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Creating sustainable innovative cities in developing countries: challenges and strategies

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Creating sustainable innovative cities in developing countries: challenges and strategies

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1. EXECUTIVE SUMMARY

With rapid growth of urbanization in developing world, urban sustainability has become the precursor of global sustainability. By 2025, two billion people – 25 percent of world population – will live in 600 cities, accounting for 60 percent of global GDP. The growth of cities in developing and emerging economies is accelerating much faster than cities in more developed countries. In this paper the challenges and strategies for creating sustainable innovative cities in developing world is explored. The greatest challenge is the increase in the numbers of the urban poor. Most cities have not been able to provide adequate basic services for their citizens. To prosper in a long term, fast growing cities must consider factors such as the availability of resources (space, water and energy), job opportunities and provision of services. Successful innovative cities tend to support and nurture technology and innovation as a mean of providing solution to these problems. Many of these solutions are scalable, replicable and can be adapted to a variety of specific urban environments. To create an environment for creative class in the scale of large cities requires right planning as well as good degree of local partnerships among public and private stakeholders.

2. INTRODUCTION

The success of United Nations' Sustainable Development Goals (SDGs) to end poverty, protect the planet, and ensure prosperity for all, will depend to a large extent on how well developing countries manage their cities. Over the next few decades, most of the world's population growth is expected to be concentrated in urban areas in these countries. The challenge of achieving sustainable urban development in developing world is going to be a formidable task. Rapid urban growth is exceeding the capacity of most cities to provide adequate services for their citizens. The idea of using science, technology and innovation, as added value, is particularly useful for creating cities as knowledge ecosystems. Lessons learned from experiences in creating innovative cities in more developed countries can contribute to a better understanding of what it takes to build similar cities in less developed countries. The objective of this paper is to explore the challenges and strategies to create sustainable innovative cities in developing countries as a mean to reduce poverty and increase comfort and security.

3. BIG CITIES AND ECONOMIC DEVELOPMENT

Currently over half of the world's total population and more than seventy percent of the population in higher income countries live in urban areas. In the next 30 years most of the increase in global population is expected to occur in urban areas in the developing world. By 2050, two-thirds of earth's population will call urbanized areas their home. This trend will be more noticeable in Africa, Asia and Latin America. At the present time, more than ninety percent of the global urban growth is taking place in these regions. This means adding 70 million new residents to urban areas every year (United Nations, 2014). If this trend is compared with what has happened in the past, a significant departure becomes evident. In the second half of 20th century the spatial distribution of population growth in the developing world has been much more evenly divided between urban and rural areas (Figure 1). The rate of urban development in the world today and the growth in number and size of largest cities are unprecedented. At the beginning of the 20th century, only 16 cities contained a million people or more. Today, more than 400 cities have more than a million people, and more than seventy percent of them are in developing countries (Figure 2).

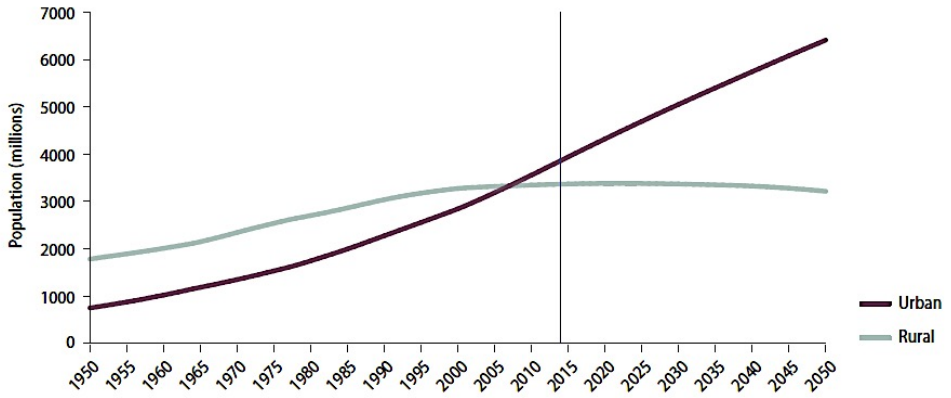

Figure 1. Urban and rural population of the world, 1950–2050
(United Nations, 2014)

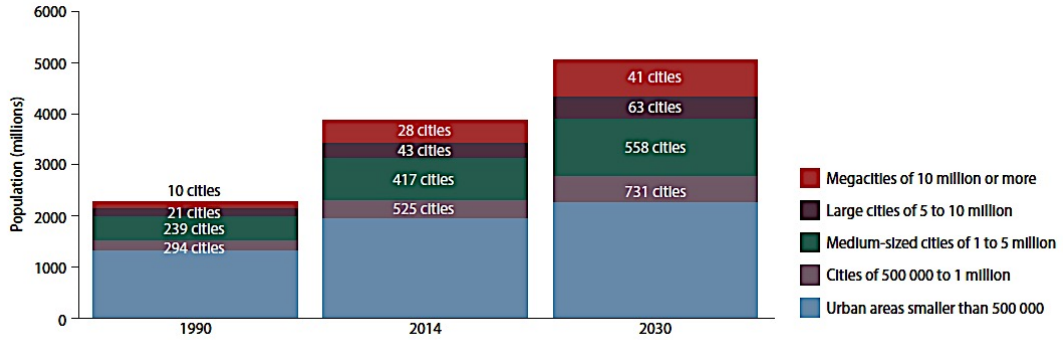

Figure 2. Global urban population growth is propelled by the growth of cities of all sizes
(United Nations, 2014)

Economists have shown that there is a connection between urbanization and economic development. Richard Florida (2014) believes big cities can act as economic engines for entire countries. McKinsey Global Institute estimates that the economic output of the 600 largest cities and metro areas will grow $30 trillion, accounting for two-thirds of all global growth. Today, these 600 cities generate about 60 percent of global GDP. It is very difficult to precisely relate metro areas to productivity and economic development because of the lack of comprehensive and systematic data. Agencies such as the United Nations, the World Bank, or others mainly provide estimates on populations for the world's urban areas. However, the Brookings Institution's Global MetroMonitor (2012) has gathered data on GDP per capita for the world's 300 largest metropolitan economies. These metros account for nearly one-half of global output, while being home to less than 20 percent of its people. Compared to their countries, most of these metro areas outperformed their countries on employment growth in 2012. Richard Florida (2012) developed a metric called the *urban productivity ratio* to compares the per capita economic output of metros to the per capita economic output of their nations (Figure 3). The urban productivity ratios tend to be highest in the metros of the developing and emerging economies. The large metros in more developed countries such as United States and Europe show an urban productivity ratio of 1 to 1.25, which means a productivity of equal or 25 percent greater than the national average. Based on these ratios, Florida (2014) believes metros in the developing and emerging economies have higher urban productivity ratios than their counterparts in the advanced world.

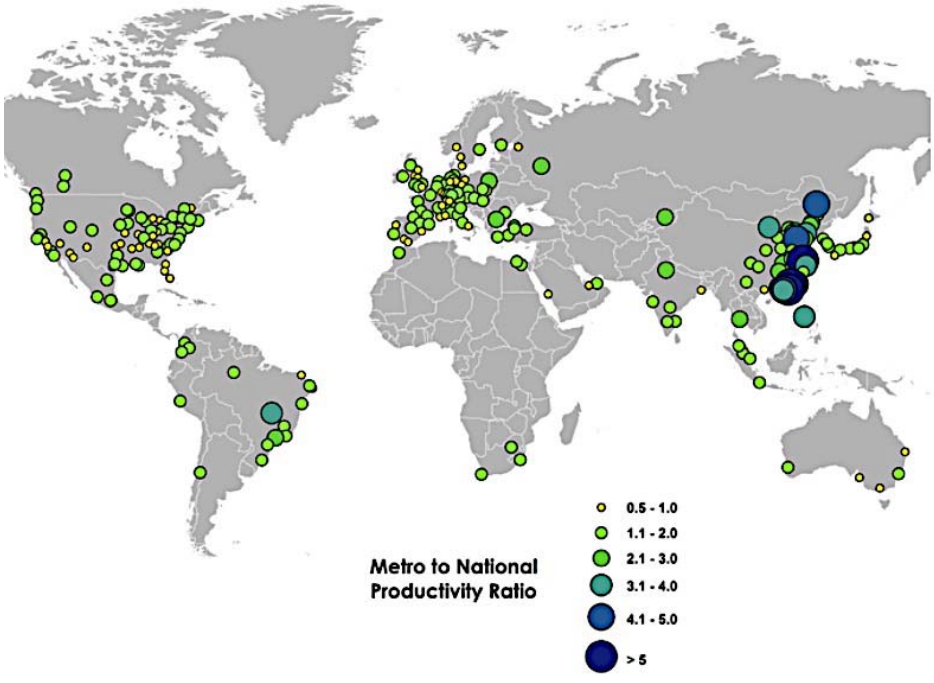

Figure 3. Metro to National Productivity Ration. (Florida, 2014)

4. SUSTAINABLE CITIES

Debates about sustainable cities have been mainly focused on problems for larger metro areas, while the majority of all urban dwellers continue to reside in far smaller urban settlements. The rapid growth of small and medium cities and the deteriorating living conditions of the urban poor has not been adequately recognized nor anticipated. As cities grow, managing them becomes increasingly complex. There are risks to the surrounding environment, to natural resources, to health conditions, to social cohesion, and to individual rights. The greatest challenge, however, is the increase in the numbers of the urban poor. In 2003, almost 72 percent of the urban population of Africa lived in slums (United Nations, 2003). The proportion was 43 percent for Asia and the Pacific, 32 percent for Latin America, and 30 percent for the Middle East and Northern Africa (United Nations, 2003). These numbers have certainly increased dramatically in the past 15 years. This rapid growth of urban poor in developing countries has created an immense challenge for most cities to provide adequate basic services for their citizens. To begin to deal with these challenges, we at least require accurate projections of future urban growth.

Migration of people from rural areas to larger cities and the transformation of rural settlements into towns and cities have also had an impact on the lifestyle of people in developing world. This has caused a general convergence in lifestyles between urban and rural areas. Urban lifestyles are being spread over larger geographic areas and traditional distinction between urban and rural lifestyles is becoming unessential for many purposes.

Bugliarello (2006) defines urban sustainability as an intersection of urbanization and global sustainability (Fig. 4). The ability of a city to prosper in long term depends on factors such as the economy of the city and the availability of resources such as space, water and energy, job opportunities and provision of services. To achieve these factors, cities need to overcome many technical as well as socio-economic challenges (Bugliarello, 2006). Technical challenges such as finding sources of water or creating land fills for waste and socio-economic challenges, such as creating new jobs.

New means and methods of sustainability are being practiced by some large cities. They pay attention to new concepts such as zero energy buildings, sustainable site initiative, sustainable transport system and sustainable urban drainage system. The concept of eco-industrial park is also promoted by many cities with the purpose of connecting firms and organizations to work together to decrease their environmental impact while simultaneously improving their economic performance.

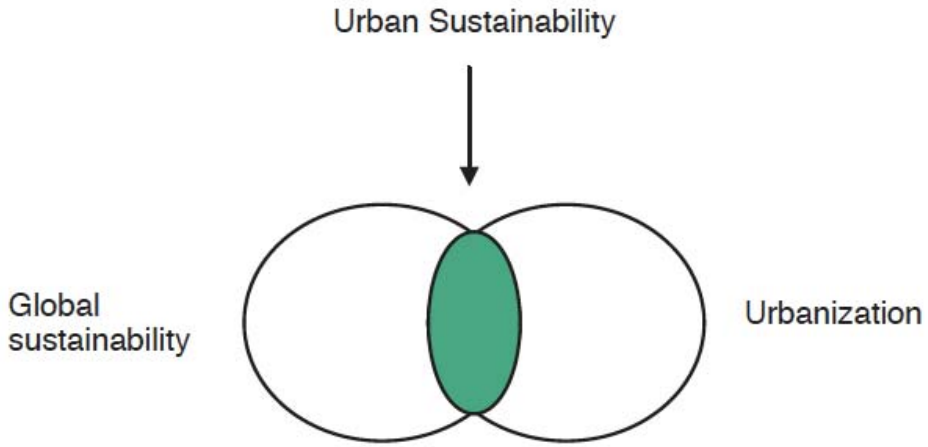

Fig. 4. Urban sustainability as the intersection of two phenomena.(Bugliarello, 2006**)**

5. INNOVATIVE CITIES

Creation of cities that emphasize on the use of innovation to solve problems can enhance social life in urban areas. The 2000 document "Transition to sustainability in the twenty-first century" was adopted in Tokyo by more than 50 national and international science organizations. The essence of this document is that creating sustainability in cities is a big challenge and it requires more effective use of existing science and technological knowledge through a greater integration between science and wisdom in society as a whole (Carrillo, 2002).

The world's most dynamic cities, however, tend to support and nurture technology and innovation. According to JLL City Momentum Index 2017, the most dynamic cities are spread throughout the world, but more than half of the top 30 in the 2017 ranking are in Asia-Pacific (Figure 5). The City Momentum Index (CMI) measures population, connectivity, technology and R&D, education, economic output, corporate activity, construction, real estate investment and property prices. As can be seen in Figure 5, Bangalore, had the number one spot in 2017. In fact, India took the lead from China, taking six of the top 30, compared with China's five. The CMI is not an indicator of best cities to invest, but it indicates cities that have the strongest short-term socio-economic and commercial real estate momentum, and those that have the future-proofing capacity for longer-term success. It is meant to identify change and introduce cities or metropolitan areas, which may be best at positioning themselves to compete in today's ever-changing economic landscape. While cities change ranks from year to year, only three cities – London, Shanghai and Silicon Valley – have consistently made it into the top 10 since the index was first published in 2014.

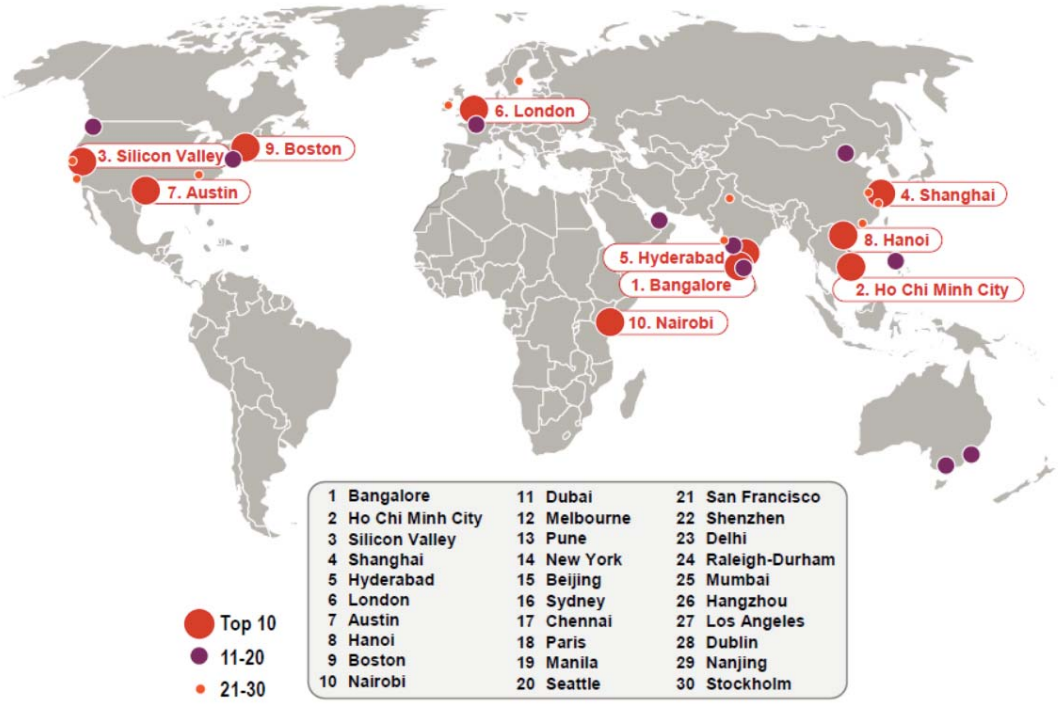

Fig. 5. Top 10 most dynamic cities in the world. (JLL City Momentum Index, 2017**)**

World Economic Forum (2015) introduced top 10 innovations from cities around the world that can provide solutions to variety of urban problems. Many of these solutions are scalable, replicable and can be adapted to a variety of specific urban environments. Some of these innovations make use of existing yet underutilized resources such as space, while others cut the use of resources during peak hours.

Larger cities tend to be more creative because agglomeration favors the creation, diffusion, and rapid adoption of new ideas. Therefore, large cities have the right environment for the emergence of innovative firms and the attraction of firms hoping to create new products. The relative success of innovative cities concept has resulted in a new debate on the relationship between local and regional areas and sustainable development. Storper (1997) emphasizes on the inherent advantages of cities that use social capital to implement sustainable innovations. These advantages may include trust, shared values, norms, “eye” contact and learning. Such elements could promote networks, collaborative relationships and trust building, values that are the foundation of social capital in knowledge cities (Amin, Thrift, 1994; Putnam, 1996; Bagnasco, 1999). Geographical proximity acts as a catalyst for meaningful learning experiences and innovation (Maskell and Malmberg, 1999). This is because innovation is a social phenomenon that depends on interaction so that tacit knowledge shared by a number of institutions in a common space can be transmitted. This means that cities are privileged arenas for social interaction and generation of knowledge (Storper and Venables, 2004).

6. MANAGING INNOVATIVE CITIES IN DEVELOPING WORLD

In most developing countries the central government has a dominant role in the governance of large cities. At the same time, the concept of urban governance has undergone a major transformation over the last two decades. Governance of cities throughout the developing world has been affected by movements towards democratization and political pluralism, emphasis on decentralization, and the rise of civil society. To create innovative cities, it is important to move toward decentralization and ensure the participation of all aspects of public sectors including universities, research centers, non-government organizations as well as the private sector.

Science and technology parks and areas of innovations (STPs/AOI) in developing world face a similar challenge. The role of government in managing STPs/AOI in developing countries is much more dominate than private and business sector. STPs and AOIs can play a significant role in creating a knowledge-based city. The lack of participation of non-government entities in the governance of STPs/AOI might be acceptable to some degree. However, to create an environment for creative class in the scale of large cities requires right planning as well as good degree of local partnerships among public and private stakeholders. Numerous legal and institutional changes might be required in many countries to shape reforms at the local and municipal levels. Consequently, solutions to urban problems are increasingly being sought at the local rather than the state or national level. These trends underscore the urgent need to build and support the capacity of local governments to manage the environmental and social service problems that accompany rapid urban growth. This underscores the importance of creative class in innovative cities and the role of science parks and research institutions.

There is an urgent need, especially in the developing world, for immediate action to deal with rapidly growing urban populations and finding innovative solutions for many urban challenges that are effective and at the same time affordable. The challenges in these fast growing cities demand a long-term commitment by the citizens and leadership of a city. Fast growing innovative cities in developing countries can benefit from joining forces in addressing common problems and developing new and appropriate technologies.

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