

Special Lecture: April 23rd, 2019
Patel Center for Global solutions
3:45 – 5:00 pm, Room – 140



Cities, Climate Change, and Sustainability

Jose A. Puppim de Oliveira

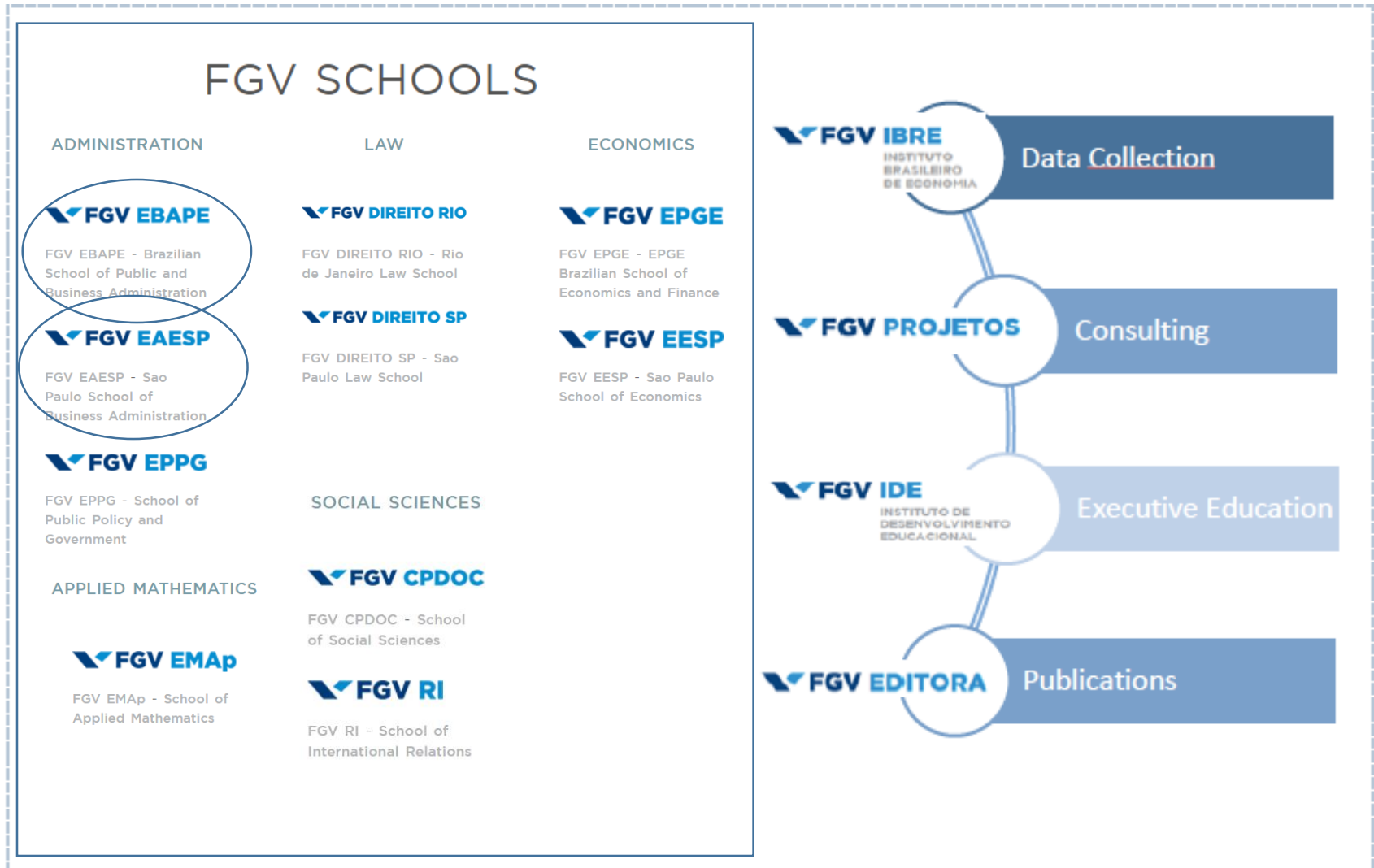
Professor

Fundação Getulio Vargas (FGV)

portal.fgv.br/en

FGV-FUNDAÇÃO GETULIO VARGAS (portal.fgv.br/en)

Five Pillars of Knowledge Creation and Transfer





FGV is one of the **TOP 10** think tanks in the world

#6 THINK TANK IN THE WORLD

In 2017, **7,815 think tanks** from 187 countries were evaluated.

#1 in Latin America
for **9** consecutive years

Top 20
worldwide
in **18**
categories

#1 in Latin America
in **12** categories, including

#1 Best managed
in the world
for the **2nd year** running

2017 Global Go To Think Tank Index Report

Produced annually by the
University of Pennsylvania, since 2008.



ELECTED ONE OF THE
WORLD'S 10 MOST INFLUENTIAL
EDUCATION BRANDS
ON LINKEDIN.

Source: *The 50 Most Influential Education Brands on LinkedIn*

#FGVBRAZIL

TOP
10

Broad Motivation for Research

- Urbanization in an unprecedented scale,
- Evidence of Climate Change
- Increasingly interconnectedness of countries, nations and societies, recognized by countries' collective interests and goals (e.g., SDGs, Paris, HRs),
- Abundance of data and knowledge available as never before,
- Management theories and practices constrained to research that are not connected to evidence or not concerned about what goes on *beyond administrative boundaries*,
- *Scientists do not understand the problems of using science in practice*

WORKING GROUP I

[About](#)

[Reports](#)

[Activities](#)

[News](#)

[Co-Chairs](#)

[Vice Chairs](#)

[TSU Staff](#)

[Contact](#)

WORKING GROUP II

[About](#)

[Reports](#)

[Activities](#)

[News](#)

[Co-Chairs](#)

[Vice-Chairs](#)

[TSU Staff](#)

[Contact](#)

WORKING GROUP III

[About](#)

[Reports](#)

[Activities](#)

[News](#)

[Co-Chairs](#)

[Vice-Chairs](#)

[TSU Staff](#)

[Contact](#)

Reuniao a
Fev 2019.

[About](#) [Conference Programme](#) [Host City Edmonton](#) [Beyond the](#)

CITIES
2018-CONFERENCE
IPCC

Cities & Climate Change Science Conference

MARCH 5-7, 2018

EDMONTON, ALBERTA, CANADA

Links with 2030 Development Agenda



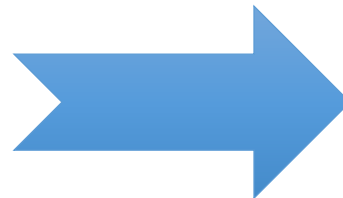
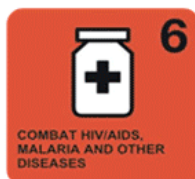
UNITED NATIONS

TRANSFORMING OUR WORLD:



THE 2030 AGENDA FOR
SUSTAINABLE DEVELOPMENT

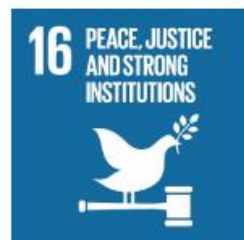
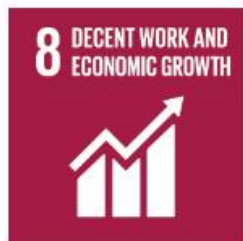
The 8
Millennium
Development
Goals



SUSTAINABLE
DEVELOPMENT GOALS



SUSTAINABLE DEVELOPMENT GOALS



The UN 2030 Development Agenda:
achieving plain human development for
all while keeping the life supporting
systems for the next generations.



UNITED NATIONS

TRANSFORMING OUR WORLD:



THE 2030 AGENDA FOR
SUSTAINABLE DEVELOPMENT

- **The transformations will occur only if policymaking frameworks are able to recognize the ecological limits at the different scales, from local to planetary.**
- Need radical innovations and the way they define and carry out development processes.
- Require better coordination among different stakeholders and levels of governance
- But, we are far from having comprehensive governance and policy mechanisms to transform development processes,

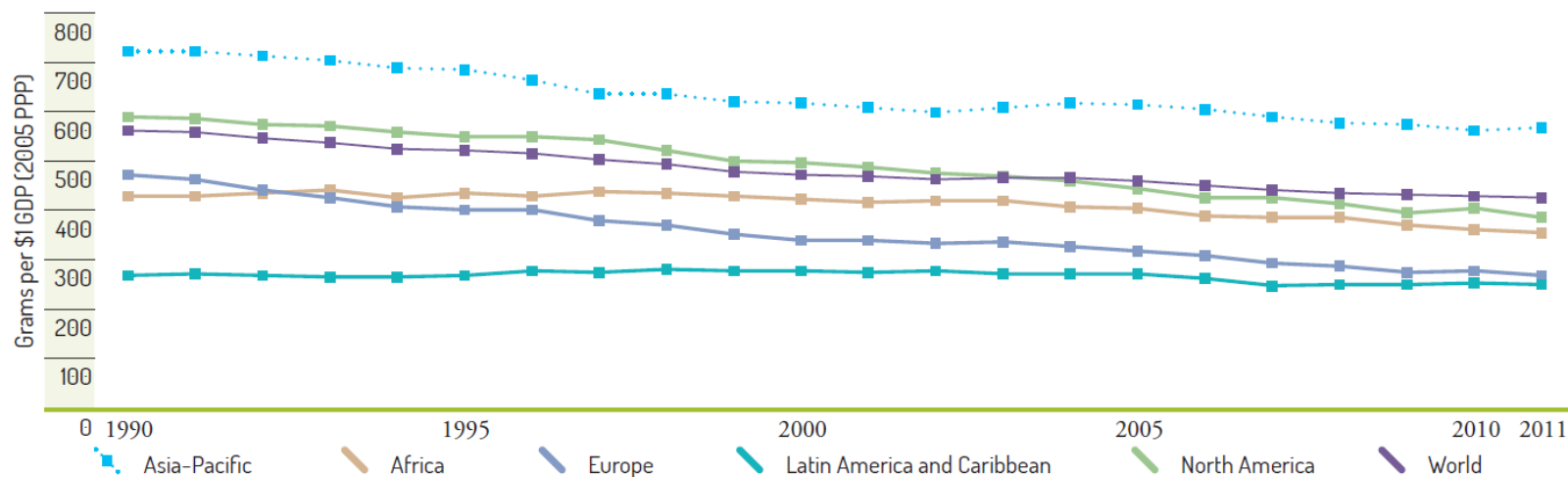
TRANSFORMATIONS FOR SUSTAINABLE DEVELOPMENT

PROMOTING ENVIRONMENTAL SUSTAINABILITY
in Asia and the Pacific



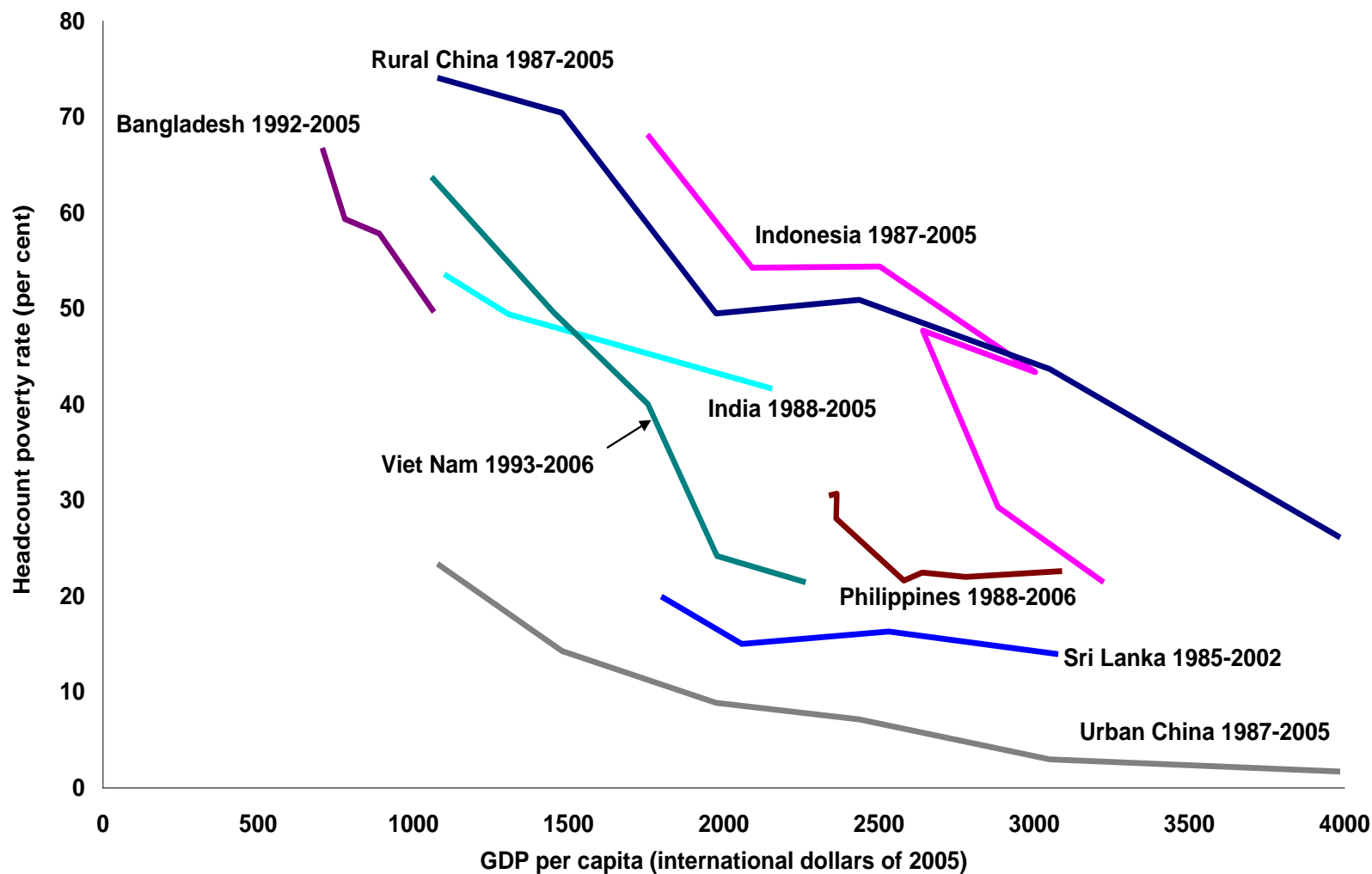
<http://www.unescap.org/publications/transformation-for-sdg>

Figure B11 Carbon intensity of the economy, Asia-Pacific region and the rest of the world, 1990–2011



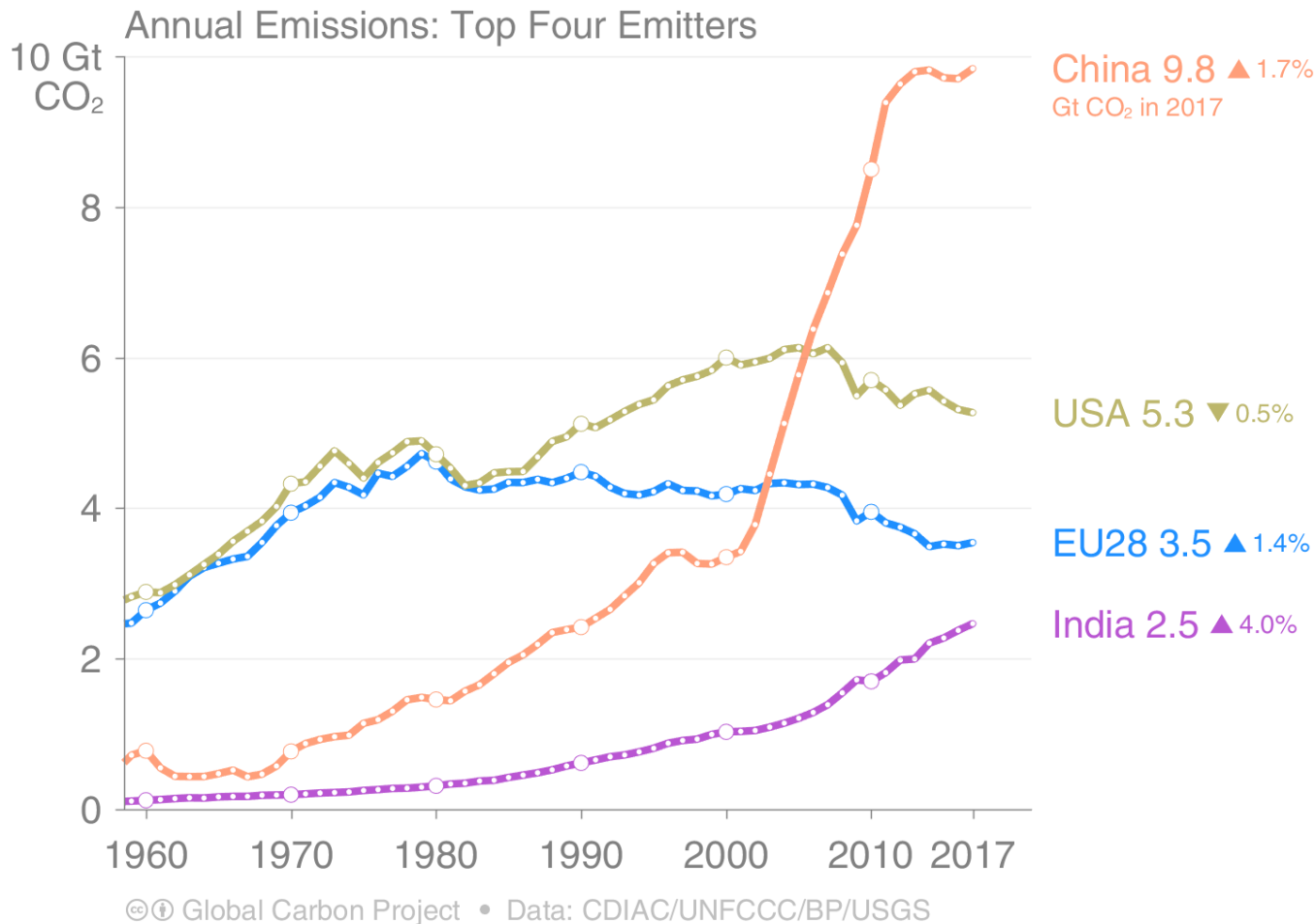
Source: ESCAP Asia Pacific Energy Portal, based on data from the International Energy Agency, CO₂ emissions from fuel combustion statistics and World Bank World Development Indicators.

Economic growth impact on poverty reduction



Top emitters: Fossil CO₂ emissions

The top four emitters in 2017 covered 58% of global emissions
China (27%), United States (15%), EU28 (10%), India (7%)



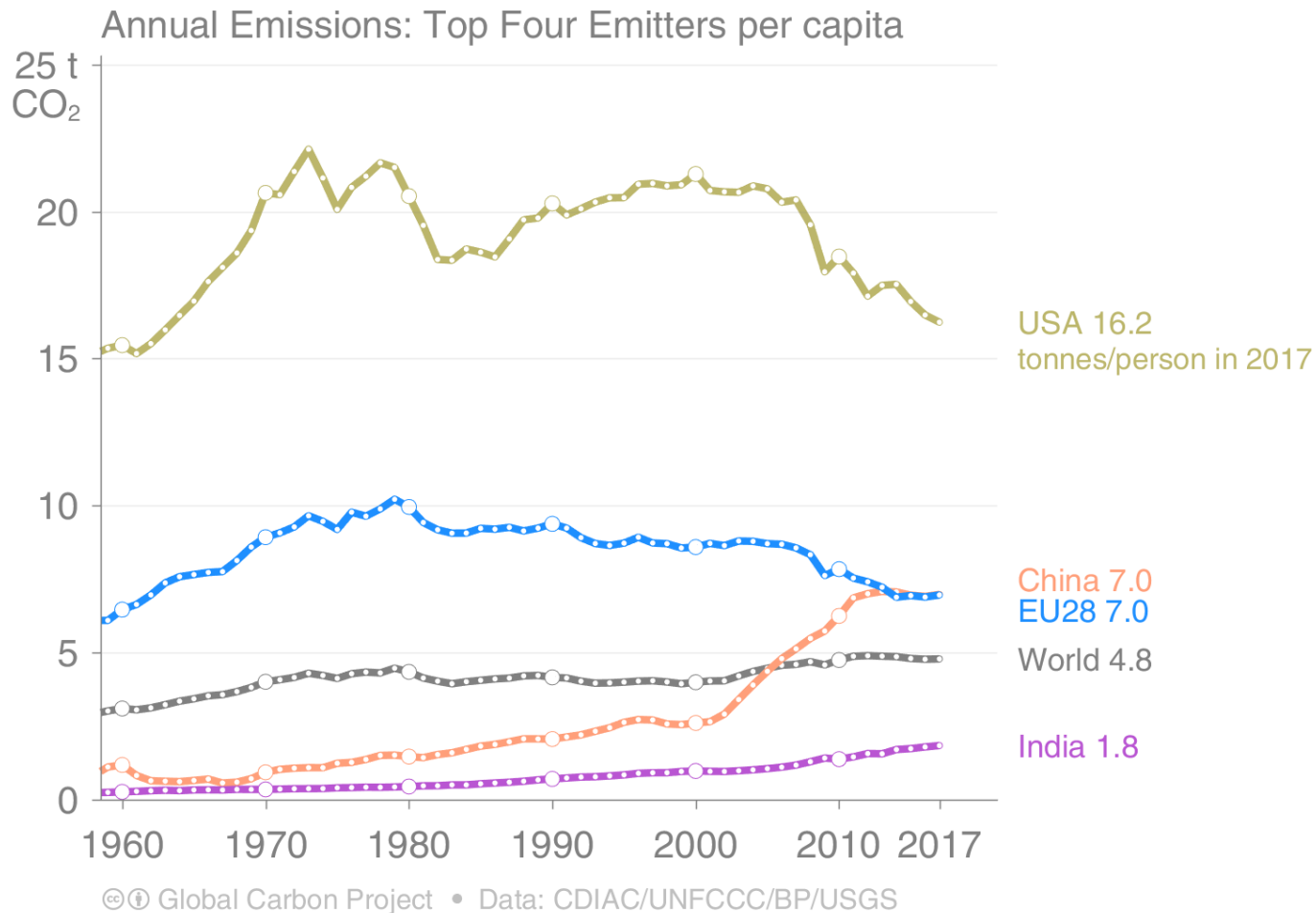
Bunker fuels, used for international transport, are 3.2% of global emissions.

Statistical differences between the global estimates and sum of national totals are 0.7% of global emissions.

Source: [CDIAC](#); [Le Quéré et al 2018](#); [Global Carbon Budget 2018](#)

Top emitters: Fossil CO₂ Emissions per capita

Countries have a broad range of per capita emissions reflecting their national circumstances

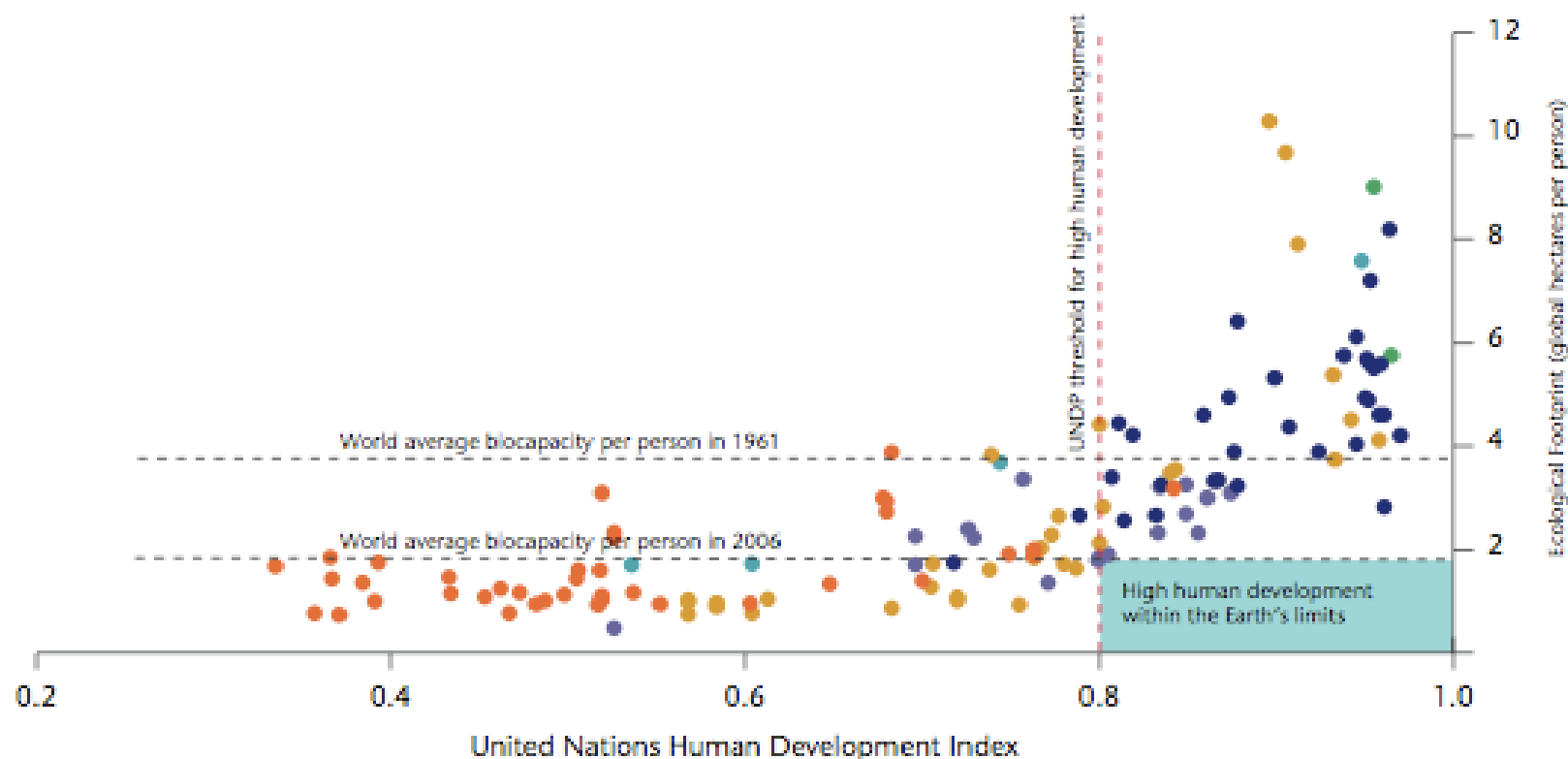


Source: [CDIAC](#); [Le Quéré et al 2018](#); [Global Carbon Budget 2018](#)

Box 1.1: Meeting the dual goals of sustainability – High human development and low ecological impact

Equity Issues

- African countries
- Asian countries
- European countries
- Latin American and Caribbean countries
- North American countries
- Oceanian countries



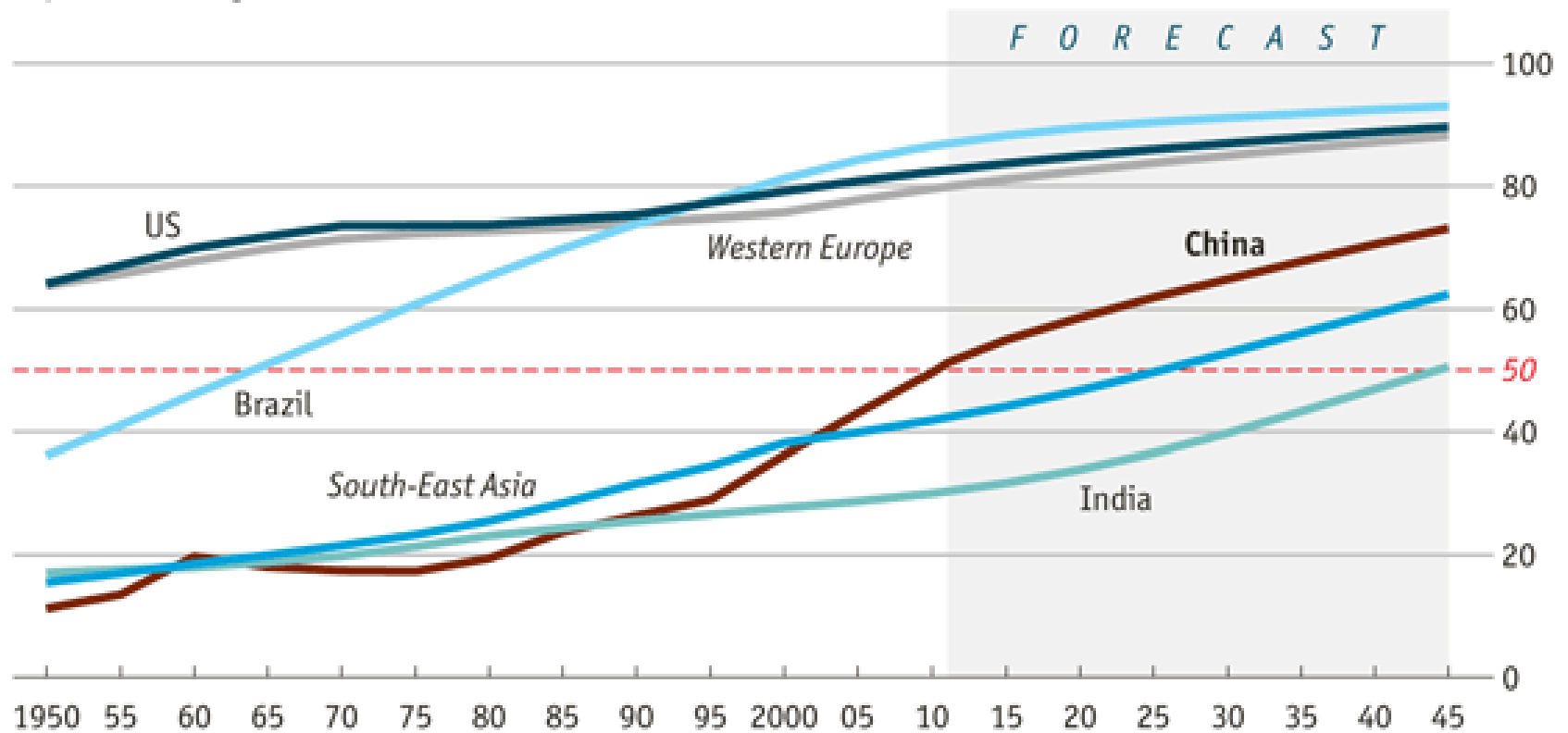
Why Cities?

- Cities just 3-4% of the area
- The economic activities located in cities account for 55% - 85% GNP. More than 70% of greenhouse gas emissions.
- The challenges and opportunities for creating a greener economy and the institutional framework for sustainable development pass necessarily, or mostly, to how cities are developed and managed.
- We still have tremendous urban challenges that need to be addressed in a more sustainable manner to avoid a steep increase in GHGs worldwide

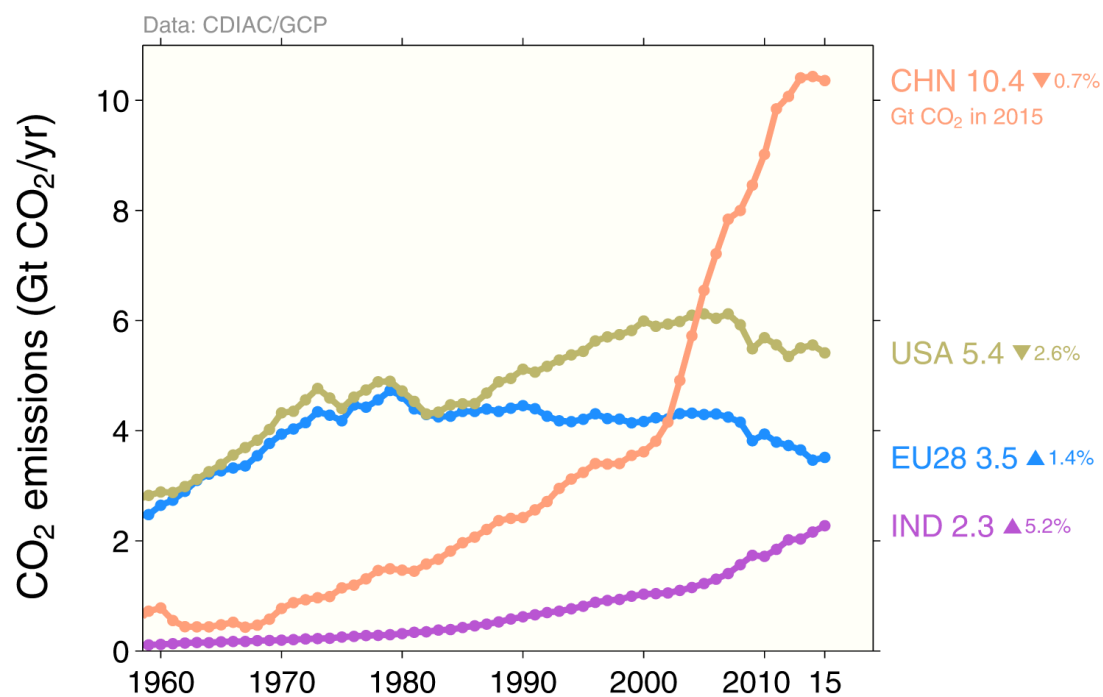
Urbanization rates

Urbanisation

Population living in urban areas, % of total

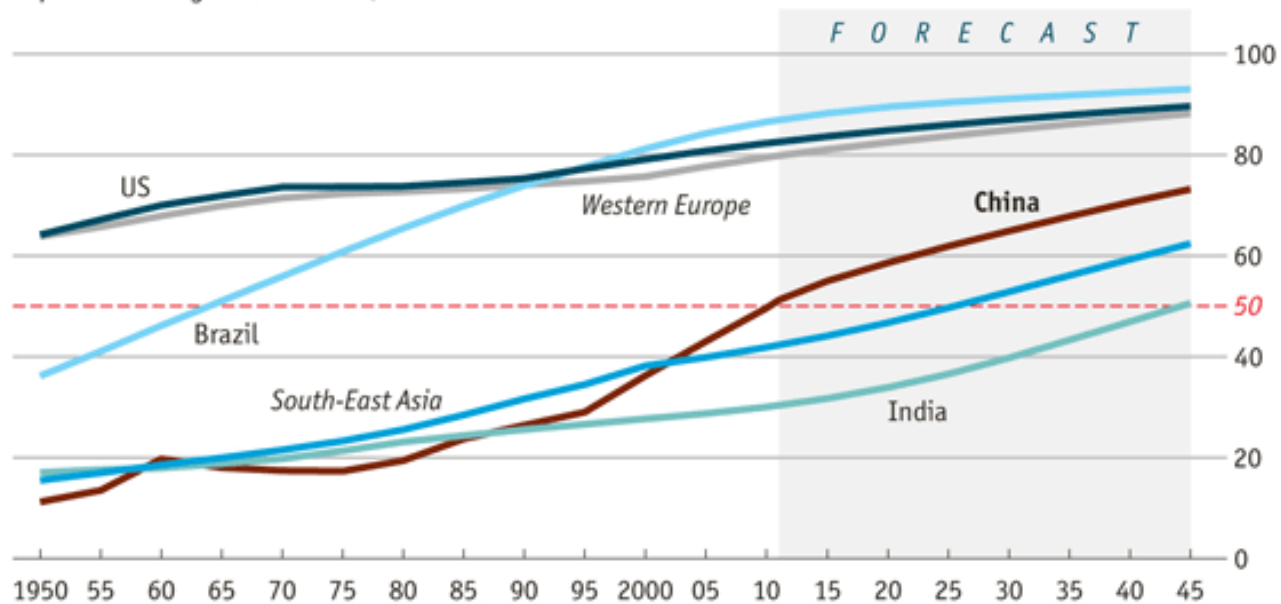


Sources: CEIC; UN Population Division; *The Economist*



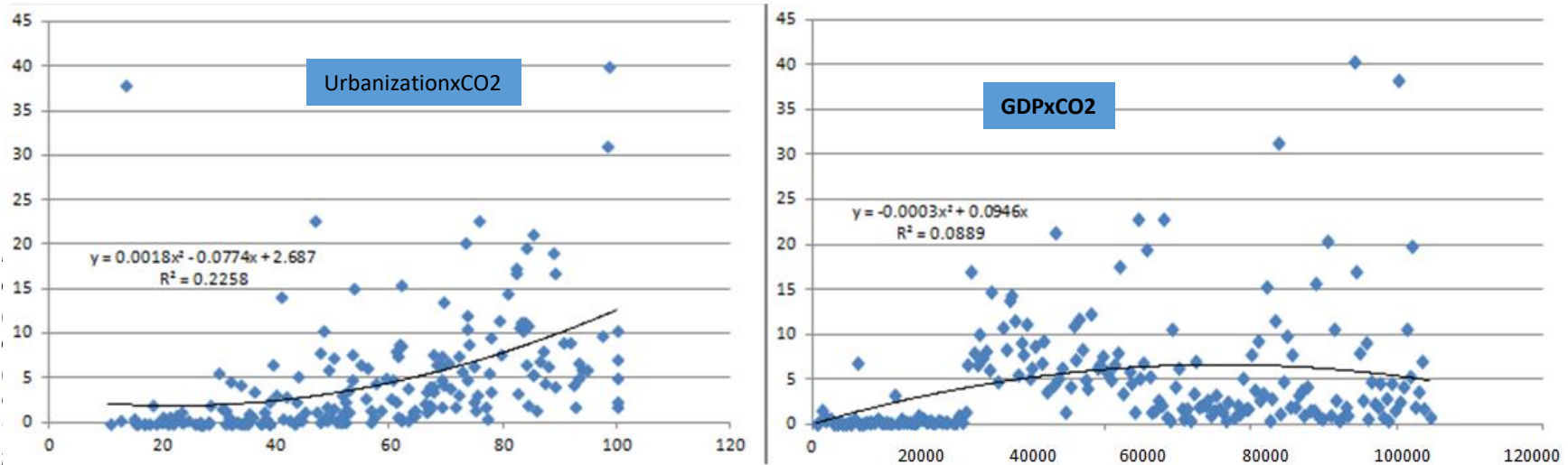
U Global Carbon Project

Population living in urban areas, % of total

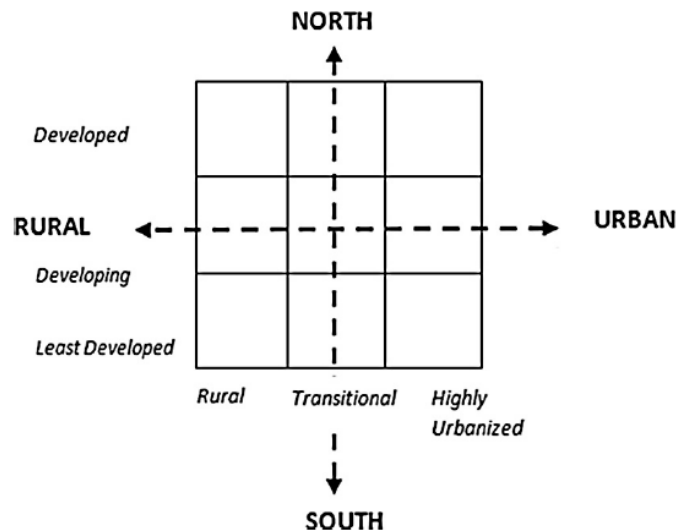


Sources: CEIC; UN Population Division; *The Economist*

Urbanization rate more correlated to CO2 emissions than GDP/per capita



Source: Sethi and Puppim de Oliveira,, *Urban Climate*, 2015



From global 'North-South' to local 'Urban-Rural': A shifting paradigm in climate governance?

Mahendra Sethi^{a,d,*}, Jose Puppim de Oliveira^{b,c,d,e,1}



Fig. 1. The analytical framework – 3 × 3 spatial-development matrix.

Urbanization

- More than half of the population is now urban,
- Urbanization and associated lifestyle changes increase the demand for material consumption, drive land-use change and greenhouse gas emissions,
- 1 billion people moved to Asian cities between 1990 and 2014, and another billion in the next 20 years,
- India and Africa still lags behind in urbanization (~30%)

Impacts of cities (and vice-versa) (negative and positive)

- Local (within the city)
- Regional (in the immediate boundaries of the city)
- Global (in far away places).

Climate Change and Cities

- Mitigation and Adaptation

- Sectoral issues (energy, transportation)
- Physical issues (buildings)
- Land use issues (urban form, heat islands)
- Regional issues (effects on economy of the region)
- Green Agenda issues (consumption)



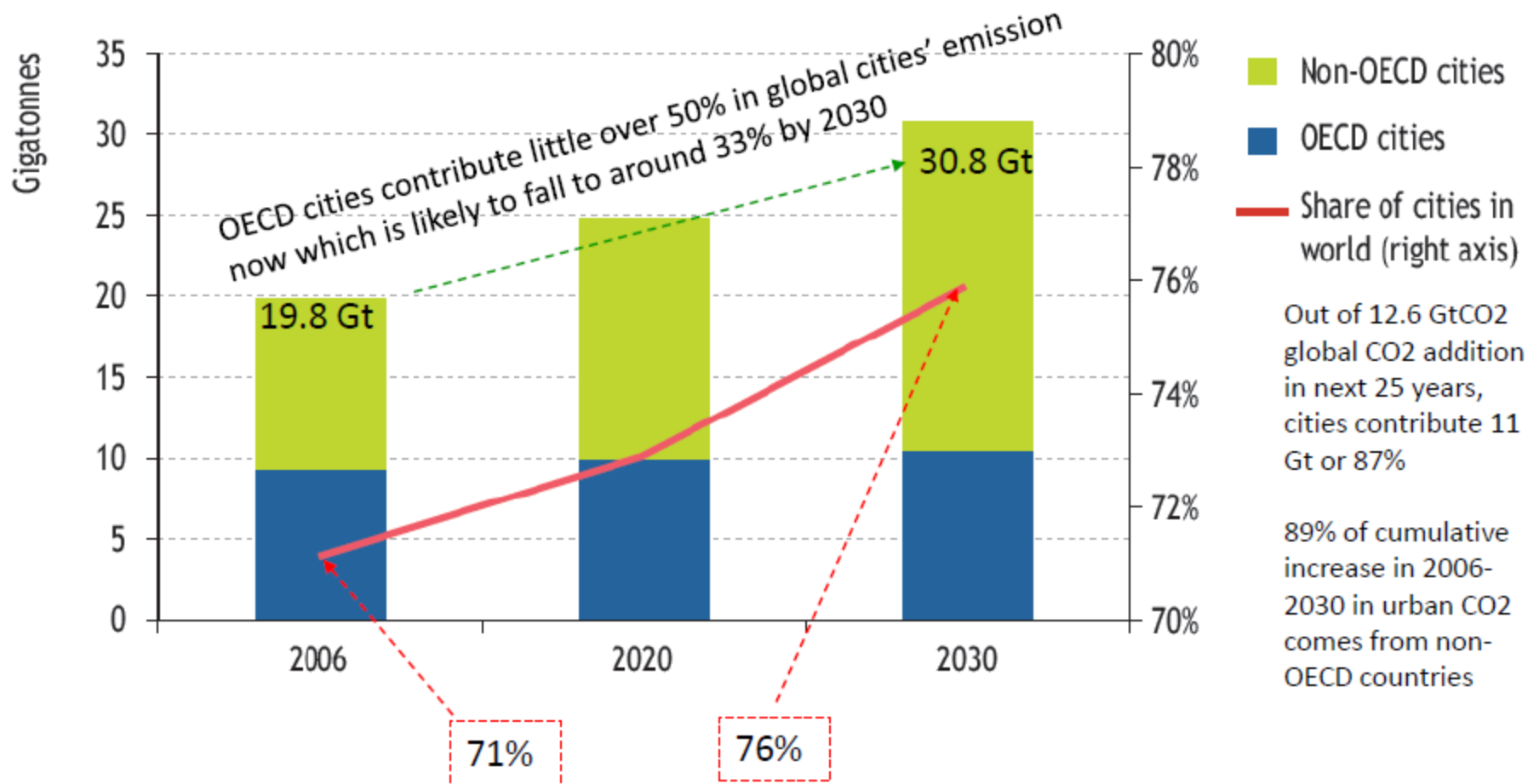
Complexity increase

Urban Emissions

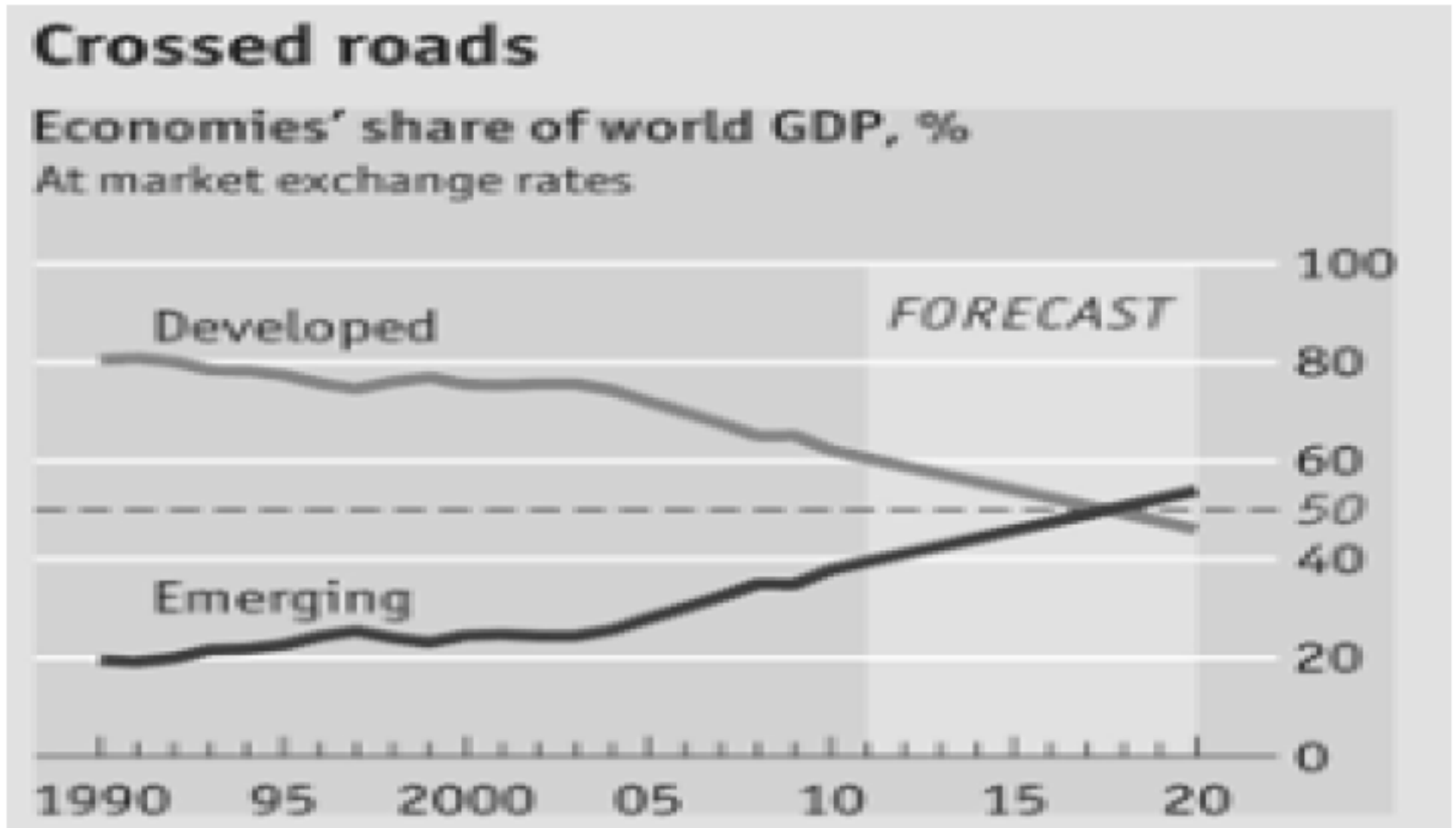
- Production-Based Approach (PBA),
- Consumption-based emissions inventories (CBA)
- Combination (PAS 2070)
- The results of CBA inventories can be much larger than those of PBA inventories (Millward-Hopkins, 2018)

Importance of Cities in Emerging Economies

CO₂ Emissions (Ref Scenario)



Emerging Economies



- 40% of GDP in 2010, twice than in 1990

Economy and Research in LDCs

- 25% of the largest 500 firms in Forbes list 2011 on (4% in 1995)
- China and India will likely to become world powers in research being responsible for around 20% of the R&D in 2025 (European Commission, 2011)

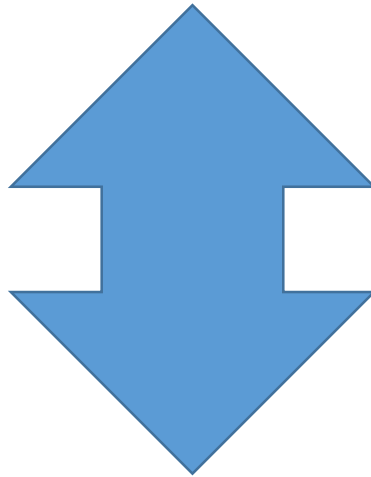
Solution?

- The solution passes through the cities of emerging economies
- Others have to join as well
- How to solve the puzzle?

Linking Global and Local

PROBLEMS (Global):

- Climate change
- Health
- Security and human rights



SOLUTIONS (Local):

- Local governance: local governance structures emerge and change,
- Old problems, new agendas for implementation: global policy implementation more effective at the local level by integrating with other policies

Conceptual discussion

Multi-actor Governance



Multilevel Governance

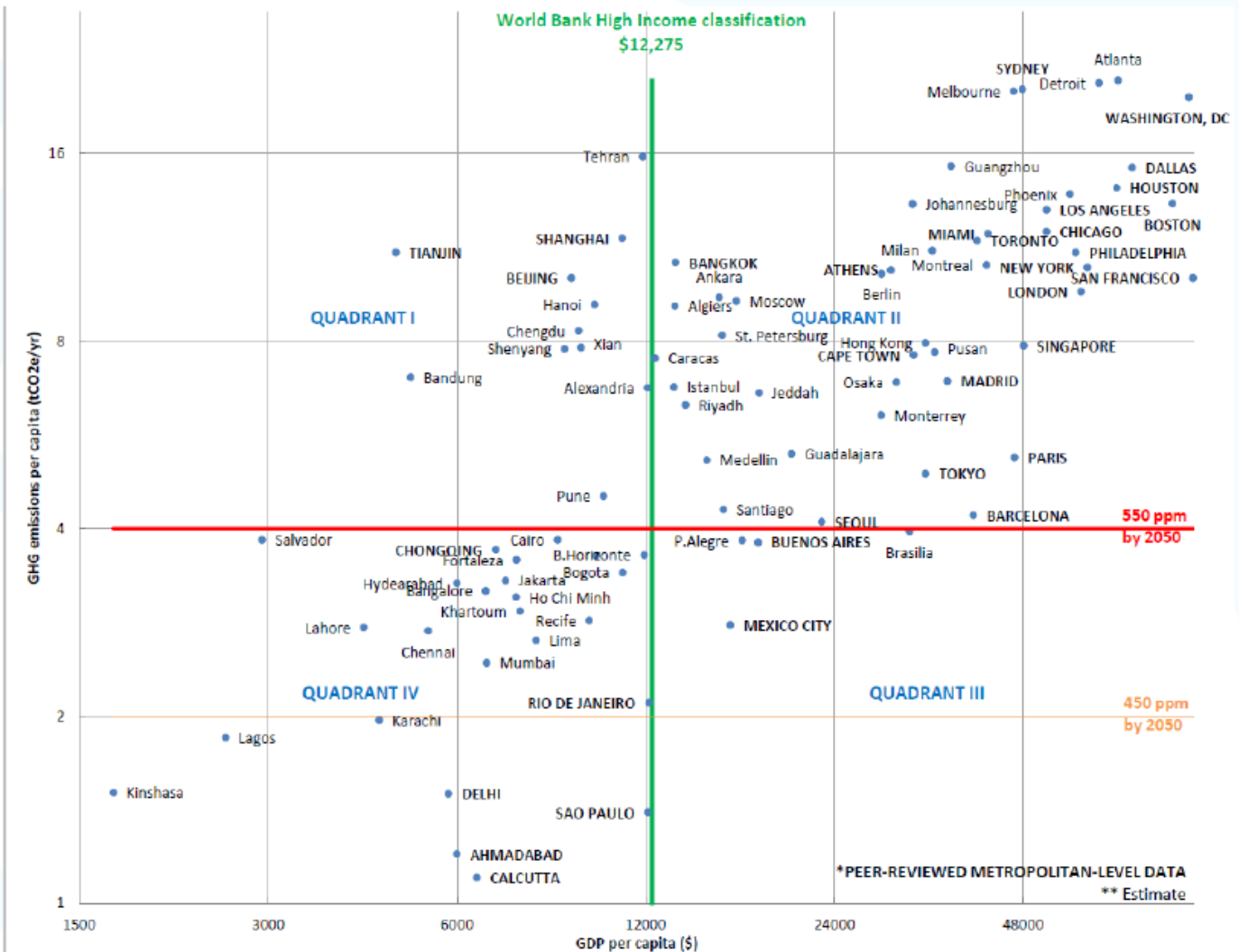


Global
Regional
National
State
Local

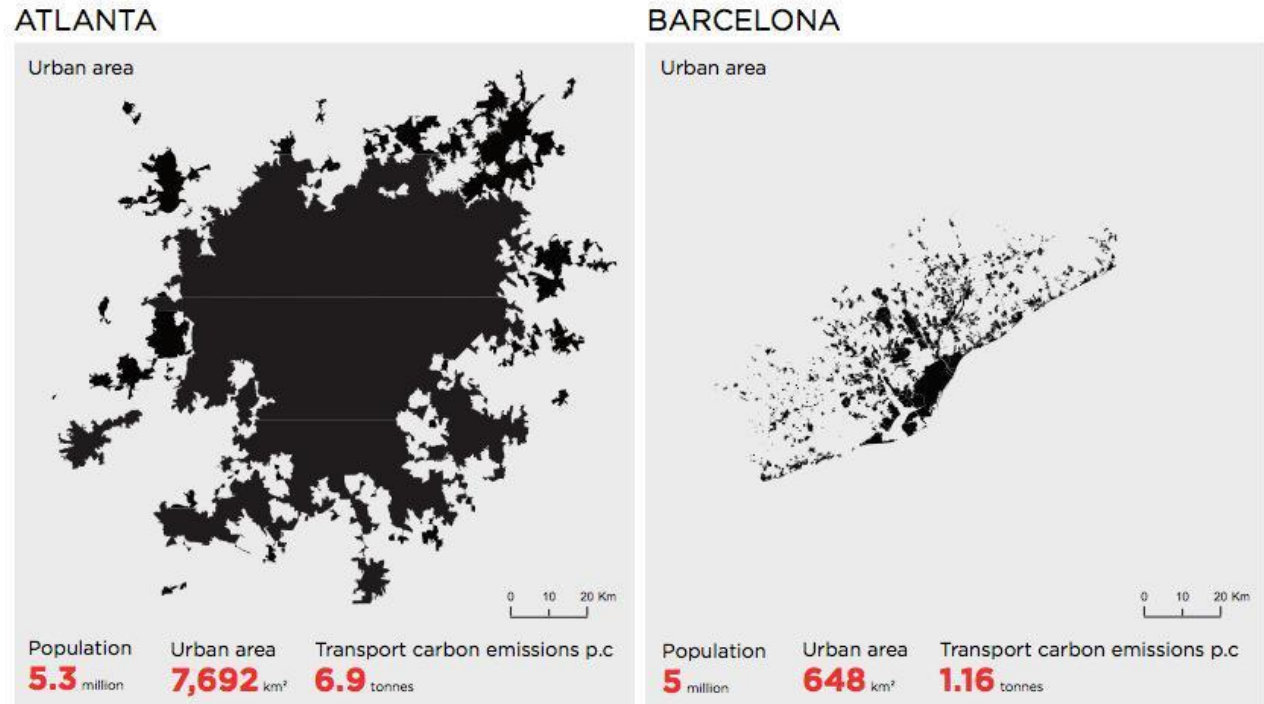


**How are the institutions built
and policies implemented to
have an impact?**

Emissions x GDP per capita



Greening the sectors Transforming space and movement

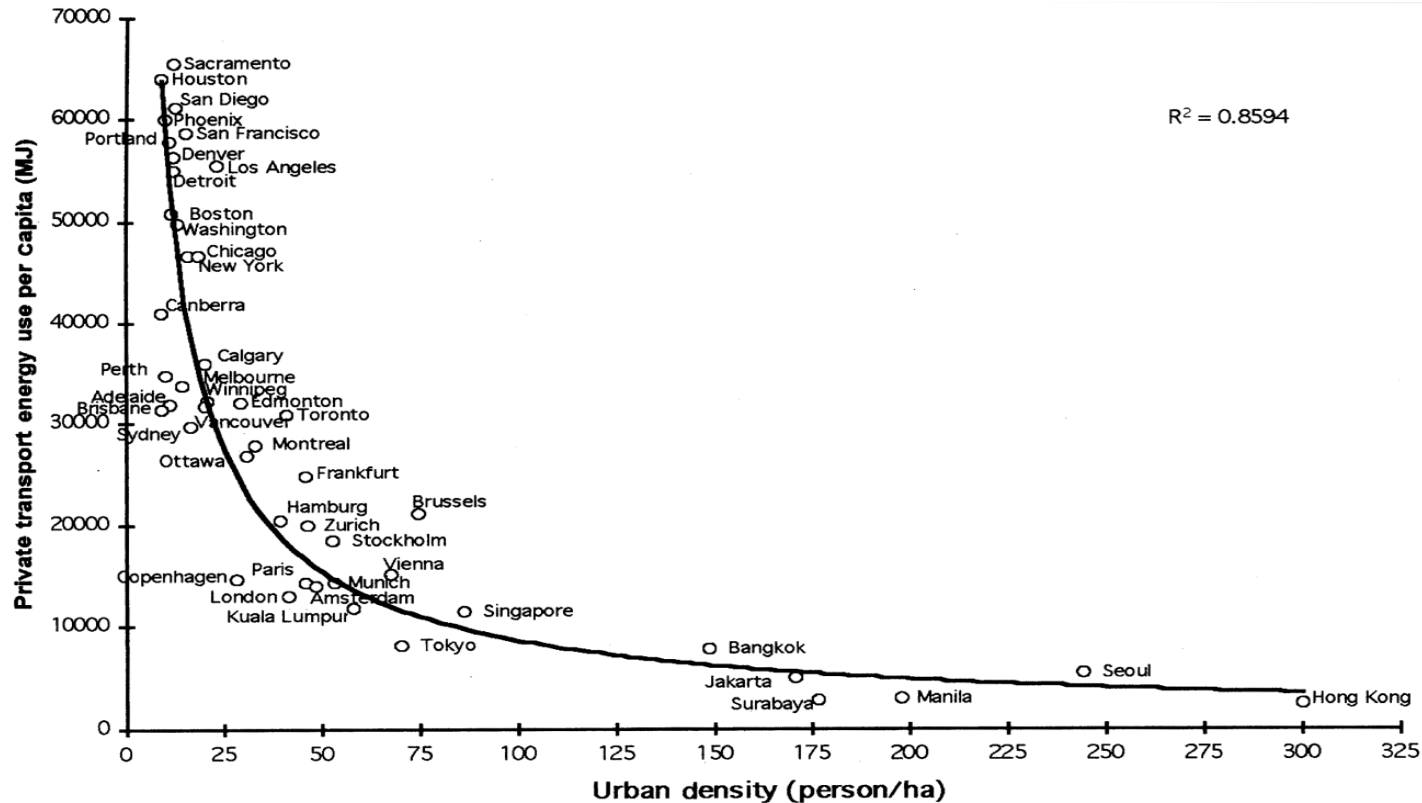


Source: LSE Cities 2014

More compact development can reduce transport emissions by an order of magnitude.

- Compact urban development increases density, which promotes all kinds of efficiencies in terms of energy use and reduced travel
 - 20-40% reduction in private vehicle kilometres driven
- Combined with mixed land-use and increased public transport
 - Green buildings
 - Enhanced urbanism

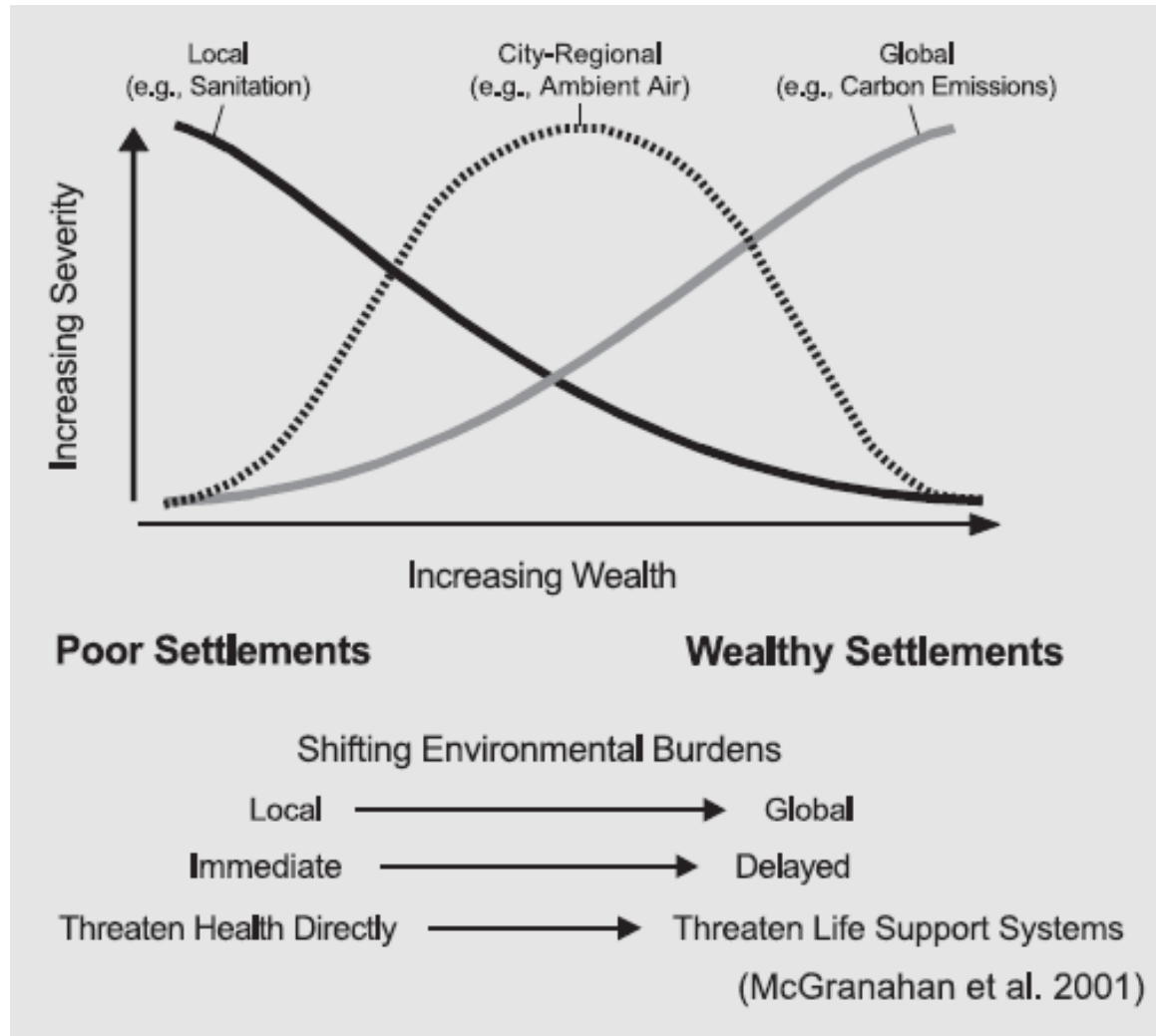
Private transport and density



- Compact urban development increases density, which promotes all kinds of efficiencies in terms of energy use and reduced travel
 - 20-40% reduction in private vehicle kilometres driven
- Combined with mixed land-use, increased public transport, energy efficiency, waste management, reduction in consumption
 - Green buildings
 - Enhanced urbanism

Case: Dealing with various development objectives

Economic Development and Environmental Issues



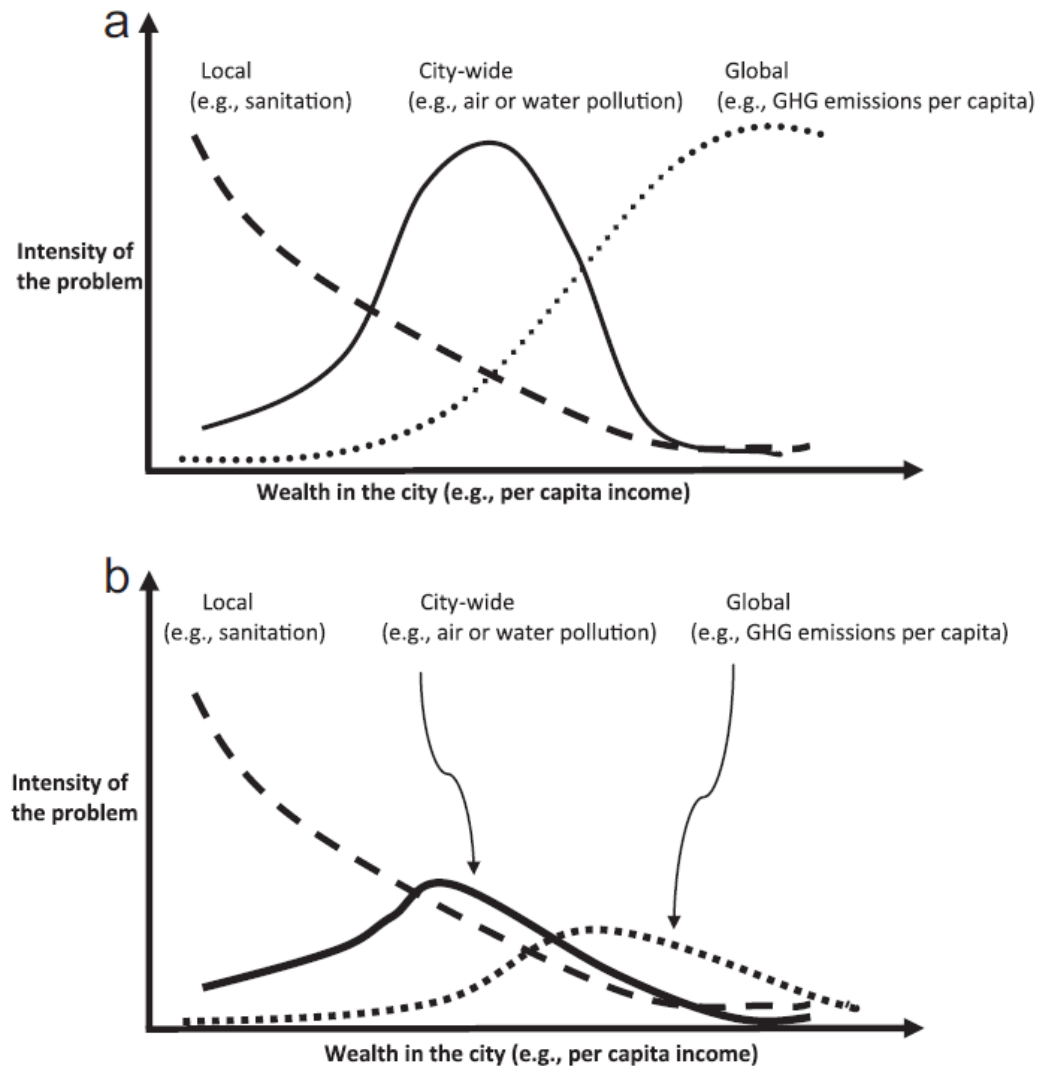
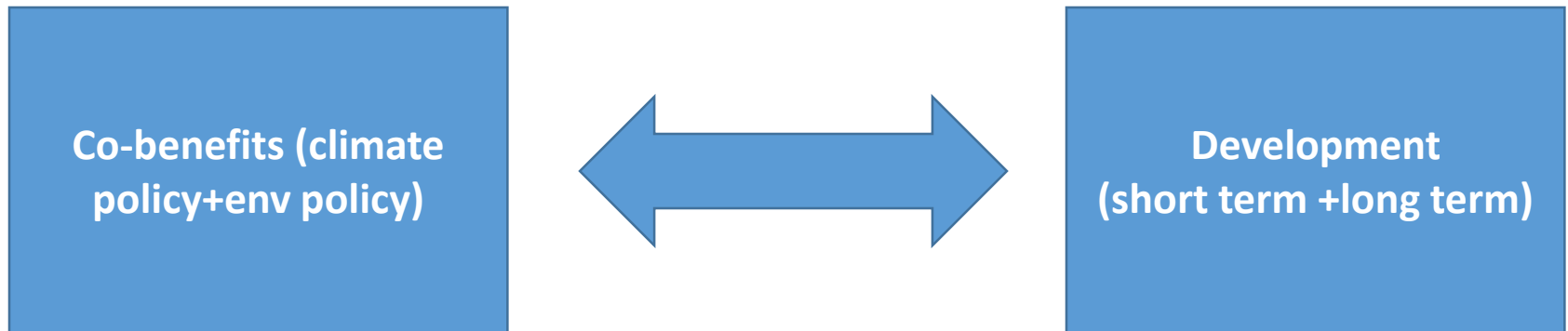


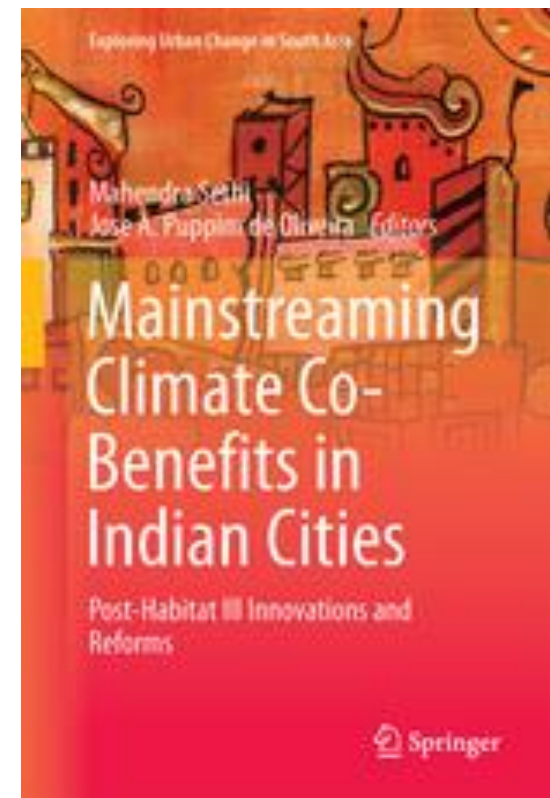
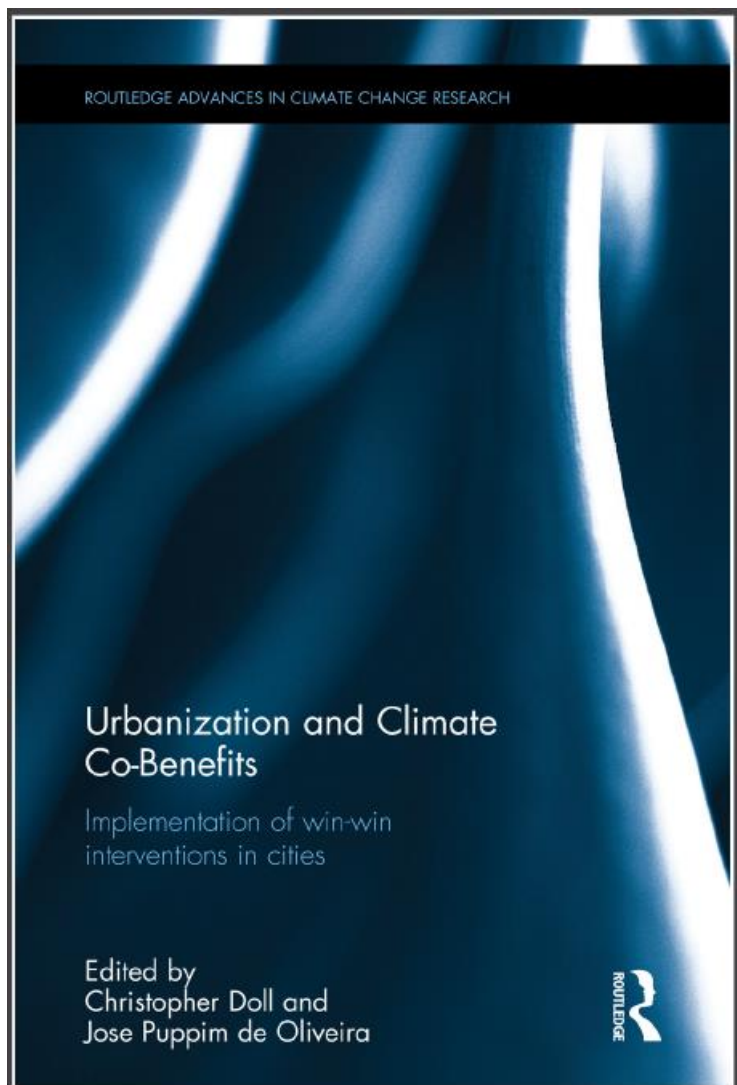
Fig. 1. a – Graphic representation of a typical wealth versus environmental burdens (no scale, based on [McGranahan et al. \(2001\)](#)). b – Needed changes in the curves.

Co-benefits and Development



Innovate for Co-benefits

- Innovate to create opportunities for Co-benefits
- Win-win situations exist in large scale
- No need for “rocket science”





SUSTAINABLE DEVELOPMENT GOALS



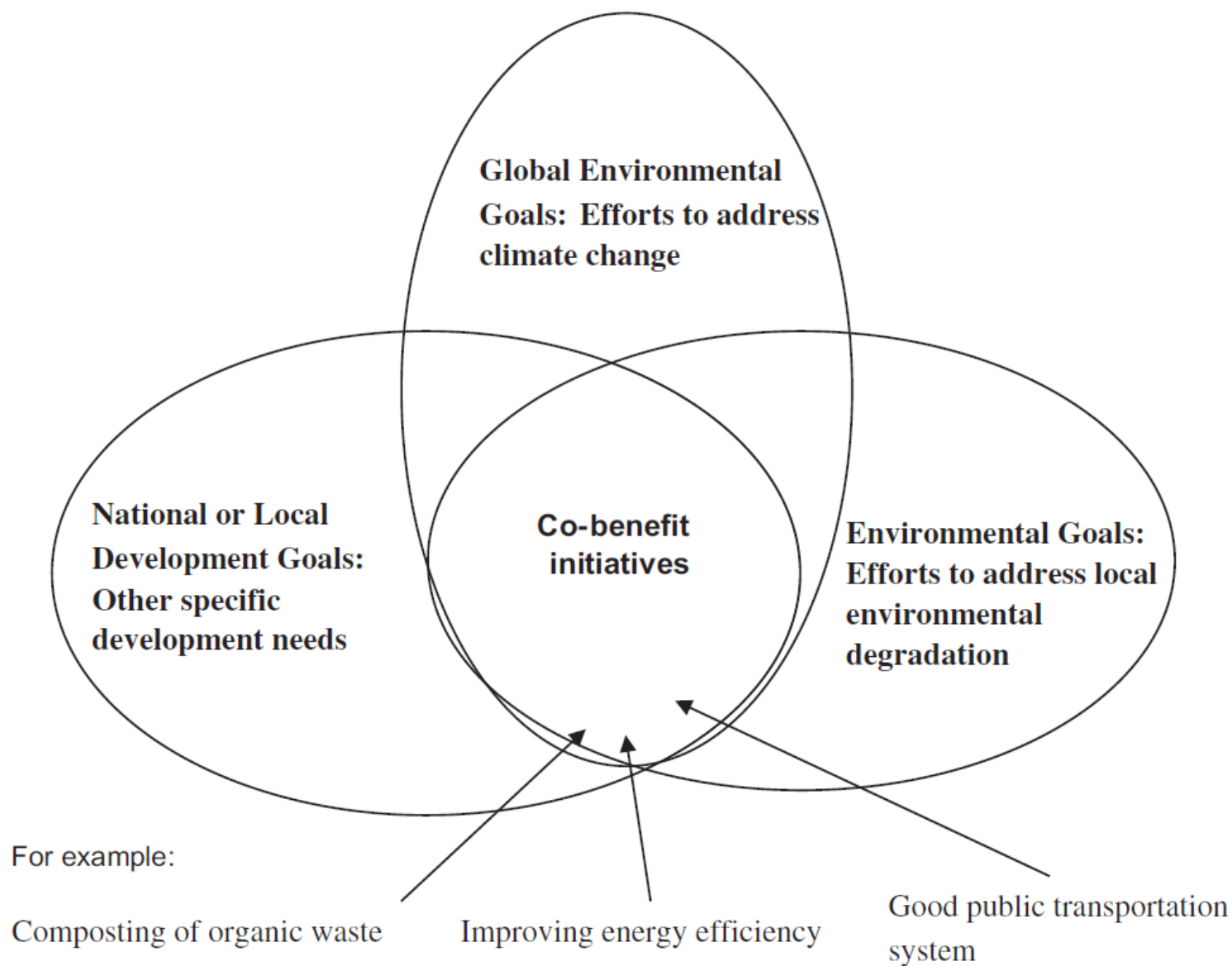


Fig. 1. Framework of co-benefits approach for cities utilized in the cases in this special volume.

Innovation

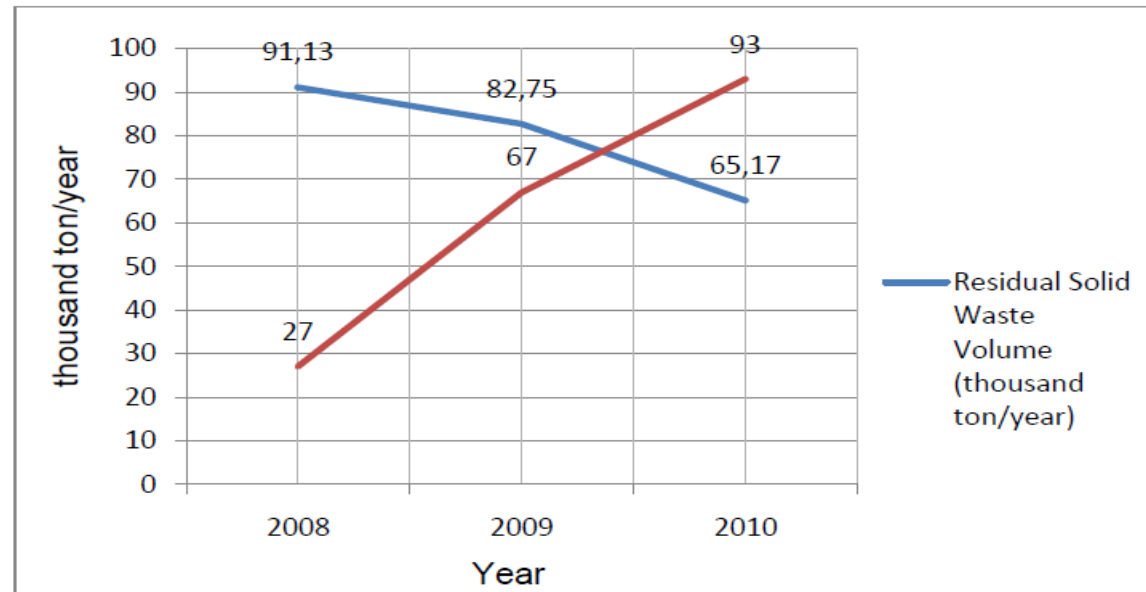
- **All the projects had a certain kind of technology or practice new to the locals.**
- **Appropriate technology.**

Community-Based Waste Management Actions – Indonesia, Co-Management



Case Study Analysis: Solid Waste Management, Yogyakarta, Indonesia

Correlation between Amount of CBSWM Group and Volume of Disposal Solid Waste into the Landfill in Yogyakarta City, 2008 – 2010



Source : Environmental Agency of Yogyakarta City (2008 – 2010); Yogyakarta City CBSWM Association “Jari Polah” (2011).

Figure 10 - Correlation between among of CBSWM group and volume of disposal solid waste into the landfill in Yogyakarta city

The growth of CBSWM in last 7 years shows correlation to waste generation and disposal into landfill. Figure 4 shows there is a decreasing of solid waste about 28 % from 2008 until 2010.

Yogyakarta and Surabaya



Contents lists available at ScienceDirect

Journal of Cleaner Production

journal homepage: www.elsevier.com/locate/jclepro



City-to-city level cooperation for generating urban co-benefits:
the case of technological cooperation in the waste sector between
Surabaya (Indonesia) and Kitakyushu (Japan)

Tonni Agustiono Kurniawan^{a,b,*}, Jose Puppim de Oliveira^{a,*}, Dickella G.J. Premakumara^c,
Masaya Nagaishi^d

^aUnited Nations University-Institute of Advanced Studies (UNU-IAS), Yokohama 220-8502, Japan

^bNational Graduate Institute for Policy Studies (GRIPS), 7-22-1 Roppongi, Minato-ku, Tokyo 106-8677, Japan

^cInstitute for Global Environmental Studies (IGES), Kitakyushu Urban Center, Kitakyushu 805-0062, Japan

^dKitakyushu International Techno-Cooperative Association (KITA), Kitakyushu 805-0062, Japan

ARTICLE INFO

Article history:

Received 20 April 2013

Received in revised form
31 July 2013

Accepted 2 August 2013

Available online 14 August 2013

ABSTRACT

In recent years, Surabaya has confronted municipal solid waste (MSW) with a partnership with Kitakyushu city for the use of the Takakura Home Composting (THC) method. A large number of Takakura bins have been distributed to households and cadres have been involved in educating local households about organic waste reduction through the method. In the past decade (2005–2013), the city has reduced organic waste through many diverse composting methods such as THC and about 3421 Mt of CO₂ equivalent emissions could be reduced annually. By adapting the THC method, Surabaya has made positive changes to its MSW management practices. This kind of city-to-city technological cooperation



Curitiba (Brazil)

- Parks in low land areas reducing the risks of flooding, and health related problem
- Since 1980s, the city gives tax breaks of up to 100% for landlords that keep more than 70% of native or old growth forests.
- Owners who preserve 100% can use their development rights in other areas of the city.
- Parana State also established the Ecological Value-Added Tax (ICMS-E), which includes incentives for protection of water reservoirs



The Case of Rio de Janeiro

- Bus Rapid System (BRS) in the City of Rio de Janeiro
- Rio de Janeiro has made some efforts to improve the urban transportation system recently due to the World Cup in 2014 and the Olympic Games in 2016.
- The BRS made gradual adjustments to improve the existing bus system.
- These changes were able to reduce the travel time in up to 50% in certain routes, improving mobility and reducing fuel consumption
- The city is also building new initiatives in the bus system such as a Bus Rapid Transit (BRT).

Learning mechanisms

Level of cognitive efforts	<div> <div>High</div> <div>↑</div> <div>↓</div> <div>Low</div> </div>	(A) Rank ELM	(B) External learning mechanisms	(C) Internal learning mechanisms	(D) Rank ILM
		2 Two-way knowledge flows	R&D-based interactions with foreign organizations	Knowledge codification	2 High complexity
			R&D-based interactions with local universities and research institutes	Knowledge sharing/socialization	
			R&D-based interaction with suppliers	Learning from formal R&D experimentation	
			R&D-based interaction with users	Learning from engineering and design experimentation	
			Exchanges of knowledge with foreign organizations or other cities		
		1 One-way knowledge flows	Hiring of expertise	Internal training	1 Low complexity
			Education and training programmes	Learning from operational experimentation	
			Learning from technical assistance and consulting services		
			Learning from supply assistance		
			Learning through feedback from lead users		
			Searching into specialized knowledge sources		

Main points on Climate Co-Benefits Innovation in Cities

- Understanding innovation goes beyond firms (e.g., city management) or organizations (urban governance, communities)
- Innovation is place based, and I would say mostly city based
- Other factors beyond economics (e.g., culture) explain the appearance of innovative places/innovation systems
- Individuals and organizations are important, but their interactions are key to understand innovative places, and those interactions go beyond economic transactions
- Innovation goes beyond technological innovations (e.g., social innovation)
- Spatial dimension of processes (e.g., shaping urban spaces and communities),
- Public policies can nurture the development of place based innovations, but can also hurt

Case – Bottom-up without top-down

Malaysia

- Sustainable Living in Malaysia (SLiM) is a concept developed by the Environmental Protection Society Malaysia (EPSM), one of the oldest NGOs in the country with support from some of the leading scientists.
- SLiM is based on ecological footprint analysis. EPSM has led national efforts to quantify carbon, food and water footprints in households through surveys,
- SLiM and the Rio+20 discussions in Malaysia
- The long-term success of this initiative partly depended on sustained government support, which after Rio+20 faded away.

Lessons:

- Bottom-up alone cannot sustain the changes in the long term with broader “top” support
- The forces for transformation and solutions for collective-action problems will be **both “top-down” and “bottom-up”**, bringing about a combination of efforts in different scales

Journal of Environmental Management 233 (2019) 481–488



Contents lists available at [ScienceDirect](#)

Journal of Environmental Management

journal homepage: www.elsevier.com/locate/jenvman



Research article

Intergovernmental relations for environmental governance: Cases of solid waste management and climate change in two Malaysian States

Jose A. Puppim de Oliveira

Fundação Getúlio Vargas (FGV), Management School of São Paulo (FGV/EAESP) and Brazilian School of Public Administration (FGV/EAPE), Brazil



ARTICLE INFO

Keywords:

Intergovernmental relations
Environmental governance
Climate change
Waste management

ABSTRACT

Institutions for environmental governance evolve differently across sectors. They also vary in the same sector when governments at two levels (national and subnational) have different political alignments. As the policy environment becomes more complex, with global problems like climate change, and politics more dividing, better coordination among various levels of government is a tough governance challenge. Scholars and practitioners need to realize how best to build institutions to bridge the various levels of government in different

Case. Health as driver of change: Networks of implementation in Delhi and Surat, India

Environment International xxx (2016) xxx–xxx



Contents lists available at ScienceDirect

Environment International

journal homepage: www.elsevier.com/locate/envint



Full length article

Governance and networks for health co-benefits of climate change mitigation: Lessons from two Indian cities

Jose A. Puppim de Oliveira^{a,b,c,d,*}, Christopher N.H. Doll^e

^a Fundação Getúlio Vargas (FGV), São Paulo School of Business Administration (FGV/EAESP) and Brazilian School of Public and Business Administration (FGV/EBAP), Brazil

^b Instituto COPPEAD de Administração, Universidade Federal do Rio de Janeiro, Brazil

^c School of International Relations and Public Affairs (SIRPA), Fudan University, China

^d United Nations University International Institute for Global Health (UNU-IIGH), Kuala Lumpur, Malaysia

^e United Nations University Institute for the Advanced Study of Sustainability (UNU-IAS), Tokyo, Japan

ARTICLE INFO

Article history:

Received 17 December 2015

Received in revised form 24 June 2016

Accepted 23 August 2016

ABSTRACT

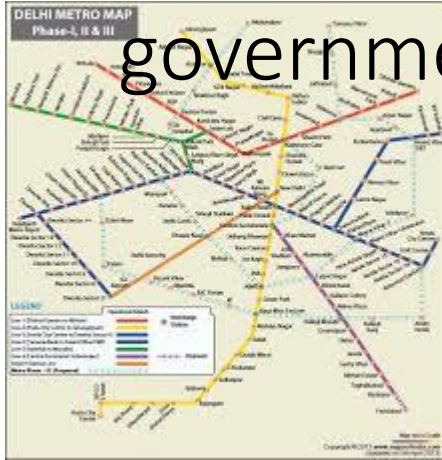
Health has been the main driver for many urban environmental interventions, particularly in cases of significant health problems linked to poor urban environmental conditions. This paper examines empirically the links between climate change mitigation and health in urban areas, when health is the main driver for improvements.

Drivers of Change: Health and well-being (e.g., Water)

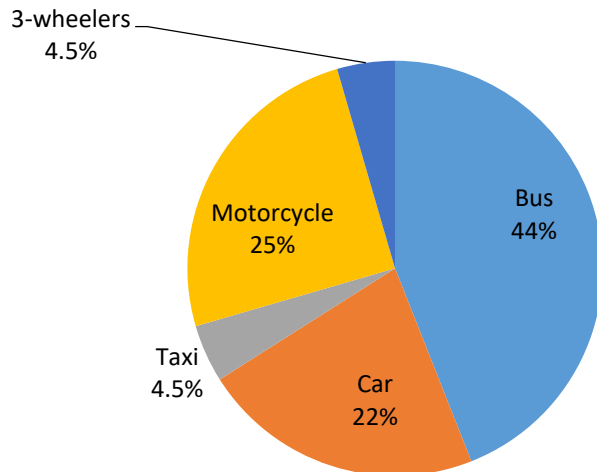
- Large part of the diseases in developing countries are related to the environment (~65% of hospital entries in some cities)
- Cases of large disruption in cities because of health (from floods, drought etc.)
- Large investment in the health sector (in most countries is the largest budget)
- Relate to people (rich and poor) directly
- Large urban transformations were caused by health drivers (e.g., London, Surat)

Delhi Clean-up

Delhi Metro Corporation: Partnerships among governments



Mode shift to the Metro



However...



Surat, India.
Health Drivers





In 1994 poor sanitation in vulnerable communities is reasoned to have caused [an outbreak of pneumonic plague](#). A chain reaction following a flood permanently changed Surat's approach to waste and flood management, becoming one of the India's cleanest cities. Health got control of environmental management.

Networks in Public Policy

Key features for network effectiveness in Surat and Delhi cases.

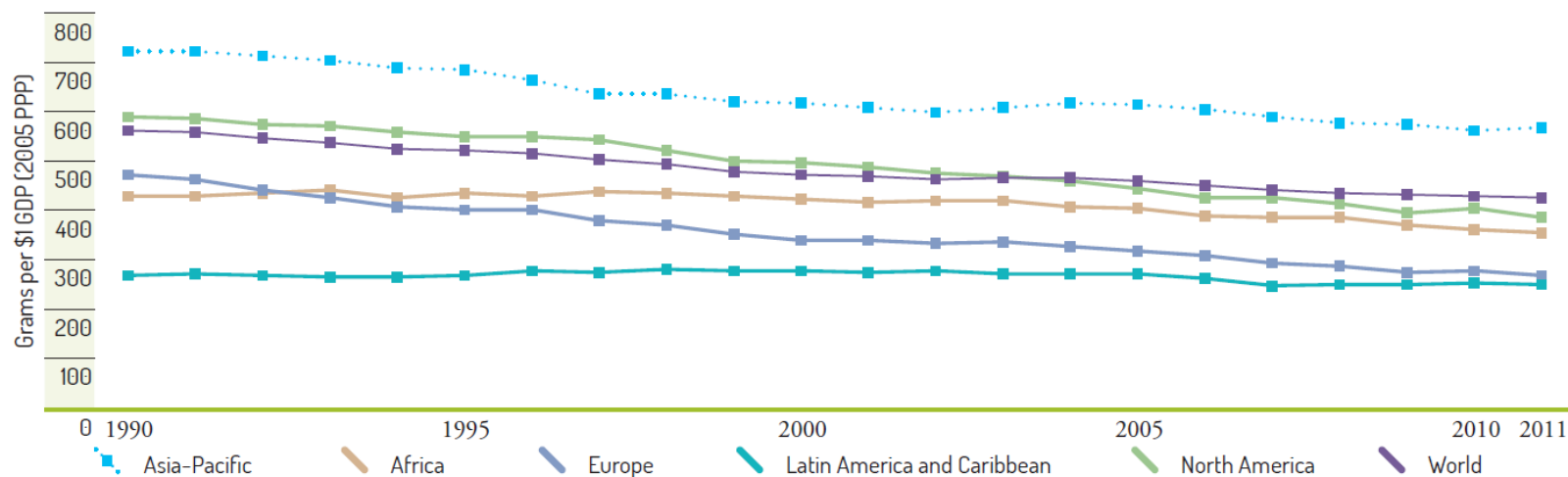
Key features	Surat	Delhi	Analysis of the difference
Involvement of multiple levels	<ul style="list-style-type: none"> – Plague led to decentralizing its decisions and operations to zonal chiefs – Decentralization led to the creation of a multiplicity of relations with various nodes 	<ul style="list-style-type: none"> – The courts became the focus of the network for pushing for the clean-up of the air in Delhi. – Network function essentially depended on the court – Relations with the other actors were largely the same through court rulings. 	A more centralized network led by court through the rulings pushed by the PIL led to difficulties to deal with the multiplicity of regulated actors.
Network design	<ul style="list-style-type: none"> – The new design of the SMC dispersed the burden of coordinating the relations among the zonal chiefs – Chiefs could balance the intensity of the relations with the local actors, creating more intense relationships when needed 	<ul style="list-style-type: none"> – The courts occupy a privileged position in the network hierarchy – Ability to force cities to enforce laws on private and public actors. – No balance in the relationships (see Appropriate governance) 	The capacity to manage the design of the core of the network in the case of Surat contrasts with the rigid design in Delhi.
Appropriate governance	<ul style="list-style-type: none"> – The decentralization allowed a reduction in the number of organizations in each network – This led to a more participative governance and helped in the management of the relations with local actors according to the needs of the zone 	<ul style="list-style-type: none"> – A series of rulings created incremental changes in ad-hoc areas of the transport system. – Other actors lacked the capacity to reinforce these gains with complementary policies to balance what was coming from the court. – Courts did not play the role of managers (nor should they); thus, the network was not participative or had a proper manager. 	There was no proper network governance in the case of Delhi while Surat had the SMC as manager with the decentralization helping in govern a large number of actors.
Building and maintaining legitimacy	<ul style="list-style-type: none"> – Zonal chiefs brought the municipal government closer to the local actors and increased the responsiveness of the SMC to local needs – Trust was improved between SMC and local actors – This helped to build legitimacy to SMC and bring support to the health initiatives of the city 	<ul style="list-style-type: none"> – High degree of mistrust among the different actors in the network – Although the court and city used their legitimate 'police' power of state actors to enforce the environmental legislation – Lack of legitimacy for the network to perform other tasks that needed a more voluntary approach 	The city had to enforce the rulings, and the own court decision undermined the legitimacy of the city. There was also a lack of trust between the actors behind the PIL and court on the one side, and the city and regulated actors in the other side.
Stability	<p>The decentralization helped SMC to be flexible in its relations at the local level</p> <ul style="list-style-type: none"> – Each zonal chief could manage the local waste supporting network according to its capacity and local needs – SMC kept the core of the city-wide network formed by the chiefs stable to perform the core activities, including network management. 	<ul style="list-style-type: none"> – Court decisions did not lead to the formation of a stable network. – Enforcement network was formed by the courts with pressure from civil society actors in order to have the city enforce legislation over regulated actors. 	The network formed in Delhi had a weak core, formed basically by the court. As soon as the effects of the ruling ceased, network was weakened.

Lessons

- The advice of specialists in health led the changes in the two cities,
- However, resilience in the network in Delhi made the improvements to be reversed,
- Network: Delhi's had a more centralized network and lack of changes in urban management design,
- Legitimacy: Court led the changes in Delhi, undermining legitimacy of the city government,

Case – Setting efficiency/carbon intensity boundaries (decoupling)

Figure B11 Carbon intensity of the economy, Asia-Pacific region and the rest of the world, 1990–2011



Source: ESCAP Asia Pacific Energy Portal, based on data from the International Energy Agency, CO₂ emissions from fuel combustion statistics and World Bank World Development Indicators.

Case: Recognizing ecological limits at the local level

- Is it possible? How? Why? Is it irrational?
- E.g., Tokyo

Tokyo

-In 2010, the Tokyo Metropolitan Government (TMG) introduced a mandatory CO₂ emission reduction. It is the world's first such scheme that sets binding targets for buildings.

-GHG reduced by 23 per cent on average from the base years and 10 per cent below the average of other parts of the country before the end of the first compliance

period of five years (2010–2014). 90% of ~1,350 regulated facilities achieved the first reduction target,

and 69% of them

even met the 2019

targets.



Climate Policy



ISSN: 1469-3062 (Print) 1752-7457 (Online) Journal homepage: <http://www.tandfonline.com/loi/tpo20>

Innovating in sub-national climate policy: the mandatory emissions reduction scheme in Tokyo

Hitomi Roppongi, Aki Suwa & Jose A. Puppim De Oliveira

To cite this article: Hitomi Roppongi, Aki Suwa & Jose A. Puppim De Oliveira (2017) Innovating in sub-national climate policy: the mandatory emissions reduction scheme in Tokyo, Climate Policy, 17:4, 516-532, DOI: [10.1080/14693062.2015.1124749](https://doi.org/10.1080/14693062.2015.1124749)

To link to this article: <https://doi.org/10.1080/14693062.2015.1124749>

Factors for Success (Tokyo)

FACTORS FOR SUCCESS IN POLICYMAKING

- *Administrative leadership and capacity of public administration.*
- *Energy security*
- *Fair involvement and facilitation of stakeholders in policy design.*
- *Availability of historical data to support the discussions.*

.

FACTORS FOR SUCCESS IN IMPLEMENTATION

- *Transparency in monitoring and enforcement.*
- *Gradual implementation.*
- *Flexibility.*

Lessons: Recognizing ecological limits

- **Context: Need to shift the discussions from what policies are needed to the political and institutional conditions that make the adoption of certain policies more likely,**
- **Capabilities need to be build overtime.**

Case - Changing Environment- Economy-Society Relations through values

Bhutan

- Bhutan is well known for initiating the Gross National Happiness (GNH)
- The country's Constitution mandates that forests should cover 60 per cent of Bhutan's territory through a network of protected areas covering more than 40 per cent of the country's territory.
- Certain political and institutional conditions have facilitated these innovative initiatives.
 - The political transition process from an absolute to a constitutional monarchy,
 - Bhutan's unique political and administrative systems, in which religious affairs are interwoven with administrative affairs in the bureaucracies at the national and local levels,

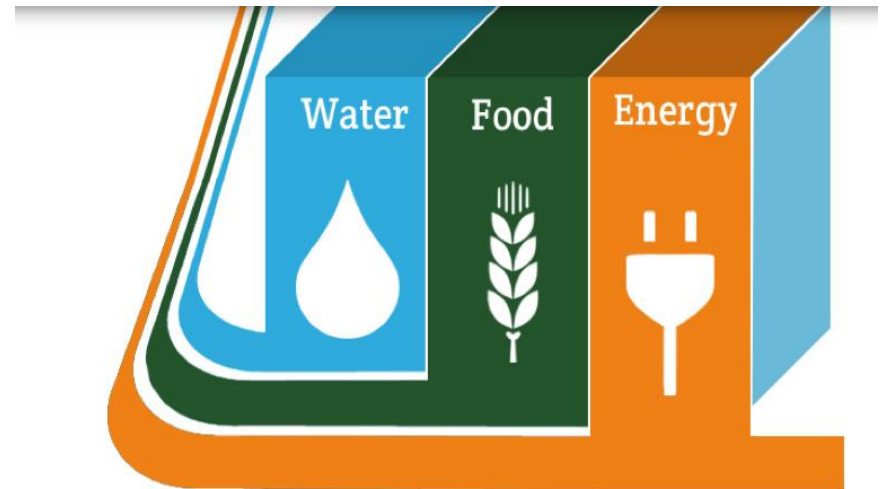
Lessons: Changing Environment-Economy-Society Relations through values

- Different ways to think about development having a window of opportunity
- Looking beyond Western models of the State and economic system (e.g.: accountability mechanisms beyond rational choice)

Key Messages

- The core of the *modernization* discourses, are a necessary but insufficient condition for a broader transformation towards sustainability;
- **Western models of development x Other models** (e.g., culture of sufficiency)
- Transformations towards more sustainable development will occur only if **policymaking frameworks recognize the socio-ecological limits at the different scales**, from local to planetary,
- The forces for transformation and solutions for collective-action problems will be **both “top-down” and “bottom-up”**, bringing about a combination of efforts in different scales (e.g. Malaysia).
- Need to **shift the discussions from what science and policies are needed to the political and institutional conditions** that make the adoption of certain policies more likely (e.g., Tokyo),

Understanding Innovative Initiatives for Governing Food, Water and Energy Nexus in Cities Using Green and Blue Infrastructure



Thanks!
jose.puppim@fgv.br