

# Innovation with Spatial Impact: Sustainable Development of the Brazilian Cerrado

Akio Hosono · Nobuaki Hamaguchi ·  
Alan Bojanic  
Editors

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 Springer

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# Foreword

In just over four decades, Brazil has achieved a remarkable transformation of the Cerrado, a vast area of tropical savanna, 5.5 times the land area of Japan. The Cerrado, once believed to be unfit for agriculture, is today one of the most productive agricultural regions in the world. The second of the seventeen sustainable development goals (SDGs) is aimed at ending hunger, achieving food security and improved nutrition, as well as promoting sustainable agriculture. In meeting this goal, Brazil's experience of agricultural development and formation of agro-industrial value chains in the Cerrado, based on technological and institutional innovations, may offer some valuable insights.

Brazil and Japan engaged in technical and financial cooperation through the Japanese Brazilian Cooperation Program for Cerrados Development (PRODECER) as well as other programs to increase grain production in the Cerrado and contribute to the world food supply. Through demonstration and diffusion effects, this cooperation contributed to the increase in agricultural and livestock production, formation of agro-industrial value chains, and sustainable development of the Cerrado region. This book analyzes the process of transformation of the Cerrado, and the economic, social, and environmental impacts of such a transformation.

It is worth noting that Japanese Brazilians contributed significantly to Cerrado agriculture during its inception and early development phases. The soybean and coffee cultivation by pioneers of the early 1970s in a corner of the Cerrado plateau served as the basis for the Alto Paranaíba Guided Settlement Agricultural Program (PADAP). This program was promoted by the State of Minas Gerais in cooperation with the Cotia Agricultural Cooperative founded by Japanese Brazilians. Following on from these successful PADAP experiences, PRODECER was launched in 1979.

This book is the outcome of a research program conducted by the Food and Agriculture Organization (FAO) and the Japan International Cooperation Agency (JICA). It was undertaken through the participation of Brazilian and Japanese researchers and professionals as well as FAO and JICA staff members. We hope

that this book will offer insights that can be applied to other natural resource-based sectors and industries facing similar challenges during the course of their development. We also anticipate that this will contribute to the attainment of the SDGs and, in particular, the second goal.

Tokyo, Japan

Shinichi Kitaoka  
President, Japan International  
Cooperation Agency

# Foreword

The tropical savanna of Brazil, known as the Cerrado, was considered unfit for agriculture for many years. Its highly acidic and nutrient-deficient soil combined with its remote location—landlocked and with a weak transport network—led to an assumption that these were insuperable barriers to development.

Today, the Cerrado is one of the most competitive grain-producing regions in the world. Its transformation over the last four decades has attracted the attention of all those interested in food security, nutrition, and sustainable agriculture. Thanks to this remarkable breakthrough, the Center-West region of Brazil has achieved impressive results in the formation of agro-industrial value chains, the creation of jobs, the increase and diversification of production and trade, and overall socio-economic development.

This book aims to discuss the Cerrado transformation through the unique lens of spatial economics and analyses related thereto. It demonstrates that diverse private stakeholders such as pioneering farmers, agribusiness traders, and agro-processing companies have developed activities of their own initiatives, whilst simultaneously making time-concerted efforts with public and private research institutions, as well as partnering with central and local governments. Their overall contributions progressed in successive phases of agricultural development and culminated in the formation of strong agro-industrial value chains in the Cerrado.

The Food and Agriculture Organization of the United Nations (FAO) and the Japan International Cooperation Agency (JICA) have collaborated on the preparation of this book, conducting a joint research program and organizing joint workshops and seminars in Brasilia and Belo Horizonte. As is known, Japan, through JICA, contributed to the development of the agricultural technology that made the “Cerrado miracle,” possible by cooperating with Brazil on research from the early stages of development.

FAO has three main goals: the eradication of hunger, food insecurity and malnutrition; the elimination of rural poverty and advancement of economic and social progress for all; and the promotion of sustainable food systems and agriculture production.

I am confident that this book will contribute to these goals by providing researchers, practitioners, and the general public with a wealth of useful policy and development insights, based on solid quantitative analyses and evidence. I am also confident that it will contribute to a deeper understanding of key issues related to food security, nutrition, social inclusion, and sustainable agriculture.

Rome, Italy

José Graziano da Silva  
Director-General, Food and  
Agriculture Organization (FAO)

# **Praise for Innovation with Spatial Impact: Sustainable Development of the Brazilian Cerrado**

In 1826, a German economist, Johann Heinrich von Thünen, published a famous book *Der isolierte Staat* (The Isolated State). In his seminal work, Thünen developed the theory of land use and land rent in the agricultural hinterland surrounding a town, familiarized by the *Thünen ring* diagram. Although much less well known, he also studied the mechanism of industrial agglomeration and city formation in the space surrounded by farmland. Thünen's work deserves the credit for the first general theory of location and space economy, encompassing interactions between rural and urban economies. The spatial economics approach was elaborated in the formal model of spatial economics in the 1990s.

The recent history of the Brazilian Cerrado development provides prima facie evidence that the rural sector, directly linked to the global market and with appropriate input of scientific knowledge and capital, can play a leading role. I believe that globalization opens more opportunities for rural transformation. Soybeans are native to China but today, China imports soybeans from South America in great quantities. Production changes locations quite fluidly, but it does not mean that production can take place anywhere. Globalization and localization develop simultaneously. To understand this process, the spatial economics approach is essential because it involves complex spatial interactions such as transportation, supply chains, knowledge transfers, environmental constraints, migration, and urbanization. This book makes an excellent contribution to uncover how the initial development of Cerrado agriculture made a real spatial transformation from unfertile wilderness to a world grain basket with contributions of pioneer farmers, agribusinesses, central and local governments, and international cooperation.

Masahisa Fujita  
Kyoto University



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Akio Hosono  
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Full CV: <http://buscatextual.cnpq.br/buscatextual/visualizacv.do?id=K4769712E4&idiomaExibicao=2>

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His major publication results include Akifumi Kuchiki, Tetsuo Mizobe, and Toshitaka Gokkan eds, *A Multi-Industrial Linkages Approach to Cluster Building in East Asia* (Palgrave Macmillan, 2017). Also, related major academic papers are Tetsuo Mizobe, *Value Chain of Soybean Products in the Brazilian Cerrados* (*Journal of Agricultural Development Studies*, 2014).

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