SUSTAINABLE DEVELOPMENT GOAL 11

SUSTAINABLE CITIES AND COMMUNITIES

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Brazilian Agricultural Research Corporation
Ministry of Agriculture, Livestock and Food Supply

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Chapter 1

Urbanization: perspectives and trends

Joanne Régis Costa
Patricia da Costa

Introduction

The United Nations predicts that the world's population will continue to rise in the coming decades, reaching 8.3 billion by 2030 and 8.9 billion by 2050. Subsequently, global population will stabilize at about 9 billion. Compared with an estimated 7.4 billion by 2015, 1.5 billion people would thus be added to the world population by 2050, even if fertility instantaneously reaches replacement levels and mortality remains constant at the levels observed in 2010-2015. The UN World Population Outlook for 2017 is the 25th round of United Nations population official estimates and projections prepared by the Population Division of the UN Department of Economic and Social Affairs (The impact..., 2017).

In this context, the impossibility of remaining with the current development model is visible. It is necessary to go for a type of development that integrates the social, environmental and economic dimensions, that is inclusive, offers security and sustainability.

The 2030 Agenda is multidisciplinary, urgent and requires numerous strategies to promote the transformation of the planet. Specifically about Sustainable Development Goal 11 (SDG 11), addressed in this book, the Agenda refers to building more just, democratic, safe, resilient and sustainable cities.

The targets, established within the scope of this objective, related to the mission of the Brazilian Agricultural Research Corporation (Embrapa), are presented in Table 1.

Urbanization

Urbanization was associated with a movement that reached substantial complexity levels, to the point of being considered as the most important contemporary phenomenon, since more than half of the world population resides in urban environments. According to 2050 projections by the United Nations Human Settlements Program (State..., 2008), cities will to hold 70% of humanity.

Table 1. SDG 11 targets related to Embrapa mission and respective indicators.

Target	Indicator
11.1 – By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums	11.1.1 – Proportion of urban population living in slums, informal settlements or inadequate housing
11.3 – By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries	11.3.1 – Ratio of land consumption rate to population growth rate 11.3.2 – Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratically
11.4 – Strengthen efforts to protect and safeguard the world's cultural and natural heritage	11.4.1 – Total expenditure (public and private) per capita spent on the preservation, protection and conservation of all cultural and natural heritage, by type of heritage (cultural, natural, mixed and WHC designation), governmental level (national, regional and local/municipal), type of expenditure (operational or investment) and type of private financing (donations, private non-profit organizations and sponsorship)
11.6 – By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management	11.6.1 – Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated by cities 11.6.2 – Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)
11.A – Support positive economic, social and environmental links between urban, peri-urban, and rural areas, by strengthening national and regional development planning	11.A.1 – Proportion of population living in cities that implement urban and regional development plans integrating population projections and resource needs by size of city
11.B – By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disaster; and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030[(1)], holistic disaster risk management at all levels	11.B.1 – Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030

[(1)] Framework agreed upon at the Third UN World Conference in 2015 in Japan.
Source: Nações Unidas (2016).

At the *Third United Nations Conference on Housing and Sustainable Urban Development* (Habitat III) held in 2016, 167 countries adopted the New Urban Agenda (NUA), which aims to guide urbanization policy for the next 20 years. The NUA points out that by 2050, the world's urban population will almost double, making urbanization one of the most transformative trends of the 21st century (Nações Unidas, 2016).

The 2014 revision of the World Urbanization Prospects (World..., 2014) states that the world's urban population has grown rapidly from 746 million in 1950 to 3.9 billion in 2014, and that Asia, despite its lower level of urbanization, is home to 53% of the world's urban population, followed by Europe with 14% and Latin America and the Caribbean with 13%. Meanwhile, the global rural population has grown slowly since 1950. Currently, the rural population is 3.4 billion, and is expected to decline to 3.1 billion by 2050.

The close relationship between rural and urban areas reveals the need for broad territorial planning and management that seek sustainability in both spaces. The flows of goods, people, money and information between the rural and urban areas reveal this close and promising relationship between these spaces. Such relationship, according to Rosa and Ferreira (2010), allows us to observe the continuities and discontinuities between rural and urban and to rethink the concept of the continuum, seeking to understand rural and urban as parts of the same structure. They also underscore urban and rural permanently transforming comparative advantages and differences, which can only be assessed considering their articulation and contiguity. An isolated approach to any of the spaces is only a partial approach to reality (Classificação..., 2017).

To achieve SDG 11, this interdependence between urban and rural areas must be addressed. Urban areas are highly dependent on fossil fuels, energy, water and food. These natural resources are largely present in the countryside and are vital to supply the population and enable industry, commerce and services to function properly. The richest cities are the ones with higher energy demand and higher rates of solid waste and effluent disposal into the environment.

Population densification in Brazilian urban areas

The UN 2030 Agenda for sustainable development is global, but its targets directly relate to national, regional and local initiatives and can act as a guiding tool for the planning of permanent public policies.

The temporal and regional context that dynamically affects Brazilian society and territory, including the accelerated urbanization process, must necessarily be part of the background upon which one can reflect on the complex issue of urban sustainability in Brazil (Classificação..., 2017). In Brazil, there is a historical increase in urban population due to natural growth and migration of the rural population to urban centers, and it is expected to continue during the 21st century. People prefer cities for the opportunities and services offered, mainly jobs and education. This migratory flow overcrowds cities and their surroundings, lead to so-called slums, irregular and precarious occupancies that do not serve the population well-being.

Advancing unplanned urbanization causes the destruction of natural ecosystems and can alter water resources, among other environmental problems. Poor basic sanitation services are common, negatively impact the environment and pose risks to human health.

The maps of *Atlas nacional digital do Brasil 2017* (*2017 National digital atlas of Brazil*) (IBGE, 2017), released by the Brazilian Institute of Geography and Statistics (IBGE), contain a thematic booklet on sustainable cities. This booklet presents the following theme axes: urbanization, housing and urban mobility; urban environment and safety; planning, democratization and social participation; and culture and heritage. For all that is presented in the maps, one realizes that Brazil is far from having sustainable cities.

In 2017, Embrapa carried out the study *Identificação, mapeamento e quantificação das áreas urbanas do Brasil* (*Identification, mapping and quantification of Brazilian urban areas*) (Farias et al., 2017), which quantified and mapped all areas currently occupied by cities in the national territory. The study pointed out that 54 thousand square kilometers of Brazilian territory are occupied by urban areas, which corresponds to only 0.64% of the total surface of Brazil. This reveals significant population densification in large urban centers, mainly in metropolitan areas of Brazil, largely based on the verticalization of cities, i.e., the construction of large buildings to house residential and commercial activities in urban spaces.

Results of the mentioned study show that only a small part of the Brazilian population lives in the immense Brazilian territory formed by non-urban areas, but which are vast and provide services throughout Brazil: water and energy resources, agriculture and livestock, mining, tourism zones, indigenous lands, forests, conservation units, among others.

The rural, the urban and Embrapa

Considering rural and urban areas as opposed and excluding domains is an arbitrary approach based on physical and geographical criteria that do not consider social and economic processes in these territories (Sarmento et al., 2015). There is a strong relationship between rural and urban spaces, and in addition, there is a need for innovative territorial planning and management solutions.

The great densification of urban areas and the historical absence of integrated urban-rural planning in Brazil reveal important challenges for governments, not only in terms of adjusting the infrastructure, but also of meeting the demand for services and food so as to make cities and human settlements as inclusive, safe, resilient and sustainable as possible, according to SDG 11.

While there is a continuous urbanization, it is known that development cannot be based much longer on the extraction of natural resources, such as coal, gas and oil. In addition to these demands, as the population increases, the world will need preserved water resources and more food, which are produced mainly in rural areas. Therefore, developing alternatives for energy production (particularly from biomass), as well as strategies for the rational use of water, sustainable systems of agricultural production and conservation of biodiversity, is urgently needed. When the need for biodiversity conservation is mentioned, it is most commonly thought of the most endangered species and the consequent loss of genetic information. However, these are not the only damages caused by the reduction of biodiversity, perhaps they are not even the main ones. Much worse is the weakening of ecosystems that make them vulnerable to disasters (Veiga, 2005).

This dynamism and interdependence between rural and urban domains demand information that supports planning and management, thus allowing territorial cohesion, reducing territorial inequalities, promoting rural development, etc. Rural and urban areas must be understood as diverse domains. The use of only one approach, either alone or in combination, should be seen as a partial approximation of reality (Classificação..., 2017).

Thus, Embrapa has been seeking to understand the urban and rural dynamics, aiming at a more sustainable agricultural, livestock and forestry production for the whole national territory. In addition to knowing the profile of the space-time dynamics of agricultural products, Embrapa seeks to understand the trend of territorial evolution, strengthen the response to demands of Brazilian agriculture and anticipate future challenges based on territorial intelligence.

Embrapa has also been supporting the ecological-economic zoning of Brazilian territories, which is an instrument used to plan and organize the territory, following methodological guidelines published by the federal government (Figure 1).

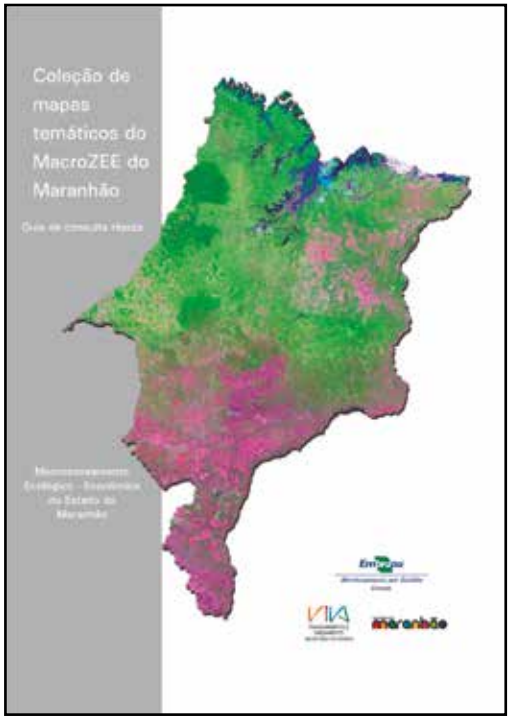

Figure 1. Collection of thematic maps of the macrozoning of the state of Maranhão, produced by Embrapa.

Source: Batistella et al. (2014).

Increasingly, it is necessary to apply technologies that serve different, either urban or rural, contexts and spaces, and integrate different areas such as: food security, small-scale agriculture, biotechnology, agroenergy, agricultural and livestock instrumentation, precision farming and agricultural risk management.

This knowledge generated by Embrapa has been made available to society in general and to meet the demands of the ministries and departments of the Brazilian President's Office, in order offer them strategic views and enable them to make strategic decisions.

Final considerations

Countryside and city are not opposites. They differ by the development logic of production forces and territory uses, by hegemonic and non-hegemonic agents,

so that these subspaces share urban as well as rural contents, since there is no way to explain them dissociating one from the other. There is now a new concept for territory, composed of new urban and rural concepts, and it is necessary to understand it from a new perspective, that is, considering all the elements present in space, which is understood as totality (Locatel, 2013).

In this context, agribusiness is an expression of the urban industrial complex, whose mindset is greatly influenced by the need to export more and more. Agribusiness expresses the marked integration of cities and rural areas, thus making the urban-rural division obsolete (except in cases of calculating national figures). Agribusiness is an immense assembly line that brings together knowledge from Brazilian and foreign science and from the experiences of farmers. For the last 40 years, Embrapa has been promoting a unique technological development in the history of agrarian sciences, the result of which are a vibrant agribusiness, a new economy and an understanding of the technological development capacities to produce and aggravate inequalities, to be a partner in Brazil's economic development, and to help to understand and solve problems of those who have not had access to modern agriculture (Marra et al., 2013).

In the case of family agriculture, which supplies part of the market with a high diversity of food, there is a greater dependence on public policies and basic services, that is, it relies more on governmental investments and entrepreneurship that guarantee an inclusive development and the sovereignty in the food and nutritional security of Brazilians. It is up to institutions such as Embrapa to contribute with inputs for public policies, technological solutions and other actions to empower small and medium-sized farmers. The challenge is to transform the countryside and the city to achieve a truly sustainable development, as stated in the UN Agenda goals.

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