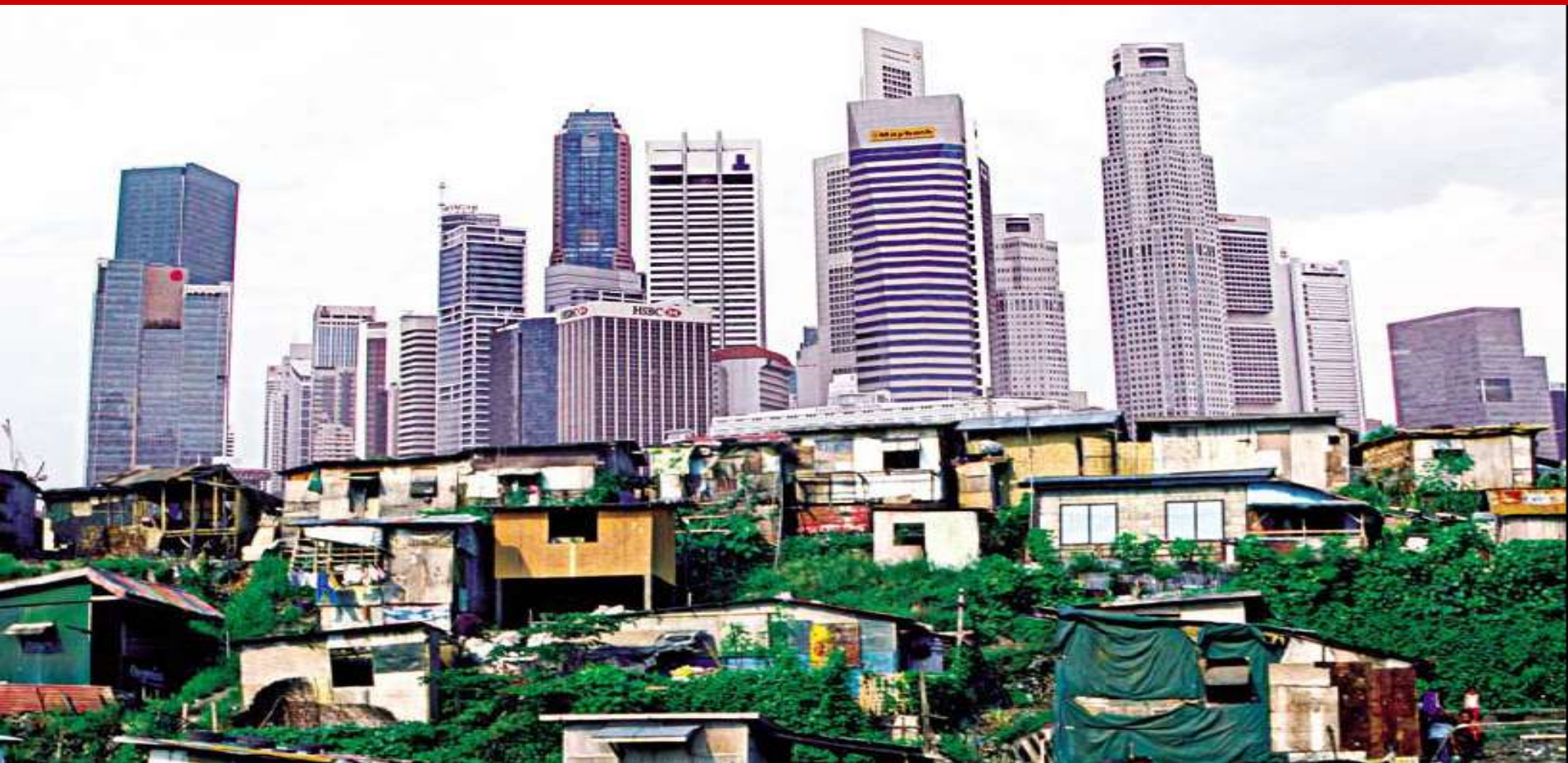
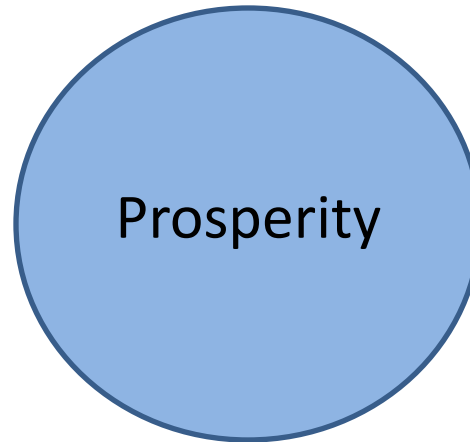
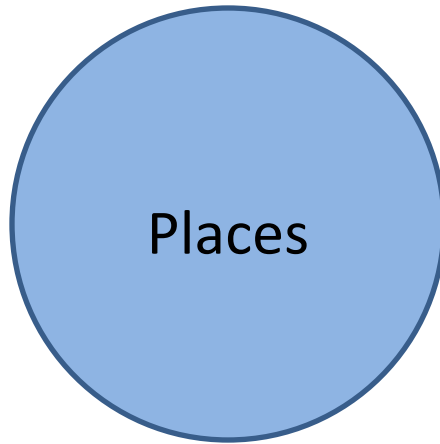
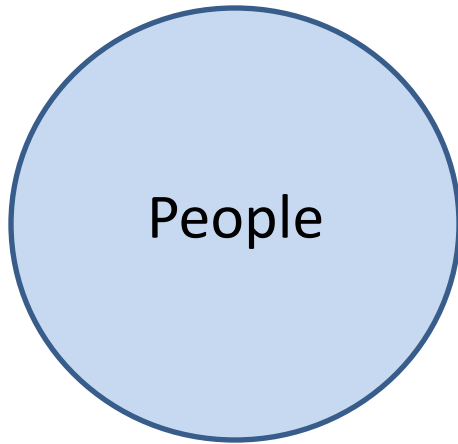


# Urban Development and WATSAN services in Low and Middle Income Countries

Dinesh Mehta, CEPT University, INDIA

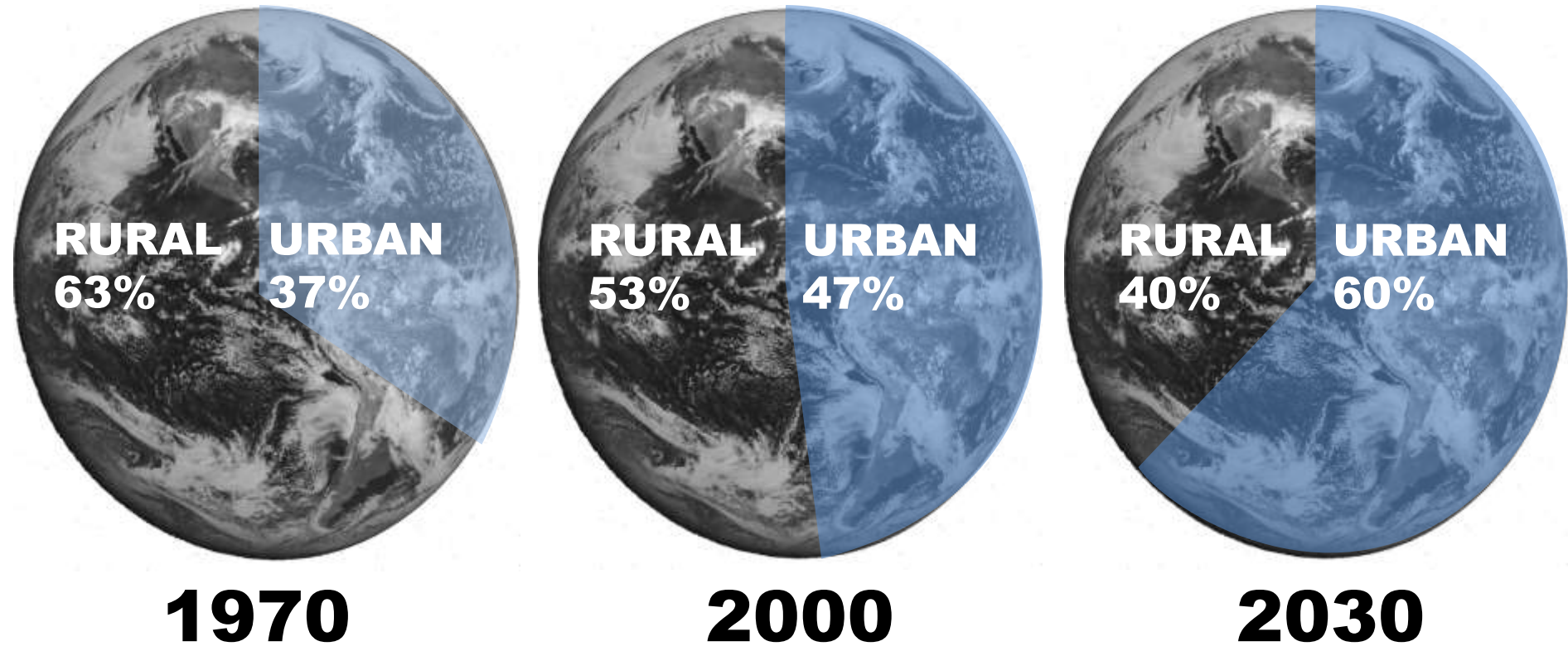


# Urban Development – 4 Ps

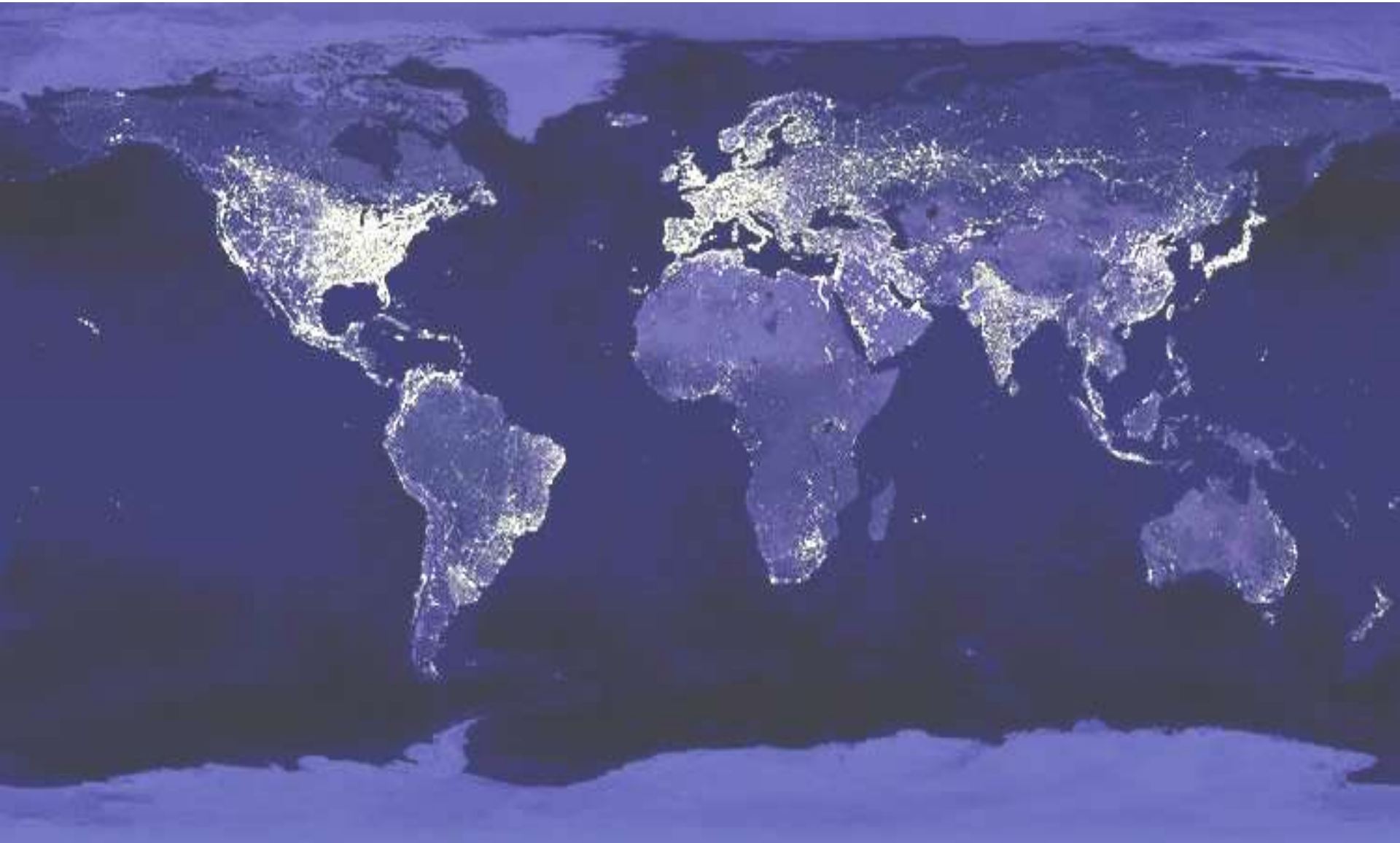


**PEOPLE**

# GLOBAL POPULATION URBAN/RURAL



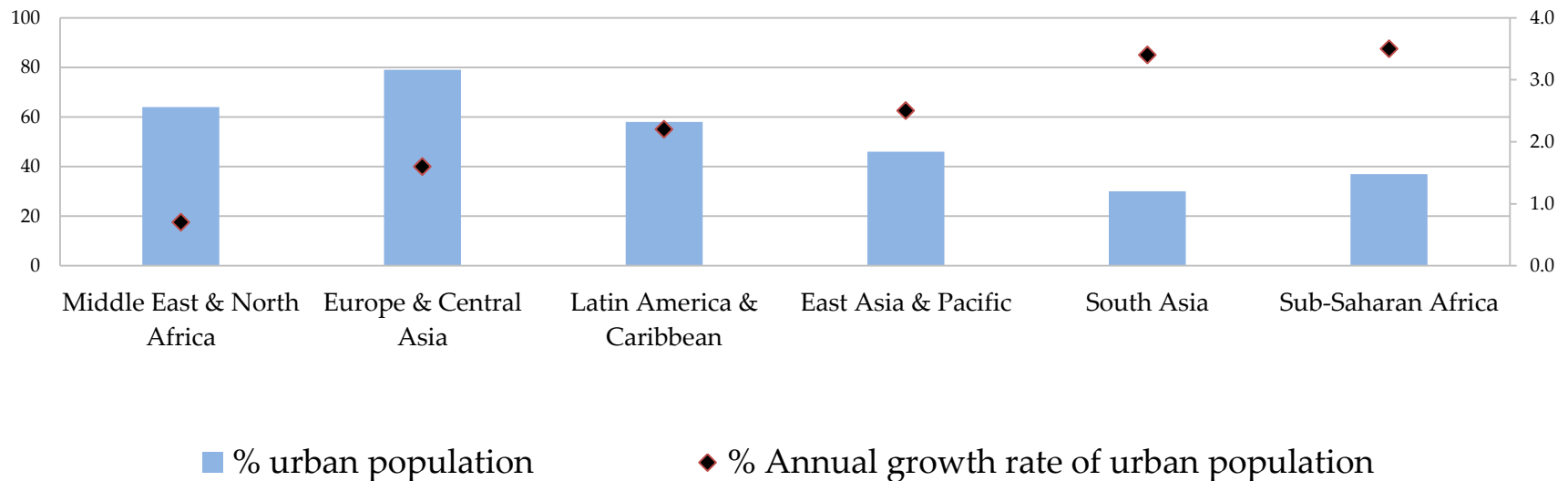
# Where are the cities of the world?



# LAMIC countries are varied

Low income		Lower middle income		Upper middle income		Total	
No of countries	No of cities	No of countries	No of cities	No of countries	No of cities	No of countries	No of cities
35	1757	56	5836	54	12392	145	19985

## Urbanisation levels in LAMIC



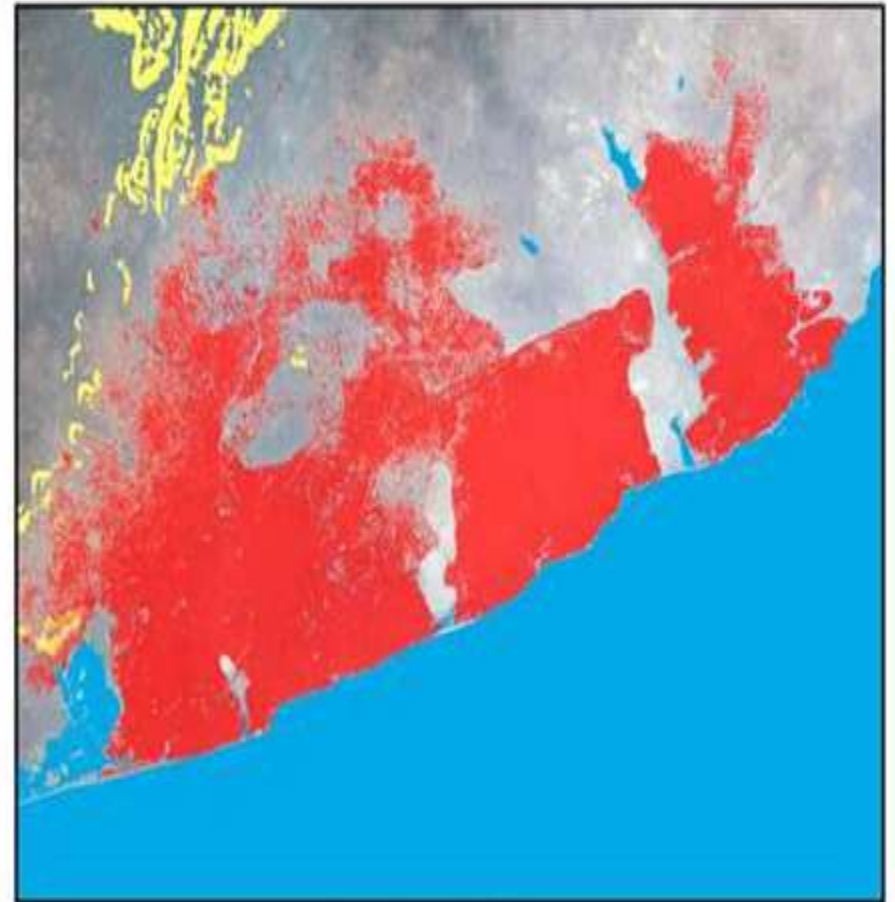
**PLACES**

# Spatial growth three times population growth

Accra, Ghana



T<sub>1</sub>: 6-Mar-85

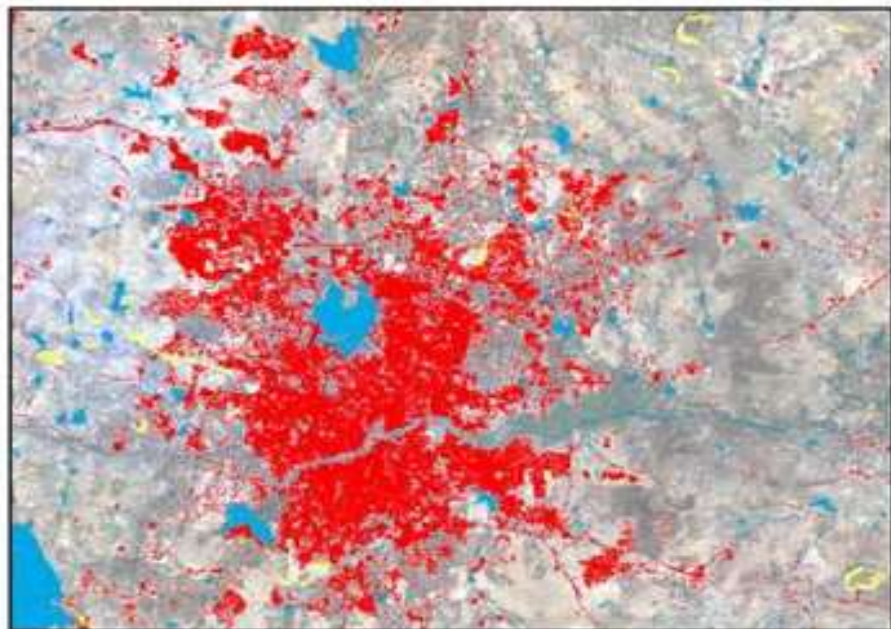


T<sub>2</sub>: 4-Feb-00

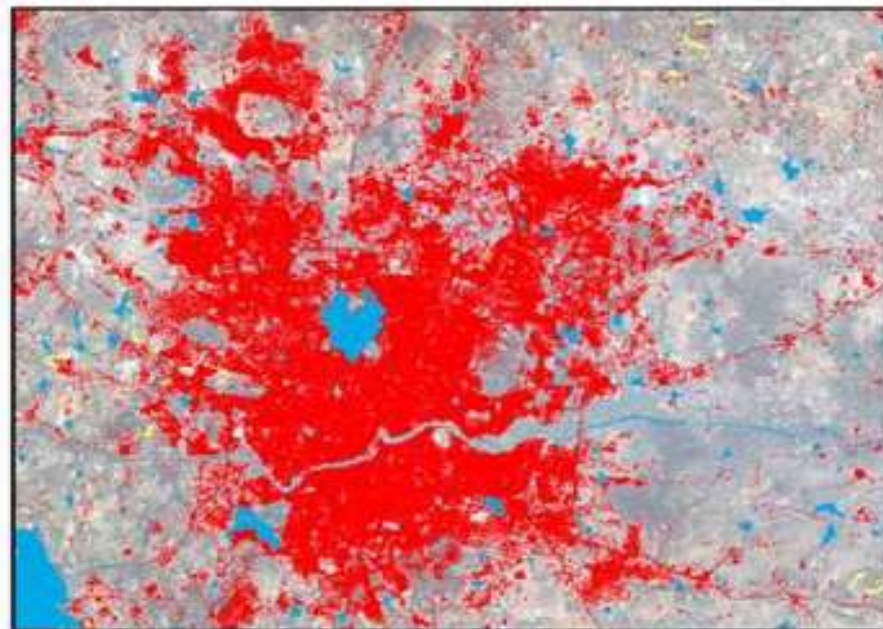


# With expanding cities, infrastructure costs rise

## Hyderabad, India



T<sub>1</sub>: 21-Nov-89



T<sub>2</sub>: 29-Oct-01

0 4 8 12 16 km

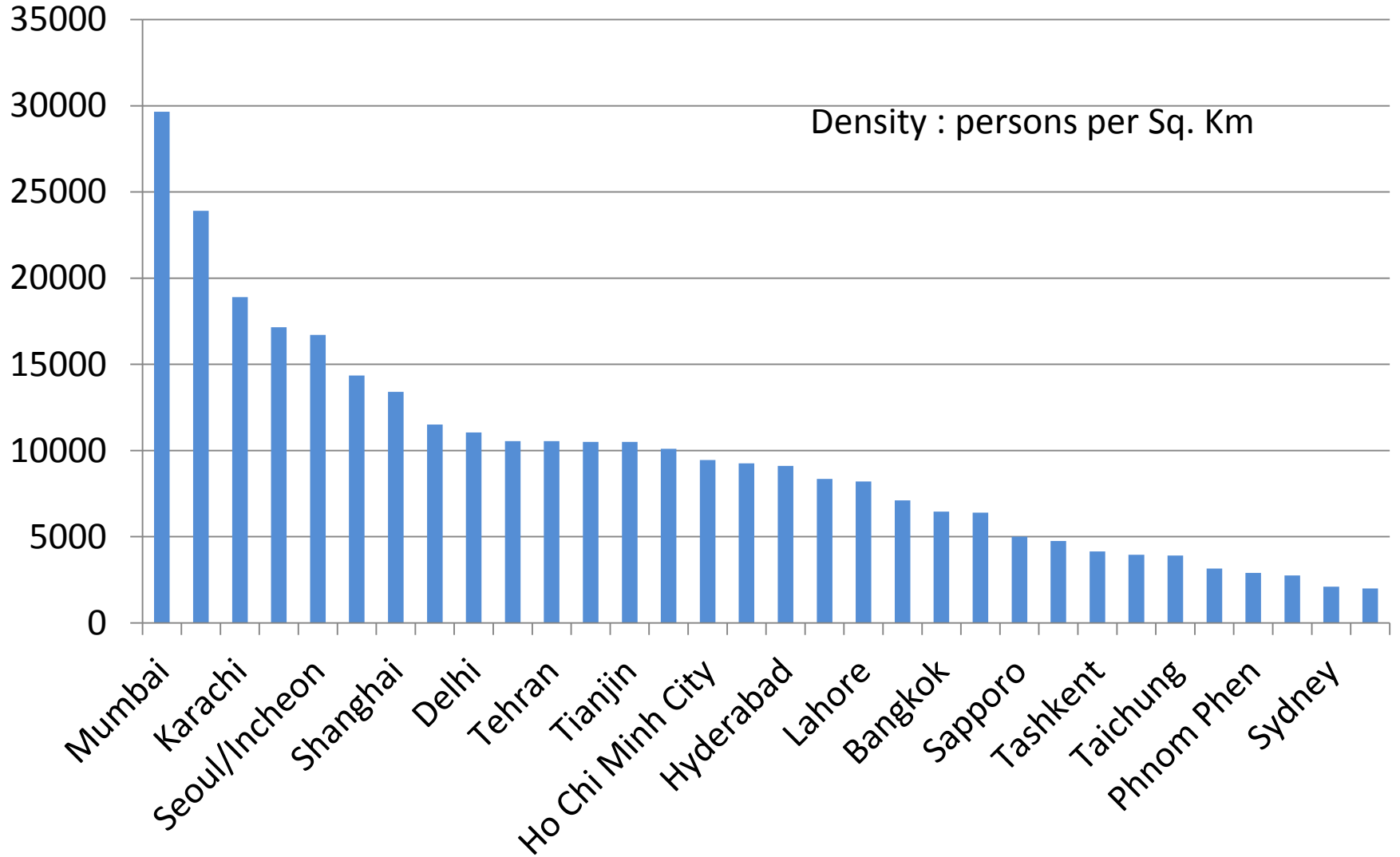


1:300,000



Measure	T <sub>1</sub>	T <sub>2</sub>	Annual % Change
Population	4,887,789	5,707,677	1.31%
Built-Up Area (sq km)	166.96	301.89	5.09%
Average Density (persons / sq km)	29,275.98	18,906.43	-3.60%
Built-Up Area per Person (sq m)	34.16	52.89	3.73%
Average Slope of Built-Up Area (%)	2.82	3.12	0.84%
Maximum Slope of Built-Up Area (%)	14.43	17.16	1.46%
The Buildable Perimeter (%)	0.94	0.93	-0.04%
The Contiguity Index	0.75	0.88	1.36%
The Compactness Index	0.37	0.38	0.22%
Per Capita Gross Domestic Product	\$1,541.53	\$2,343.04	3.57%

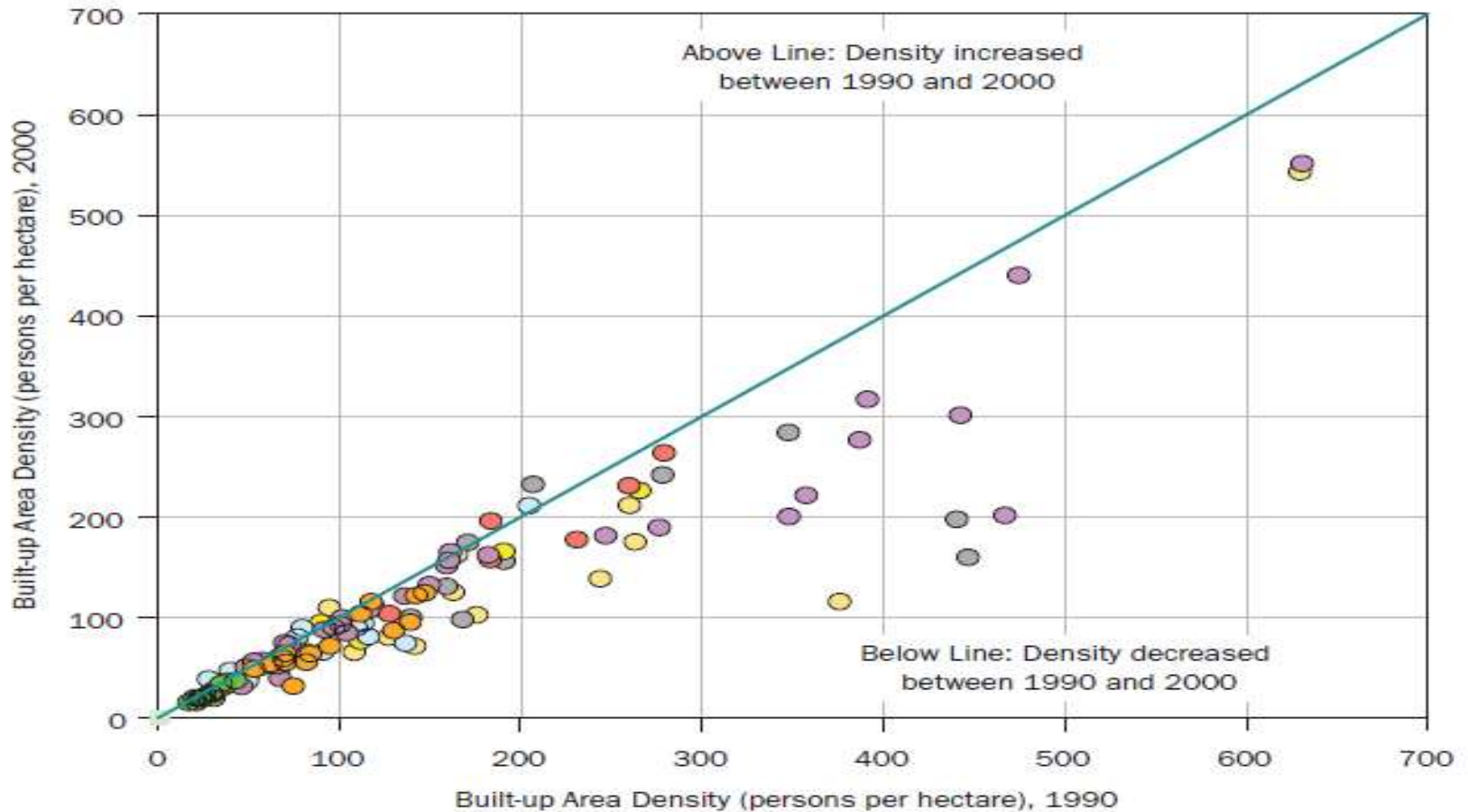
# Cities have High Population Density



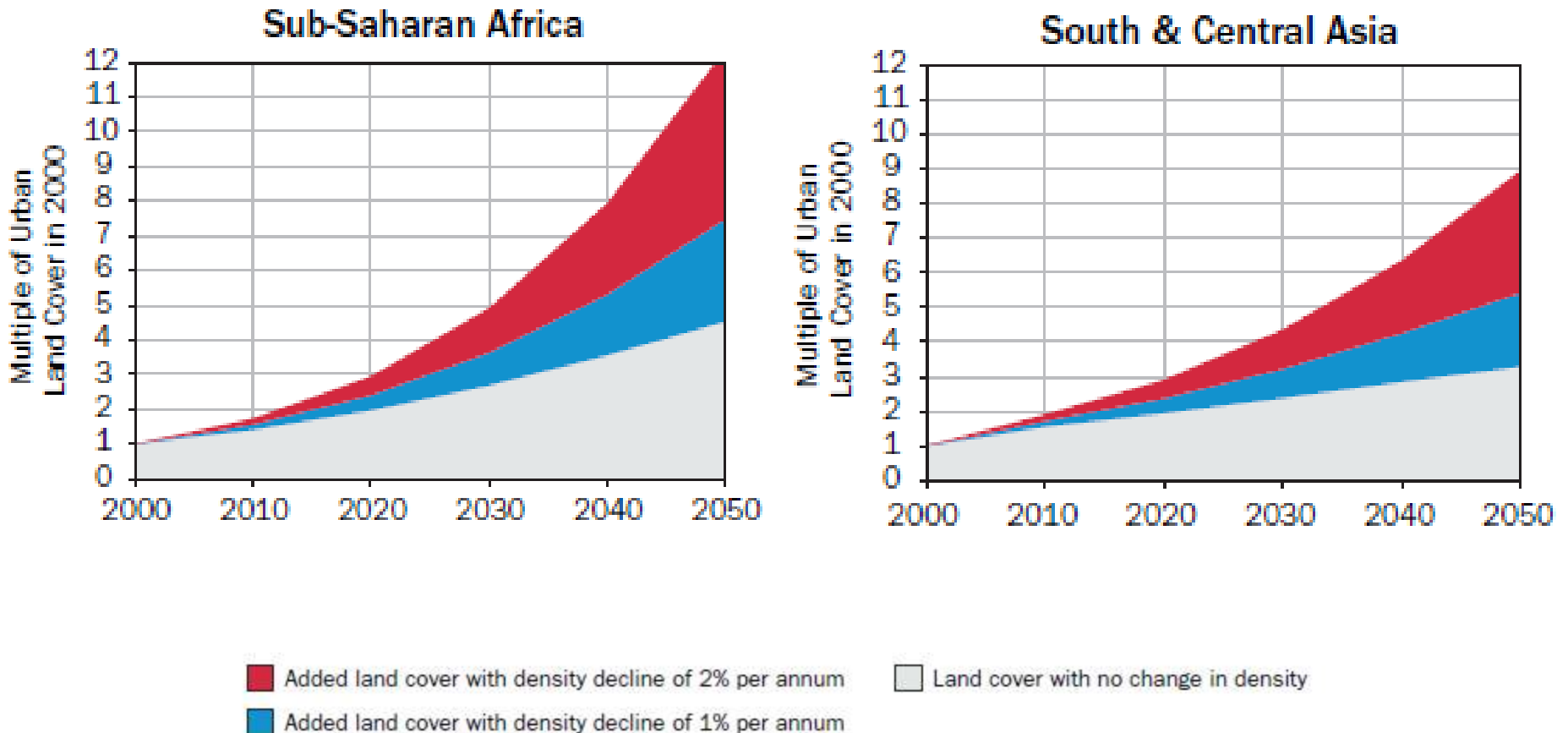
# But the densities are declining

FIGURE 2.3

Density Decline in the Global Sample of 120 Cities, 1990–2000

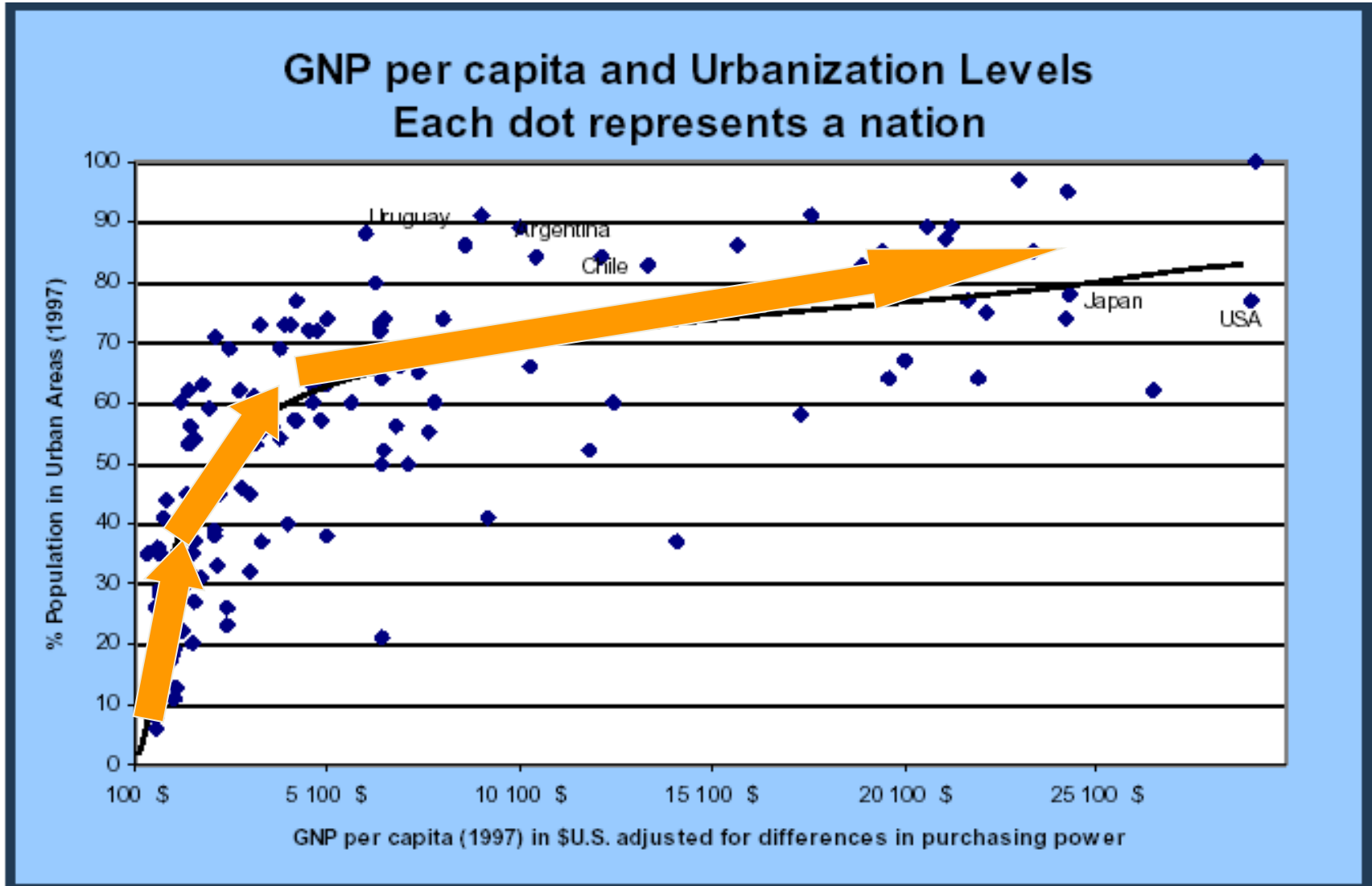


# Large Urban land cover due to density declines



**PROSPERITY**

# Urbanisation is the trigger for economic growth



# Prosperous cities

*The City 600\* today ...*

**1.5 billion**

people live in these 600 cities—  
22 percent of global population

**\$30 trillion**

of GDP in 2007—more than half of  
global GDP

**485 million**

households, with average per capita GDP of

**\$20,000**

The top 100 cities generated

**\$21 trillion**

of GDP in 2007—38 percent  
of the global total

*... and tomorrow*

**2.0 billion**

people will live in these 600 cities in 2025—  
25 percent of the global population

**\$64 trillion** of GDP in 2025, nearly  
60 percent of global GDP

**735 million**

households will live in these cities, with  
average per capita GDP of

**\$32,000**

... of which

**235 million**

households in developing world  
cities will have income above  
\$20,000 per annum

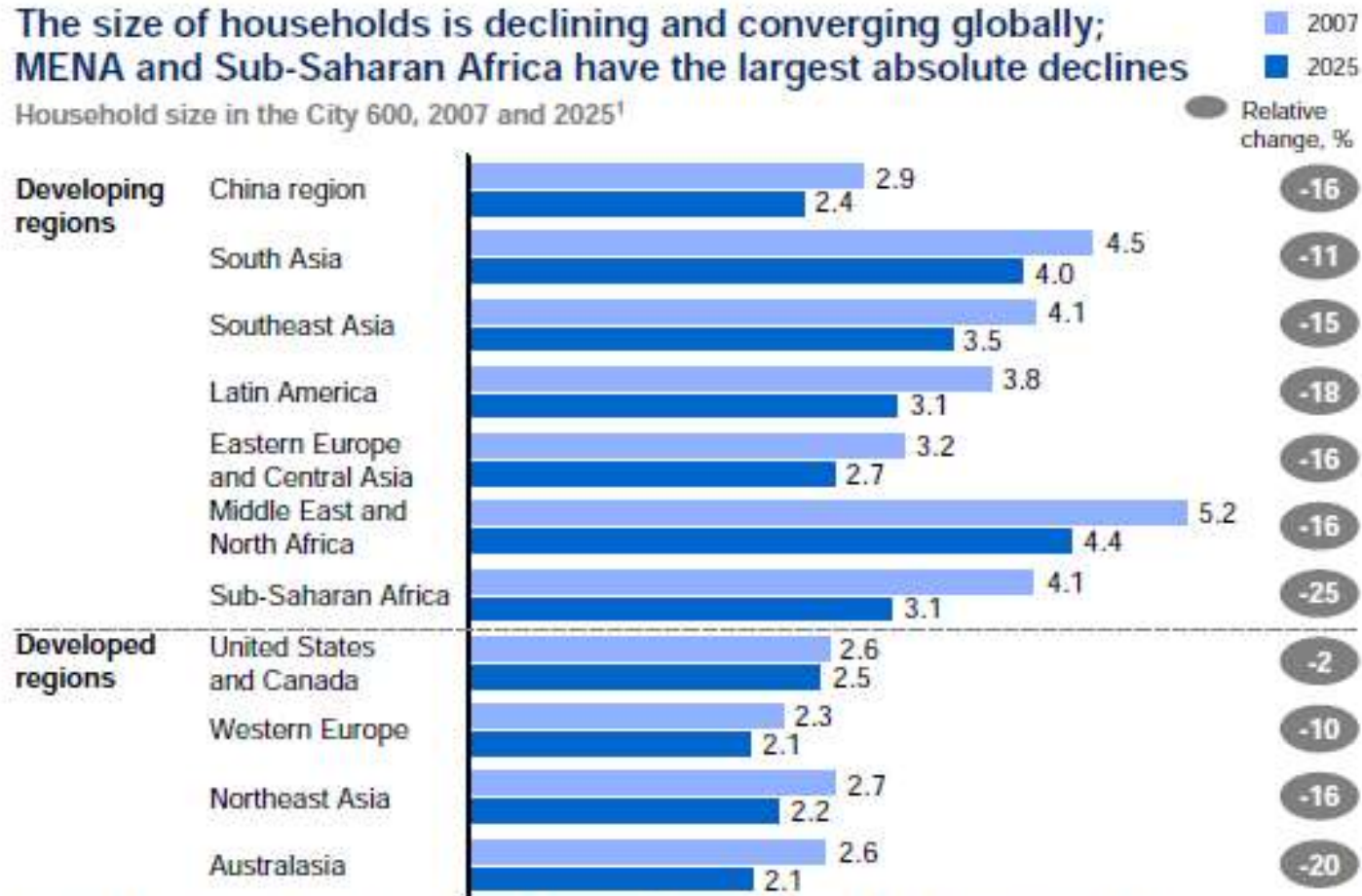
# Declining Household Size :

## More demand for Housing and related infrastructure

Exhibit 16

The size of households is declining and converging globally;  
**MENA and Sub-Saharan Africa have the largest absolute declines**

Household size in the City 600, 2007 and 2025<sup>1</sup>



<sup>1</sup> Household size calculated by taking the simple average of the household size of all cities within a region.

NOTE: Numbers may not sum due to rounding.

SOURCE: McKinsey Global Institute Cityscope 1.0



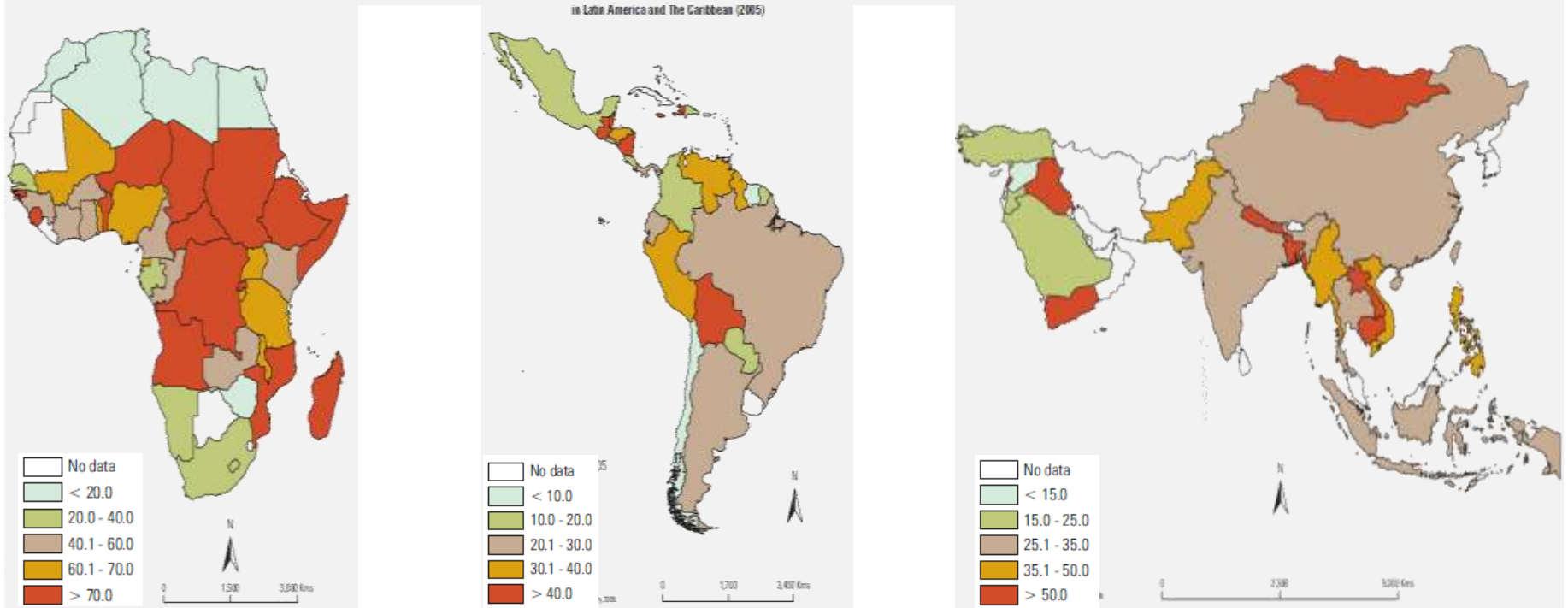
**POVERTY**

**it is an unequal world**



# Poverty levels and slums in LAMIC

Slum proportion of select countries in Africa, Latin America and Asia



Source: UN-HABITAT, Global Urban Observatory, 2009

- Regions of ECA, LAC and MENA have between 14 to 20% of their urban population residing in slums
- Role of small service providers and affordability assume significance in this context

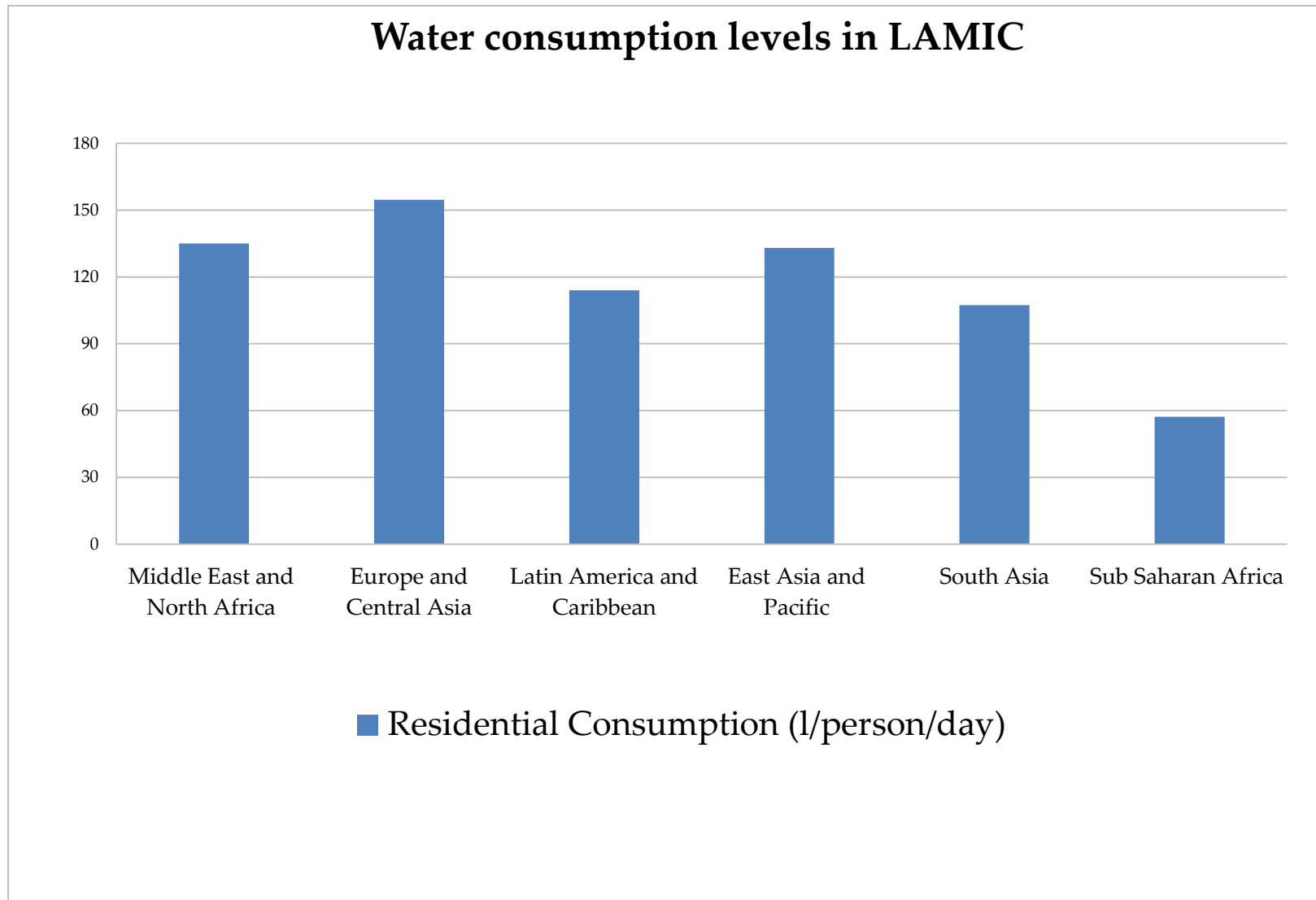
# The poor are more vulnerable



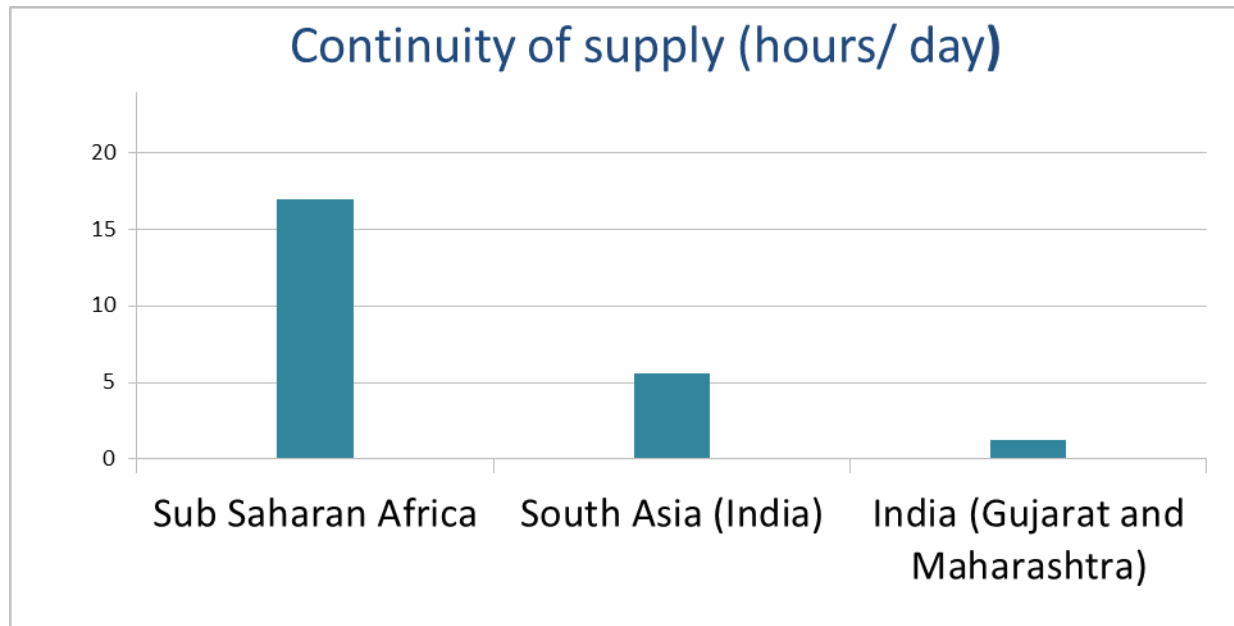
▲ Informal settlements on the bank of a canal in Manila, Philippines. ©Shadow216/Shutterstock



# Critical areas of services in LAMIC: Service levels



# Critical areas of services in LAMIC: Service levels



## Days of Supply in a Month

No of days of water supply	No of cities			
	2009 - 10	2010 -11	2011 -12	2012-13
0 -7	8	8	5	4
7 - 15	13	13	14	25
15	46	45	46	37
15 - 30	7	7	6	4
30	91	92	95	97

# NON WATER DAYS...



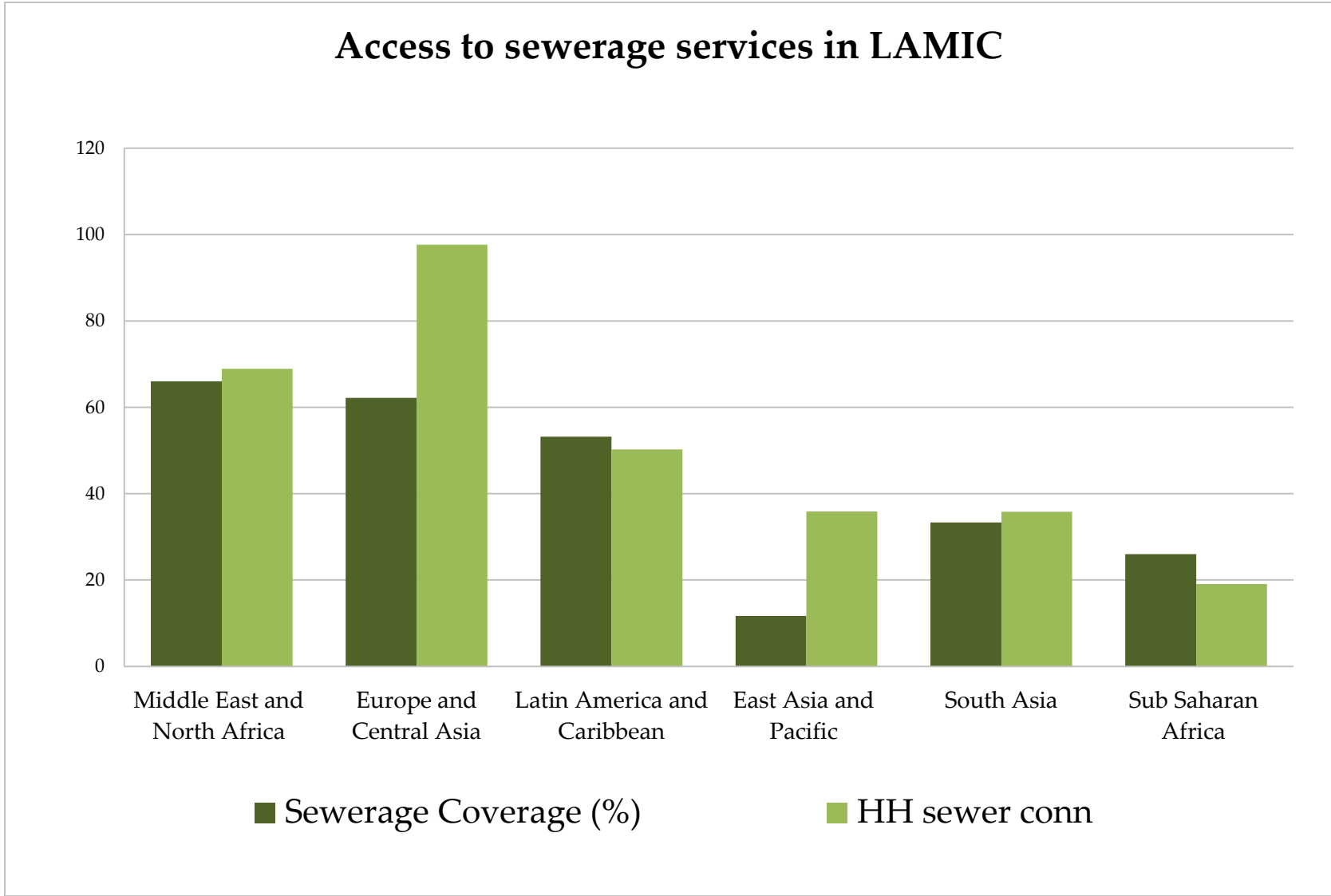
# THE 'WATER DAY'

PERFORMANCE ASSESSMENT SYSTEMS- PARTNERS' MEET 2011





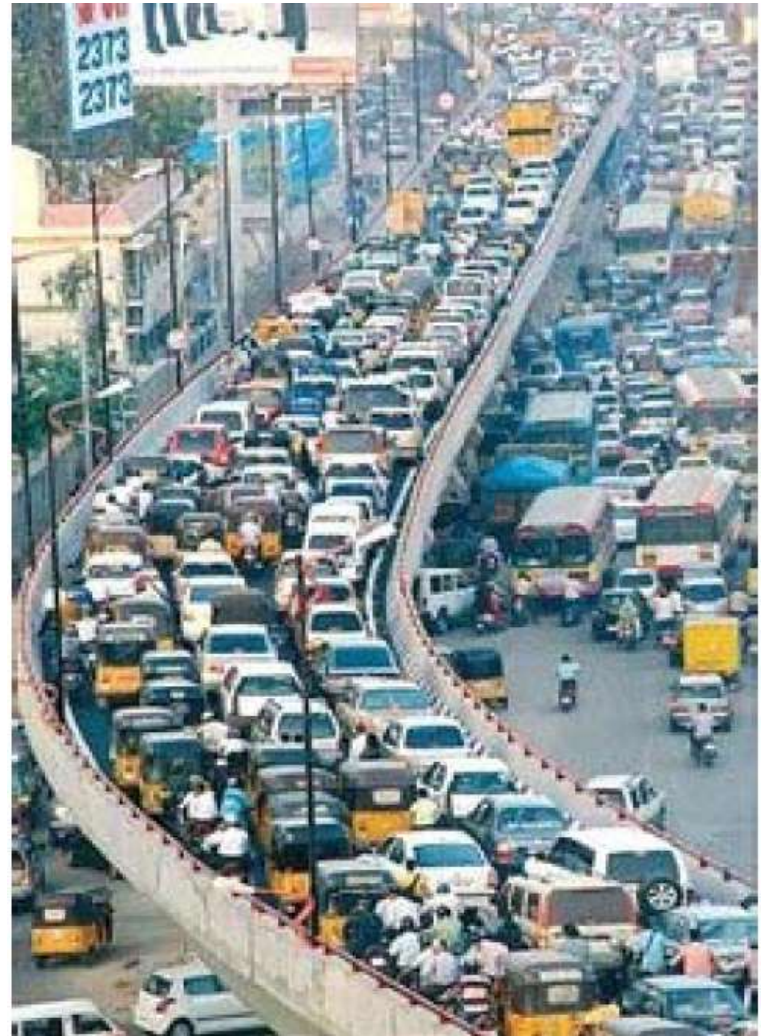
# Critical areas of services in LAMIC: Sanitation coverage



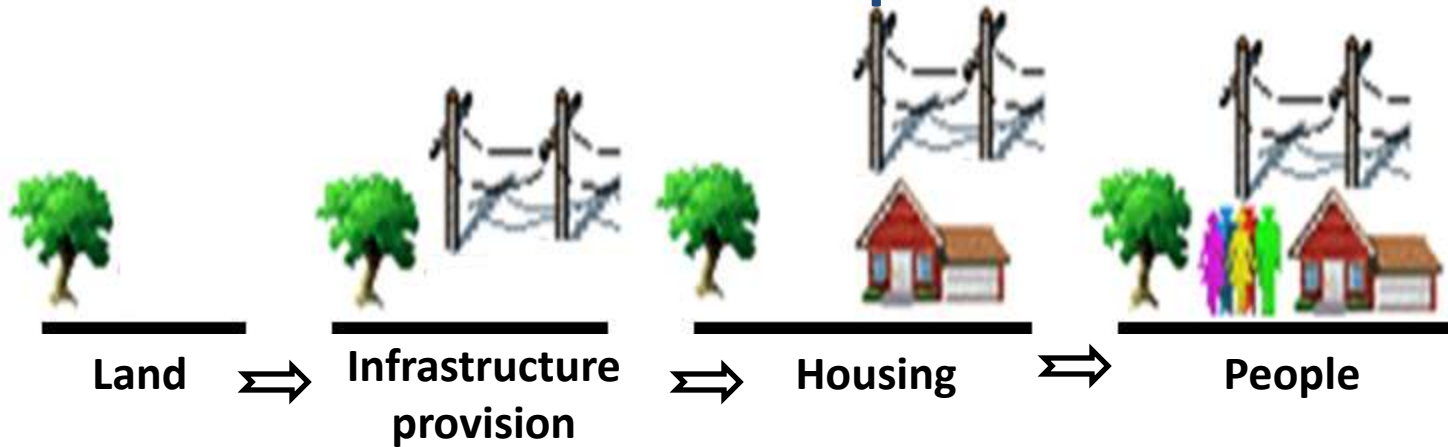
# **Urban Planning and Challenges of WATSAN**

# Urban planning dominated by transportation

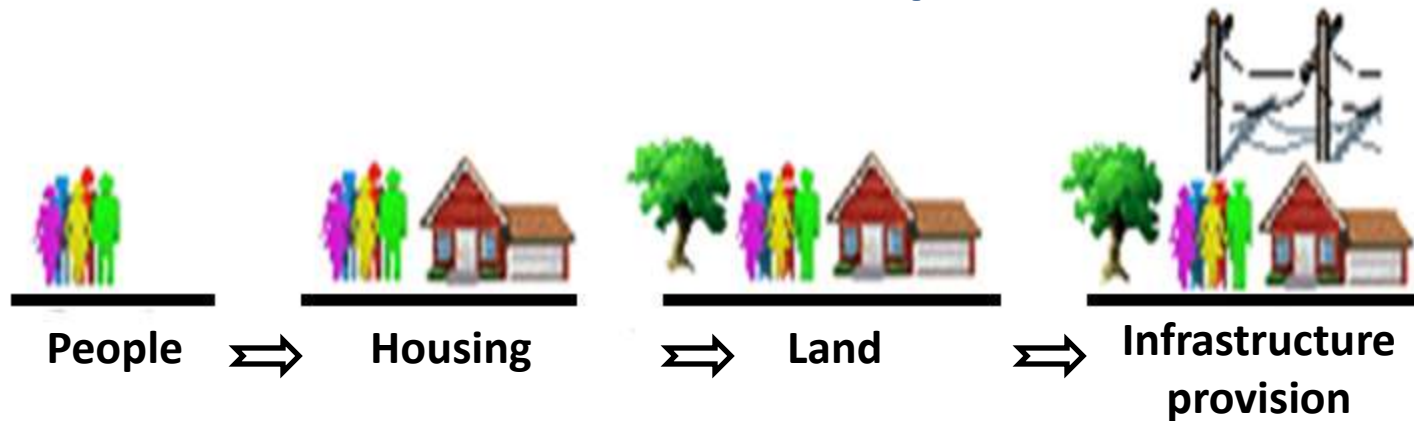
- Land use and transport planning is of paramount concern of planners
- Moving people is more important than serving people with basic services
- It is assumed that all infrastructure will follow roads
- But that is not always the best for water and sanitation systems



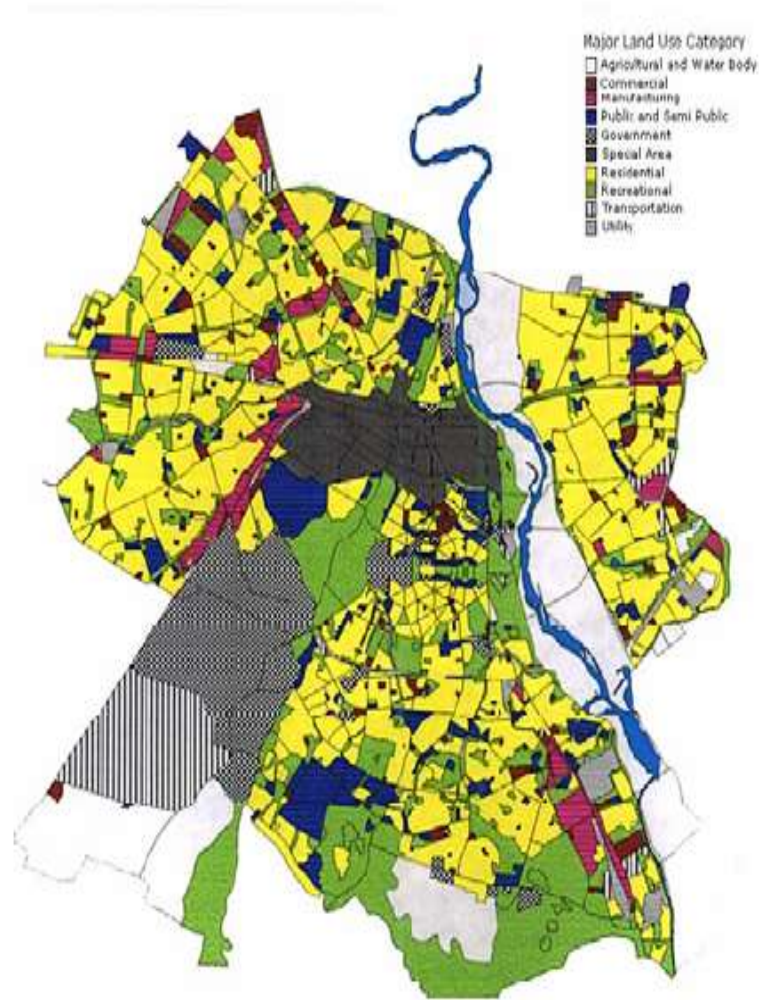
# Formal Process of Urban Development



# Informal Process of Urban Development



# Planning and the Poor : Anti-Poor bias in Planning

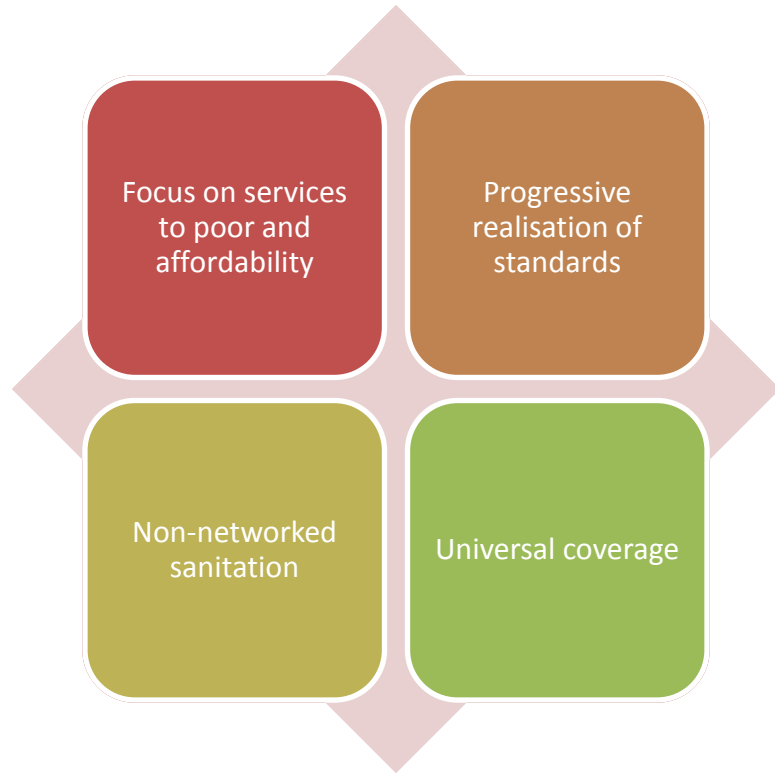


- Urban planning pre-occupied with land and its use
- Vision to make world-class cities only include the non-poor

## Why do the poor have no place in our planning?

- Slums have 20-25% of population but use less than 3 percent of land
- The poor do not have title over land and hence are not a part of the planning process

# Key focus areas – developed countries versus LAMIC



*Themes adopted by major utilities in developed countries*  
*Key focus areas in developing countries*

- WATSAN provision in **developed countries** more focused towards
  - Water resources and quality
  - Financial management
  - Customer satisfaction
  - Sustainability
- In **developing countries'** context, focus would also need to include
  - progressive realization of improved standards
  - Universal coverage,,
  - Access to sanitation facilities and non-sewered contexts
  - Service delivery to urban poor and affordability

# Informed decision making for planning and investment

- Aggregate statistics suggest good coverage of water and sanitation in urban areas
- BUT little is known about the **quality, level and financial sustainability of service**



**Need to move from laying pipes to  
delivering water**

# PAS

Performance Assessment System

Annual Service delivery

profile for **419**

Cities in **2** States

covering **32** Key indicators and

[www.pas.org.in](http://www.pas.org.in)

**90** local action indicators

Sectors : Water supply, Waste Water, Solid waste Management & Storm Water



Focus on **Measurement, Monitoring & Improvement**



# Online Monitoring



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 Password

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[Framework](#) | [Toolkit](#) | [State Profile](#) | [Know Your City](#)

### Access and Coverage

Highlights the % of households having individual access to various of water supply, sewage water and solid waste management.

### Background of Achalpur

GENERAL INFORMATION

Name	2176	Population	24,201
Area (km <sup>2</sup> )	21.76	Population Density	1,112
Population	24,201	Male	12,100
Female	12,101	Female	12,101
Sex Ratio	1,000	Male per 1,000 females	1,000
Population per km <sup>2</sup>	1,112	Population per sq. mile	2,870

MATCH SUPPLY

Match Supply: 100%

### City Profile of Achalpur

General Information

Match Supply: 100%

Sanitation: 100%

Drinking Water: 100%

Electricity: 100%

Health: 100%

Waste Management: 100%

State profile of all SLBs

Overview of all cities      City profile of all SLBs

### Resources > Good Practices

Documentation of good practices is a key to the effective implementation of the Sustainable Development Goals. The good practices are documented in the form of a table with the following columns: Name, Description, Location, and Contact Information.

Name	Description	Location	Contact Information
1	Address and service connectivity in mountainous terrain	The project focuses on providing a general overview of the work in a particular area or area/locations. It covers the work done in a particular area and includes the details of the project, the objectives, the methodology, the results, and the impact of the project.	
2	Sanitation (improved) - community	The project aims to improve the sanitation facilities in the community. It includes the construction of latrines, the provision of handwashing facilities, and the promotion of good sanitation practices.	
3	Water supply (improved) - community	The project aims to improve the water supply facilities in the community. It includes the construction of water supply systems, the provision of water filters, and the promotion of good water supply practices.	

Documentation of good practices

# SANITATION IN SMALL TOWNS

Class: A, B, C, D, NP

State

(All)

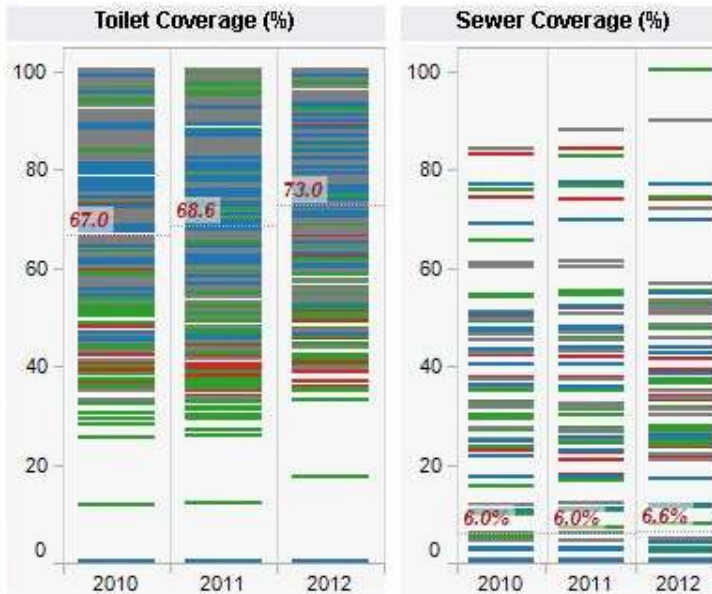
## Key Wastewater Indicators

Legends Class Filter

- A
  - B
  - C
  - D
  - NP
- (All)
  - MC
  - A
  - B
  - C
  - D
  - NP

Population

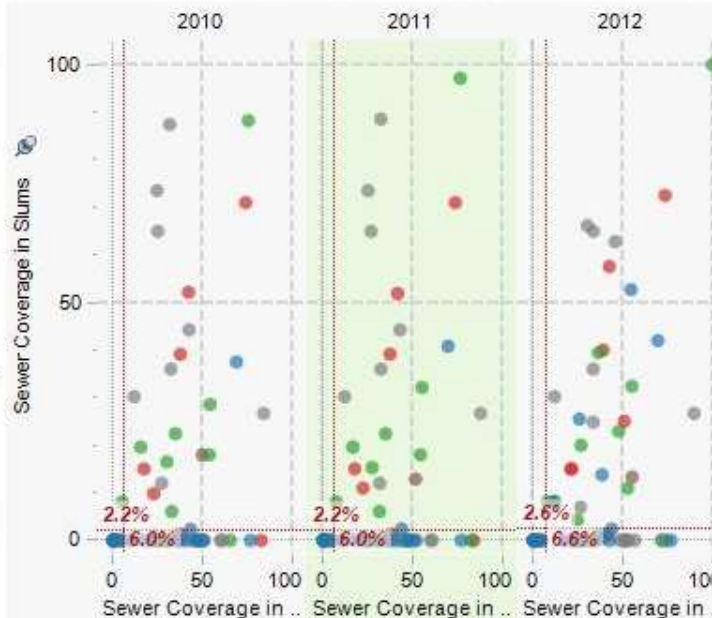
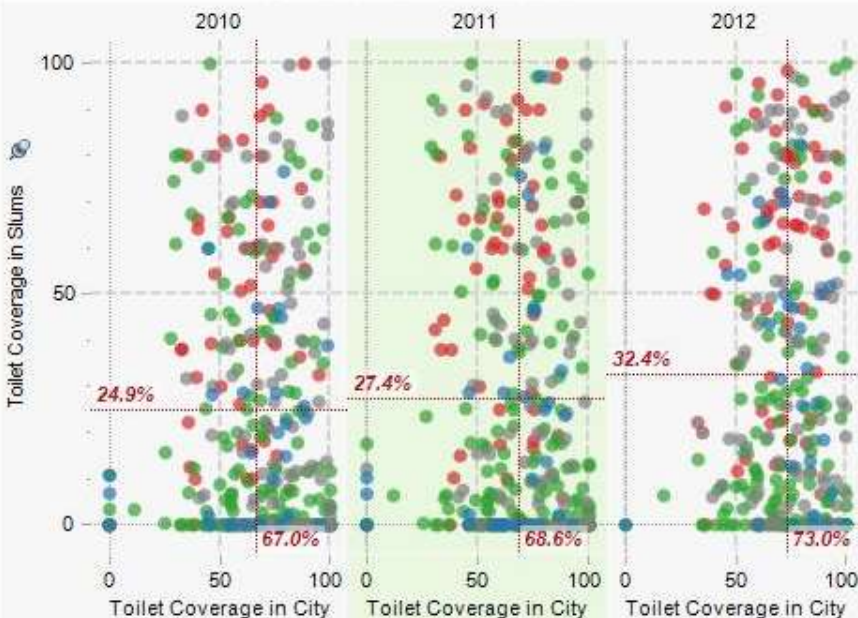
- ≤ 15,283
- 2,000,000
- 4,000,000
- 5,667,511



### Toilet Coverage: Overall vs Slums

### Sewer Connection Coverage: Overall vs Slums

### Select ULB



- Achalpur
- Ahmadpur
- Akkalkot
- Akot
- Alandi
- Alibagh
- Amalner
- Ambad
- Ambajagai
- Ambarnath
- Amod
- Amreli
- Anand
- AnjangaonSurji
- Anjar
- Anklav
- Ankleshwar

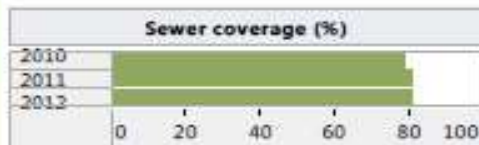
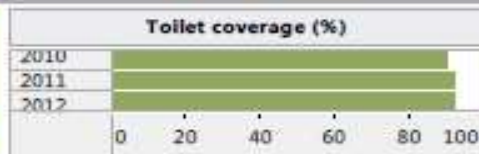
About Tableau maps: [www.tableausoftware.com/mapdata](http://www.tableausoftware.com/mapdata)

# City level dashboard

## Dashboard Showing Wastewater SLB Indicators for Aurangabad (Class: MC)

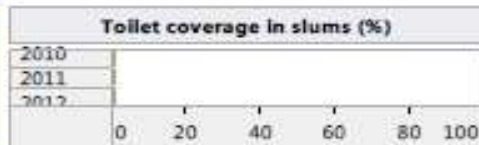
### Access and Coverage

Highlights the % of HHs having access to services of waste water (sanitation and sewerage)



### Equity in Service Delivery

Highlights the variations in city level coverage as well as between poor and non-poor HHs in the city



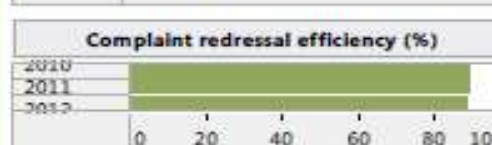
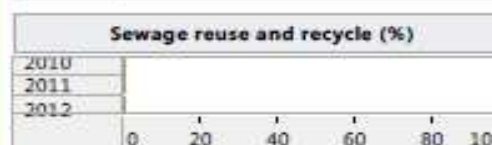
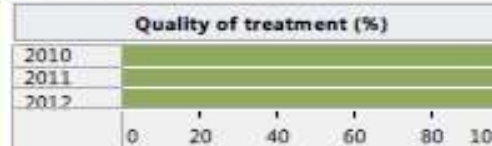
### Service Levels and Quality

Highlights the quantity of WW collected and treatment capacity of Sewage Treatment Plant



### Efficiency in Service Operations

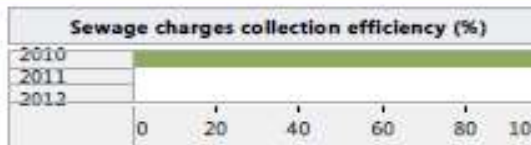
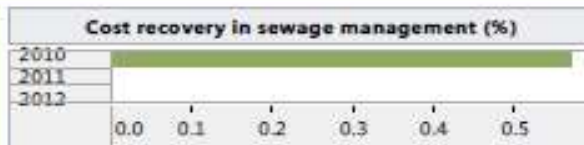
Highlights extent of WW treatment before disposal, reuse/ recycling of wastewater, and collection of sewerage related charges



Select ULB
Ahmedabad
Ahmednagar
Akola
Amravati
Aurangabad
Bhavnagar
Bhiwandi
Dhule
Gandhinagar
Jalgaon
Jamnagar
Junagadh
KalyanDombivli
Kolhapur
Malegaon
MiraBhayandar
Nagpur
Nanded
Nashik
Navi Mumbai
Pimpri Chinchwad
Pune
Rajkot
Sangli
Solapur
Surat
Thane
Ulhasnagar
Vadodara
Vasai Virar

### Financial Sustainability

Highlights the revenues accrued to expenses incurred in service operations



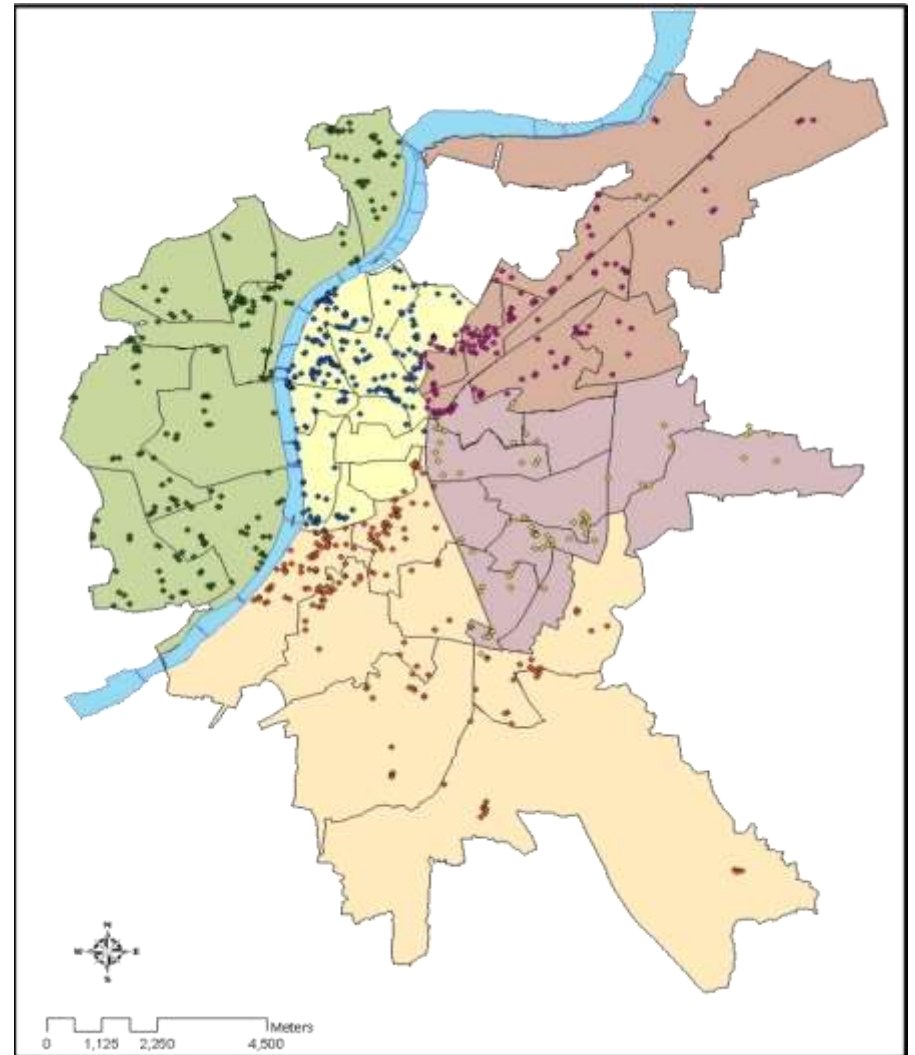
State

**REACHING OUT TO THE POOR**

# Access to water and sanitation for the poor

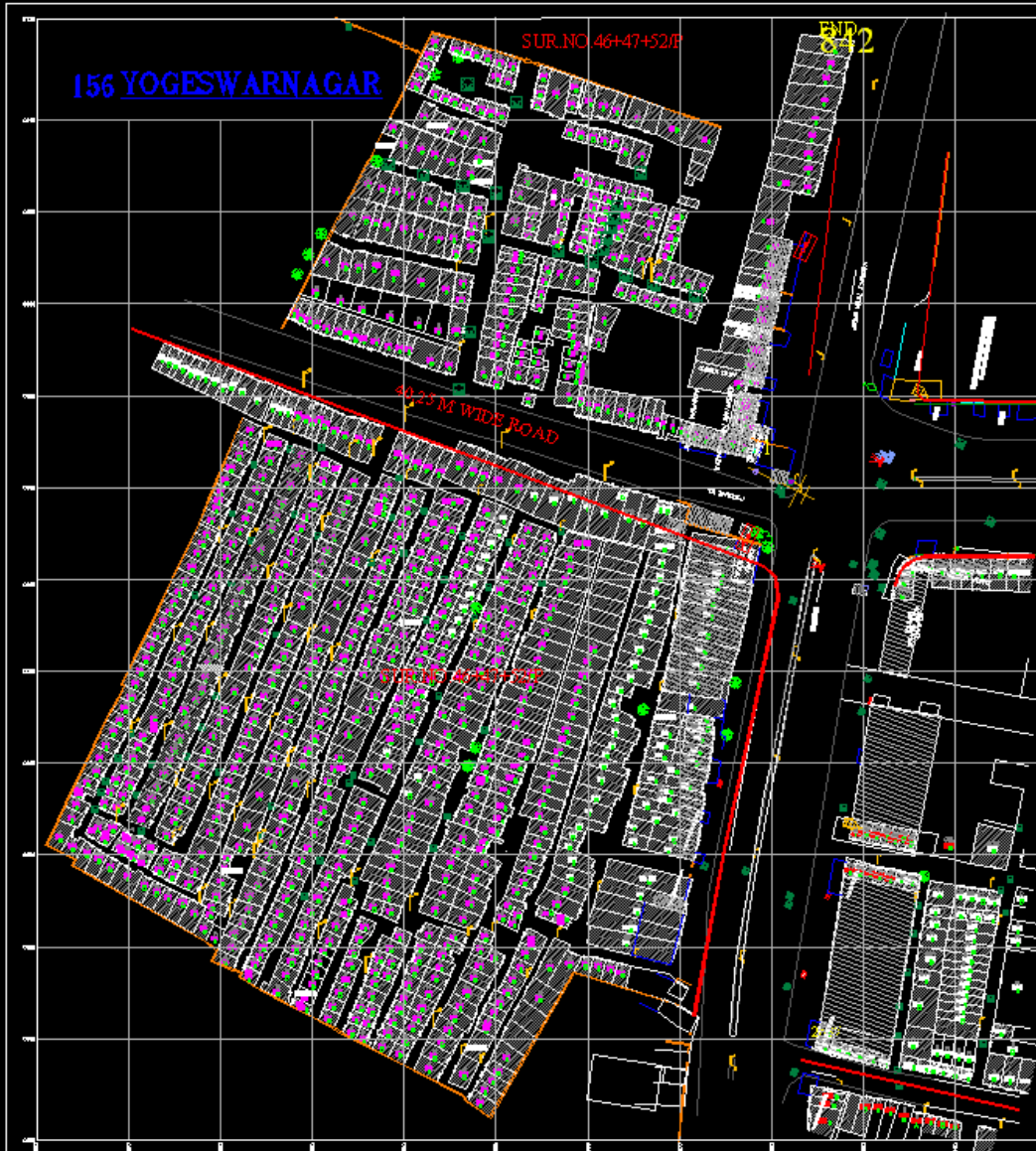
Support to the Ahmedabad municipal Corporation for using improved slum information to achieve universalization of household level water and sanitation services

- Slum information system on a GIS platform
- Use of GIS tools to support decisions and strategy development
- Financial model to support policy choices on technology, cost sharing, implementation packaging by size and service levels



Ahmedabad – population 6.0 million; slum population approx. 1.2 million

# Total Station Survey of all Slums



## NOTES:-

- 01.ALL DIM & R.LIN METER.
- 02.T.B.M.TAKEN ON MAIN ROAD ITS R.L.100.00 M

## LEGEND AS PER TOTAL STATION SURVEY

	BUILDING		ELECTRIC POST
	MAN HOLE		LAMP POST
	WATERKUNDI/WATER TANK		HAND PUMP
	ELECTRIC BOX		TREE
	TELEPHONE BOX		TELEPHONE POST
	STONE		TUBE WELL
	WATER TAP		ROW STONE
	TEMPLE		HIGH TENSION TOWER

## AREA :-

ASPER SITE  
 TOTAL PLOT AREA.....  
 BUILTUP AREA..... 37,448.00 SQ.MT

## LEGEND

LAND	BUILDING NO
A	PUCCA BUILDING
B	KUCHA BUILDING
C	HUTS
G+1	FLOOR HIGHT
R	BUILDING USE
PUB	PUBLIC USE
COM	COMM./SHOPS



## AREA TABLE:-

SR. NO.	P.P. NO./BUIL. NO.	FINAL PLOT AREA	AREA IN SQ.MT.	HOUSE NO. IN
1	46	37,448.00 SQ.MT	158	542
2				

## CLIENT:-

AHMEDABAD MUNICIPAL CORPORATION,  
 AHMEDABAD

## DATE:-

NOVE-09

## TITLE:-

**SURVEY PLAN**  
**R.S.NO.46,47,52 T.P.S.NO.28**

## DRN:-

ASHISH

## PROJECT:-

**SLUM NETWORKING PROJECT**

## CHECKED:-

MOHAMMAD BASHIR

## SURVEY & PREPARED BY:-

**RAJ SURVEY CONSULTANT,**  
 AHMEDABAD.

## APPROVED:-

98251-26668,98250-13668

## DRG SHEET NO:-

158 YOGESWARNAGAR/WEST/VASNA

## SCALE:-

1CM = 2.0 MT

# Demonstration: GIS Based MIS for Slums: Jadiba Nagar

AHMEDABAD MUNICIPAL CORPORATION



Map Browser Analysis About Us Exit



Name of Zone  
**WEST**

Name of Wards  
**VASNA**

Name of Slums  
**JADIBA NAGAR**

No. of Huts : 146



**SLUM : JADIBA NAGAR**

**Huts having Individual Sewer Connection**



**Web enabled GIS based module linked with intranet**

*Source: Preliminary Survey Result of Biometric & Total Station Survey, AMC, 2010*



**Thank You....**

[www.pas.org.in](http://www.pas.org.in)

[dineshmehta@cept.ac.in](mailto:dineshmehta@cept.ac.in)