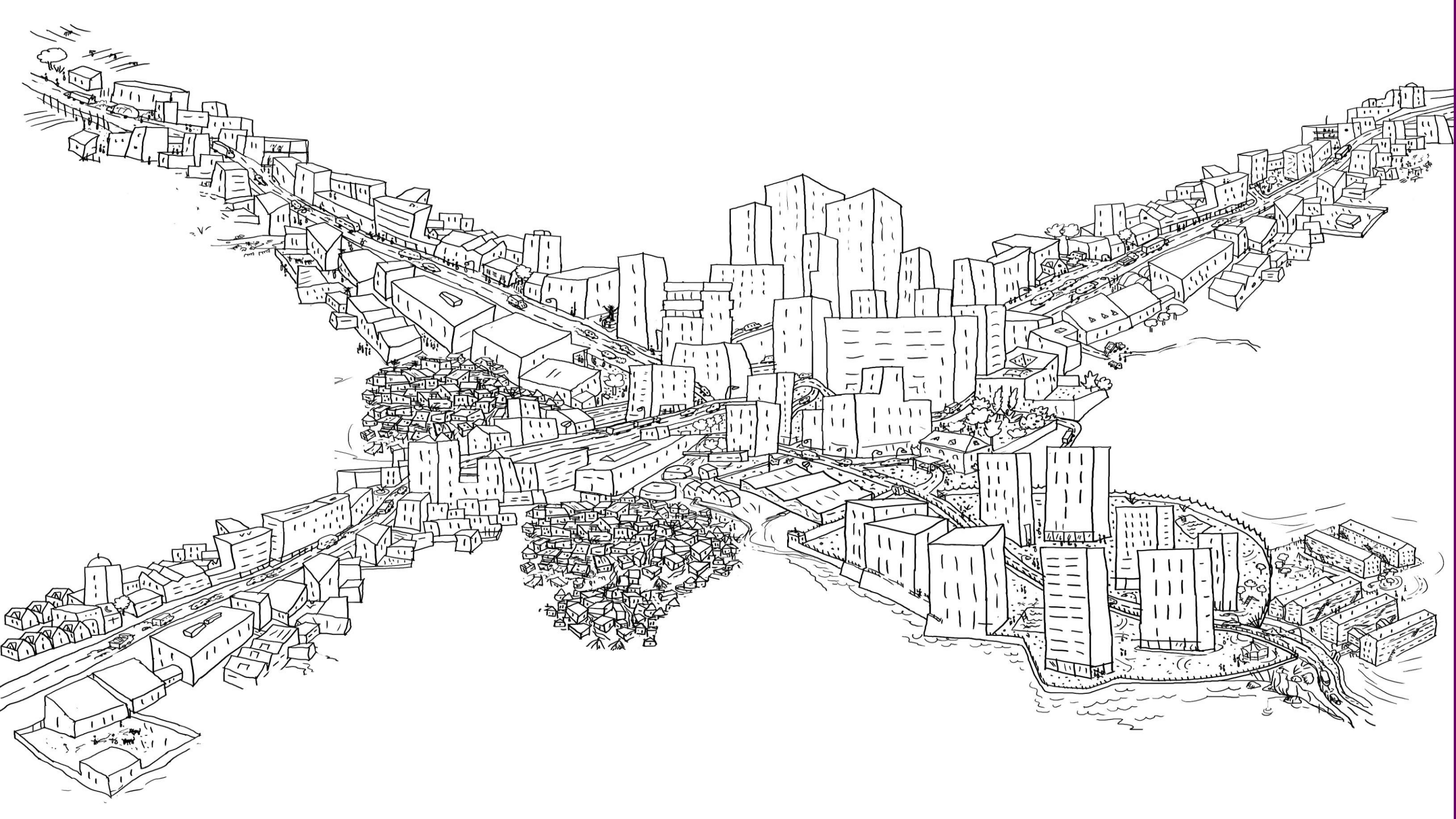
https://unhabitat.org/sites/default/files/2020/10/wcr_2020_report.pdf

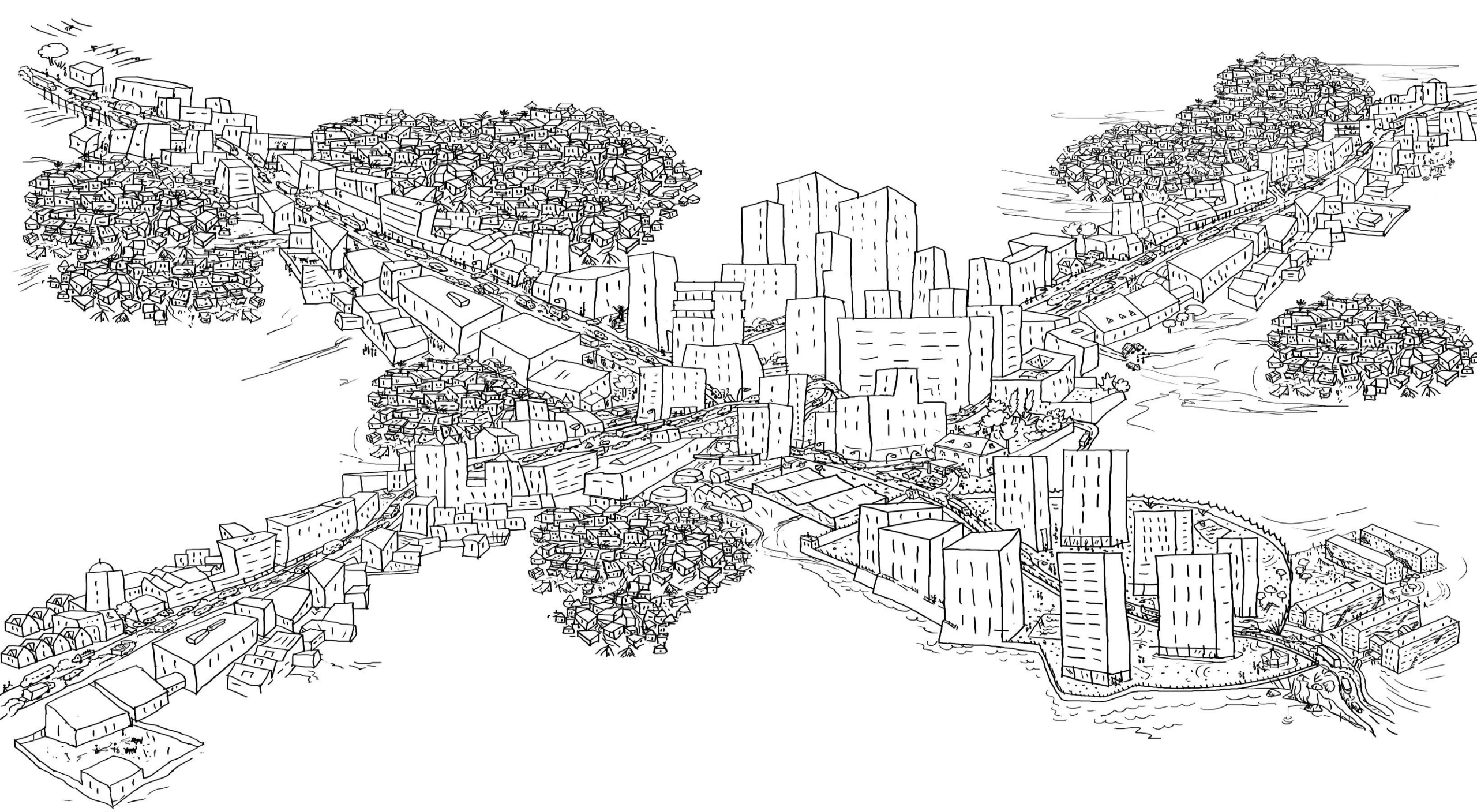
- a. **55%** of world population already in urban areas, expected to be **66% by 2050**.
- b. Cities are responsible for 3/4 of GHG emissions globally.
- c. 75% of energy consumption and of emissions of CO₂ are originated from consumption
- d. 7 – 40% of total emissions of CO₂e
- e. Between 1950 and 2005, the level of urbanization raised from 29% to 49%, while global carbon emissions originated from fossil fuels increased nearly 500%.

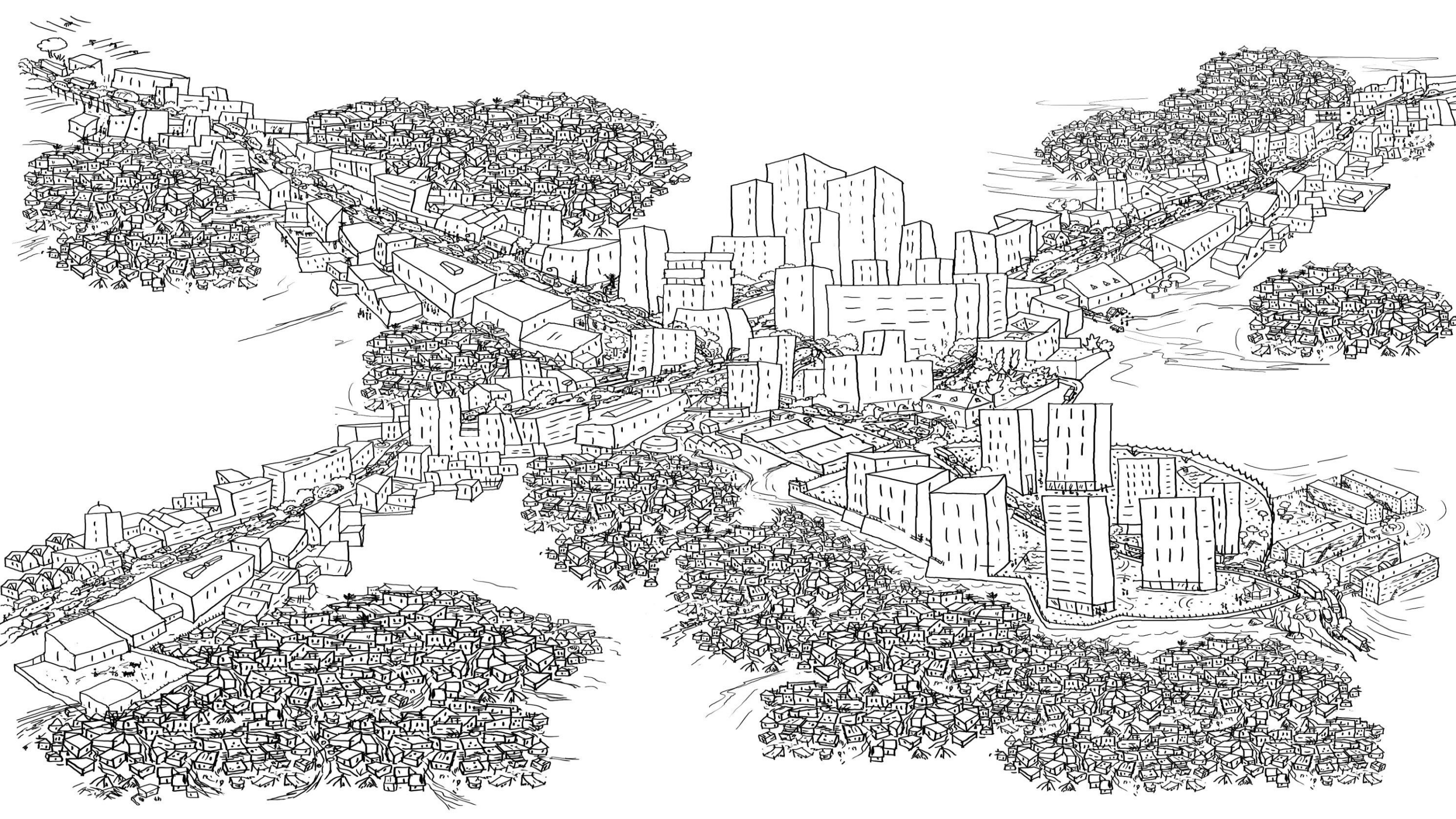
Urbanization

Unplanned urbanization becomes harmful for the environment and for sustainable development, a form of predatory urbanization

Planned and well managed Urbanization generates wealth, prosperity and opportunities for sustainable development













Claudio Acioy









10/4/2022

Claudio Acioly

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ชอยบาย
ในความเป็นอิสระ
กำลังซ่อมแซม
และปรับปรุงงาน
ตลาดสี่แยก









USA



México

Predatory Urbanization - Planned



China

China



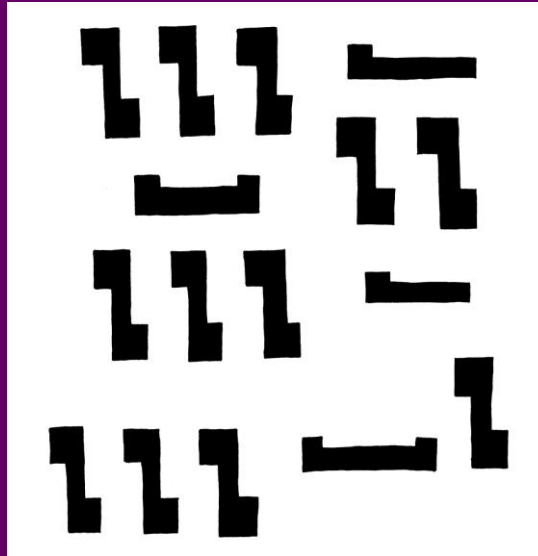
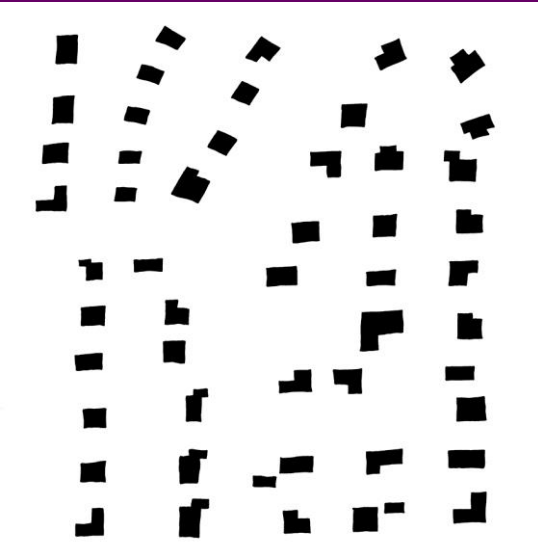
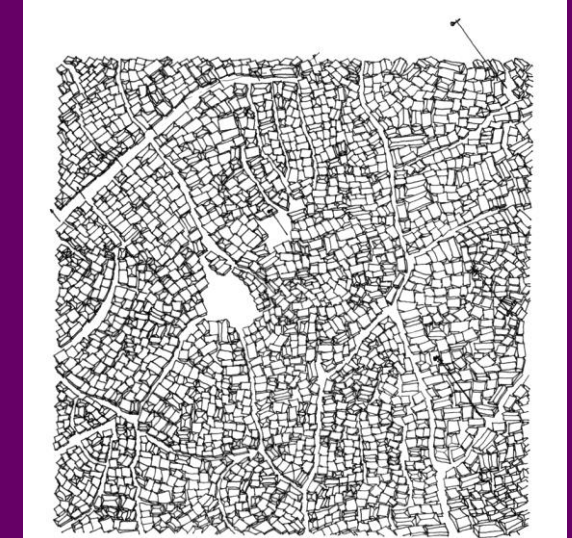
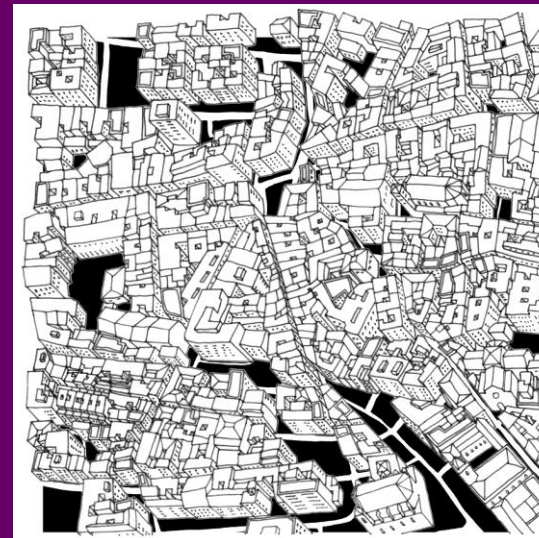
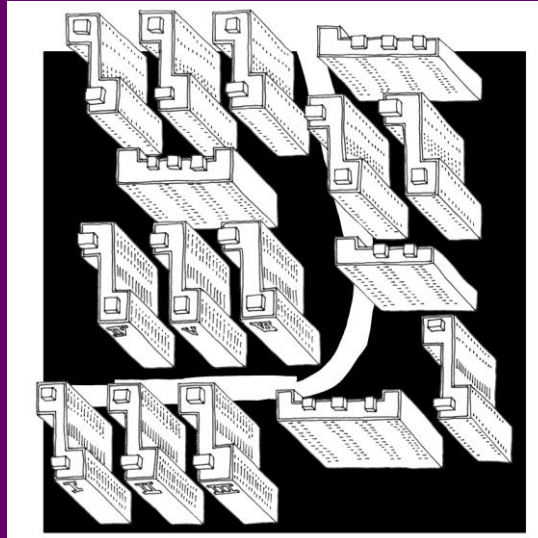
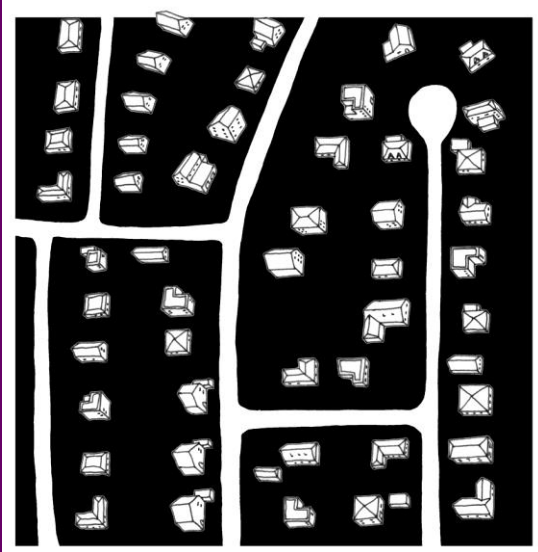
Bolívia

Bolivia

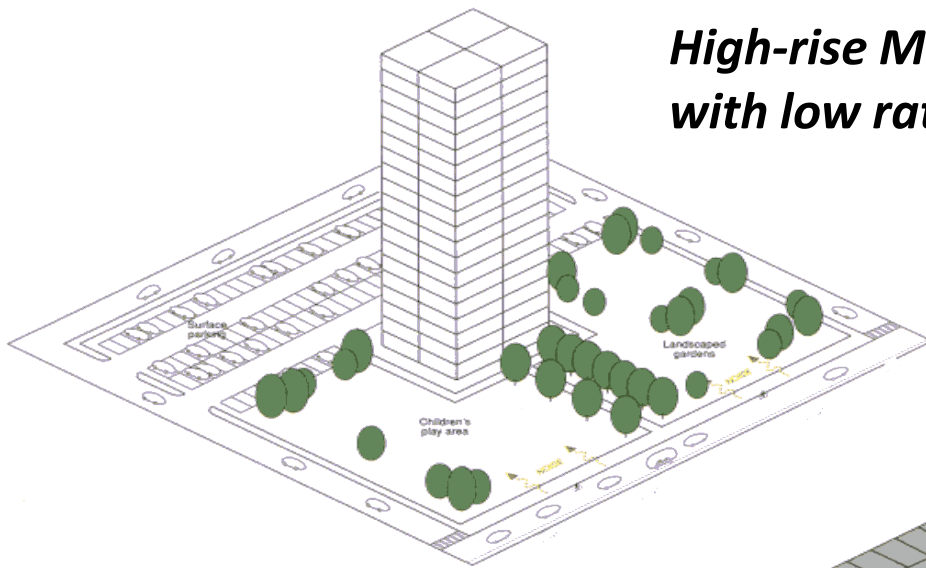




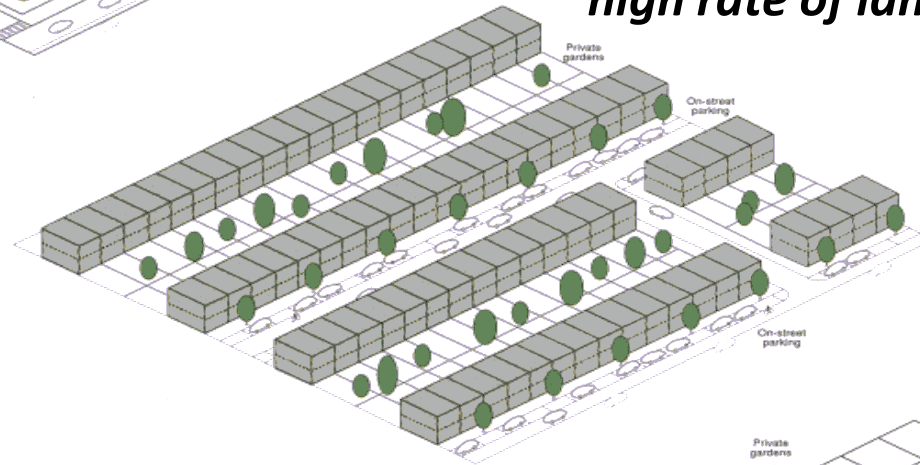
The Urban Form and Density of Cities: The Urban, Ecological and Carbon Footprint of Cities



**High-rise Multi-Family Housing
with low rate of land occupation**

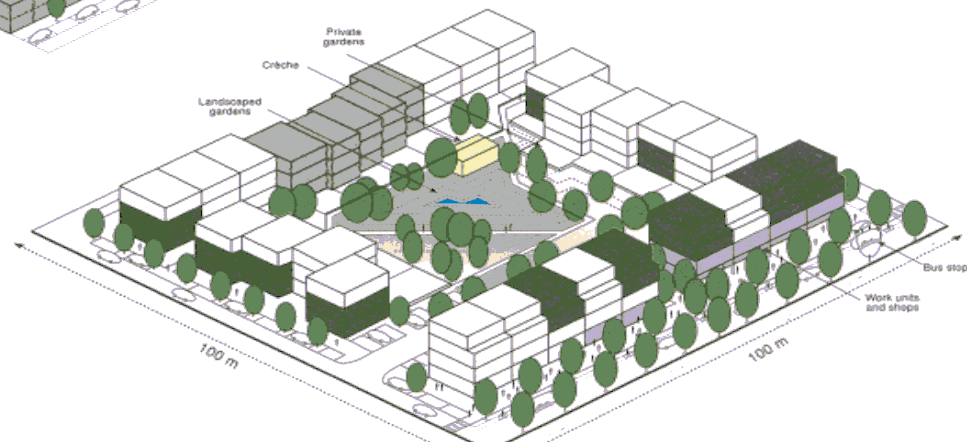


**Attached row Housing, low rise and
high rate of land occupation**



75 units/ha

**Mixed typology of
Housing with medium
rate of land occupation**



Key

*Target a mix of activities
Include a variety of house types*

- Community facilities
- Shops and workspaces
- Maisonettes
- Houses
- Apartments



Venice: 688



Toledo: 420



Florence: 255



Turin: 191



Amsterdam 17th Century: 195



London Mayfair 1735: 165



Paris Etoile: 133



Barcelona Cerdà plan: 103



Manhattan: 120



Washington L'Enfant plan: 48



Washington suburbia: 36



Brasilia Quadra: 41



Beijing South: 16



Beijing South: 13



Shanghai Liyang towers: 27



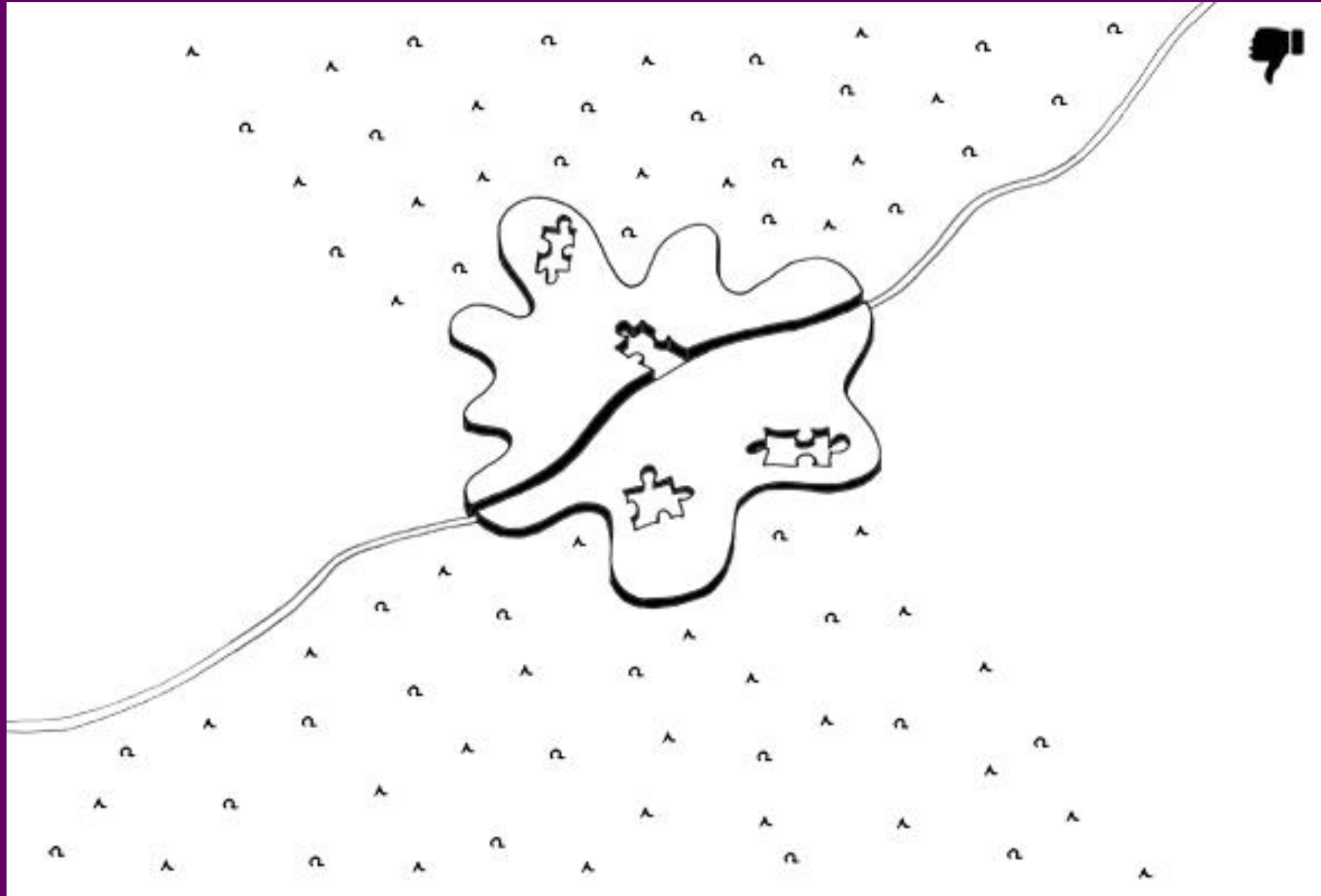
Shanghai Lujiazui (Pudong): 17





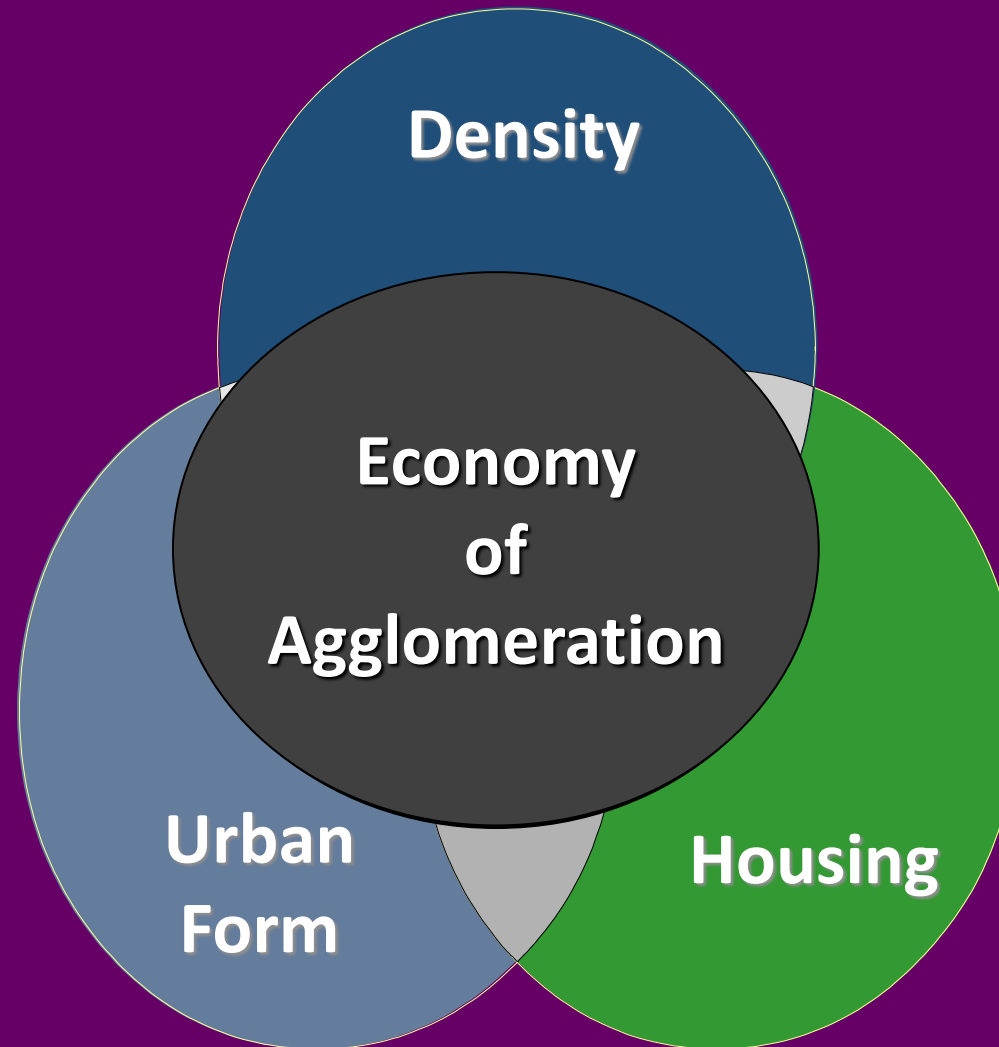
Predatory Urbanization

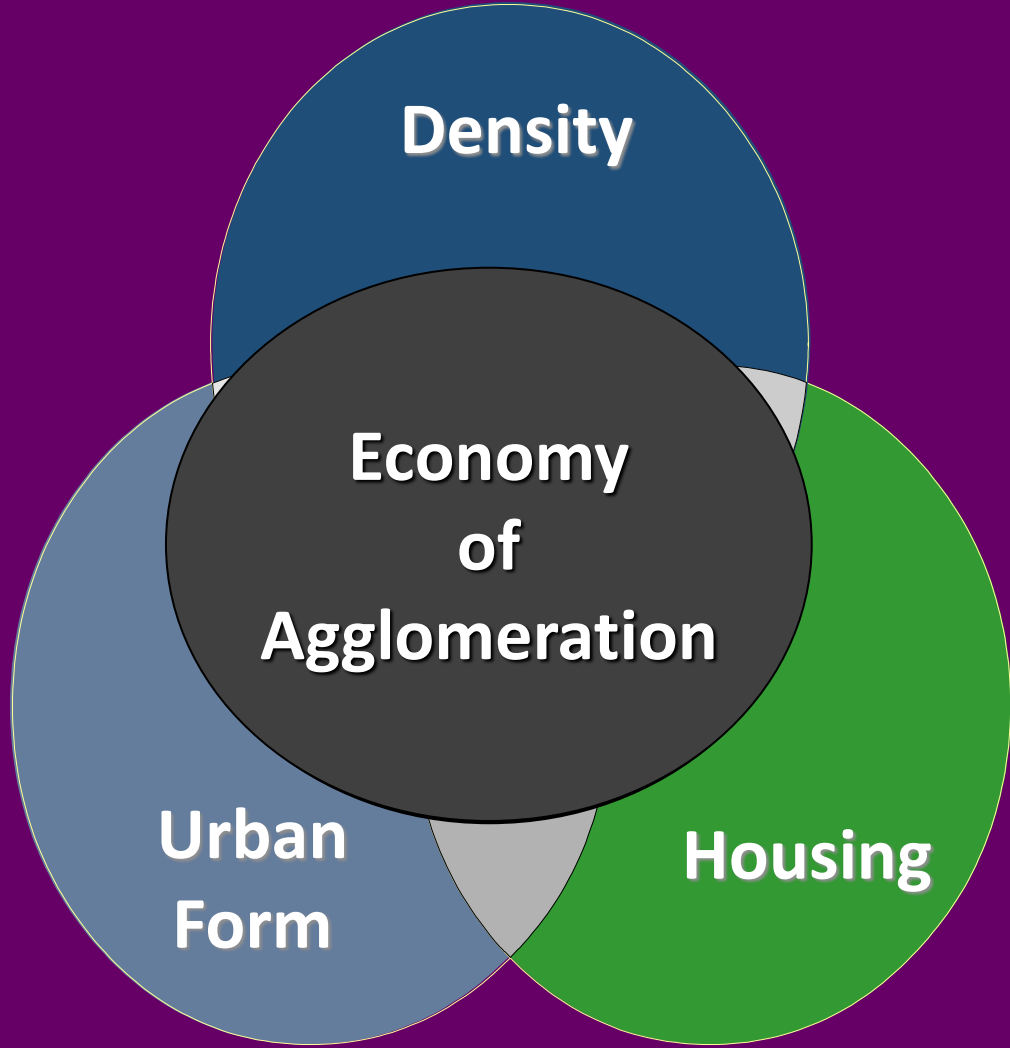
Unsustainable Patterns of Urbanization



Adopt Policies to Maximize Land and Infrastructure

Maximize Public Resources

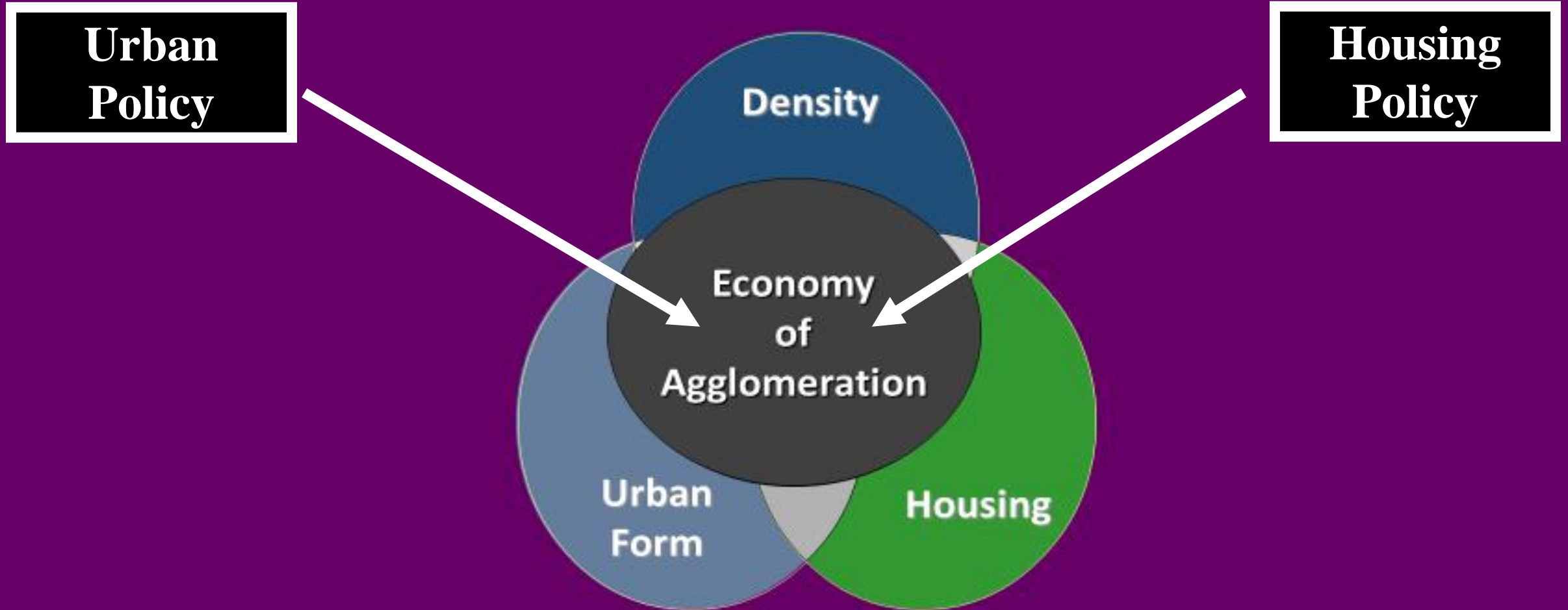


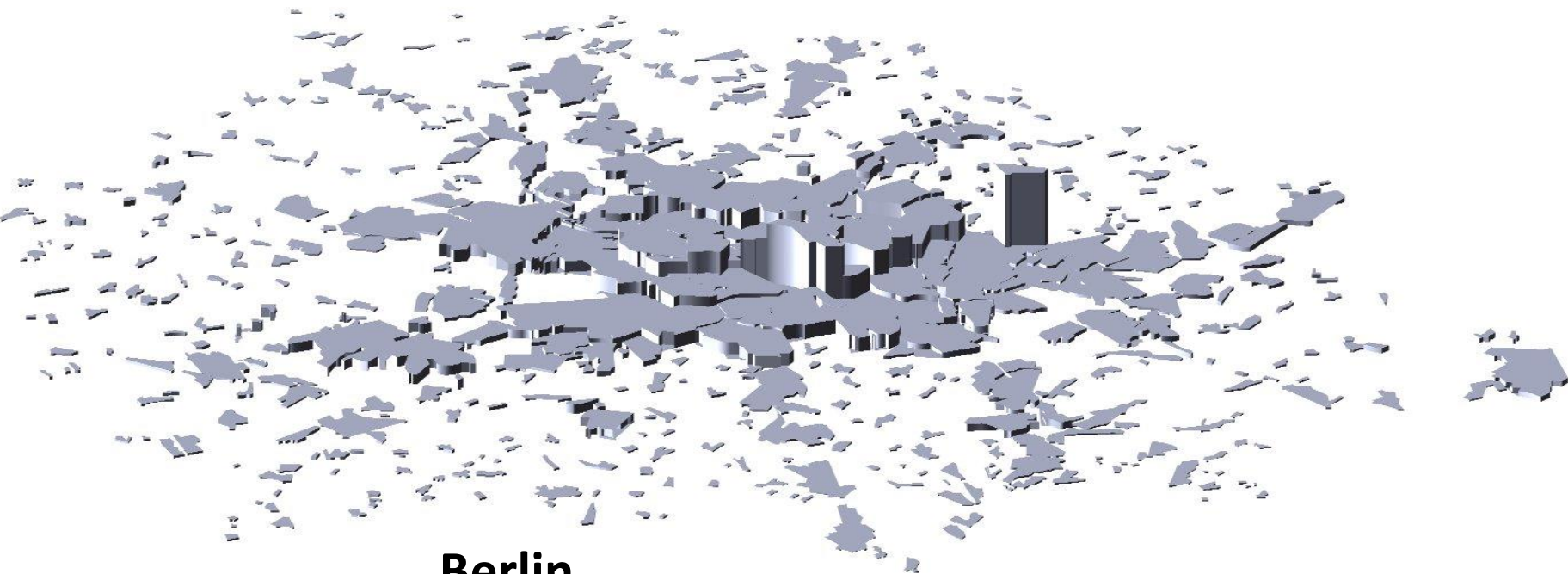


An Inclusive, Resilient, Safe and Sustainable City

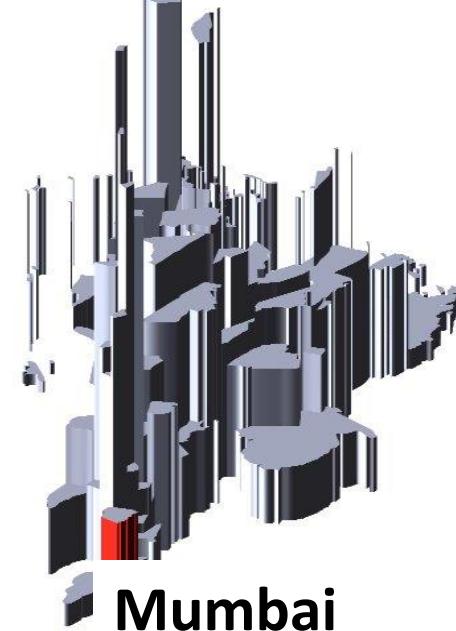
103

98





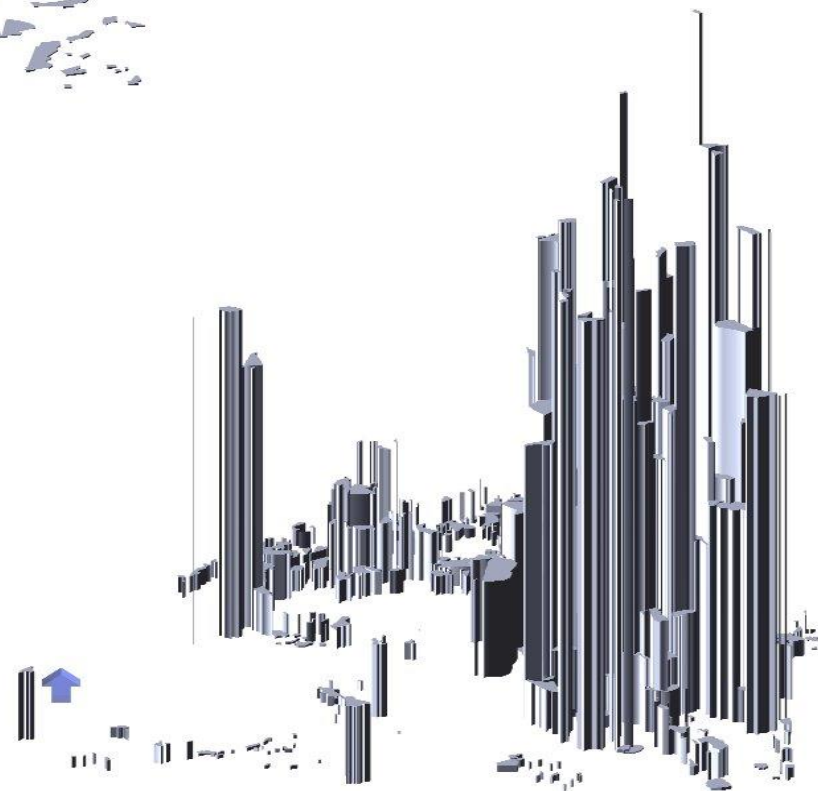
Berlin



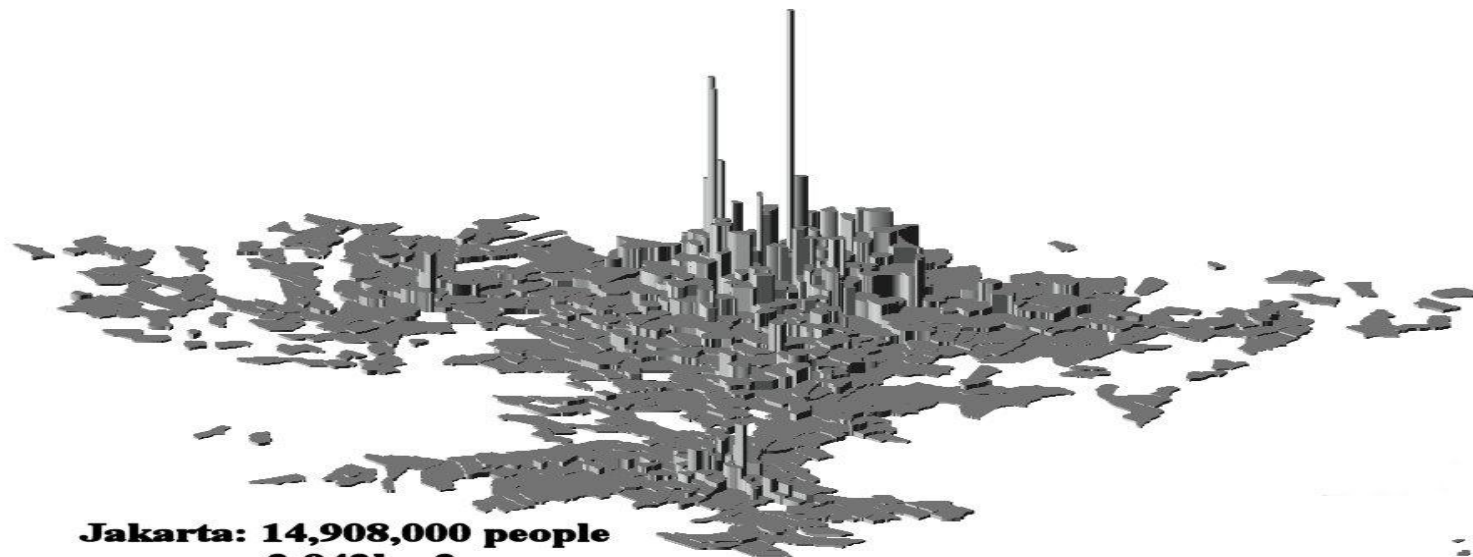
Mumbai



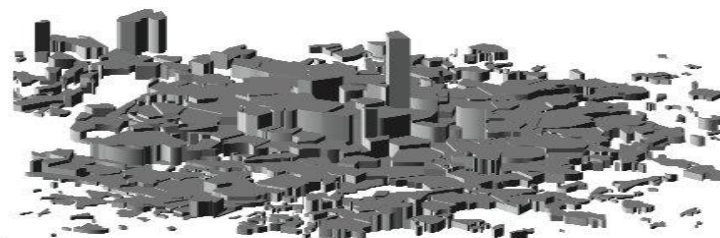
Moscow



Hong Kong



Jakarta: 14,908,000 people
2,942km²



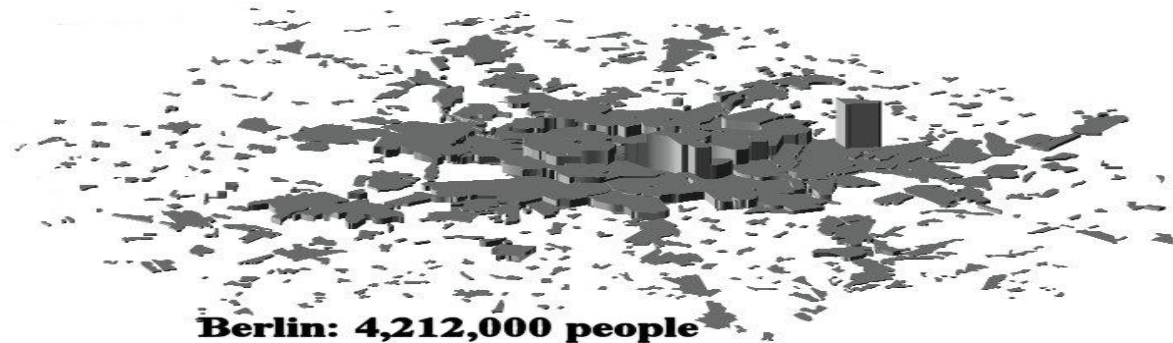
Paris: 7,877,000 people
893 km²



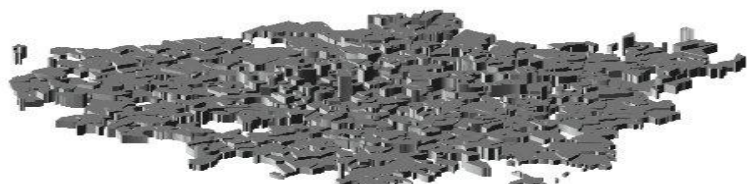
Moscow: 8,543,000 people
470 km²



Shanghai: 7,397,000 people
244 km²



Berlin: 4,212,000 people
1,176 km²



London: 6,626,000 people
1,062 km²

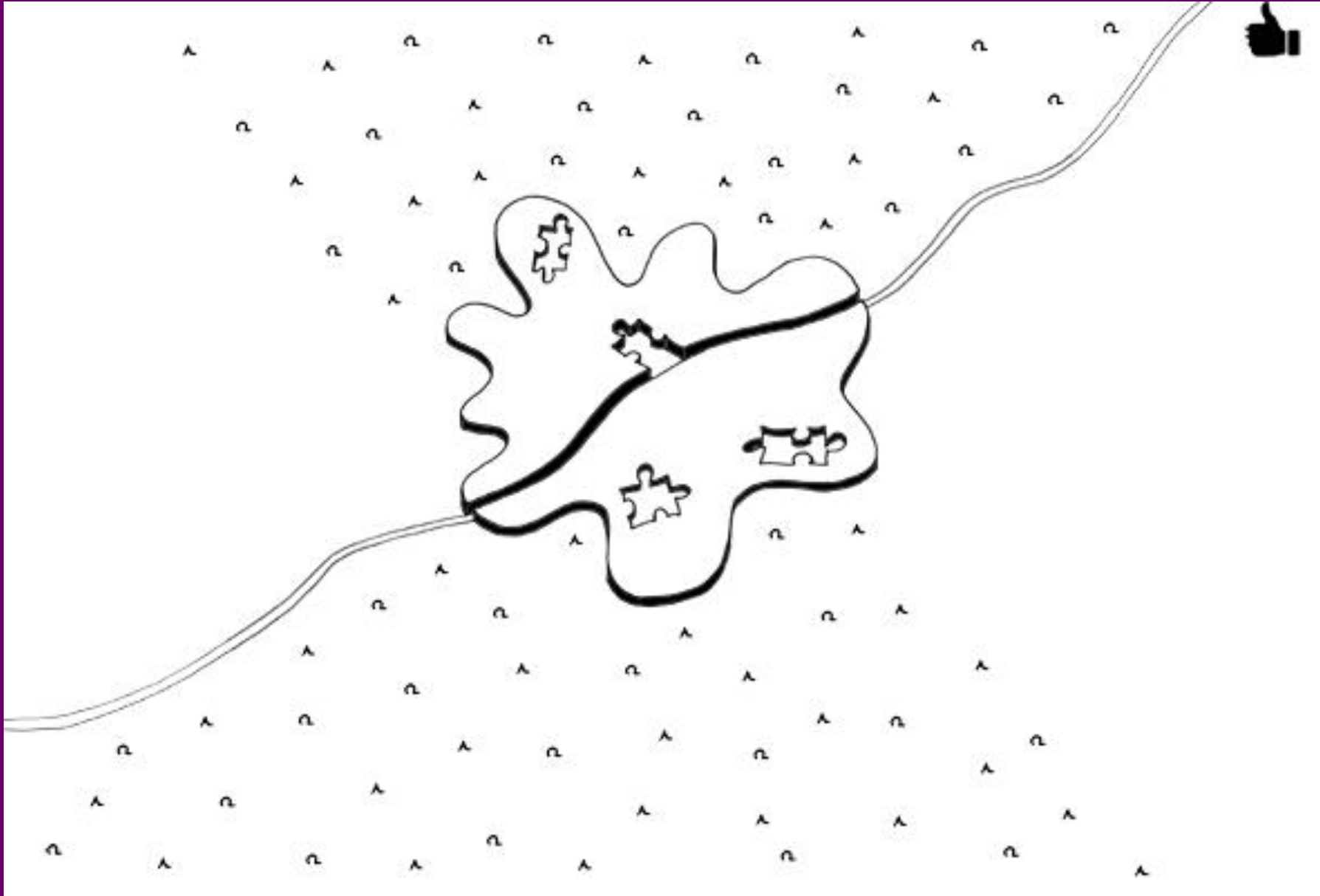


New York: 10,752,000 people
2,674 km²


Scale: 100,000 people

0 10 20 30 40 50 km

Sustainable Urbanization

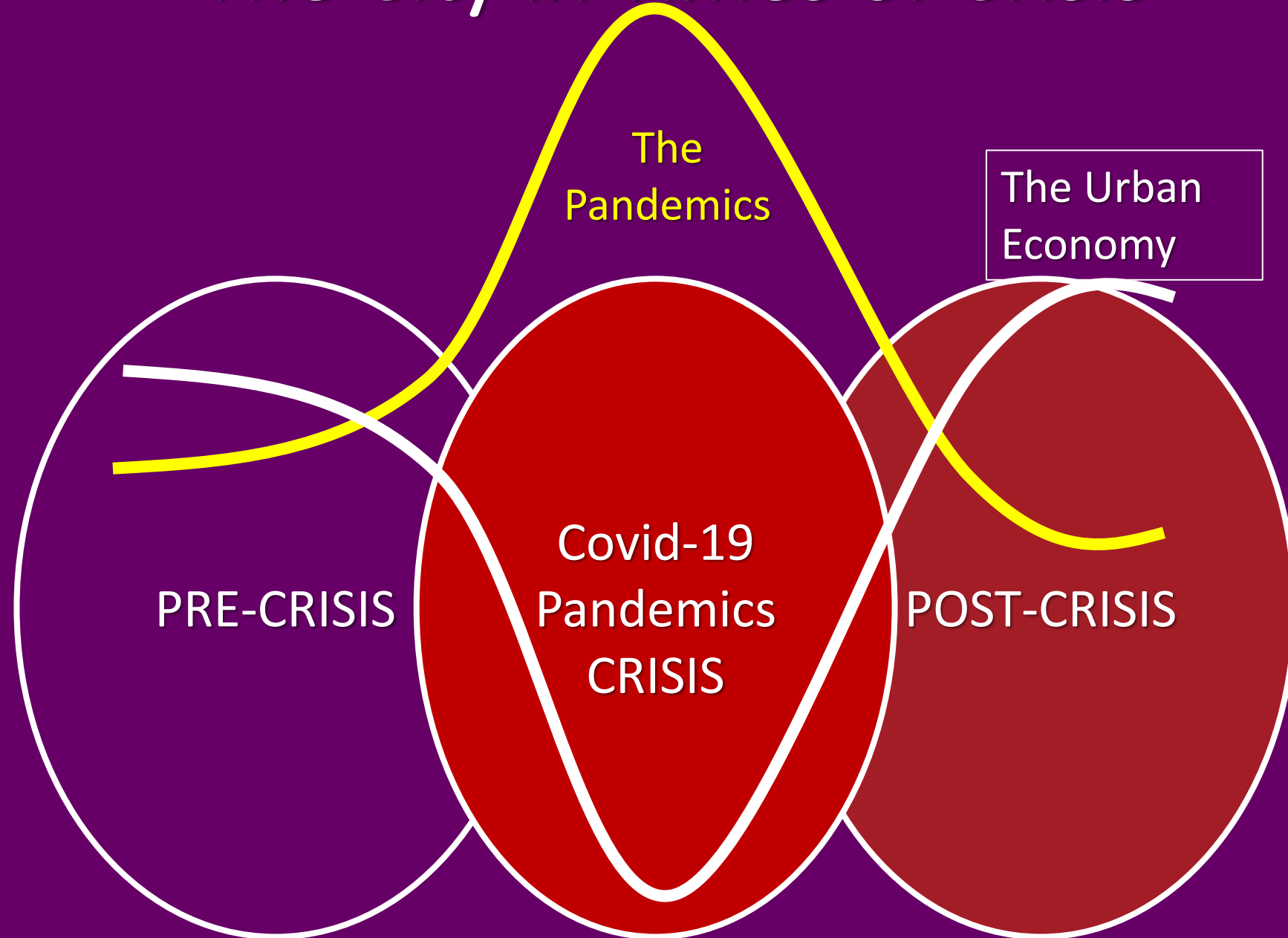


3.

A Municipal Agenda for Sustainable Urban Development in a context of climate change:

Identify sources of emissions and design and implement mitigation and adaptation policies for local responses to the Paris Accord and face climate threats.

The City in Times of Crisis



The Urban Economy

The Pandemics

PRE-CRISIS

Covid-19
Pandemics
CRISIS

POST-CRISIS

What do we learn from the Crisis to Built an Urban Future that is resilient, safe, inclusive and Sustainable? ¹⁰⁹

Priorities

Wellbeing
Employment & Income
The Population
The Public Health

BEFORE

DURING

AFTER

Public
Policies

The Environment
The Public Services
Technology & Knowledge
Mobility & Energy

Urbanization and Climate Change: 4 steps

1. Identify the sources of Emissions of Greenhouse Gases.

2. Quantify.

3. Identify Risks

4. Define strategies for Mitigation and Adaptation

Land Use

Occupation, Exploration, Transformation, Conversion rural-urban

Industrial Processes

Production and Consumption of various products

Mobility and Transport

Fossil Fuel Consumption, modalities, Technologies

Solid Waste

Liquid Effluents, Sanitary Landfills, Recycling,

Energy Consumption

Losses in systems, production and consumption, sources, technologies

Urbanization and Climate Change: 4 steps

1. Identify the sources of Emissions of Greenhouse Gases.

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3. Identify Risks

4. Define strategies for Mitigation and Adaptation

Land Use

Industrial Processes

Mobility and Transport

Solid Waste

Energy Consumption

Public Policy Intervention with Programmes, Urban Projects, Legal Instruments ...

A Urbanização e a Mudança Climática

1. Identificar as Fontes de Origem das Emissões de Gases de Efeito Estufa (GEE) é imprescindível.

2. Quantificar

3. Identificar Riscos

4. Definir estratégias de Mitigação e Adaptação

Uso do Solo

Processos Industriais

Mobilidade e Transporte

Resíduos Sólidos

Consumo de Energia

Intervenção de Política Pública com Programas e Projetos Urbanos

Cities and Climate Change

Interventions:

Mitigation: measures to reduce sources of the problems or expand the sinkholes of GHG

Adaptation: adjustment processes to anticipate the adverse impacts of climate change

Interventions towards Urban Sustainability

1. **Sustainable Urban Development** at the local scale.
2. Urban Policy
3. Housing Policy
4. The Form and Urban Density of Cities
5. Land-use, Mobility and Management of the Territory
6. Upgrading and Spatial, Social and Economic Integration of Slums and Informal Settlements

4.

Urban Policies to Mitigate and Adapt to Climate Change and realize sustainable urban development:

Efforts of municipal governments, innovations in management, planning, urban policies, legal instruments and technology.

Some Innovative References

Belo Horizonte

Niterói

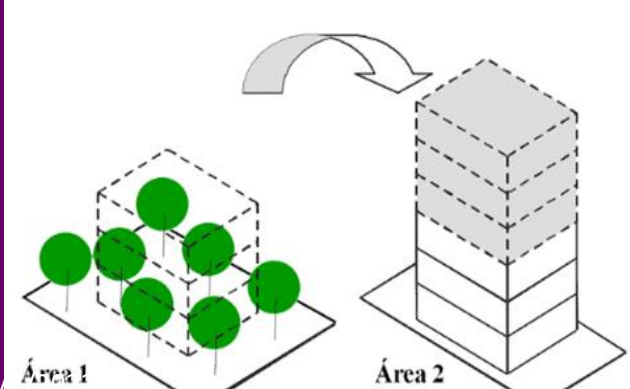
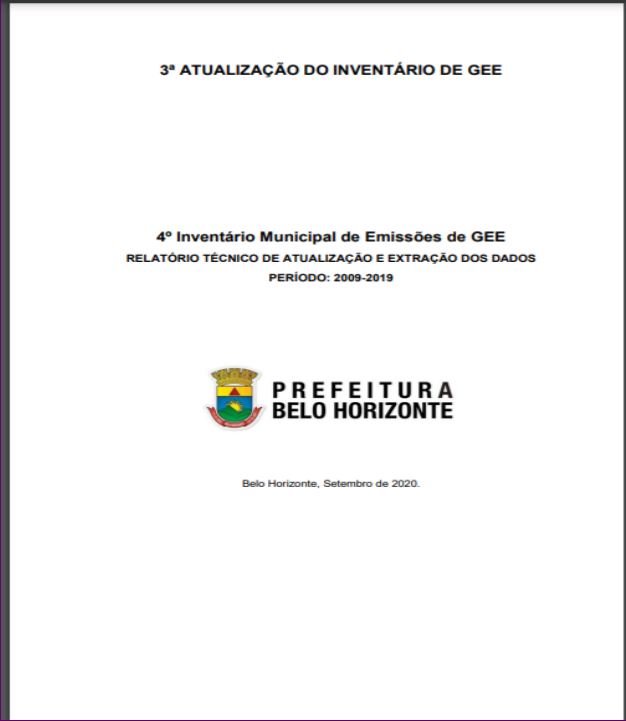


Some Measures Adopted by Belo Horizonte

1. Master Plan/Development Plan: instrument of Outorga Onerosa (CA=1) and sales of additional building rights to finance urban development, improve infrastructure in underprivileged areas and foment compact city.
2. Urban Mobility with interventions promoting public transport and non-motorized mobility
3. New centralities and fast-tracking requests for new investments and economic activities
4. Environmental Protection and permeability of the soil
5. Housing Policy and upgrading & Regularization of Informal Settlements
6. Intense and systematic citizen participation



Measuring Emissions in Belo Horizonte



Compensatory measures and innovations in the use of legal and urban planning instruments in land use & management, creating housing, financial and environmental management solutions.





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Impactos e Resultados de Baixo Carbono em BH

<https://prefeitura.pbh.gov.br/noticias/emissoes-de-gases-de-efeito-estufa-caem-22-em-belo-horizonte>

1. The GHG emissions **fell by 22%**, during the period 2014-2019.
2. Data from transport, solid waste and energy, **GHG emissions per capita fell from 2,135 tCO²e/ha in 2014 to 1,1656 tCO²e/ha in 2019.** (tonnes CO²-equivalent = tCO²e)
3. “We cannot minimize the importance of policies that demonstrate the effective mitigation of emissions, such as the transformation units established at the dumpsites/sanitary landfills and in the Sewerage Treatment Stations Arrudas; the biofuel policy and the replacement of gasoline by ethanol, which is still conditioned to the price policy in place.

5.



Some Conclusions:

Sustainability, mitigation and adaptation incorporated into everything that the local government (municipality, city government) does in its territory and jurisdictions.

Some Conclusions:

1. The principle of sustainability must be inserted into all actions, policies, programmes, projects, activities in the territory where people live and work;
2. Sustainability on the 4 pillars: territorial/spatial, social, economic and environmental.
3. There are more and more funds available to finance mitigation and adaptation (GEF, City Gap Fund, CDP-Carbon Disclosure Project, Philantropics, Private Funds)
4. Strengthening the capacity of local government staff and stakeholders to prepare projects and fertilize municipal policies grounded on the principles of sustainability to effectively implement adaptation and mitigation actions that will lead to a sustainable urban future of the planet.

THE END