

Productive Development and Innovation: The Quest for Sustainable Growth

**Proceedings from the 3rd Policy and
Knowledge Summit between Latin
America and the Caribbean and China**

Editors:
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Mónica Salazar

**Institutions for
Development Sector**

**Competitiveness, Technology,
and Innovation Division**

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PROCEEDINGS FROM THE 3RD POLICY AND KNOWLEDGE SUMMIT BETWEEN LATIN AMERICA AND THE CARIBBEAN AND CHINA

第三届中拉政策与知识高端研讨会

生产力发展与创新：可持续发展之道



PROCEEDINGS FROM THE 3RD POLICY AND KNOWLEDGE SUMMIT BETWEEN LATIN AMERICA AND THE CARIBBEAN AND CHINA

第三屆中拉政策與知識高端研討會 生產力發展與創新：可持續發展之道

Editors:
Javier Guerrero C.
Mónica Salazar

ABSTRACT*

This discussion paper summarizes the proceeding at the 3rd China–Latin America and the Caribbean Policy and Knowledge Summit. The summit, held in Medellín, Colombia on October 24–25, 2016, focused on productive development and innovation policies. It was sponsored by the Chinese Academy of Social Sciences (Bureau of International Cooperation and Institute of Political Science) and the Inter-American Development Bank (Institutions for Development Sector), with the support of the Colombian Ministry of Trade, Industry, and Tourism. The paper discusses practices of the design and implementation of productive development and innovation policies at the national, local, and sectoral levels in China, Brazil, Chile, Colombia, Panama, and Peru.

* The editors are Javier Guerrero C., Consultant for the Competitiveness, Technology, and Innovation Division of the Institutions for Development Sector (CTI/IFD), and Mónica Salazar, Lead Specialist for CTI in the Country Office in Colombia (CTI/CCO). The editors are grateful to Roberto Manrique, Operations Senior Advisor (IFD); Claudia Suaznábar, Lead Specialist (CTI/CBO); and Yuan Li, Consultant (IFD) for their valuable contributions to the event and this report. This publication was made possible thanks to the support of the IDB Institutional Capacity Strengthening Fund (ICSF).



INTRODUCTION

The economic relations between China and Latin American and Caribbean (LAC) countries have become increasingly close-knit. Not only has the volume of the exchange grown substantially but the depth of the structural linkage between the two regions has also developed significantly. China's slower economic growth and lower demand for raw materials have adversely impacted LAC countries through the commodity bust, reflecting the low resistance of their economies to external shocks. Under this economic context, the quest for productive development appears as the ultimate solution for both regions. China is going through a painful structural adjustment to diverge from investment-driven to innovation-driven growth, while LAC countries are striving to move up the value chain and increase productivity.

Latin America and the Caribbean

Despite the LAC region's achievements in macroeconomic stabilization and market-friendly reforms, productivity is low and is dragging income convergence with advanced economies. Furthermore, LAC countries are facing challenges to close the gap with the technological frontier. Even countries with the best growth performance in the region are not investing nearly as much in research and development as their peers in Asia, many of which have managed to catch up with other developed countries over the last 20 to 30 years. The policy response to these challenges has until very recently fallen short. The failures of past industrial policies in the LAC region have given a bad name to economic state-led interventions, and have resulted in a timid embracement of these policies. In addition, governments across the region are weary of the incipient public institutional capacity, which could hamper an effective implementation of productive development policies (PDP).

Nevertheless, some LAC countries have recently started to design and implement "new industrial policy" measures. This approach, seeking to avoid mistakes of the past, is set on a new framework oriented toward the provision of public goods and targeted interventions (Crespi, Fernández-Arias, and Stein, 2014).¹ Argentina, Chile, and Peru have already developed such policies; others, such as Colombia, are in the process of implementing them; and others are in the initial design phase. Finally, some countries seem to be willing to undertake these measures (e.g., Ecuador and Mexico). In addition, renewed efforts to promote science, technology, and innovation policies are under way in many LAC countries at both the national and subnational levels.

¹ Crespi, G., E. Fernández-Arias, and E. Stein. 2014. *Rethinking Productive Development: Sound Policies and Institutions for Economic Transformation*. Development in the America Series. Washington, DC: Palgrave MacMillan and Inter-American Development Bank. Available at <https://publications.iadb.org/handle/11319/6634>.

China

China's miraculous high growth in income and productivity for the past 40 years created the "China model," led by a strong and pro-development state that pushes gradual reforms with great pragmatism, all of which is reflected in the country's PDP. However, as argued by many, the essential preconditions that allowed the China model to work are fading away. The low-income stage has passed; the demographic dividend has been exhausted; and environmental and social costs have accumulated. Traditional pillars of the economy such as manufacturing, real estate, and industry are all losing momentum. In this situation, the country is looking toward the "new normal," which implies a new set of PDPs that will emphasize not merely the volume of growth but also the shift to the quality of growth through structural upgrading and innovation-driven interventions.

Summit Objectives

Given the close linkage of the economic structures in China and LAC, it is a good time to open the dialogue among PDP policymakers from the two regions. It will not only be beneficial for policymakers to learn from each other's successes and lessons from failed attempts but also crucial for developing a collaborative channel for key stakeholders from both sides to work together to achieve better growth.

The Quest for Sustainable Growth

The summit started with a discussion on the evolution of the understanding and the pursuit of productive development as a national development strategy, followed by a sharing of experiences in the implementation of specific innovation-related PDP. During the first day, panelists discussed the medium- to long-term strategies for productive development, presenting selected cases of LAC countries and China. These policies have different names, such as productive diversification and smart specialization, among others. Representatives from China shared their more extensive experiences with prospective analysis and policy implementation, while those from LAC presented some incipient but interesting cases with sector selection.

Throughout the rest of the day, the discussions focused on a specific type of PDP-related intervention, namely the development of innovation districts or zones. China has developed industrial parks and clusters as part of its major policy tools to operationalize its strategic development vision, supporting light manufacturing and moving toward a more innovation-driven model. For their part, some cities in LAC countries, learning in many cases from past cluster development experiences, are now developing innovation districts, such as Bogota, Buenos Aires, Guadalajara, *Medellin*, and Mexico City. Unquestionably, both regions could learn from one another, looking at the experiences of setting up industrial parks and new initiatives such as innovation districts. During the second day, panelists addressed the challenges of implementing productive development policies, looking at cases on either the subnational or sectorial levels, or cluster experiences.

Participants included representatives of production ministries; heads of innovation and research agencies; executives from industrial parks; top government officials from China and LAC countries; authorities and officials from the Chinese Academy of Social Sciences (CASS) as well as other Chinese agencies; and international experts, including representatives from the Inter-American Development Bank (IDB).



PROGRAM

Monday, October 24, 2016

OPENING REMARKS

Mr. Xu Wei, *Political Counselor, Embassy of the People's Republic of China in Colombia*

Mr. Cai Fang, *Vice President, Chinese Academy of Social Sciences (CASS)*

Mrs. Yeinni Andrea Patiño Moya, *Director, Productivity and Competitiveness on behalf of Mr. Daniel Arango, Vice Minister of Entrepreneurial Development, Ministry of Trade, Industry and Tourism, Colombia*

Mrs. Ana María Rodríguez-Ortiz, *Manager, Institutions for Development Sector, Inter-American Development Bank (IDB)*

KEYNOTE SPEECHES

The Quest for Sustainable Growth: From Macroeconomic to Innovative Public Policies

A New Look at Productive Development Policies in Latin America

Prof. Manuel Agosín, *Dean, Economic and Business School, University of Chile*

Race to the Top: Policy for Innovative Development in China

Prof. Mu Rongping, *Director General, Center for Innovation and Development, CASS*

COMMENTS

Mr. Jose Miguel Benavente, *Division Chief, Competitiveness, Technology and Innovation Division, IDB*

Prof. Chen Taotao, *Professor, School of Economics and Management; Director, Center for China and Latin America Management Studies, Tsinghua University, China*

PANEL 1

Strategic Priorities for Productive Transformation in Chile: S3 Programs

Mr. Claudio Maggi, Head, Competitive Development Division, Corporación de Fomento de la Producción, Chile

China's Innovation-Driven Strategy and Relevant Key Actions

Mr. Cai Yuezhou, Senior Research Fellow and Director, Department of Quantitative Economic Theory and Methods, Institute of Quantitative and Technical Economics, CASS

Productive Development and Innovation National Policy

Mrs. Yeinni Andrea Patiño Moya, Director of Productivity and Competitiveness, Ministry of Trade, Industry, and Tourism, Colombia

PANEL 2

Industrial Park Development in the Process of Industrialization: Experiences and Problems in China

Mr. Huang Qunhui, Senior Research Fellow and Director General, Institute of Industrial Economics, CASS

Transformation and Upgrading of Industrial Parks in China

Mr. Chen Yao, Director, Department of Regional Economic Studies, the Institute of Industrial Economics, CASS

PANEL 3

The City of Knowledge as a Platform for Knowledge Management and Innovation for Sustainable Development

Mr. Jorge Arosemena, Executive President, The City of Knowledge Foundation, Panama

Parque Biopacífico

Mrs. Ana Isabel Vargas, Advisor, Parque Biopacífico, Palmira, Colombia

Minas Gerais, Economic Growth and Innovation: The Federation of Industries of the State of Minas Gerais

Mr. Olavo Machado, President, Federation of Industries of the State of Minas Gerais, Brazil

Tuesday, October 25, 2016

PANEL 4

Experience and Direction of Regional Development of China

Mr. Zhang Dongqiang, Deputy Director General, Regional Economy Department,
National Development and Reform Commission of China

Rethinking Industrial Policy: The Case of China

Mr. Zhang Xiaojing, Senior Research Fellow and Deputy Director General,
National Institution for Finance & Development, CASS

PANEL 5

Executive Workgroups

Mr. Gonzalo Villarán, Director General, Innovation, Technology Transfer, and
Business Services, Ministry of Production, Peru

*Permanent Work Group for Local Productive Arrangements: Brazilian Policy
for APL*

Mrs. Gabriela Maretto Figueiredo, Coordinator of Clusters, Industrial
Development and Competitiveness Secretariat, Ministry of Industry, Foreign
Trade and Services, Brazil

CLOSING REMARKS

Mr. Huang Qunhui, Senior Research Fellow and Director General, Institute of
Industrial Economics, CASS

Mr. Camilo Garcia Duque, Technological Development and Innovation Office,
Colciencias

Mrs. Ana María Rodríguez-Ortiz, Manager, Institutions for Development
Sector, IDB

VISIT TO RUTA N

OPENING REMARKS

MR. XU WEI, POLITICAL COUNSELLOR, EMBASSY OF THE PEOPLE'S
REPUBLIC OF CHINA IN COLOMBIA



The main theme of the 3rd Policy and Knowledge Summit between Latin America and the Caribbean (LAC) and China is innovation, one that corresponds both to the trends of international development and to the needs of our countries. After thirty years of openness and reform from 1979 to 2009, the economic growth has increased steadily. The average growth of the GDP during that period was 9.9 percent, and recently has continued at 8 percent. The Chinese government—recognizing the unsustainability of this kind of growth—developed a new policy and unveiled five new development concepts with stress on innovation. According to the policy, development must be: innovative, harmonious, eco-friendly, open, and inclusive. Based on these five concepts, China is striving to promote a stable and sustainable development of its economy, as part of realizing the first achievement of its two centennial goals in the year 2021.

At the moment, the revitalization of the world economy continues at a slow pace, and the consequences of the global financial crisis of 2008 are still being felt. During the World Economic Forum on Latin America 2016, held in Medellín, the New Industrial Revolution based on innovation was considered as the starting point for the recovery of the world economy.

In recent years, China-LAC relations have steadily strengthened, especially in economic trade cooperation. Currently, China is the second largest trading partner and an important source of investment in LAC. In recent years, the economic cooperation between China and LAC have been growing rapidly; currently commerce has surpassed US\$200 billion and

China's investment in LAC has reached over US\$100 billion. However, in the face of the new challenges posed by the international economy, it is crucial for the economic cooperation between the two sides to reach a new level, a process in which innovation will undoubtedly be key.

As the participants in this summit are experts and specialists in the study of economic trade relations between China and LAC, I am confident that, through exchanges of ideas and options, they will offer new ideas, methods, and schemes to raise both the quality and the quantity of Chinese–LAC cooperation.

MR. CAI FANG, VICE PRESIDENT, CHINESE ACADEMY OF SOCIAL SCIENCES



After the outbreak of the global financial crisis, the world economy has been depressed as evidenced by slow economic growth rate and economic fluctuations. The International Monetary Fund (IMF) forecast shows that the recovery of the global economy will be slower than initially projected; projected economic growth for 2016 and 2017 will be 3.1 and 3.4 percent respectively. The depression of the global economy has been a source of negative shock to LAC countries as expressed in the sharp decline in commodity prices, irregular international capital flows, and protectionism in trade. Alongside some underlying problems in the LAC region such as a high percentage of informal jobs, low potential growth, low industrial competitiveness and low national saving rate hinder economic development. Under such circumstances it is crucial to develop and promote productive development policies aimed to enlarge the innovative capabilities of the industries and to increase overall productivity.

In recent years, the Chinese economy has been at the stage of development known as the “new normal,” characterized by a more moderate rate of structural growth and adjustments and changes in the engines of growth. As China's growing potential has diminished, causing lesser investment returns, investors are less likely to invest in the real economy,

which has an impact on economic growth. The growth of the Chinese economy was 7.7 percent in 2012 and 2013, and 7.3 and 6.9 percent in 2014 and 2015, respectively. In the first half of 2016, growth was 6.7 percent. Nevertheless, we can claim some positive structural changes. First, the service sectors have become the major engine driving the economic growth in China, providing more than 50 percent of the gross domestic product (GDP). Second, the domestic demand has been the primary pillar to support the economic growth, and consumption has played a more substantial role. Third, central and western China continue to take advantage of the latecomers' effect and they have kept a robust above-average economic growth. Fourth, the development of new drivers for economic growth is being seen, as evidenced by the fast growth in emerging sectors and high-tech sectors, with further innovation in industrial reorganization and business models, such as e-commerce, e-education, and e-health.

As mentioned, currently China is at a new stage of its economic development: the "new normal." Apart from cyclic economic shocks, a significant factor affecting current issues is supply. Focusing only on external factors may lead to implementing a series of fiscal stimuli, displacing the private sector resource allocation role. It may also result in the implementation of actions such as subsidies, which could have a positive effect in the industry, but can also create "zombie industries," enterprises lacking competitiveness. Those adverse consequences get in the way of augmenting supply and improving life standards of the population. In turn, we need to increase fiscal capacities and the supply of public products.

At the new stage of economic development, China has yet to implement the structural reforms on the supply side to move from a model driven by investment to a model driven by innovation, providing new drivers to economic growth. In the 13th Five Year Plan, the Chinese government promulgated the five concepts in development: innovation, harmony, eco-friendly, openness, and inclusion. Those concepts both target the main issues in the Chinese economy and incorporate the new tendencies of economic governance. The structural reforms on the supply side are key for the implementation of the new ideas of development. The structural reforms on the supply side will improve total factor productivity so as to maintain a mid-high economic growth, eliminating unbalanced and unsustainable factors. The long-term goal is to promote innovation driven development and the short-term goal is to reduce financial levers and to reduce costs.

Both China and LAC countries are at a crucial moment to modernize their economies. These countries are facing the challenges of stabilizing economic fluctuations, transforming development models, improving growth potentials, and avoiding the middle-income traps. Therefore, the topic of this summit—productive development and innovation—is of particular policy relevance to both China and the LAC region. As we face similar challenges, we can learn from each other and find better ways of coping with current difficulties.

MRS. YEINNI ANDREA PATIÑO MOYA, DIRECTOR, PRODUCTIVITY AND COMPETITIVENESS ON BEHALF OF MR. DANIEL ARANGO, VICE MINISTER OF ENTREPRENEURIAL DEVELOPMENT, MINISTRY OF TRADE, INDUSTRY AND TOURISM, COLOMBIA



This summit is an opportunity to bring to light the challenges and obstacles that we all face in the design and implementation of productive development policies (PDP), but it will also serve to identify new cooperation opportunities between LAC countries and China. China has shown that it is possible to turn ideas into products and services that contribute to improving living conditions, and has also demonstrated a remarkable transformation capacity.

For the Colombian government, PDP are of key interest; we expect that the implementation of such policies will generate long-term sustainable economic growth, and consolidate a modern, productive and innovative country. Since 2016, with the guidance of the Inter-American Development Bank (IDB), we have worked with private and public institutions on the design of a PDP, and we are currently working on its implementation.

In developing this policy, we used previous tools and programs that aim to solve market and government failures as a departure point, but with a new focus. Solving those obstacles will allow entrepreneurs to provide assorted and sophisticated goods and services. Overcoming these barriers will facilitate high added value products and services to reach around 1.5 billion potential consumers, living in the over 50 countries with which Colombia currently has trade agreements.

Furthermore, we are working toward a sustainable production policy. Colombia, as a signatory of the Paris Agreement, 2015, has committed to reducing the emissions of greenhouse gasses by 20 percent. The Colombian government is working together with industries to reduce carbon footprints.

We have important challenges, but we also have made significant improvements. A good example is the City of Medellin, in which the articulation of industry, academia, and government—the triple helix—has been successfully transferred from theory to practice, producing a substantial socio-economic impact.

MRS. ANA MARÍA RODRÍGUEZ-ORTIZ, MANAGER, INSTITUTIONS FOR DEVELOPMENT SECTOR, INTER-AMERICAN DEVELOPMENT BANK



This summit has been made possible due to the contribution of The People's Republic of China, which together with IDB has created the Institutional Capacity Strengthening Fund (ICSF) to support LAC in issues concerning institutional transformation and policy knowledge. This program successfully promotes knowledge about salient policy and management issues, how to tackle them, and the design and implementation of pilot studies to test solutions. The IDB plays a broker role to facilitate the learning of good practices, build a common agenda around the topic of development, and guarantee the long-term sustainability of the relationship as result of the meetings.

The productivity gap between LAC countries and the United States has doubled during the last 30 years, and the growth rates of LAC countries are both heterogeneous and modest. China, on the other hand, accounts for sustained economic growth, with an average of 9.7 percent. Another significant difference concerns investment in research and development (R&D) in relation to the GDP, which in China grew from 0.898 to 2.067 percent, but in LAC countries saw a modest growth, from 0.57 to 0.74 percent.² China has also made significant efforts regarding the development of human capital.

This summit is the third encounter of a series aimed to share relevant development experiences between two regions that have, albeit at different levels, the same challenges. The first summit was held in Peru on the topic of urban development. The second took place in China on the topic of public sector leadership. We consider that the subject of productive development and innovation is a fundamental issue, not only for our countries but the whole world. We aim to provide some ideas to solve this problem, commonly known as the “productivity puzzle.” Although with different starting points, both China and LAC countries face this problem.

² Source: <http://www.ricyt.org/indicadores> (consulted in April 2017).

KEYNOTE SPEECHES

THE QUEST FOR SUSTAINABLE GROWTH: FROM MACROECONOMIC TO INNOVATIVE PUBLIC POLICIES

A NEW LOOK AT PRODUCTIVE DEVELOPMENT POLICIES IN LATIN AMERICA

PROF. MANUEL AGOSÍN, DEAN, ECONOMIC AND BUSINESS SCHOOL,
UNIVERSITY OF CHILE



Background: Economic Performance of Latin America and Caribbean Countries

It is possible to characterize Latin American and Caribbean (LAC) countries as underperformers when referring to their economic development, and even more so if compared with Asian countries, especially China. Since 1990, with the exception of Chile, the Dominican Republic, and Panama, LAC countries have been diverging from the income levels of the advanced economies. GDP per capita is still 40 percent or less than the standard in the United States, and the only two countries that approach the 40 percent level: Chile and Uruguay.

There have been two prominent development policies implemented by LAC countries: state-led inward-oriented growth, roughly between the 1950s and 1980s, and market-oriented policies since the 1980s. Due to their nature, the adoption of each one meant the rejection of the other. Despite market-oriented reforms across the region, LAC countries

have been unable to grow as rapidly as they did during the import substitution period (roughly 1950–90). Even during periods of favorable external circumstances (such as rising commodity prices), most countries' economic growth lagged behind that of the dynamic Asian countries.

A characteristic of the successful Asian countries has been their capacity to diversify their production and exports to sectors that did not previously exist in their economies and which are technologically more sophisticated than existing production. This capability has allowed them to experience fast growth in productivity and wages. LAC countries remain behind in the process of economic diversification. Diversification should not be understood as import substitution policies, but the creation of new competitive advantages together with sound macroeconomic policy practices. With notable exceptions, most countries still concentrate their production and export structures on a few primary commodities. Products and services requiring sophisticated technologies and advanced human capital are still incipient. The above does not mean that LAC countries should copy the specific policies but suggests that PDP are noticeably absent from the policy toolkit in the LAC region.

Looking Ahead: Toward a New Industrial Policy

The difficulties of creating new sectors imply the need for new development policies. Neither the public nor private sector possesses the knowledge and capacity to create new industrial sectors. This new PDP aimed to complement the market, putting emphasis on new competitive goods, both for the internal market and exports.

Table 1 presents a 2x2 matrix of the PDPs. The columns distinguish horizontal policies and vertical policies. The former seek to correct market failures that may affect the development of many sectors of the economy. One example is subsidies to stimulate on-the-job training. Since trained workers can migrate to other firms or sectors, there is a tendency to undersupply on-the-job training in a market economy. The latter are policies that seek to stimulate production and exports from individual sectors.

Table 1. Typical Policies that Countries Adopt

	Horizontal policies	Vertical policies
Public input	HP <ul style="list-style-type: none"> • Rule of law • Pro-investment business climate • Sound macroeconomic framework • Stability-oriented financial regulation • Free trade agreements • Macro policies, including exchange rate 	VP <ul style="list-style-type: none"> • Sanitary and phytosanitary measures • Sector-specific infrastructure • Business–government councils • Sector-specific regulation
Market intervention	HM <ul style="list-style-type: none"> • General export subsidies • Subsidies for entering foreign markets • FDI subsidies and tax exemptions • Innovation subsidies • SME policies • Financial market access policies 	VM <ul style="list-style-type: none"> • Sector-specific subsidies and taxes or tariffs • Sector-specific FDI subsidies • Subsidizing sector-specific education

Source: Authors' elaboration.

The rows distinguish policies implemented through the provision of public inputs from those that involve the alteration of market prices through taxes or subsidies (and direct state provision). The example given above involves intervention in markets in a horizontal manner (that is, without attempting to alter the allocation of resources to individual sectors). A tariff or subsidy on specific sectors would correspond to vertical market interventions.

Thus, there are four types of policies: horizontal, with the provision of public inputs (HP); horizontal, with intervention in markets (HM); vertical, with the provision of public inputs (VP); and vertical, with intervention in markets (VM). PDPs fall into the three last types of policy. Horizontal policies through the provision of public inputs are usually not considered PDPs. They include the rule of law or macroeconomic stability, which are, for other reasons, essential for the growth process. As discussed below, we will make one exception to this general rule and consider exchange rate policy a tool that fits in this box, but that has large effects on the allocation of resources to new tradable sectors.

Safer policies are those that are horizontal in nature because they do not involve an attempt to choose sectors. At the same time, policies implemented through the provision of public inputs are also to be desired over those that require subsidies or taxes, because they do not create constituencies that favor the maintenance of such incentives. However, there is scope for policies that do involve a degree of verticality and the use of the market intervention.

Characteristics of the New Industrial Policy

First, policies should be transitory and have clear sunset clauses. Upfront, one-time subsidies to investors are better than open-ended income tax breaks that are difficult to remove. Second, policies should aim at encouraging the emergence of human and capital inputs needed by new sectors. For example, this could be achieved through incentives for specific types of higher education or venture capital investing in new technologies, sectors, or exports. Third, policies should involve a considerable degree of self-selection by individual firms and sectors. Rather than choosing sectors outright, it is better to select the type of activity that one wishes to stimulate: new products, new exports, or new technologies. I call these policies “straddle-the-fence” policies because they partake of both horizontal and vertical elements. If, for example, policymakers choose to stimulate the appearance of new exports, existing ones are excluded from the use of the instruments chosen. However, this kind of policy does not select specific new exports to promote and let market forces determine the take-up of the incentives. Fourth, one specific policy that uses public inputs that have yielded good results is the creation of business-government councils that serve as spaces for dialogue between the public sector and the business community. The latter has important information that can guide the actions of the government in providing a framework of laws and regulations that are needed for the successful emergence of new products or services. Finally, maintaining a competitive exchange rate and avoiding the excessive real exchange rate fluctuations that have affected many countries in the region may be the most efficient and cheapest policy to encourage production and export diversification. Table 2 presents a more modern approach to PDPs.

Faster growth needs a more diversified productive infrastructure than the one currently in place in the LAC region, whereby the vast majority of countries depend on a small number

Table 2. New Industrial Policy Matrix

	Horizontal policies	Vertical policies
Public input	Competitive and stable exchange rate	Private–public associations: identification of needs, coordination function
Market intervention		Subsidize provision of human and financial capital to broad sectors
	Straddle-the-fence policies: some selectivity, market orientation in deciding investments	

Source: Authors' elaboration.

of commodities. There is a need to search for new ways of intervening, which accept that the market, under guidance, plays a major role in resource allocation to diversifying regional economies. Finally, it is necessary to review the exchange rate regimes, pointing out not only the aim of low inflation rates but also productive development.

RACE TO THE TOP: POLICY FOR INNOVATIVE DEVELOPMENT IN CHINA

PROF. MU RONGPING, DIRECTOR GENERAL, CENTER FOR INNOVATION AND DEVELOPMENT, CHINESE ASSOCIATION OF SCIENCE AND S&T POLICY



In the last 30 years, China has designed and implemented several visions of development, exploring new demands for science, technology, and innovation. Since 1982, the Chinese government has moved toward the construction of the welfare state and in 2002 it set the goal of a new industrialization. In 2003, the implementation of a new outlook on development began. In 2004 the government proposed the construction of a resource-saving/environment-friendly

society. In 2005 it issued the goal of building a harmonious society. In 2006 it introduced a policy creating an innovation-driven country by 2020, and in 2012, it proposed building an eco-civilization society.

With these initiatives, the Chinese government has designed and implemented several national strategies: in 1978 on “reform and openness” based on exportation; in 1992, on sustainable development; in 1995 on a national reinvigoration through science, technology, and entrepreneurship, in 2002 on reinvigorating the nation through talent; and in 2012 on innovation-driven development.

Since 2001, with the entry into the World Trade Organization, the Chinese economy has made a significant contribution to the world economy. Despite the deceleration of the economy as result of the global crisis, the Chinese economy continues to grow at a good rate. Several factors have played a vital role in Chinese economic development, among them rapid industrialization and urbanization. Industrialization has benefited from generous demographic conditions. Nevertheless, Chinese economic development faces critical challenges; specifically, the industrialization process is growing faster than the urbanization process, and there are generation gaps in the provision of public services. The protection of the environment and a structural supply reform are also important challenges.

The Policy for Innovation-Driven Development

The innovative development policy is based on the five concepts promulgated in the 13th Five Year Plan: innovation, harmony, eco-friendly, openness, and inclusion. The innovation-driven development is not a change in the model, but a different level of development. Innovation within this strategy is more than science and technology. It is a complex value creation process and incorporates science, technology, social, cultural and economic values, each one of them with particular characteristics and therefore requiring the design and implementation of specific policies. In a broad sense, innovation is the first step of all those activities toward development, and specifically, this strategy means that innovation is the main engine of development, which implies a higher level of science and technology, economic, social and related physical infrastructure development.

The policy for innovation-driven development proposes the coordination of different actors with the aim of achieving development goals, with each actor playing a specific role. In the last three decades, China designed and implemented three key policies: the national system of innovation, the technological innovation program, and the transformation of public research institutes. In March 2015, 30 years after the first reform of the national system of science and technology, a new policy was introduced extending the role of innovation beyond science and technology. In May 2016, the Communist Party of the China Central Committee and State Council issued the “National Strategy for Innovation-Driven Development Outline.” Its objectives are as follows:

- Cultivate world-class innovative enterprises.
- Build world-class universities.
- Establish world-class research institutes.
- Develop new market-oriented research and development institutions.

- Construct specialized technology transfer service systems.
- Create regional economic growth poles.
- Innovate the industry technology systems.

The five main points in the policy are as follows:

- ***Development of capacity building in firms and establishing R&D centers inside the firms.*** Key to the success of this policy is that its implementation is the result of coordination of development centers at national, regional and local levels.
- ***Regional development.*** For pilot innovations, we divided the country into eight regions—Shanghai, Guangdong, Anhui, Sichuan, Wuhan, Shenyang, and Beijing-Tianjin-Hebei—involving local universities and enterprises.
- ***National innovation demonstration zones.*** This initiative has been implemented since the 1990s in the form of technology and scientific parks to carry out pilot projects and boost regional economies involving local governments in development.
- ***Innovation-driven cities initiatives.*** Since 2007, the National Development and Reform Commission (NDRC) and the Ministry of Science and Technology have been boosting innovative local initiatives.
- ***Mass entrepreneurship and innovation.*** Since 2014, this initiative proposes to propel innovations at different levels, including the individual level, recognizing that most of the innovations will fail.

Innovation is a process of value creation; it is necessary to gather society potential behind it and support it throughout the policy. It will also generate better platforms for innovation. It is essential to improve the management of public spending in science, technology, and innovation (STI). The reform of financial institutions and finance tools also plays a role in improving innovative capacities. A suitable innovation environment implies the protection of property and intellectual property rights. We need to carefully reflect and plan the internationalization of the R&D of enterprises, the integration of business, technology and marketing models, and finally to boost science, technology, and innovation diplomacy.

COMMENTARIES

MR. JOSE MIGUEL BENAVENTE, DIVISION CHIEF, COMPETITIVENESS, TECHNOLOGY, AND INNOVATION DIVISION, IDB



There are two key issues concerning the discussions about innovation essential to both LAC countries and China. The first issue is value creation, and how value created from innovation reaches the broad society. The second theme is which institutions, actors, and rules, are needed to support change.

A quick glance at the variables regarding innovation demonstrates that LAC countries are undoubtedly far behind. Even making per capita income correction, the efforts in research and development, the investment in human capital formation, and efforts in the production of new knowledge, are strikingly low. There is a contrast in the manufacture and exportation patterns. While in China the exports have increased in value and technology content since 1984, LAC exports have little value added products and are concentrated on a handful of commodities.

Recent studies are starting to provide evidence of a correlation between the export sophistication, added value, technological content, and rent distribution. Countries that concentrate their exports on products with high added value have a better rent distribution. The production of added value and technological content goods requires knowledge, distributed at various levels, which implies that more people participate in the whole process, while the commodities intense economies tend to concentrate production in few hands.

As part of productive development policies, the IDB has promoted a mechanism to help decision makers decide between horizontal, sector-neutral, and vertical, sector-specific, intervention strategies, separating public goods provision, such as physical infrastructure, from market intervention, such as subsidies. From a political economy point of view, the

easiest policies are horizontal and the provision of public goods strategies, while vertical and market intervention have traditionally been problematic.

The strengthening of institutional capacities is fundamental both to solve the above issues and because development and innovation policies are complex. First, they required a process of discovering the right policies, in which trial and error plays a significant role. Second, the design of policies must take into account that effects will be only visible in the mid- and long-term. Third, a close collaboration between public and private sector is needed, making conscious attempts to avoid perverse incentives. Fourth, inter-agency cooperation must be intensified; in the LAC case the efforts are dispersed among several ministries and agencies.

The IDB also promotes evaluations, with the aim of learning from the different types of interventions. Rather than promoting a “best way,” the goal is to find the appropriate policies that match local capacities and existing institutions. It is possible to move toward both a collaborative improvement dimension and a dimension of institutional learning, with the aim of transforming our economies into knowledge-based economies.

PROF. CHEN TAOTAO, PROFESSOR, SCHOOL OF ECONOMICS AND MANAGEMENT; DIRECTOR, CENTER FOR CHINA AND LATIN AMERICA MANAGEMENT STUDIES, TSINGHUA UNIVERSITY, CHINA



A recurring topic of discussion regarding development in LAC countries is the hope of overcoming the dependency on natural resources. Countries are, however, modest when presenting possible solutions, but if we aim to overcome those dependencies, discussions about industrial policy are unavoidable.

The LAC region has benefited to a certain degree from the Washington Consensus and globalization. I argue that when the results of policies and strategies are satisfactory, they should be embraced. However, if the outcomes are not entirely successful, it is necessary for the states to pursue a more direct role regarding industries, throughout industrial or productive development policies.

The discussion about industrial policy is hampered by a reminder of the failures of the past and by the notion that implementing such policies is a step back to old industrial policies, and finally, they are seen as in opposition to globalization. Nevertheless, another interpretation is possible. Choosing globalization was the result of particular conditions, but we are now at a different stage of development, in which the evaluation of results reflects an evolution of our knowledge about industrial policies.

The discussion about industrial policy dating from 1950–80 should clearly state failures and successes, and it is only then that we should make decisions about what to change and what to continue promoting from those policies. A good example is the positive outcomes of some forms of state intervention mentioned by Agosín. Both Agosín and Benavente mentioned two types of policies, horizontal and vertical ones. Agosín stressed the importance of horizontal policies as a way of correcting market failures. I would add the importance of policies in creating a sound business environment for both local and multinationals. Vertical policies target specific sectors or choose a specific part of the value chain to support. I propose that we need both types of policies.

I suggest that for the implementation of horizontal policies we always need a broad scope of encouraging policy for all sectors and all firms, so that the market has room to play its role. However, specific vertical policies are also needed. Countries have to evaluate and analyze the potential of their different industries, and to focus on what they do best. Chile, for example, has prioritized forest industries, given a history of competitiveness, and the challenge is to potentiate this industry. China on the other hand carefully considered the specific characteristics of each industry to design and implement targeted policies.

Industrial policies should take into account the deepening of the globalization process, and the fact that value chains are formed already. If we wish to augment competitiveness, we have two paths. First, to restructure global chain values. If a country wants to build a new value chain within the already formed value chains, this new one should be more competitive than those in place. Second, discover new demand sources. There are two main issues at stake here: the development of an export market and the identification of local specific demand. Local talents, entrepreneurs, and companies are able to discover local demands. In summary, innovation policies are useful to discover solutions to local needs, while helping to build new value chains and enlarge the size of the productive sector.

PANEL 1

STRATEGIC PRIORITIES FOR PRODUCTIVE TRANSFORMATION IN CHILE: S3 PROGRAMS

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Recent Performance

One critical issue in Chile in the past was the lack of integration and coordination between neutral policies and policies oriented to the development of demand and strengthening of capacities. Recent efforts aim to overcome the gap between those two strands of policies, generating systemic ones. There is a new emphasis on strategic analysis and solving coordination problems, along with encouraging prospective studies with the participation of relevant stakeholders.

The Chilean economy has lost some of its previous dynamism. At the end of the 1980s and early 1990s, the growth rate was, on average, 7 percent, while in the first decade of this century it fluctuated between 4.5 percent and 5 percent. In the current decade it is even lower. This tendency is the result of the diminishing contribution of productivity factors. While the Chilean productivity basket has grown, its content remains stable. Chilean dependency on the exploitation of natural resources continues. Currently, more than 80 percent of the Chilean exports are raw materials. As a consequence, Chilean growth patterns are tied to export capacities, this amid a fluctuating exchange rate scenario and the cyclic prices of commodities. During the past 50 years, the content of the productivity basket has been stable, with minor changes due to the entry of light manufacturing, such as wineries and fisheries. Chile also has

a minor and decreasing sophistication level of production if compared with other countries in the region. Investments and economic growth are still strongly linked to mining and copper prices, which represent more than 50 percent of Chilean exports. Notwithstanding that the total productivity factor in the mining sector has been dramatically declining since 2000.

Being a country rich in natural resources should not be an obstacle to producing and exporting other products and services. Countries such as Australia, Canada, New Zealand, and Norway are examples of economies both rich in natural resources and with a diversified export base. However, Chile shows a deficit in innovation, research, and development, well below the rest of OECD countries. According to the National Survey on Innovation (2012–13), concerning products or process innovation, less than 25 percent of local firms systematically recognize innovation. Also, around 40 percent of Chilean companies possess enabling capabilities to absorb new knowledge.

Moving toward more Diversified and Sophisticated Growth

As a strategy to shift from an economy based on natural resources to a knowledge-based economy, CORFO is promoting—in the context of the government's productivity, innovation, and growth agenda—"Smart Specialization Programs." These programs are based on a fourfold participatory approach (government, industry, community users, and academia) and imply the following:

- Identification of new challenges, opportunities for diversification and sophistication within existing or emerging sectors, interaction with principal enabling technologies.
- Detection and prioritization of gaps to achieve challenges and opportunities.
- Construction and implementation of a roadmap with activities to close both technological and competitive gaps.

Combining a Neutral Approach with Focused Innovation Policies: What Areas are We Focusing On and How Do We Approach Them?

As a way to move from natural resources to a knowledge-based economy, we have designed a set of policies combining neutral policies regarding innovation and strategic policies that are target focused. To date, we have identified 11 strategic S3 programs, including seven priority sectors: mining, sustainable tourism, healthy food, creative economy, sustainable construction, health technologies and services, and fisheries plus aquaculture; and four enabling platforms: logistics, solar industry, smart industries, and advanced manufacturing. The idea is that every prioritized sector, utilizing a participatory methodology, builds a roadmap to close their main productivity and technology gaps. These programs were selected based on the following criteria:

- **Good timing:** the moment is favorable to initiate a productive transformation, considering the economic, social, and political conditions.
- **Coordination failures:** the State has a clear role in solving market and coordination failures.

- **Global market potential:** there are significant international opportunities for growth.
- **Significant offer:** to render the current supply more sophisticated, there are capacities and needs to generate knowledge and technology.
- **Sustainability:** the program clearly incorporates a sustainability dimension (social, economic, and environmental).

The joint initiatives and collaborative projects included in the 11 roadmaps cover a broad range of scopes and objectives. Deadlines range from three to nine years. The current portfolio has already leveraged US\$405 million from public financial sources, and a significant amount of committed contributions from private counterparts. Finally, monitoring and impact assessment tools have been designed, taking into account a set of variables to measure governance, social capital, export sophistication, productivity growth, intelligent diversification, and sustainability.

CHINA'S INNOVATION-DRIVEN STRATEGY AND RELEVANT KEY ACTIONS

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China's Economic Growth since 1978

Since 1978, when Chinese leader Deng Xiaoping initiated the "Open and Reform Policy," China has achieved remarkably high economic growth. Between 1978 and 2015, China's GDP had an average growth rate of 9.7 percent per year, increasing from CNY365.02 billion to CNY67,670.8 billion. In modern history, only Japan and Korea have had a similar experience of continuous high growth in the 1950–70s and 1960–90s respectively.

The Chinese growth miracle can be attributed mainly to two factors, its demographic structure, and the latecomer advantage. A low demographic dependency ratio means high savings rate and abundant labor supply. High national savings provided sufficient cash flow for capital accumulation, while the abundant supply of labor helped to reduce the diminishing marginal returns of capital. This resulted in preconditions for the factor and investment-driven growth pattern. The dependency ratio of the population in China is following a decreasing trend, dropping from 73.58 percent in 1978 to 34.49 percent in 2011.

The latecomer advantage mainly comes from the huge technical gap between China and the western developed economies that still existed in 1978. Importing advanced equipment brought very significant technical progress. As a result, along with the fast accumulation of capital, the total factor productivity (TFP) improved significantly.

Background of the Innovation-Driven Strategy

However, China's factor and investment-driven growth pattern encountered a predicament in the 21st century, particularly after the global financial crisis. First, from the view of the national income account, the contribution of capital accumulation to growth is increasing constantly, which results in insufficient internal demand, overcapacity, and over-reliance on overseas market demand. Second, as the technical gap narrowed with the development of the Chinese economy, the TFP growth brought by the embodied technical progress slows down, resulting in the decrease of the contribution of TFP to economic growth. Third, the demographic structure of China has changed. The working age population (15–59) dropped for the first time to 937.27 million, 3.45 million less than 2011, decreasing 0.6 of a percentage point, and the dependency ratio increased for the first time, from 34.49 percent in 2011 to 34.74 percent in 2012. Fourth, there are factors related to natural resources and environmental regulations. External dependence on crude oil reached a record-high ratio of 60.6 percent in 2015. Furthermore, air pollution, water pollution, and land pollution have turned into significant challenges confronted by China. The country was the leading emitter of carbon dioxide in 2010.

The only way to solve the above-mentioned problems, keeping a medium-high growth rate, and achieving the goals of building a prosperous encompassing society, is to accelerate the pace of innovation, particularly technological innovation.

Key Actions of the Innovation-Driven Development Strategy

In November 2012, the Innovation-Driven Development Strategy was formally presented for the first time in the report to the 18th National Congress of the Communist Party of China. Since then, to support the Innovation-Driven Strategy, the Chinese Central Government has implemented the “Made in China 2025,” the “Internet Plus” action plan, the action plan for “The Development of Big Data,” and the “Strategic Emerging Industries (SEI)” initiative.

The SEI was initiated in 2010, aimed at supporting the emerging global technology and future strategic industries and enhancing the innovative capacity of China. This strategy is divided into seven fields: (i) energy efficient and environmental technologies; (ii) next generation information technology (IT); (iii) biotechnology; (iv) high-end equipment manufacturing; (v)

new energy; (vi) new materials; (vii) new energy vehicles (NEVs). It also recognizes the cultural and creative industry.

“Made in China 2025” was first initiated in December 2014, corresponding to the CPS (Cyber-Physics System) of the United States, and particularly the German “Industry 4.0.” It emphasizes smart technology, eco-friendly manufacturing, and the spirit of craftsmen—or craftsmanship—aiming to upgrade the manufacturing industry and transform China from a manufacturer of quantity to a manufacturer of quality. The HUAWEI Kirin 960 and the Shenzhou XI manned spaceship are examples of this new trend.

The term “Internet Plus” appeared officially for the first time in the Report on the Work of the Government in March 2015. In July 2015, the State Council of China issued a document of *“Guiding Opinions of the State Council on Actively Promoting the Internet Plus.”* Internet Plus is intended to: (i) promote the integration of internet technology with the existing industries; (ii) create innovation patterns, or new economy, such as e-commerce, O2O (Online to Offline) sharing economy, platform economy; (iii) improve the efficiency of the economy; (iv) enhance the growth potential and provide more jobs.

In September 2015, the Chinese State Council released the “Action Plan of Promoting Big Data Development,” aiming to conform to the new trend of global technological innovation, particularly in the field of information and communication technologies, and to grasp the potential opportunities in big data. The action plan treats big data as a strategic resource, and aims to: (i) provide a new driving force for China’s economic transformation; (ii) form new competitive advantages based on big data and relevant technologies; (iii) improve governance capacity by utilizing big data analytical technology.

In short, the government of China has implemented a series of concrete policies to promote the implementation of the Innovation-Driven Strategy. An initial survey shows that central government agencies released at least 83 relevant policy documents between November 2013 and July 2016. China’s growth pattern is in the process of significant transformation to an innovation-driven one. With all the relevant initiatives and action plans implemented, China is sure to realize a new level characterized by innovative, harmonious, eco-friendly, open, and inclusive development.

PRODUCTIVE DEVELOPMENT AND INNOVATION NATIONAL POLICY

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Based on its mission statement, the Colombian Ministry of Trade, Industry, and Tourism works to generate policies to promote new structures that reform economic factors and solid long-term actions to increase competitiveness and sustainable economic growth. The Colombian government works in synergy with the private sector and international organizations to ensure that innovative and productive areas gain more market share and to enable the achievement of the goal of building a modern Colombia.

Current Performance

One of the main challenges of the Colombian government is to diversify the export basket. Currently, 80 percent of Colombian exports are raw products. The results of our analysis concerning productivity in Colombia show that for the period 1990 to 2015 it was either negative or zero for half of the years studied. The average growth between 2000 and 2014 revealed that Colombian economic growth comes from capital and labor, but not productivity growth. To overcome those issues we created, using the framework provided by the National System of Competitiveness, Science, Technology, and Innovation, a productive development policy technical committee composed of members of the private and public sector. With the guidance of the IDB, it is assigned the task of designing the productive development policy (PDP).

Productive Development Policies, Strategic Axes

The starting point and a key issue for the creation and transformation of our society, for the creation of a modern Colombia, is the formulation of long-term policies. The recently adopted productive development policy (Document Conpes 3866) aims toward the consolidation

of a much more sophisticated, diversified supply of goods and services with greater capacity to generate value.

Today, Colombia has a focused policy that responds to the needs of the productive sector and provides a guide to concrete actions. The achievement of productive development in the regions is central to the policy. This policy also provides directions for the sophistication and diversification of the products and services basket. This policy contemplates seven strategic axes:

- **Innovation and entrepreneurship.** This strategy is aimed at the generation of high value added entrepreneurship, that is to say, those that have innovative content and that respond to differentiated consumer needs.
- **Transfer of knowledge and technology.** The main aim of this strategy is to produce more and better. Among other actions, it proposes to promote the adoption and adaptation of existing knowledge and cutting edge technology, throughout the productivity-scaling program.
- **Human capital.** This strategy provides concrete measures to develop professionals and technicians according to the needs of the productive sector. Its aim is to attract human capital to the areas relevant to the country and region's productive ventures, promote higher education, and co-finance STEM programs (science, technology, engineering, and mathematics). Also, regulations and incentives will be adjusted to attract foreign human capital to mentioned areas.
- **Financing.** This strategy aims to provide resources to those who produce high added value goods and services. It proposes the development of a private equity and risk capital industry to finance the creation, growth, and expansion of innovative companies. It includes the development of credit aimed at promoting innovation, including rediscount schemes, as well as the development of new financial support schemes for companies in their early stages and the scaling up of R&D and business innovation projects. It also pursues the internationalization of Colombian companies.
- **Productive chains.** This axis aim to create and strengthen connections between supply and demand.
- **Quality.** This axis aims to adapt the offer to international standards that allow access to new markets, but also to adapt to the quality requirements of local consumers.
- **Foreign trade.** This axis seeks to solve coordination and governance failures and to facilitate trade, through strategies such as the development of instruments for promotion and investment, the promotion of trade facilitation instruments, the rationalization of non-tariff measures, and the provision of market access information.

To make decisions about the focalization of the efforts, we carried out a series of studies. The main variables analyzed were current and latent competitiveness, world demand, industrial production, labor, and productive chains. During this phase, the Colombian Atlas of Economic Complexity was a very useful tool.³ The outcome of those analyses indicates that several sectors have the potential for diversification and sophistication of their production

³ See: datlascolombia.com.

capacity: chemical and life sciences, fashion, metal-mechanics, agroindustry, industries 4.0, and tourism. The analysis also highlighted the strengths of Colombian regions in these sectors, and we are currently validating the analysis in each one of the regions, with the aim of achieving a consensus between the results of the studies and local players.

Colombia has already begun its journey toward productive development. The PDP seeks to consolidate human capital that is both relevant and of high quality, responding to the needs of the productive sector. It aims at the strengthening of different financing links to high potential for growth and added value enterprises, and facilitating the insertion of Colombian companies in regional, local, and global value chains.

This PDP will enable the country to conquer new markets, to strengthen trade relations with China, trade partners in Latin America and the Caribbean and the rest of the world. The Colombian government has decided to make efforts toward achieving competitiveness. To accomplish this goal entrepreneurs, government, academia, and citizens must work together, solving the obstacles posed by everyday life, and together achieve sustained growth, in harmony with quality of life for Colombians.

PANEL 2

INDUSTRIAL PARKS DEVELOPMENT IN THE PROCESS OF INDUSTRIALIZATION: EXPERIENCES AND PROBLEMS IN CHINA

MR. HUANG QINHUI, SENIOR RESEARCH FELLOW AND DIRECTOR GENERAL, INSTITUTE OF INDUSTRIAL ECONOMICS, CASS



Since the “reform and openness,” China has quickly promoted a process of industrialization and has maintained a double-digit economic growth for over 30 years. The fulfillment of China’s industrialization, expected by 2020, will have a considerable impact on the world’s industrialization process. Industrial parks have played a significant role in China’s industrialization process and have promoted economic development in different regions. These parks are spaces where multiple functions including the accumulation of production factors, improvement of intensiveness, enhancing industrial characteristics, and optimization of industrial layout take place through policy guidance, modern industry labor division and collaboration.

China has a population of 1.3 billion and a vast territory, comprised of regions with different resource endowment, economic conditions, and development levels. The country plans to quickly and continuously promote the industrialization process, allowing creativity and exploration of local industrialization models, such as the Southern Jiangsu model, Wenzhou model, and Pearl River Delta model. In the process of advancing regional industrialization, industrial parks have played an important role. We can distinguish three main phases in the development of industrial parks in China:

- **Phase 1: Promotion and demonstration.** From the 1980s to the beginning of the 1990s (Shenzhen Shekou Industrial Park; Dalian economic and technological development zone in 1984).

- **Phase 2: Construction.** From the mid-1990s to the beginning of this century. Thousands of industrial parks of different types, scales and levels were gradually built. In August 1998, with the Torch Plan, China implemented the national high-tech industrialization development program.
- **Phase 3: Transformation and upgrading.** After entering the 12th five-year plan, accompanied by China's economy gradually stepping into the new normal, the industrial parks entered the transformation and upgrading stage.

Accomplishments and Experience of China's Industrial Parks Development

From a national perspective, the gross value of the industrial output of the industrial parks provides more than half of the local gross value of industrial output. For example, in Xiamen city the industrial parks contribute 90 percent of output. Most of the industrial parks are also major tax contributors. In 2014, Suzhou Industrial Park paid direct tax of CNY53.46 billion, CNY23.89 billion of which was national tax, CNY16.38 billion was land tax, and CNY13.19 billion was customs tax. In Suzhou Industrial Park, the permanent resident population was about 781,000 and the tax contribution per capita was CNY68,500, which was 7.7 times the national average. The administration area of Suzhou Industrial Park covers 278 square kilometers. The tax contribution per square kilometer reached CNY192 million, which was 148 times the national average.

After decades of development, we can summarize the main achievements of China's industrial parks:

- Guiding the aggregation of industries in industrial parks to solve the problems of enterprises scattering across different areas and unregulated land exploitation.
- Conducting infrastructure construction supplying water, power, transport, communications and drainage and site leveling, raising funds by using financial investment, land leasing, land mortgage lending and other means.
- Increasing support for industrial parks to finance investment promotion and capital introduction to attract businesses and to make investments in corporate development, common technological platform construction, and public services to continuously improve the "soft environment."
- Shaping organizational safeguarding mechanisms, setting up management committees with key personnel selected from relevant government departments and various development companies to take charge of land development, investment and financing in infrastructure, property management and other operations in the parks.
- Following the rule of industrial structure evolution during the industrialization process to address the relationships between heavy and light industries, between cities and rural areas as well as between the market and government, while adapting to and directing the transformation and upgrading of industrial structure.

Issues and Challenges Facing China's Industrial Park Development

Despite the impressive achievements of industrial park development under the “new normal,” with economic development shifting from a rapid growth rate toward a medium-high rate, some issues need to be addressed. First, the management system can be improved. Some management services are still insufficient. Industrial parks, with various industries, and their supervising entities make the management of industrial parks difficult, because of overlapping authorities and non-efficient decision making.

Second, industrial parks are not planned and arranged in a forward-looking and scientific way, which lead to low efficiency in land development and use. The intensity of land investment and output is low. Some industrial parks' development even became an enterprise “enclosure movement,” and the contradiction between park layout and urban development is increasingly prominent.

Third, industrial parks lack functional supporting facilities. There are problems with infrastructure construction that we can summarize as “emphasize production, despise life, value development, and neglect support.” The development of industrial parks has paid too little attention to common technology service platforms, innovation service networks, and regional innovation systems, amongst others. According to a survey on industrial parks in Fujian, among the 45 sampled parks, 44 percent do not include non-industrial enterprises. Even for the parks that do, only small-scale service companies are included. The non-industrial enterprises account for 38.6 percent of the total amount of enterprises; however, the output value accounts for only 5.5 percent of the gross value of output.

Fourth, the development of leading industries is sub-standard and homogeneous, with less obvious effects of industry clusters. Some industrial parks do not have outstanding industrial characteristics, and the development is low level, homogeneous, and excessive.

Fifth, technological innovation capability still has room for improvement, while industrial transformation and upgrading are awaiting an impetus. Conditions at the time of development of some old industrial parks constrained the technical level of some other parks. However, even some newly constructed industrial parks have disconnection problems between manufacturing and innovation and R&D, because they lack clear industrial development planning, leading to low innovation capacities.

Trend and Policies for the Transformation and Upgrading of China's Industrial Parks

To adapt to the new normal economy and to continue their role as a crucial element of economic development, industrial parks should change their model from a quantity-oriented expansion to quality-focused improvement, and we should implement the following actions:

- Deepen the operation and management system reform, encouraging local innovations in the administration system, personnel arrangement, and operation pattern and so on,

to improve the relationships between industrial park agencies and the local governments establishing long-term mechanisms for their interaction and coordinated development.

- Continue the improvement of the supporting facilities, attracting social capital participation to improve the supporting infrastructure capacity of the industrial parks while solving the infrastructure debts problem in the less developed areas. Promoting the transformation and upgrading of industrial parks should adhere to the ideas of classified guidance, with measures adjusted to local conditions, and integrating production and the city.
- Boost the technological innovation capabilities and accelerate the pace of construction of demonstrative industrial parks. For this goal, we should take into consideration the strategy of “Made in China 2025” and the “Internet Plus” action plans.
- Consolidate the management and mechanisms of coordination of the national industrial parks. The national level of coordination should take into account differences due to local context and that localities face unique problems due to their different industrial structures and types, as well as their various stages of economic development.
- Promote the alignment between Industrial parks and the “Silk Road Economic Belt and the 21st-Century Maritime Silk Road” or “One Belt One Road” initiative. By the end of 2014, China had built 118 cooperation zones in 50 countries, 77 of which are in the 23 countries along “One Belt One Road.” China’s foreign economic and trade cooperation zones consist of four types: processing and manufacturing, resource utilization, agricultural processing, and trade logistics. More than 2,790 Chinese enterprises have reached into these cooperation zones. In the future, we should encourage the building of industrial parks in the main transportation hubs and the port cities along “One Belt One Road” with the support of the National Development Bank, the Silk Road Fund, Asian Infrastructure Investment Bank and other financial institutions. We should adhere to the principles of government guiding, enterprise acting, and market operating. The government should help enterprises with regard to national guidance, industry guidance, and overseas security risk prevention.

TRANSFORMATION AND UPGRADING OF INDUSTRIAL PARKS IN CHINA

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Industrial parks in China are recognized as an important engine for regional growth. Economic growth in the parks is higher than the average across the regions. They have been an important vehicle for China's opening up, a demonstration of transformation and upgrading, an important platform for industrial agglomeration, and a test area for system reform.

The concept of industrial parks encompasses different strategies, such as the special economic zone, the development zone, the border economic cooperation zone, the free trade zone, new urban districts, the specialized towns, the economic and technologic development zone, and the high-tech zones. The first industrial park appeared in the early 1980s when the Shenzhen Special Economic Zone was established. In 1988, the high-tech zone was created, and in 2015, there were 219 national parks and 147 provincial industrial parks.

New Challenges of Industrial Parks

Industrial parks need to overcome two main challenges. First, there is a need to clarify and intensify the path of industrial transformation and upgrading processes, to strengthen innovation capabilities and to enhance the modern service industry, which is lagging behind comparatively. Second, the business environment needs to be improved; there is a need to upgrade administrative efficiency, the legal environment, and financing mechanisms. Most of the land development in national parks is inefficient, and it is necessary to solve problems related to the extensive use of land, and to improve energy saving and environmental protection in some industrial parks.

Trends and Directions of Industrial Parks

- ***Diversification of investment and management:*** Currently, the government carries out investment in and management of industrial parks. In the future, companies will also play a major role.
- ***Orientation toward the provision of services:*** We should shift the focus of the industrial parks from manufacturing to provision of services, such as scientific innovations, financial services, and cultural and tourism services, the proportion of which should steadily increase.
- ***Development of service platforms:*** The parks should be transformed into service platforms for innovation and entrepreneurship offering complete services for industries from product development and asset incubation to an investment service for customer and property operation.
- ***Increase ecological efficiency and intelligence:*** As requirements for the buildings, surroundings, and services in the park increase, we should use modern communication technology both online and offline to make the industry and management more intelligent and efficient.
- ***Integration of production and the city:*** The upgraded version of the traditional industrial park development should include intensive use of land, clusters of industry, overall plans for improvement of urban functions, and entire commercial value.

Policy for Transformation and Upgrading of Industrial Parks in China

Since 2014, the relevant departments in the Chinese State Council have provided guidance on the innovation and development required for the transformation and upgrading of the national development zones. This guidance also serves as instructions for various types of industrial parks at different levels. The direction of development of the industrial parks in China is to build the national economic-technological development zones as an important vehicle of regional economic development. This trend also contemplates the implementation of a development strategy on a regional level. In this sense, the aim is to transform the parks into a vanguard, a safe place for mass entrepreneurship and innovation, constructing the new system of open economy and creating new advantages to attract foreign investment, demonstration zones for scientific and technological innovation-driven and intensive eco-friendly development. The goals of this strategy are as follows:

- ***To optimize the industrial structure and overall arrangement.*** This involves promoting the coordinated development of the advanced manufacturing industry and the modern service industry, pushing for advances in research and development, logistics, service outsourcing, finance, and insurance.
- ***To improve the driving ability of technological innovation.*** This involves encouraging the construction of various forms of synergic innovation platforms to form industrial clusters.
- ***To strengthen human capital by promoting skilled technical talents.*** This involves diverse strategies of cooperation between China and other countries, supporting the

establishment of venture capital guidance funds, venture capital discount and intellectual property shares, and other ways to set up docking platforms for talents and industry.

- **To set up and modernize an innovation financing system.** This involves the creation a combined funding system through cooperation between the public sector and private capital.
- **To promote the computerization of industrial parks.** This implicates supporting the development of software and information services, the internet, cloud computing, and other industries, using information technologies to expand the traditional industry chain and enhance the industrial added value.

Case Study: Specialized Small Towns of Zhejiang Province

China is currently promoting and building specialized small towns nationwide. The aim is to build about 1,000 individual towns by 2020. The specialized small towns will spread gradually from the Yangtze River Delta to the whole country. This process has turned into an important vehicle to attract outside investment and play a major role in industrial transformation and upgrading. It focuses on industrial characteristics and emphasizes industrial specialization and the integration of industries and the city. The specialized small towns represent a new type of industrial park and a new intensive, low carbon, intelligent road to urbanization.

The local government of the Zhejiang province, with an investment of CNY500 billion, will build 100 specialized small towns within three years, each one covering an area of about three square kilometers and focusing on a particular specialized industry, with cultural and tourism functions. These towns will cover industries including information technology, high-end equipment manufacturing, environmental protection, and finance, as well as traditional industries such as tea and silk. By 2015, the first 37 specialized towns in the Zhejiang province had attracted 3,207 enterprises, including 21 Fortune 500 companies, helping to create 46,000 new jobs and 431 new construction projects.



PANEL 3

THE CITY OF KNOWLEDGE, PLATFORM FOR KNOWLEDGE MANAGEMENT AND INNOVATION FOR SUSTAINABLE DEVELOPMENT

MR. JORGE AROSEMENA, EXECUTIVE PRESIDENT, THE CITY OF KNOWLEDGE FOUNDATION, PANAMA



Creation, Development, and Contribution of the City of Knowledge

The City of Knowledge Foundation (FCDS) was created as a private non-profit organization in 1995. The first office opened in January 1997, but it was only on December 2, 1999 that it started to be fully operational and moved to the current buildings, Clayton Fort. The creation of the City of Knowledge (CDS) was the result of the vision of two entrepreneurs, who had also worked at the Ministry of Foreign Affairs, guided by the idea that the 21st century would be the century of knowledge.

Currently, around 7,000 people are working with the CDS as well as 82 companies in diverse fields, around 40 percent working on information technologies and a substantial number working on biotechnology. There are also 2 vocational and technical training institutions and 21 higher education and post-graduate programs. There are 18 international organizations, 30 offices of non-governmental organizations and 8 government offices working on STI issues.

It was only in 2000 that the first business incubator was created in the CDS. We moved to a company accelerator, which is currently an innovation center. This role can be illustrated,

for example, by the Development and Innovation Development Program, which involves the participation of 153 people (entrepreneurs, consultants, mentors, experts, freelancers, CEOs, programmers). In 2016 we invested US\$175,000 in five start-ups. Additionally, and with the support of the IDB, we carried out “The Channel Entrepreneurship Program,” aimed at promoting the growth and management of companies led and operated by women, through improved performance in access to financing and new markets. As result of this program 1,200 women entrepreneurs have been trained; there are 75 mentors, 15 agreements with other members of the innovation ecosystem, and we have reached some 5,000 women around the country.

In 2016, the CDS contributed US\$400 million to the economy of Panama. This figure may not be significant in quantitative terms but is in qualitative terms, because of the contribution of the CDS to developing new ideas and the promotion of new companies and start-ups.

The City of Knowledge and Relations between LAC Countries and China

Recent Chinese economic growth and its participation in the economy of knowledge indicate the need to strengthen cooperation between the CDS and China. It is worth noting some key issues concerning the trade relationship. The commercial trade balance is currently in China's favor and China is the second user of the Panama Canal, the latter being a highly relevant point for Panama.

Science, Technology, and Innovation Policies and the City of Knowledge

The office in charge of formulating science, technology, and innovation policies in Panama is the National Secretariat of Science and Technology (SENACYT), and it is based in the CDS. The objectives of STI policies are competitiveness, sustainability, and inclusion. SENACYT also designed the National Science, Technology, and Innovation Plan (2015–19), taking advantage of the scientific and innovative environment provided by the CDS. The main components of this policy can be summarized in five dimensions expressed in their permanent programs: (i) a science, research, technological development, and innovation program for sustainable development, (ii) science, research, technological development, and innovation for social inclusion, (iii) development of entrepreneurial innovation and dynamic entrepreneurship for sustainable competitiveness, (iv) strengthening of science and national scientific capacity, and (v) strengthening of the governance capacities of the system.

CDS is a platform to foster cooperation among scientists, researchers, and investors. It is an ecosystem in which, on a daily basis, there are interactions between researchers, entrepreneurs, start-ups, academic programs, and international institutions. CDS seeks to strengthen the alliance between the LAC countries and China by taking advantage of the CDS platform, and based on the development of science, technology, innovation, and human capacities.

PARQUE BIOPACÍFICO

MRS. ANA ISABEL VARGAS, ADVISOR, PARQUE BIOPACÍFICO, PALMIRA, COLOMBIA



The Parque Biopacífico is the result of a public-private partnership, with initial funding from private capital, and promotes an integration model for national, regional, and local levels of the government. It is a meeting place that brings together universities, centers for research and technological development, public and private companies, Colombian and international organizations, and central and regional government agencies. Parque Biopacífico is a knowledge-based development pole, with the largest critical mass of researchers in the country. Currently there are more than 1,400 international and national scientists working in the Park.

The Parque Biopacífico is located in the city of Palmira (department of Valle del Cauca). The area of the park is 1,000 hectares and its location allows access to both international and national markets. It is located 17 kilometers northeast of Cali—the capital city of the department—and 10 minutes away from the Alfonso Bonilla Aragon International Airport, near the free trade zones Palmaseca and Pacífico, and the seaport of Buenaventura—Colombia's main port on the Pacific Ocean. Additionally, there is a railroad northwest of the park that, while currently underused, is being refurbished, and will soon resume its role easing transportation with the port of Buenaventura. Additionally, the region has one of the best road infrastructures in Colombia. The economy of Valle del Cauca is well developed and diverse, presenting multiple value chains, real estate at competitive prices, and a young and highly qualified workforce. Valle Del Cauca also has excellent research ability and tradition reflected in the many investigation and technology development groups, related to life sciences and the agroindustry.

Development Strategy 2011–2030

The development plan of Parque Biopacífico has three phases:

- **Phase one: foundation (2011–12).** This included the initial design proposal, structure of the agreements between the park promoters, the legal arrangements, agreements between the public and private sector, the establishment of a management agency, the design of the first service portfolio, and a development plan to procure financial support.
- **Phase two: consolidation and growth (2013–20).** This phase includes the implementation of science, technology, and innovation (STI) services, intellectual property management (IP) services, training programs, and business incubation support services on a limited scale. If feasible, the adaptive reuse of buildings is encouraged. Other features of this phase are: designs for the development of new, future infrastructure, strengthening extension services and technology, transfer and commercialization of services, attracting new organizations and companies, and strengthening international cooperation.
- **Phase three: stability and maturity (2021–30).** The goal is to ensure the stability of the parks' services and increase the number of enterprises joining. At this stage we expect the park to fulfill an advisory role concerning issues of regional and STI policies.

Taking advantage or updating current local capacities, the park will focus its efforts in three areas in the coming years: fruits/vegetables, sugar cane and biofuels, and biodiversity. The park is also planning and promoting the development of a well-built regional and national bio-industry, and consolidating its model as an innovation ecosystem. As such, it should cover entrepreneurial and innovation issues as a fundamental process to promote the region's social and economic development. This implies permanent and systematic support to entrepreneurs within an encouraging surrounding for collective learning, and an exchange of experiences and collaboration, where institutionally and growing connections between the parties play a leading role. To succeed, the park must work on three interactions: coordination (a transaction based alliance), collaboration (a co-creation relation) and cooperation (of value creation in the whole park's ecosystem). During its current development stage (growth) the park has moved from coordination to collaboration while focusing efforts on cooperative interactions.

Biopacífico Park Infrastructure

There are currently 1,000 hectares of potential development. The most important infrastructure projects are as follows:

- **Growing a native forest within the park to use it as a perimeter protective barrier (around 193 hectares).** This barrier will have multiple uses. It will allow biodiversity preservation and will become a germplasm bank to reinforce research in forest ecosystems. It will also be a pilot project for carbon sequestration, a place for the social appropriation of science and research, and space for amusement and recreation.
- **Building a special connecting area (around 5.48 kilometers).** This will provide unity and coordination by linking the current institutions' infrastructures.

- **Building the administrative offices.** Complementary to these projects, there are several construction companies developing projects to increase housing and urban development supply.

Service Portfolio

Park services are grouped into five categories:

- **STI services:** management of research, development, and innovation specialized in agro-business and with access to more than 1,400 researchers developing alternatives to strengthen the competitiveness of productive value chains; researching the entire value chain to make decisions about what to plant and where to plant; technological options for planting and crop management; harvesting and handling processes, covering the development of alternative processing and generation of products with increased added value.
- **Intellectual property management:** the Park offers IP services through the Support Center for Technology and Innovation (CATI), supported by the Superintendence of Industry and Trade and the World Intellectual Property Organization (WIPO).
- **Training:** training a new generation of entrepreneurs and researchers who contribute to the productive transformation of the agricultural industry in the region and the country is a priority activity for the park. It is procured throughout academic offerings at the National University of Colombia, the Universidad del Valle and the Universidad Pontificia Bolivariana. Through the participation of the National Training Service (SENA), the park it is actively involved in the training of technicians and technologists.
- **Business incubation and acceleration services:** this includes studies on the feasibility and viability of new products, formalization processes for new companies, developing the creative and innovative capacity of entrepreneurs, strategies to protect new developments, resource mobilization, and networking.
- **Infrastructure and support services:** this includes legal, accounting, organizational, and technical assistance, conferences facilities, accommodation services, banking services, travel agency, post office, nursery, sports areas, and shuttle services to and from Palmira and Cali.

Tax Incentives and Benefits

Becoming a member of Parque Biopacífico includes the following tax incentives/benefits. Regarding national taxes, there is a reduction in income tax of up to 175 percent for STI projects. Moreover, the park is currently working on obtaining free trade zone benefits. At a local level, the park is classified as special management zone, which implies commerce, property, and trade tax exemptions.

MINAS GERAIS, ECONOMIC GROWTH AND INNOVATION: THE FEDERATION OF INDUSTRIES OF THE STATE OF MINAS GERAIS

MR. OLAVO MACHADO, PRESIDENT, FEDERATION OF INDUSTRIES OF THE STATE OF MINAS GERAIS, BRAZIL



Minas Gerais State Figures

Minas Gerais is the fourth major Brazilian state in geographic expanse and is located in the southeastern region of Brazil, sharing borders with the states of São Paulo, Mato Grosso do Sul, Bahia, Espírito Santo and Rio de Janeiro. With 21 million inhabitants (2014), Minas hosts the second largest state population in Brazil. The human development index in the state was 0.731 in 2010, a high development level as per the United Nations methodology. Minas Gerais has 531,000 companies that employed 4.8 million workers in 2013.

The state is home to the country's second greatest number of students and has the largest number of federal universities. The Federal University of Minas Gerais has the greatest number of engineering students in Brazil (more than 5,000), and is a leader in obtaining patent registers: 439 national and 89 international patent registrations, most of which are from science and engineering fields.

The Federation of Industries of the State of Minas Gerais

The Federation of Industries of the State of Minas Gerais (FIEMG) works to make the state industry more competitive, innovative and sustainable, and capable of generating new businesses, wealth, and development. The mission of the FIEMG is to lead the state industry's sustainable development process while strategically focusing on the following guidelines: quality of life; representation of interests; industrial development; education and corporate management; and innovation and technology, being essential contributions to the industry in Minas Gerais, and generating results that sustain competitiveness. Our aim is to transform Belo Horizonte into the knowledge, innovation, and culture capital of Brazil.

FIEMG's initiatives, realized with partnerships with public and private organizations, include several projects aimed at supporting innovation in Minas Gerais state's production chains. These projects adopt differentiated methodologies, such as: interventions made with the goal of increasing productivity in industries inserted in the main local productive arrangements; road mapping development to open new markets for the metal-mechanical industry sector and improve the oil and gas industry supply chain; development of micro-, small and medium-size suppliers in the state; identification and proposals of collective actions over the short-, medium-, and long-term for the state's main industry sectors, encompassing not only traditional state sectors, but also those with a technological basis; and fostering the state's innovation culture by providing support to start-ups.

Concerning specific industry sectors, we understand that innovation concepts involve a successful exploration of new ideas. That is why it is fundamental for innovation zones to have an organizational arrangement that makes every single stage of an innovation process feasible, all the way from the generation of ideas to their implementation in the market.

The Innovation, Technology, and Science Act, approved by the federal government in January, 2016 with the aim of simplifying processes and reducing taxes to foster the importation of research materials, allows universities to share teams and labs with industries for research projects and holds intellectual property rights over results.

It is worth pointing out that even though industrial activities in Minas Gerais are still concentrated mostly in the mining and steel industries, the state holds a vast territory that features strong socio-economic diversity. Overall, there are 12 micro-regions, among which are the northern and northeastern regions that typically enjoy the presence of more traditional and labor intensive industries, the western region, which features high development in the agribusiness chain, and the mid-southern region that hosts the state's largest technological base and industrial grid. Therefore, differentiated policies are required to foster competitiveness in the state.

The competitive advantage of the state of Minas Gerais is that the innovation network is composed of several different institutions that encompass specificities ranging from the most traditional sectors to those with a technological basis. Organizations such as FAPEMIG—the Minas Gerais State Research Support Foundation, BDMG—the Minas Gerais Development Bank, and SENAI—the Industrial Training National Service—constitute an institutional governance able to support every single innovation link from the generation of ideas to the implementation of diffusion to the market, carrying out applied research and required tests, and providing financial resources.

With the objective of making Minas Gerais less dependent on commodities, public and private innovation networks are proposing more investments in advanced manufacturing areas and industry 4.0. Those investments will help to build up opportunities and leverage business potential in sectors such as mining, metal mechanical, automotive, agro-industry, fashion, steel industry, biotechnology, information technology, electro-electronics, new materials, renewable energies, health, and aerospace industry.

Our intention is to consolidate a knowledge agenda that will allow Minas Gerais to adapt and excel in the ongoing transformations the world economy is undergoing. After all, when the goal is to rebuild economic growth, producing more of the same is not enough. Our initiatives must go alongside a growth strategy focused on the capacity to produce better, add value, and generate new solutions for an increasingly demanding market.

PANEL 4

EXPERIENCE AND DIRECTION OF REGIONAL DEVELOPMENT OF CHINA

MR. ZHANG DONGQIANG, DEPUTY DIRECTOR GENERAL OF REGIONAL ECONOMY DEPARTMENT, NATIONAL DEVELOPMENT AND REFORM COMMISSION OF CHINA



The Progress and Achievements of Regional Development in China

Since the founding of the People's Republic of China, regional development has been continuously modernized and enriched. China's regional development can be divided into four stages. The first stage, 1949–78, was characterized by a weak industrial base and the promotion of inland industrial distribution moving industries from the coastal area to China's inland. The second stage, 1978–95, was the beginning of the reform and openness process, in which coastal areas took the lead in development in China. During this period, the first special economic zones were established, and a series of strategies and openness to foreign investment were introduced, promoting economic growth and convergences with other countries. As a result, the gap between coastal areas and the inland increased. During the third stage, 1996–2012, a regional coordinated development overall strategy was designed and implemented. This strategy pursued the goal of reducing the development gap between regions.

Stage 4 is currently ongoing and began in 2012. During the new phase coordinated and shared regional development is promoted based on the overall strategy of regional development

and guided by the construction of the “Silk Road Economic Belt and the 21st-Century Maritime Silk Road,” or “One Belt, One Road,” the coordinated development of the Beijing-Tianjin-Hebei region and the development of the Yangtze River economic belt.

The main achievements of the regional development strategy are: (i) building a new regional development structure (Beijing-Tianjin-Hebei, Pearl Delta River, and Yangtze River); (ii) optimization of the regional growth pattern, (iii) exploitation of regional comparative advantages; (iv) improvement of the level of regional integration; and (v) enhancement of regional sustainable development capabilities.

To measure the regional development and guarantee a balanced growth we consider five aspects: (i) the GDP gap has to remain within a 10 percent range, (ii) reduction of regional core competencies, to reduce the Matthew effect, (iii) equality in access to public services, (iv) exploitation of comparative regional advantages, and, (v) the relationship between development and environment.

Main Experience of China's Regional Coordinated Development

After many years of research, design, and implementation of regional development policies, we have developed major approaches in the promotion of regional coordinated development of China. These approaches deal with five key issues: (i) top-down strategic planning and leadership strengthening institutional support for regional development; (ii) planning and optimizing of regional resources; (iii) management of policies in support of the enhancement of regional development capabilities, taking into account differences between regions; (iv) investment support and point-to-point assistance to boost the development of underdeveloped regions; and (v) institutional development and improvement of the coordination mechanisms for regional development.

We also have accumulated several experiences of good practice in regional development: (i) to use regional development policies as an important means to promote regional coordinated development and develop specific target policies; (ii) target specific regions to promote the development of the lesser developed area; (iii) use urbanization as a driver for regional coordinated development; (iv) establish functional zones to encourage development in the regions; and (v) institutional improvement to the enhancement of integration and coordination between regions, establishing offices in charge of coordination.

The Direction of China's Regional Coordinated Development

The mission is to implement the overall regional development strategy and regional planning, supporting the special areas. This includes Go-West, the revitalization of the northeastern region, the rise of the central region, and the leading development of the east, as well as vigorously carrying out the three strategies of the “One Belt, One Road” construction, the collaborative development of the Beijing-Tianjin-Hebei region, and the Yangtze River economic belt. Moreover, it involves supporting the development of special types of regions such as old revolutionary base areas, ethnic minority areas, border areas,

and less developed areas, as well as speeding up the construction of functional zoning areas. The main methods to achieve this are to plan and implement the necessary regional plans; monitor the implementation of regional plans; and, based on the result of mid- and late-term assessments of the implementation of regional plans, innovate and improve regional policies, promote regional cooperation, and enhance regional cooperation support systems. Finally, the mechanism for the optimization of the regional development environment includes establishing long-term mechanisms for promoting regional coordinated development and accelerating the local legislation to provide strong legal guarantees to promote the regional development.

RETHINKING INDUSTRIAL POLICY: THE CASE OF CHINA

MR. ZHANG XIAOJING, SENIOR RESEARCH FELLOW AND DEPUTY DIRECTOR GENERAL OF THE NATIONAL INSTITUTION FOR FINANCE AND DEVELOPMENT, CASS



Industrial policy is a structural policy and is regarded in mainstream economic textbooks as a distortion of the market. However, after the global financial crisis of 2008, this understanding has changed, and even advanced economies turned to industrial policy to restructure the economy and stimulate economic growth. Mainstream economists such as Joseph Stiglitz and Olivier Blanchard (*In the Wake of the Crisis: Leading Economists Reassess Economic Policy*, MIT, 2004) argued that the aggregate macroeconomic policy it is not enough to manage the imbalance and other structural issues. Moreover, even advanced economies turned to industrial policy to restructure the economy and stimulate economic growth, a prime example of that is the reindustrialization policy of the United States.

Role of the Industrial Policy in China

Industrial policy plays a major role in every five-year plan in China. It has played an important role in industrial development and innovation and is the strategy through which the government of China promotes economic development.

However, the industrial policy also causes obstacles such as overcapacity, insufficient innovation, and other market distortions. The competition between local governments increases distortions resulting from industrial policies. Local governments provide various preferential policies, such as land taxation and protection for local brands to invite investment. Most of the overcapacity is related to the homogeneity of industrial competition in many regions. In fact, the local strategic emerging industries listed in the five-year plans in different provinces are usually similar to each other, and very consistent with the central government's five-year plan. From this perspective, the development of these industries itself may not be in line with the local comparative advantages and simply reflects their incentive to get subsidies from central government or some policy arbitrage.

Industrial Policy in Different Development Phases

At early development phases of technology follow-up, introduction, and imitation, the government can play an important and decisive role by promoting technology catch-up, using the latecomers advantage to collect cutting-edge technology and develop new industries at low cost, determine technological trajectories, mobilize resources, organize R&D, and promote technological innovation. However, when the latecomer's advantage gradually narrows and the uncertainty of technological innovation at the forefront increases, the government's ability to collect information and make correct decisions declines and industrial policy such as "government picks the winner" is no longer successful.

Case Study: Industrial Policy for New Energy Vehicles

In 2009, the Chinese government set out to become the world leader in the manufacturing of electric and hybrid vehicles and adopted a plan to seize the growing new energy vehicle (NEV) market. In June 2012, the State Council of China published a plan to develop the NEV industry. The plan set a sales target of 500,000 new energy vehicles by 2015 and 5 million by 2020. In September 2013, the central government introduced a subsidy scheme providing a maximum of US\$9,800 toward the purchase of an all-electric passenger vehicle and up to US\$81,600 for an electric bus. The subsidy level is about nine times that of the level California. Government-supporting policies for NEV including vast and universal subsidies may distort the incentives of producers and cause problems such as insufficient input in R&D, poor product quality, overcapacity of the industry, and swindling of the subsidies.

Considering the distorting effects of supporting policies for NEV, the Chinese government proposed several adjustments. In 2015, the government issued a policy cutting 2017–18 subsidies by 20 percent compared to those granted in 2016, and 2019–20 subsidies will be 40 percent less than that in 2016. Moreover, there will be no subsidies after 2020. The government will implement more market-friendly policies similar to the points-based scheme practiced in California.

The Role of the Government

There is a Chinese saying that could help to highlight the appropriate role of the government, “growth only happens during the night.” This implies that the role of the government is not one of direct intervention but to generate, through policies, a suitable context for companies. This includes the protection of private property, a guarantee of fair competition, carrying out universal rather than selective industrial policy, and acting as a venture capitalist.

Successful growth catch-up stories share a similar feature: the government plays an important role. We propose that countries that neglect the state capacity and the government role need to enhance its function. In China the government role and industrial policy should carefully consider following the principle “a better role of government and a decisive role of market.”

PANEL 5

EXECUTIVE WORKGROUPS

MR. GONZALO VILLARÁN, DIRECTOR GENERAL FOR INNOVATION, TECHNOLOGY TRANSFER, AND BUSINESS SERVICES, MINISTRY OF PRODUCTION, PERU



Executive workgroups are temporary public–private groups that are created to improve the productivity of a specific vertical or horizontal sector production factor. The Ministry of Production established these workgroups to enhance cooperation among the various industries and between industries and academia. Traditionally, there has been limited collaboration between companies in the same sector and weak cooperation between industries and academia, and even less between the private and public sector. The working tables also serve as a way to make visible and eliminate many small bureaucratic limitations, which, while not perceived by government officials, are well known to private actors. Executive workgroups aim to solve minor problems that potentially add up to big issues.

Objectives of the Executive Workgroups

Executive workgroups strive to stimulate the growth of companies, from micro to small and medium in size, to high growth potential, to large corporations. One of their roles is to encourage businesses “to climb the ladder without barriers.” These workgroups have helped to solve issues of public–public coordination, improve the interaction between the public and private sectors, and promote the efficient use of limited public sector capacities. In addition,

they have helped to focus resources on solving problems for sectors with high potential that can generate quick impacts.

How Do the Executive Workgroups Contribute?

Executive workgroups contribute through three main functions: enhancement of institutions, promotion of innovation, and removal of informality. Institutions are important to guarantee long-term stability, providing both a physical space where academia, industry, and public sector collaborate and an institutional framework for removing bureaucratic barriers. We seek to promote an innovative approach, using the tools provided by *Innovate Perú*, a program financed with the help of the IDB. Finally, we seek to solve the “informality problem” by providing companies companionship to access wider markets, exports, and other services.

Outcomes of the Executive Workgroups

There are sectoral (forestry, aquaculture, creative industries, textile, gastronomy, farming industry, non-metallic mining) and transversal (logistics, innovation-driven entrepreneurship) executive workgroups. Initial steps were made to prioritize high-potential sectors—that is, sectors with a high probability of success—and as a result forestry and aquaculture were prioritized.

The forestry executive workgroup was created by ministerial resolution, and the first meeting was held on December 22, 2014. The workgroup is composed of representatives from the public sector, the private sector, and specialized institutions.

Achievements of the forestry executive workgroup are the publication of four regulations within the Law of Forestry and Wildlife—Law N° 29763 (forest management regulations, regulations for wildlife management, regulations for the management of forest plantations and agroforestry systems, and regulation for forest and wildlife management in native communities) and clarity regarding financial instruments for the forestry industry (i.e., leverage on forestry assets).

The aquaculture executive workgroup was created by ministerial resolution, and the first meeting was held on May 19, 2015. One of the most important tasks was the preparation of the new Aquaculture Act (August 30, 2015) and its regulations (March 25, 2016). Both texts received contributions from institutions, organizations and regional governments. Another important task was the elimination of duplicated regulations from different governmental institutions.

The transversal logistics executive workgroup was created by ministerial resolution early in 2016, and the first meeting was on February 10, 2016. Some of the main outcomes were the creation of the pilot plan road construction projects in the Port of Callao, elaboration of the operational regulations of APM terminals, and contribution to simplifying referral guidelines.

The transversal innovation-driven entrepreneurship executive workgroup was created by ministerial resolution in 2016, and the first meeting was held on May 12, 2016. A result is the design of new instruments and improvements in project implementation processes for *Start-Up Perú* and *Innovate Perú*. It also has been working on the creation of a new legal

framework for crowdfunding, income tax modifications for non-local digital services, medical devices regulations (DIGEMID), and B-Corporations approach.

Lessons from the Executive Workgroups

There are two sets of experiences gained and they can be summarized by counterpoising the less and more significant ones. First, did we choose the sector with the high potential? However, more importantly, are the industries in this sector committed? A second valuable lesson is the question of the initial big-bang approach where launching a large number of executive workgroups has turned into an agile and iterative approach. Third, are the budgets provided to teams reasonable, and, most importantly, is the team from the public sector efficient and does it have the tools to make things happen? Fourth, can extended periods of questions and study with the private sector, with analysis and extensive reporting, turn into quick solutions to create momentum?

PERMANENT WORKGROUP FOR LOCAL PRODUCTIVE ARRANGEMENTS: BRAZILIAN POLICY FOR APL

MRS. GABRIELA MARETTO FIGUEIREDO, COORDINATOR OF CLUSTERS, SECRETARIAT OF INDUSTRIAL DEVELOPMENT AND COMPETITIVENESS, MINISTRY OF INDUSTRY, FOREIGN TRADE, AND SERVICES, BRAZIL



What is an APL?

Local productive arrangements (APL) are agglomerations of companies located in the same territory with a high degree of specialization that sustain interaction, coordination, cooperation, and learning amongst themselves together with other local institutions such as government, associations, banks, finance, teaching, and research institutions. It is a broader view and can

also be called productive systems or clusters. There are currently 677 APL in Brazil (2015) from 40 sectors, 267 of which were prioritized by the Permanent Work Group for Local Productive Arrangements (GTP APL) encompassing 395,141 companies and 3,820,409 employees.

The APL emerged from the existing interactions and agglomerations, but with scarce governance. The government role was to understand the territory and space from those existing arrangements and to provide governance, responding to local demands. Several players had an important part in the early stages of APLs, academia and international cooperation. In 2004, the Permanent Group for APL was created with the participation of several federal cabinets, federal banks, confederations, teaching and research institutions, and state governments.

The assumptions behind the creation of APL recognized that policies to promote small and medium-sized enterprises (SME) are more efficient when targeting groups of companies. In this sense, the policy recognized the local level as the guiding principle for economic and social development. There are 35 public and private institutions at a local and national level and 27 State Nucleus (NE). The nucleus, replicates at the state level the national arrangements, promotes the agenda and deals with the local APL.

Policy Guidelines

- **Fostering systemic interaction:** includes actions and instruments aimed at intensification of the productive space and innovation, competitiveness and joint production and commercialization, incorporating a systemic view in a productive space.
- **Promoting the strengthening of productive and innovative capabilities:** aims to mobilize the capacity to acquire and use knowledge and innovations to add quality and value to goods and services produced, promoting grounded, cohesive and sustainable development.
- **Local development cohesion and coherence:** refers to a clear direction of the institutions for the strengthening of local specificities and potentialities and their productive and institutional environment, and a new insight into the development which seeks to integrate the priorities of national, regional, state and local development with a long-term perspective.
- **Economic, political, social and environment:** instruments aimed at building a strategic/competitive analysis of each space should be made available, the use of mechanisms to support multi-level governance, integration with structures intended to provide a local social infrastructure and the focus on eco-efficiency of enterprises organized in clusters.

Goals of APL Policy

- Reduce the intra- and inter-regional inequalities in the territories of APLs based on an inclusive and environmentally sustainable development.
- Promote productive inclusion of economic and social actors through access to public services and the consolidation of their supply chains.
- Increase the competitiveness of Brazilian companies through innovative learning. The local APL is an instrument to innovative learning.

Main Actions of the APL

After 10 years of existence the principal actions undertaken by APLs are as follows:

- Brazilian Observatory of APLs, producing data about the APLs in Brazil.
- Creative economy: integrating a broad range of cultural activities for the enhancement of local economies.
- Partnership with industry.
- Survey of the existing APLs.
- National conference and regional workshops.
- Territorializing industrial policy seminars.
- Productive integration–MERCOSUR.

Other notable achievements of the policy are: (i) the mobilization of actors at different levels: federal, state and local; (ii) enhancement of collaboration among federal entities: decentralization of planning and action; (iii) promotion of the role of entrepreneurs and institutions present in clusters at a local and state level; (iv) recognition of the importance of participation and organization of local actors: emphasis on collective projects; and (v) institutional integration: GTP APL and NEs; and (v) creation and customization of tools and actions.

Challenges of APL

Some important challenges for APLs are as follows:

- Consider APL as a state policy.
- Decentralize the policy, guaranteeing the continuity of policies regardless of changes at national level.
- Generate project driven group/more with practical actions.
- Work on multiple scales.
- Attract the private sector: rapid gain and long-term goals.
- Coordinate policies.
- Professionalize governance.
- Increase suppliers/expand production capacity.
- Technological development and innovation.
- Market access, business intelligence.
- Productive integration.
- Improvement of policies to increase the competitiveness of APLs.

A More Productive Brazil Program

A major challenge is the need to generate more practical actions. One such action is the program “A More Productive Brazil” (Brasil Mais Produtivo). The program was designed in partnership with the Secretaria do Desenvolvimento e Competitividade Industrial of the Ministério da Indústria, Comércio Exterior e Serviços (SDCI/MDIC); the Confederação Nacional da Indústria/Serviço Nacional de Aprendizagem Industrial (SDCI/MDIC); Agência Brasileira de Promoção de Exportações e Investimentos (Apex-Brasil); and Agência Brasileira de Desenvolvimento Industrial (ABDI), using the methodology Indústria + Produtiva (more productive industry) from CNI/SENAI.

The program also offers consultation, with low-cost, quick manufacturing interventions that aim to increase productivity in SMEs, aligning the increase of productivity in Brazilian companies and local development. The first phase includes 3,000 companies and 77 APLs from food and beverages, metal mechanics, fashion, and the furniture industry sectors. The program contemplates intervention inside the companies with a definition of cost from the analysis of the investment return and proven results (pilots). The program considers that indicators and goals must include measurable methodologies on the production floor and in the design of the policy.

The program was launched in April 2016, and 3,106 companies applied. There are currently more than 700 companies being assisted in all states; more than 400 consultants have been trained; and a medium increase of 51.92 percent of productivity has been reached.

CLOSING REMARKS

MR. HUANG QUNHUI, SENIOR RESEARCH FELLOW AND DIRECTOR GENERAL,
INSTITUTE OF INDUSTRIAL ECONOMICS, CASS



On behalf of the Chinese Academy of Social Sciences (CASS), which co-organized this seminar, and on behalf of Mr. Cai Fang, Vice President of CASS, I would like to express my sincere thanks to all delegates and friends who have contributed to the success of this summit. We are grateful for the efficient work of the IDB, our long-term partner; the thoughtful arrangements of the Colombian Ministry of Commerce, Industry, and Tourism (MinCIT); and the city of Medellín.

The questions of productive development and innovation discussed in this summit are too important and complex to be able to provide accurate answers and solutions in a two-day seminar. However, it is clear that participants of this summit have benefited from the various presentations.

This summit has focused on relevant topics of discussions both for China, the second-largest economy in the world, and LAC, a region in the middle-income stage. Both are in the mid- and late-stage of industrialization and facing the opportunities and challenges arising from the “re-industrialization” of developed countries. The two regions face the important tasks of advancing the industrialization process in the context of the information society. Both need to address the critical question of how to maintain productivity growth and sustainable development through innovation.

This summit has provided a valuable and open framework for analysis and discussion addressing various topics. These range from national innovation policy to policies toward economic zones, from regional development policy to industrial policy, from short-term

planning to long-term strategy, from market failures to the Washington Consensus, from resource-intensive industries to smart manufacturing, and from trade to exchange rate policy. This comprehensive agenda allowed us to engage in thorough discussions on the complex issue of productivity development and innovation.

This summit offered opportunities to share knowledge and experiences. Over the years, China has developed its practices and collected numerous experiences. During this summit, we exchanged our views and experiences on China's innovation-driven strategy, policies toward technology progress, the development of industrial and economic zone policies, and industrial policy and governance mechanisms. The speakers from Brazil, Chile, Colombia, Panama, Peru, and some other LAC countries shared their practices and experiences in creating innovative ecosystems, promoting SME innovation, industrial clustering, and improving R&D and innovation financing systems.

As a Chinese saying goes, "there is no never-ending feast." As we approach the end of this intellectual feast, we also embark upon a new beginning because we have a common task: to promote sustainable development in countries through innovation-driven productivity development. We are looking forward to more in-depth cooperation in the future.

MR. CAMILO GARCIA DUQUE, TECHNOLOGICAL DEVELOPMENT AND
INNOVATION OFFICE, COLCIENCIAS



On Behalf of Colciencias and the Ministry of Commerce, Industry, and Tourism, I would like to thank the IDB staff and the representatives of the countries present here, Brazil, Chile, Costa Rica, Panama, Peru, and Surinam, as well as to the Chinese Academy of Social Sciences and the National Development and Reform Commission. In this summit we have shared valuable experience concerning productive development based on STI, as well as the promotion of innovation. LAC countries have yet to implement the lessons from Chinese experiences, such as the continuity and coherence of the policies, incentives based

on actors' performance, and the ongoing assessment of the tools and policies. There are also commonalities, specifically concerning the challenges arising from the uncertainty of the global economy. This implies a need to consider the role of innovation-driven productive development. The tools and policies regarding productive development should be designed to contemplate the long-term and the promotion of sustainable development. In this summit, we have shared multiple experiences and knowledge, which no doubt, will help to enhance our relationships.

MRS. ANA MARÍA RODRÍGUEZ-ORTIZ, MANAGER, INSTITUTIONS FOR DEVELOPMENT SECTOR, INTER-AMERICAN DEVELOPMENT BANK



I would like to thank the Chinese government, which has decisively accompanied LAC institutional development. I also thank presenters, moderators, and the staff that made this possible. Rather than giving a farewell, this is an opportunity to welcome this community. This community shares questions and challenges. It is a community that has demonstrated the value of sharing experiences, good practices, and failures. This is the beginning, as in the past summits, of an active dialogue network with a clear focus. This network will pursue the aims of innovation with the goal of benefiting the broad population. Finally, I thank the city of Medellín, a city that has boosted a culture of innovation, which is an example to both Colombia and the world. Medellín is a city full of entrepreneurs, ideas, and innovation.



VISIT TO RUTA N

Medellin: From Urban Inclusion to Social Inclusion

During the last decade, Medellín has undergone a process of social, urban, cultural, and economic transformation, which has enabled the city to appear before the world as a success story worth being publicized and promoted. Thus, Medellín continues to create strategies and programs, which allow it to continue to be a source of wonder to the world, and pride to its citizens. Medellín is located in the Vallé de Aburrá, and is the capital of the department of Antioquia. It constitutes the second most important economic center of the country, after Bogotá.

The city contributes up to 7.9 percent of the national gross domestic product and the department of Antioquia contributes about 13 percent, being one of the most productive regions of the country. According to a study conducted by the Chamber of Commerce of Cartagena, the Colombian Caribbean Research Center and the Caribbean Economic Observatory (OEC) in 2013, Medellín was the most competitive city in Colombia, displacing Bogotá, the capital of the country, a city that topped this list for many years. This classification took into account fundamental factors for sustainable development such as public finances, infrastructure, economic strength, and environment, among others. However, according to the departmental competitiveness index published by the Private Competitiveness Council, the department of Antioquia ranks second, slightly behind Bogotá, where basic conditions, efficiency factors, and sophistication and innovation factors are considered.

The city of Medellín presented an excellent economic performance in the period 2006–15, which was reflected in its business base: the total number of companies in the city increased by 4 percent a year, from 57,177 in 2006 to 89,164 in 2015. This growth was reflected, in turn, in the indicator of business density, which in 2015 stood at 36.2 companies per thousand inhabitants.

Currently, Medellín is the main export city of Colombia in flat and knit fabric, with 53 percent of the total exports of finished garments going to countries such as Costa Rica, Ecuador, the European Community, Mexico, Venezuela, and the United States. The textile industry generates 30 percent of the total employment, equivalent to 45,000 direct and 135,000 indirect jobs. In the tourism sector, Medellín has advanced to become the third tourist destination for foreign visitors visiting Colombia. These advances are mainly generated by business tourism, fairs and conventions, and medical tourism, thanks to the excellent level of medicine in the city particularly in the field of organ transplants.

The good economic performance in Medellín, which explains in part the good performance of the department of Antioquia in the aggregate, is due in large part to the strategy adopted by the mayor of Medellín with the creation of clusters, which have facilitated the consolidation of economies of agglomeration. This initiative dates back more than 10 years, led by the mayor of Medellín and the Medellín Chamber of Commerce for Antioquia, when they formed the “Community Cluster” that groups six initiatives under a public-private management model. The community operates under a global strategy, and each cluster initiative

is governed by a strategy and a set of particular actions designed in accordance with the needs of the businesses that are identified, developed and enhanced within it. The clusters that were constituted were electric energy, textile/apparel, design and fashion, construction, business tourism, fairs and conventions. The choice of these clusters was based on aspects such as participation in the economy, experience in international markets, generation of employment, capacity to integrate and promote other economic activities, and the opportunities that this sector generates in the market.

Medellin was recently recognized as the City of the Year in innovation worldwide, above New York, Tel Aviv, and a group of more than 200 cities initially nominated as part of a competition led by the Citi Group, the Wall Street Journal, and the Urban Land Institute. One of the programs that has allowed Medellin to be recognized as a safe, innovative and intelligently developed city is Ruta N.

Ruta N is a public, non-profit organization created on November 11, 2009 with the purpose of strengthening the innovation ecosystem of the city of Medellin. It is subject to private law and covered by the legislation of science and technology. It was born as a strategy of the mayor's office of Medellin, with the mission of facilitating the economic evolution of the city toward a business focus on STI in an inclusive and sustainable way, at the same time positioning it as one of the most innovative cities in the world. Ruta N is owned by the mayor of Medellin, the communications company UNE (recently merged with Millicom's TIGO), and Empresas Públicas de Medellín (EPM), the utility company of the city.

Ruta N is a complex centered on business development and innovation. It is the heart of an innovation ecosystem in the city, which includes the University of Antioquia, Explora Park, the planetarium, the botanical garden, and the Center for Innovation and Business. Together they create an urban center that supports progress toward a knowledge-based society and economy.

Goals

The main object of Ruta N is to facilitate the economic evolution of the city toward a focus on STI businesses in an inclusive and sustainable way. It has two strategic focuses of work, which are within the framework of the city CT+i Plan. The first focus is the business of knowledge, the objective of which is to support the actors of the system to generate new knowledge businesses through three strategic lines:

- Capacities for research and innovation, to improve the capacities of innovation, research, and development in companies.
- Access to capital, to strengthen and support the creation of new capital vehicles to meet financing needs.
- Access to markets, to accompany companies so that they can enter new markets.

The second focus is on innovation platforms, the objective of which is to promote the elements of the innovation system that operate as support for the development of innovation dynamics and creation of new knowledge businesses through three strategic lines:

- **Knowledge and information management:** transferring knowledge to the actors of the innovation system.
- **Network management:** increasing the connectivity between the actors of the innovation system and the world, to foster synergies.
- **Culture management:** making STI a legitimate option for achieving personal and business success.

Additionally, it has defined three strategic sectors with extraordinary growth potential linked to the existing production chains:

- **Energy:** engineering services, smart grids, and energy eco-efficiency.
- **Information and communication technologies:** development of technology platforms, smart grids, and generation of animation and digital content.
- **Health:** development of technological platforms for e-health and internationalization of the health chain.

Ruta N Corporation is pursuing the consolidation of Medellin as a city of knowledge. To increase the competitiveness of the city, it has undertaken the development of a technology district in the north of the city. This district will lay the foundation for economic development in this area, attracting companies related to STI, especially in the areas of health, energy, and information and communication technologies.

SHORT BIOGRAPHIES SPEAKERS AND MODERATORS

Manuel R. Agosín

Dean, Economic and Business School, University Of Chile

Dr. Agosín is the current dean of the School of Economics and Business of the University of Chile. An expert in the international and macroeconomic aspects of development, he has been a professor at the Department of Economics of the University of Chile since 1992 and served as its chair between January 2009 and June 2010. He has been an economic advisor to several Latin American governments and a consultant to the United Nations, the Inter-American Development Bank (IDB), and the Latin American Reserve Fund. Between 2001 and 2006, he was the chief economist for Central America, Mexico, Dominican Republic, and Haiti at the IDB in Washington, D.C.



Jorge Arosemena

Executive President, The City of Knowledge Foundation, Panama

Mr. Arosemena is the current executive president for the City of Knowledge Foundation. He has led the executive team of the City of Knowledge Foundation since its inception in 1997. He was a sociology professor at the University of Panama, an institution in which he taught from 1971 and where he eventually became Secretary General and Academic Vice President. Between 1987 and 1993, he worked as the project coordinator of the Action Committee for the Support of Economic and Social Development in Central America (CADESCA) of the Latin American Economic System, promoting cooperation projects with the European Union, the Nordic countries of Europe and the IDB. In the public sector, he has held positions such as general manager of the Panamanian Institute of Tourism, deputy minister of the Presidency, deputy minister, and minister of education. He studied civil engineering at the University of Panama and earned a bachelor's degree in philosophy and master's degree in sociology, both from Saint Louis University in the United States.



José Miguel Benavente

Division Chief, Competitiveness, Technology, and Innovation Division, IDB

Mr. Benavente is the division chief of the Competitiveness, Technology, and Innovation Division at the IDB. Before joining IDB in 2014, he was the director of the Productivity Center at Universidad Adolfo Ibañez (Chile) and a professor at Universidad de Chile for over 15 years. In these institutions, he taught and researched on a variety of topics such as economic development, innovation, productivity, R&D, SMEs, start-ups, and applied microeconometrics, among others. He has authored about 100 national and international journal articles and books on these topics, and has been a columnist for magazines and newspapers, journal editor, consultant for major international organizations, government advisor, and vice president of the National Innovation Council of Chile. José Miguel holds a degree in industrial engineering from Pontificia Universidad Católica de Valparaíso, completed his master's degree in economics at Universidad de Chile, and has a master's degree and PhD in economics from Oxford University.



Sieglien Burleson

Minister of Trade and Industry, Suriname

Minister Burleson is the current minister of trade and industry in Suriname. She is the founder and executive director of the Competitiveness Unit Suriname, as well as the advisor to the vice president of Suriname on competitiveness, legal, and entrepreneurial matters. She has performed staff functions in the Ministry of Foreign Affairs and the Central Bank of Suriname. Minister Burleson has also been a member of several state committees on renewal of civil code and intellectual property rights, a lecturer on company and trade law, and dean at the Faculty of Social Science at the University of Suriname. She holds a master's degree in law, and has obtained training in diplomacy, business management, and international relations.



Cai Fang

Vice President, Chinese Academy of Social Sciences (CASS)

Professor Cai currently serves as the vice president of CASS. He is also a member of the Standing Committee and the Rural Affairs Committee of the 12th National People's Congress of China. Professor Cai is a Fellow of CASS, and the editor-in-chief of studies in labor economics. He is also on the advisory board of the 13th Five-Year Plan on National Economic and Social Development of China. Professor Cai has published numerous papers and books on the Chinese economy, including China's economic reform, economic growth, employment and population migration, income distribution, and poverty. He recently published three books on the Chinese economy: *Demystifying the Economic Growth during China's Transition*, *Beyond Demographic Dividend*, and *From Demographic Dividend to Reform Dividend*. Professor Cai has also been the editor of the annual series *Reports on China's Population and Labor* since 2000. He graduated from Renmin University of China (RUC) and the Graduate School of CASS. He holds a PhD in economics.



Cai Yuezhou

Senior Research Fellow and Professor, Institute Of Quantitative and Technical Economics (IQTE), CASS

Mr. Cai joined in IQTE at the end of 2006, and is currently the director for the Division of Quantitative Economic Theory and Methods. Before joining CASS, he served in the Ministry of Finance and China Orient Assets Management Corporation, a stated-owned financial institution. From 2007 to 2008, he resided in the University of Western Ontario as a post-doctoral research fellow in the Department of Economics. Mr. Cai's main research interests include innovation economics, S&T policies, and big data Analysis, with a special focus on how technological change and innovation support China's economic growth. He is also member of the Expert Consultative Committee for the Action of Internet Plus launched by the National Development and Reform Committee. Mr. Cai holds a PhD in quantitative economics from the graduate school of CASS.



Chen Taotao

Professor of School of Economics and Management, Director of Center For China and Latin America Management Studies, Tsinghua University

Dr. Chen is a professor at the School of Economics and Management, and director of the Center for China and Latin America Management Studies, Tsinghua University. Her main research areas are foreign direct investment, international business, and globalization and strategy. She has published more than 30 papers on the topic of foreign direct investment spillover and Chinese companies investing abroad, and has presided research projects supported by the National Science Foundation, Ministry of Education, and Ministry of Commerce, among others. She has attended international conferences in and outside of China, making speeches and engaging in various debates. Professor Chen taught courses in management of global enterprise, international economics, and corporate finance for the MBA program at Tsinghua University, as well the courses “Chinese Company investing Abroad,” “Business Valuation,” and “Cross-border M&A” for the executive training programs. She has also taught “Doing Business in China” for the FGV Business School in Brazil and Bocconi University in Italy.



Chen Yao

Director, Department of Regional Economics, Institute Of Industrial Economics, CASS

Mr. Chen Yao is currently a senior research fellow at the Institute of Industrial Economics, and also leads the Chinese Association of Regional Economies and the Western China Development Center. His major interests of research include regional development, industrial organization, and government policy. Professor Chen has published many well-known papers and books. He has deep knowledge and experience in the area-based development strategy and policy in China, and is particularly experienced with planning, construction, and management of industry and technology parks. He has advised national and local governments in areas such as western regional development, territorial planning, economic transition of resource-based areas, industrial clusters, rural-urban integration, and local investment climate and policies. He also participated in the drafting of the policy for trans-provincial cooperation and governance. Professor Chen has conducted more than 100 research projects, contracted from various authorities and international agencies such as the UNDP and ADB.



Andrea Díaz Fonseca

Director, Program of Innovation and Human Capital for Competitiveness, Ministry of Science, Technology, and Telecommunications, Costa Rica

Ms. Díaz Fonseca currently leads the Innovation and Human Capital Program for Competitiveness managed by the Ministry of Science, Technology, and Telecommunications in Costa Rica. The program's objective is to contribute to productivity growth by supporting innovation activities and advanced human capital formation in the strategic areas defined in the National Plan for Science, Technology, and innovation. Ms. Díaz has extensive experience in government administration projects in the areas of public health, infrastructure, social development, and innovation. She has been handling management planning, public budgets, loans, state procurement processes, logistics, and risk management. During the past 13 years, she has been an active member in the implementation of projects undertaken by public institutions, such as the Costa Rican Department of Social Security and the Ministry of Science, Technology, and Telecommunications. Ms. Díaz holds a bachelor's degree in business administration from the Distance State University, Costa Rica, and a master's degree in project management from the Costa Rica Institute of Technology.



Sergio Escobar

Executive Director, International Cooperation Agency of Medellín (ACI), Colombia

Mr. Escobar is currently the executive director of the Agency for Cooperation and Investment of Medellín and the Metropolitan Area. He has held various positions in the public sector at the Ministry of Foreign Affairs of Colombia and the Embassies of Colombia in Brazil, Costa Rica, Italy, and Mexico. He has also been the director of PRO-EXPORT / ProColombia in Costa Rica and Mexico. In the private sector, he has been vice president of Fedemetal in Colombia, senior partner of Candiani Mining, and advisor to several companies in Colombia, as well as a former member of some corporate executive boards in Colombia, Mexico, and in international organizations in the United States. Mr. Escobar holds a law degree from the Javeriana University and graduated from the University Jorge Tadeo Lozano in diplomacy and international relations. He also holds a master's degree in international law and diplomacy from the Diplomatic Academy of Itamaraty in Brazil.



Alejandro Franco

Executive Director, Ruta N, Medellin, Colombia

Mr. Franco is currently the executive director of Ruta N, Medellin's business and innovation center. With more than 15 years of experience being an entrepreneur and then working in the private and public sectors, he is dedicated to promote innovation as the key engine of economic development for the city. Mr. Franco has a bachelor's degree in administrative engineering from the University EIA and a master's degree in innovation and entrepreneurship from Manchester University.



Camilo Garcia

Advisor, Colciencias, Colombia

Mr. Garcia has served as a consultant in the area of public policies on STI and currently serves as advisor to the Directorate of Technological Development and Innovation at Colciencias where he has coordinated the design of national strategy of technology parks and different business support projects in research and development. Mr. Garcia holds a law degree from Javeriana University and a master's degree in political, economic and international Analysis (U. Externado).



Huang Qunhui

Director-General, Institute of Industrial Economics, CASS

Mr. Huang is a senior research fellow at the Institute of Industrial Economics of the Chinese Academy of Social Sciences. He is also editor-in-chief of the China *Industrial Economics Journal* and the *Economic Management Journal*. Professor Huang's research field focuses on industrial economics and enterprise management. He was awarded with the 12th Sun Yefang Prize in Economic Sciences and the 2nd and 3rd Award of the Jiang Yiwei Academic Foundation for Enterprise Reform and Development. Mr. Huang holds a PhD in management.



Jorge Londoño De La Cuesta

CEO of Empresas Públicas De Medellín (EPM)

Mr. Londoño became the chief executive officer (CEO) of EPM on January 1st, 2016. He had been the CEO of Invamer SAS, a market research and citizen opinions company for 27 years, in which he led research strategies and consultancy market, business analytics, and social media. He also served as chairman of Asdesilla (Association of Breeders of Criollo Horses) and an advisory member to the Board of Casa Luker and the Presidency of Success Group. He has also been a columnist for *Poder* magazines, *Exchange and Money*, and *El Tiempo*. He has participated as a speaker and guest lecturer at local, national, and international universities, including the Sorbonne University of Paris, the London School of Economics and the University of Miami. Mr. Londoño holds a bachelor's degree in systems engineering from the EAFIT University, and gained training from the CEO Management Program of Los Andes University.



Olavo Machado Junior

President, Federation of Industries of The State Of Minas Gerais, Brazil

Mr. Machado is the president of the Federation of Industries of Minas Gerais (FIEMG), president of the Board of the Brazilian Support Service for Micro and Small Companies (SEBRAE-MG), president of the Regional Council of the Brazilian National Industrial Training Service, director of the Brazilian Industry's Social Services (SESI), and president of SESI's Regional Council. He is director of the National Confederation of Industry (CNI) and president of the Infrastructure Thematic Council of the CNI. He has held various leadership positions in the business and public sector, such as chair of the Electric, Electronics and Similar Appliances Industry Association of the State of Minas Gerais, director of the Brazilian Association of Electrical and Electronics Industry, vice president of the Society of Minas Gerais Engineers, president of the Business and Industrial Center of Minas Gerais, president of the Technological Center Foundation of Minas Gerais, and deputy secretary of Industry and Commerce of the State of Minas Gerais, among others. He founded Machado Correa Engenharia (Macorin) in 1974, is a partner in IG Construções Elétricas de Equipamentos Elétricos, and a director of Orteng MCT Transformadores Ltda.



Claudio Maggi

CORFO Competitive Development Manager

Mr. Maggi is a civil industrial engineer and has a master's degree in science in engineering from the Universidad de Chile, and a diploma in territorial management for development from the Polytechnic of Milan, Italy (1988–89). He was a researcher at the Program of Studies for the Development and Conversion of the State of North Rhine-Westphalia, INEF, University of Duisburg, Germany (1998–2000). He was the executive director of the Santiago Development Corporation until April 2014. He has held several management positions at CORFO-Chile: manager of innovation, development, and investments and executive director of Innova Bio Committees (2000–03) and InnovaChile (2008–10). Other posts were business director: ESSBIO (2008–10), Puerto San Vicente–Talcahuano (2005–06), and ENACAR (2001–03); development manager of Fundación Chile (2006–08); specialist operations division, IDB (2003–04); and consultant in the design and development of innovation and productive development programs for the IDB, IDB/MIF, government entities, and other international organizations in Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Colombia, Ecuador, El Salvador, Italy, Nicaragua, Panama, Peru, Spain, and Uruguay. He has been a professor of the magister in public policies at the University of Concepcion since 2008 and of the master's of business at the Catholic University of the Holy Conception since 2012.



Roberto Manrique

Senior Advisor, Institutions for Development Sector, IDB

Mr. Manrique is a senior advisor in the Institutions for Development Sector of the IDB. His responsibilities include corporate and operational matters, partnership development, and strategic affairs. He previously served as senior advisor to the IDB's executive vice president and as principal officer, a position that focused on infrastructure lending and regulatory reform. He also worked on structuring and managing public sector reform programs in the Andean, Caribbean, and Central American countries. Prior to joining the IDB, he worked as an economist at the World Bank. Mr. Manrique completed a master's degree and his doctoral studies in economics at Wayne State University in Michigan.



Gabriela Maretto Figueiredo

Coordinator of Clusters, Industrial Development and Competitiveness Secretariat, Ministry Of Industry, Foreign Trade, and Services, Brazil

Ms. Maretto currently leads the general coordination of local productive arrangements—a term used as clusters designation—in the Ministry of Industry, Foreign Trade, and Services of Brazil. She also occupies the posts of surrogate executive secretary of the Permanent Work Group of Local Production Arrangements, a group of multiple institutions that coordinates public policies for clusters in the Brazilian government, and coordinator member within the governance body of the Brasil Mais Produtivo Program. Her experience applies to developing public economic and industrial policies to stimulate social and economic growth in diversified clusters. Before, she held the position of Innovation and Industrial Development Advisor in the Secretary of Science, Technology, and Strategic Inputs of the Ministry of Health in Brazil. She graduated in economics and international relations from the College of Campinas (São Paulo), and holds a master's degree in innovation and development from Università di Bologna (2011).



Mu Rongping

Director General, Center for Innovation and Development, Chinese Academy of Science (CAS)

Dr. Mu is director general of the Center for Innovation and Development and the Center for IPR Research and Training at the CAS. He has also been president of the China High-tech Industry Promotion Society (CHIPS) since 2014 and president of the Chinese Association of Science and S&T Policy Research since 2015. He has been a member of the Governing Board of the International Science, Technology, and Innovation Centre for South-South Cooperation (ISTIC) under the auspices of UNESCO since 2014, and member of the Advisory Board of Technology and Management Centre for Development (TMCD) at the University of Oxford since 2014. Dr. Mu has published more than 40 papers in peer-reviewed journals and several books concerning technology transfer, technology foresight, innovation development, and industrial competitiveness. He has been involved in several policymaking processes concerning innovation capacity building, tax credit for technology development in firms, and strategic emerging industry development. Dr. Mu received his bachelor's of science in physics and master's degree in history of science from University of Science and Technology of China and his PhD in history of technology from Technische Universität Berlin, Germany.



Yeinni Andrea Patiño Moya

Director of Productivity and Competitiveness, Ministry of Trade, Industry and Tourism, Colombia

Ms. Patiño Moya is an economist with a master's of economics and experience in competition policy, industrial organization, and competitiveness policy. She has followed a trajectory in management positions for business development, especially focused on business formalization, SMEs, productive chains, and sectorial competitiveness from the public and private perspective. She also has extensive experience as a teacher in economic regulation and microeconomics. She is a professor at the Pontificia Universidad Javeriana and at the Universidad Sergio Arboleda. She was coordinator of the Sectorial Group for Productivity and Competitiveness in the Ministry of Commerce, Industry, and Tourism, where she was also an advisor to the Micro-, Small-, and Medium-Enterprises Department and Formalization Management. She was previously an economist in the Superintendence of Industry and Commerce.



Ana María Rodríguez-Ortiz

Manager, Institutions for Development Sector, IDB

Ms. Rodríguez-Ortiz has been the manager of the Institutions for Development Sector at the IDB since February 2011. She previously served as manager of the IDB's Andean Country Group. Since joining the Bank in 1991, Ms. Rodríguez-Ortiz has occupied several positions, including senior advisor to the Office of the Presidency, country representative in the IDB's country office in Peru, and chief advisor to the executive vice president. She has also been chief of the Finance and Basic Infrastructure Division of the Regional Operations for the Andean and Caribbean Countries; chief of the Country Division for Colombia, Ecuador, Peru, and Venezuela; and technical advisor to the Bank's executive vice president. Prior to working at the IDB, she served as economic advisor to the president of the National Banking Association in Colombia and worked at both the Central Bank of Colombia and Central Mortgage Bank of Colombia. Ms. Rodríguez-Ortiz holds a master's degree in development economics from Williams College in Massachusetts.



Mónica Salazar

Science, Technology, and Innovation Lead Specialist, IDB

Ms. Salazar is a lead specialist on Science, Technology, and Innovation at the IDB, focusing on Colombia and Ecuador. Prior to her work with the IDB (May 2008–February 2015), she acted as the executive director of the Colombian Observatory of Science and Technology. Before that she was an advisor to the director general, deputy director of innovation programs, and head of the Planning and Evaluation Division at Colciencias, the Colombian science and technology public agency. She was also head of the technological division at the National Department of Planning in Colombia. For five years, she was a research assistant in the Centre for Policy Research on Science and Technology (CPROST) at Simon Fraser University (SFU) in Vancouver. Ms. Salazar holds a PhD in communications from SFU. She also has a master's of science in technical change and industrial strategy at the University of Manchester (PREST), and a bachelor's in economics from Universidad del Rosario (Bogota, Colombia).



Claudia Suaznábar

Private Sector Development Lead Specialist, IDB

Ms. Suaznábar is a lead specialist in the Competitiveness, Technology, and Innovation Division of the IDB, where she has spent 13 years between the IDB headquarters in Washington DC, country offices in Peru, and now in Bolivia. Prior to the IDB, she worked for a number of years in investment banks in Spain. Her areas of expertise include innovation policies, entrepreneurship, enterprise competitiveness, and development. She has extensive experience working and publishing in these areas in several Latin American countries. She holds a master's degree in public administration and international development from Harvard Kennedy School and a degree in economics and business administration from CUNEF in Spain.



Ana Isabel Vargas

Advisor, Parque Biopacífico, Palmira, Colombia

Ms. Vargas has been working with Parque Biopacífico, Colombia's biggest science, technology, and innovation (STI) park, since its creation in 2012. She has been responsible for the park's public-private partnerships and has been actively involved in the design of its Master Plan 2015–2030. Currently she serves as an external advisor to the Parque Biopacífico. She also worked at the International Center for Tropical Agriculture (CIAT), where she coordinated the Agronatura Science Park. She was then appointed as the executive director of Fundaciat, an independent, not-for-profit organization aiming to contribute to CIAT's mission in Latin America and the Caribbean through public-private partnerships. Ms. Vargas is currently the coordinator of the Project Management Office of the Universidad Autónoma de Occidente in Cali. Ms. Vargas has taught political science and public policies at universities such as the Pontificia Universidad Javeriana and the ICESI University in Cali. She is a PhD candidate in political studies, specializing in STI policies and parks. She earned her bachelor's degree in government and international relations from the Universidad Externado de Colombia in Bogota.



Gonzalo Villarán

Director General for Innovation, Technology Transfer and Business Services, Ministry Of Production, Peru

Mr. Villarán is currently leading the General Directorate of Innovation, Technology Transfer and Business Services at the Ministry of Production in Peru. He has been one of the main promoters of innovation-based entrepreneurship in Peru. Starting in 2008, he began doing so through Instituto Invertir, leading a nationwide business plan competition. In 2010, Gonzalo founded and led Peru's first angel investment network: Perú Capital Networks. Gonzalo went on to establish Wayra Perú, Telefonica's start-up accelerator as the program manager. In 2014, he founded UTEC Ventures, the start-up accelerator of Universidad de Ingeniería y Tecnología. He has successfully led UTEC Ventures, allowing it to quickly gain recognition as one of the leading accelerator programs in Latin America. UV is the second accelerator in the region selected to form part of the prestigious Global Accelerator Network (GAN), and the portfolio companies have raised more than US\$2 million in funding. Mr. Villarán holds a master's degree in economics from the University of San Francisco and graduated from Singularity University, a 10-week program sponsored by Google and NASA.



Xu Wei

Political Counselor, Embassy of the People's Republic Of China in the Republic of Colombia

Mr. Xu is currently the political counselor of the Embassy of the People's Republic of China in Colombia. He was accredited to the Chinese Embassy in Chile and Mexico, and assumed the office of the Director of Southern Cone Affairs of the Department of Latin American and Caribbean Affairs. Mr. Xu graduated from Beijing International Studies University with a degree in Spanish language and literature.

**Zhang Dongqiang**

Deputy Director General, Regional Economy Department, National Development and Reform Commission, China

Mr. Zhang is currently the deputy director general of the Regional Economy Department in the National Development and Reform Commission of China. Previously, he worked in the State Commission for Economic Restructuring. In recent years, he was appointed as the deputy mayor (Party) of Xining Municipal Committee and deputy mayor (Executive) of the municipal government of the city, Qinghai Province. He has extensive experience in policymaking and its subsequent implementation in regional economic planning and development. He has chaired the crafting of several key regional development plans and policy documents in China, including The Regional Planning of Yangtze River Delta, the Chengdu-Chongqing Economic Zone, the Modernization Demonstration Area of Southern Jiangsu Province, and the Plan for Development and Opening-up of the Borderline Area in Heilongjiang and Inner Mongolia, as well as the coordination of the drafting of The Guidelines of the State Council on Further Promoting the Economic and Social Development of Guangxi.



Zhang Xiaojing

Senior Research Fellow and Deputy Director General of The National Institution for Finance and Development, CASS

Mr. Zhang is a Professor of Economics and the Deputy Director-General of the National Institution for Finance and Development at CASS. Mr. Zhang is the recipient of prestigious awards such as the Sun Yefang Financial Innovation Prize for 2015 and Sun Yefang Economics Prize (Top Economics Award in China) for 2005 and 2007. He actively participates in the research and consultant work on the 11th, 12th, and 13th national five-year plans. He also organizes a team to compile the National Balance Sheet for China with annual authoritative release. He was a visiting scholar at the International Monetary Fund in 2009; a visiting professor at Harvard and National Bureau of Economic Research (NBER) in 2006–07; and a visiting fellow at Stockholm School of Economics, from 1999–2000. His research interests are open economy macroeconomics, economic growth, and development economics. He received his PhD in economics from the Graduate School of CASS (Beijing) in 1998.



Zhou Shuo

Director, Multilateral Development Bank Division, International Department, People's Bank of China (PBC)

In her 27-year career as a Chinese central banker, Ms. Zhou had the privilege of witnessing and participating in the economic and financial reforms from their earlier stages to the current development with both rich results and new challenges. Working mostly on international matters of the PBC, she has worked in New York, Macao, Sydney, Tunis, and Washington DC, with positions at either PBC foreign offices or international organizations such as the International Monetary Fund, African Development Bank, and IDB. Her rich and unique experiences provide a profound vision and focus to her views on both Chinese and international topics in economic policies and development results. With comparisons of different regions and regimes, she can provide a more balanced and objective opinion as both an insider and observer.



