

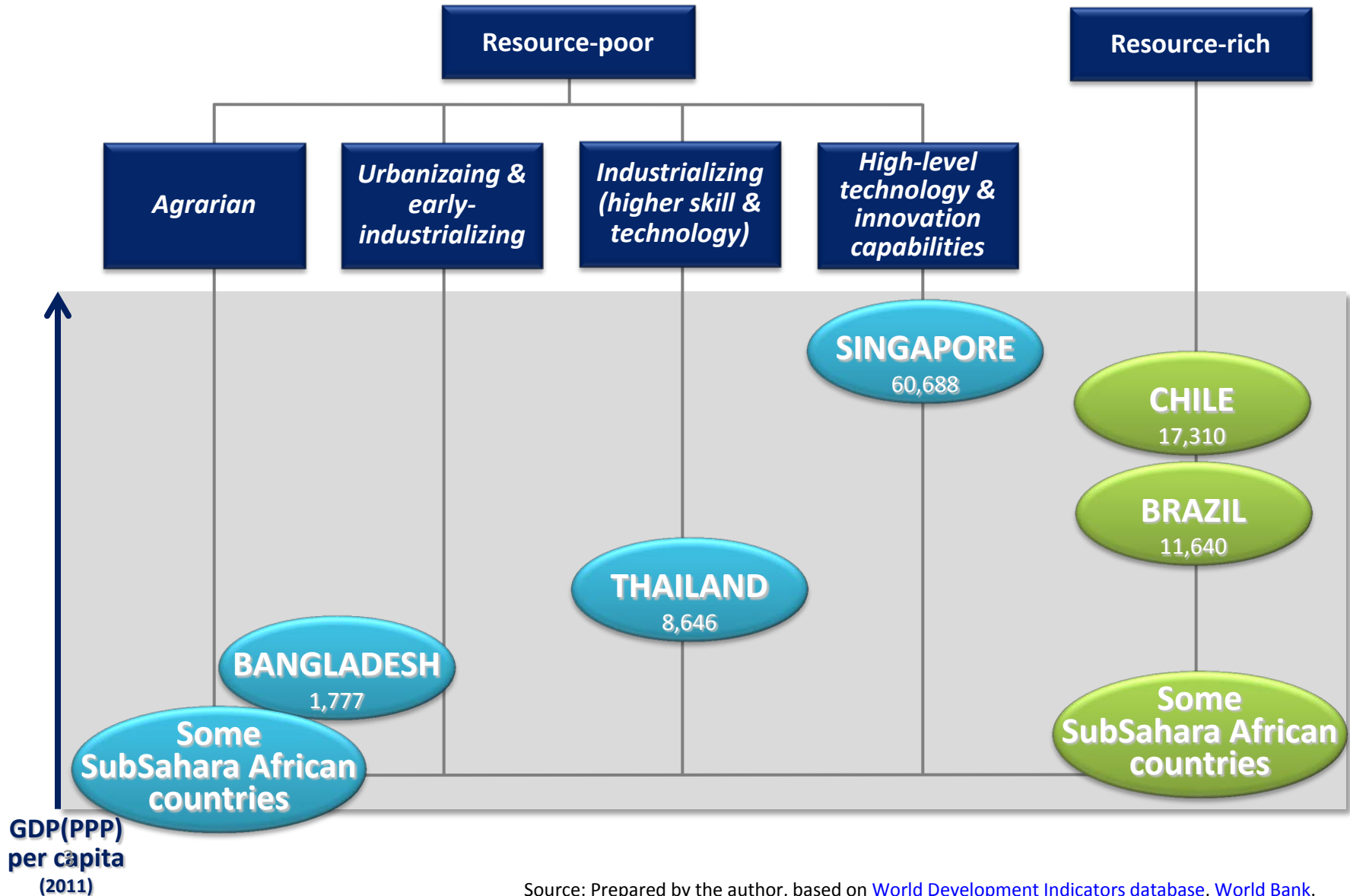
Industrial Strategy and Economic Transformation

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Diverse economic transformation agenda: Endowment and development phases

- Economic transformation agendas are different among countries which address diverse challenges of economic and social development
- Moreover, agendas are different due to diverse endowments and to development phases
- In most of the cases (of outstanding industrial transformation), **the government or public institutions facilitated the process, especially in the area of learning, innovation and infrastructure**

Diverse economic transformation agenda



Two types of dynamic change of endowments, including capabilities

- **Incremental changes of endowment**, especially by **accumulation of knowledge and capabilities** which enhance factor endowments and/or improve other basic conditions. Accumulation of knowledge and capabilities in general, absorptive capabilities and organizational capabilities, in particular, human resource development, basic and applied R&D, among others, are key.
- **Drastic changes of endowment**, especially by a new large-scale **infrastructure, technological innovations** (local and/or foreign), etc.
- Both types of dynamic changes **generate new industries, new ways of doing business, which produce economic (structural) transformation**

Societies' learning and accumulation of knowledge and capabilities

- Noman and Stiglitz (2012, p.7): Long term **success rests on societies' "learning"** – new technologies, new ways of doing business, new ways of dealing with other economies. The **essence of development is dynamic**.
- Cimoli, Dosi and Stiglitz (2009, p.2): 'Great transformation' entails a major process of ***accumulation of knowledge and capabilities***, at the level of both individuals and organizations. Capabilities have to do with the problem solving knowledge embodied in organizations...
- **Today's specializations influence tomorrow's productivity** growth, chances to innovate, and demand potential. (Ibid.p.3)
- Absorptive capabilities fundamentally concern the ways in which **past achievement in knowledge accumulation influence future learning potential**. (Ibid.p.9)

Main objective of the study

- Obtain insights into **how the crucial factors interact in practice**, focusing on several outstanding cases of what we term “industrial policy”, which **resulted in a remarkable economic transformation** in a country or in regions of a country.

- **Cerrado agriculture**: Miracle of Cerrado in Brazil
- Eastern Seaboard and **“Detroit of Asia”** in Thailand
- **Salmon industry**: Chile’s salmon miracle
- Transformation of **Singapore**: From quality, productivity to innovation
- **Bangladesh garment/apparel** industry

Research questions

- (a) how the transformation was **triggered** (initiated) and how **factor endowments** dynamically changed
- (b) how **accumulation of knowledge and capabilities** was achieved
- (c) what kind of **drivers (driving forces)** kept the momentum of transformation
- (d) what kind of **strategy/vision** was behind and promoted the process

Triggers, drivers, accumulation of capabilities interacted

- **Triggers:** drastic change of endowments and/or other conditions (breakthrough by a new large-scale infrastructure, technological innovations, external shocks, etc.) These changes trigger economic transformation
- **Readiness:** Incremental changes of endowment: especially accumulation of knowledge and capabilities which enhance factor endowments and/or improve other basic conditions. Accumulation of knowledge and capabilities in general, absorptive capabilities and organizational capabilities, in particular, human resource development, basic and applied R&D, among others, are key.
- **Drivers:** capable actors, individuals, enterprises, organizations and others, which are driving forces to keep momentum of the dynamic process. These drivers are created and strengthened by the accumulation of capabilities

Analytical Perspective

Strategy of industrial development, vision, awareness of challenges, leadership,

Drastic changes of endowments:

Triggers

Trigger

Trigger

Trigger

Principal
Trigger

Driving forces to
keep momentum of
development:

Drivers

Incremental changes of endowments and changes
of other basic conditions:

Readiness

Economic transformation as a dynamic process

Source: Prepared by the author

Analytical perspective and Key factors for economic transformation (some examples)

Triggers that change endowments and/or competitiveness	new infrastructure, new technology, external shocks (strong appreciation of yen; sudden increase of energy price; new drastic regulation, etc.)
Incremental changes that prepare endowments and other basic conditions	accumulation of capabilities, particularly formation of human capital, especially industrial personnel (engineers and middle-level technical personnel; agricultural productivity; rural women's preparedness to work in urban areas; awareness regarding environment conservation up to threshold
Driving forces to keep momentum of development	private enterprises, dissemination of technology, etc.
Roles of government and market (private sectors' spontaneous activities) (Roles changes over time according to phases of development	Generally speaking, government could play important role in enabling decisive triggers, preparing conditions, leadership, strategy formulation, etc.
Industrial development strategy, vision, strong leadership	

*Bangladesh Garment Industry: **From agrarian to early industrializing phase***

- Bangladesh garment industry: **Rural development and mobilization of female workers** have been crucial
- Modernization of agriculture based on technology adoption which enabled farmers' shift from low-yield, single crop, deep-water rice to double cropping of short maturity, high-yield rice, as well as the well-known rapid spread of microfinance and construction of rural infrastructure, were among major factors that changed the rural society
- The trigger: the collaborative effort of a **domestic catalyst** (Desh Co.) **that mobilized the necessary local resources and a foreign catalyst** (Daewoo Co.)
- **Connectivity and logistics up-grading by infrastructure**

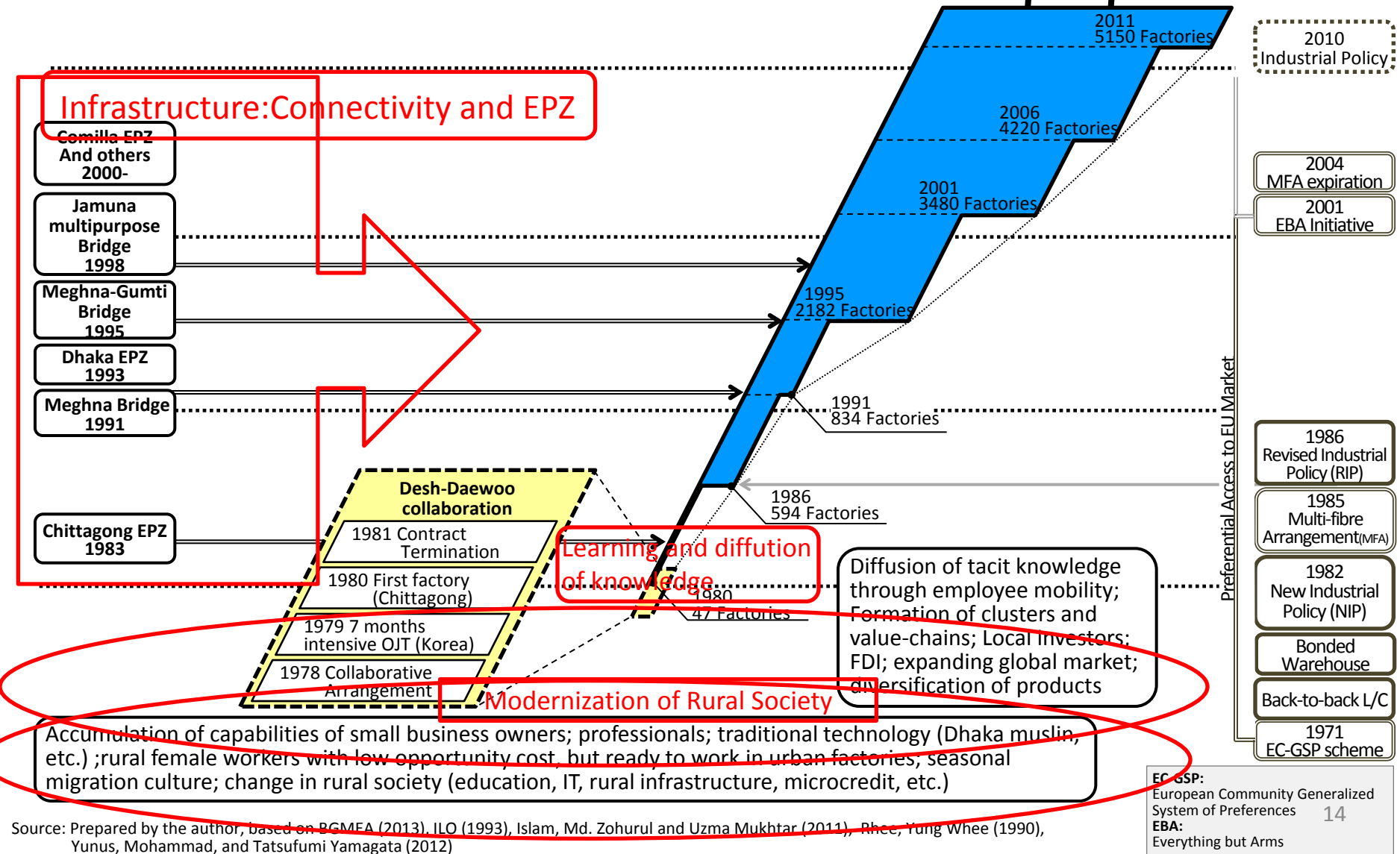
Bangladesh Garment Industry Today

- In 1981, ten years after Bangladesh achieved independence, raw jute and jute goods were its major exports corresponding to 68 percent of total exports. In 2011, garments and textiles constituted 85 percent of total exports, of which 76 percent corresponded to garments.
- Today, the garment industry has 5,000-6,000 factories with 7-8 million workers using the assembly-line method of production.
- Exports as a percentage of GDP tripled between 1990 and 2010, with much of the increase in the thriving ready-made garment industry, which is highly intensive in female labor.
- This Bangladesh success story is remarkable, because, as a recent World Bank study highlighted, “the country was often held out in the development literature as a hopeless case”

Change of endowments:
Rural development and mobilization of female workers with
low opportunity cost

- Rural roads, irrigation, market facilities and other rural infrastructure, micro-credit, school education and so forth, provided by NGOs, central and local governments and donors, all together enabled the remarkable agricultural and rural development of Bangladesh in the last three decades.(WB 2012)
- This process enhanced the mobility and readiness of low-opportunity-cost labor in rural Bangladesh and changed gradually, but steadily, the endowments of the country.
- Hossein, Sen and Sawada (2012, p.5) contend that in the predominant agricultural economy with high population density and high population growth, the critical challenge is to reduce the burden of surplus labor in agriculture. This challenge can be met through sustained sectoral and social policies and attendant institutional changes commensurate to each stage of development to support productivity/growth-enhancing relocation of “surplus” farm labor to non-farm and non-agricultural jobs. (Ibid, p.5; *italic is original*)

Bangladesh Garment/Apparel Industry



Learning, accumulation of knowledge and capabilities: Start up

- Rhee (1990) undertook extensive research on how this country's garment industry started.
- Dosh Garment Company and Daewoo signed an agreement to collaborate in the areas of technical training, purchase of machinery and fabric, plant start-ups and marketing. **Dosh recruited 130 workers for training at Daewoo's Busan plant, where "they received some of the most intensive on-the-job training in garment production ever seen in the history of developing countries"** (Ibid. p.337) for seven months in 1979.
- Another noteworthy feature of Daewoo's training is that there were **14 women among the trainees**. Rhee (1990, p.337) puts it, "Muslim tradition had precluded females from working in factories in Bangladesh. However, Quader had been so impressed by the efficiency and sheer numbers of women at Daewoo and other garment factories in Korea that he persuaded the Bangladesh government to support female trainees."

Learning, accumulation of knowledge and capabilities:
Early development phase to full-fledged development phase

- Mostafa and Klepper (2011, p.3) emphasize that tacit knowledge seeding was essential for the initial establishment and subsequent expansion of the Bangladesh garment industry. They contend that key to the explosive growth of the industry was knowledgeable workers leaving Desh, and then other successful firms, to set up the production processes of later entrants.
- Mottaleb and Sonobe (2011) conjectured that highly educated entrepreneurs have been attracted to the garment industry by high profitability, which was boosted initially by the Desh-Daewoo infusion of Korean skills and know-how. (pp.4-5) Their analysis indicated that the high-level education of manufacturers and enterprise performance were closely associated.



①Meghna Bridge



②Factory workers



③A state-of-the-art cutting machine is pictured at a garment factory



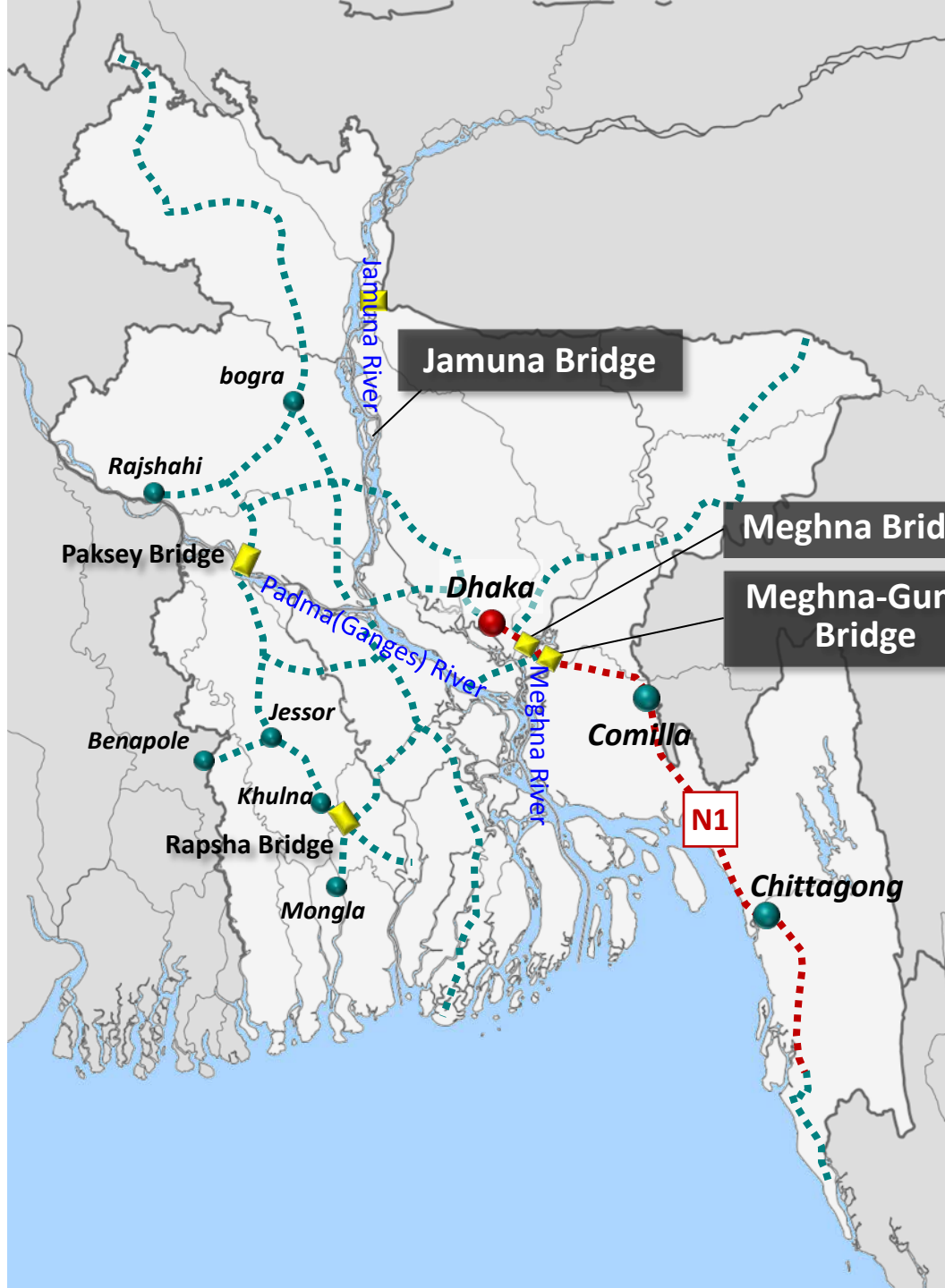
④The shipping companies in Dhaka EPZ



⑤Female workers in the garment factory

Change of endowments: Connectivity and logistics up-grading by infrastructure

- When Desh started its business in 1980, its factory was located in Chittagong, the country's main port. **The first Export Processing Zone (EPZ) was also constructed in 1983** in this port city. Exports from Dhaka, which does not have an efficient port facility nearby, had a serious bottleneck due to the lack of bridges on rivers which cross Highway No.1 that connects the capital city with Chittagong. As trucks had to use ferries, the transport between Dhaka and Chittagong was constrained in terms of time and unpredictability. This handicap affected the competitiveness of the garment industry in Dhaka. It was overcome by **the construction of Meghna Bridge in 1991 and Meghna-Gumti Bridge in 1995. The Dhaka EPZ was constructed in 1993.**
- **Jamuna multipurpose bridge, inaugurated in 1998 as the largest construction in Bangladesh history, has been a major channel for integrating the lagging western region of the country with the leading eastern region,** enabling cheaper transportation of gas, electricity and telecommunications, and enhancing the labor mobility of the western region. (Hosseini, Sen and Sawada 2012, p. 11)



Source: Prepared by the author, based on Kobayashi, Nobuyuki (2010). «Ex-Post Evaluation of Japanese ODA Loan «Rupsha Bridge Construction Project»». Ex-Post Evaluation Report. Tokyo.JICA, Road and Highways Department, A Department of Ministry of Communication, Bangladesh.

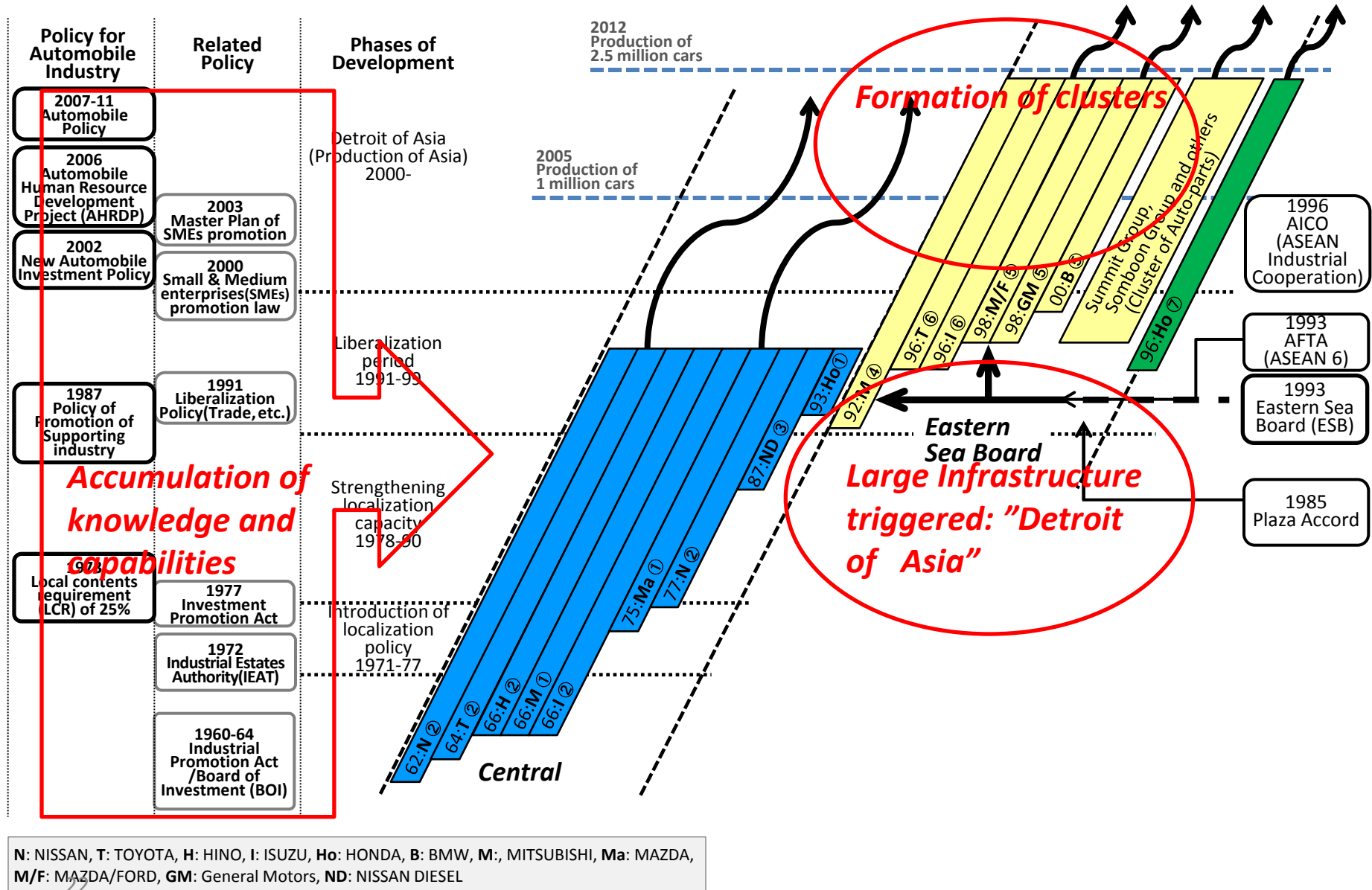
Thai Automobile Industry: “Detroit of Asia” attained by higher skill, technology, supporting industries and clusters through learning and accumulation of capabilities

- Accumulation of knowledge and capabilities has been essential for establishing competitive “supporting industries”, facilitated by a flexible industrial strategy of the government
- Automakers and parts suppliers enhanced their competitiveness when they were agglomerated as a cluster with articulated value chains
- Rapid expansion of Thailand’s automobile production was triggered by an infrastructure, Eastern Sea Board, which significantly changed the endowment of the country

Incremental change of endowments: Accumulation of knowledge and capabilities, and of supporting industries: “Detroit of Asia” today

- Production of 1 million cars achieved in 2005 and 2.5 million cars to be achieved in 2012
- It is estimated that there are about 640 first layered parts maker and 1700 second and third layered parts makers supporting the automobile industry
- Development of an automobile industry requires skilled labor and supporting industries to provide up to 20,000 to 30,000 parts and components. Supporting industries and automobile assembly plants are closely related and provide externality to each other.
- Among several policy measures, a series of initiatives by the Thai government to incrementally enhance the localization of parts production was important for the accumulation of knowledge and capabilities of supporting industries.
- Techakanont (2008, p.8) considers that “the most important policy of the Thai state was the implementation of the LCR.”
- Yamashita (2004, p.5) “the process of adaptation to the LCR enabled the accumulation of a very wide range of automobile parts industries and formation of skilled technicians and engineers...”

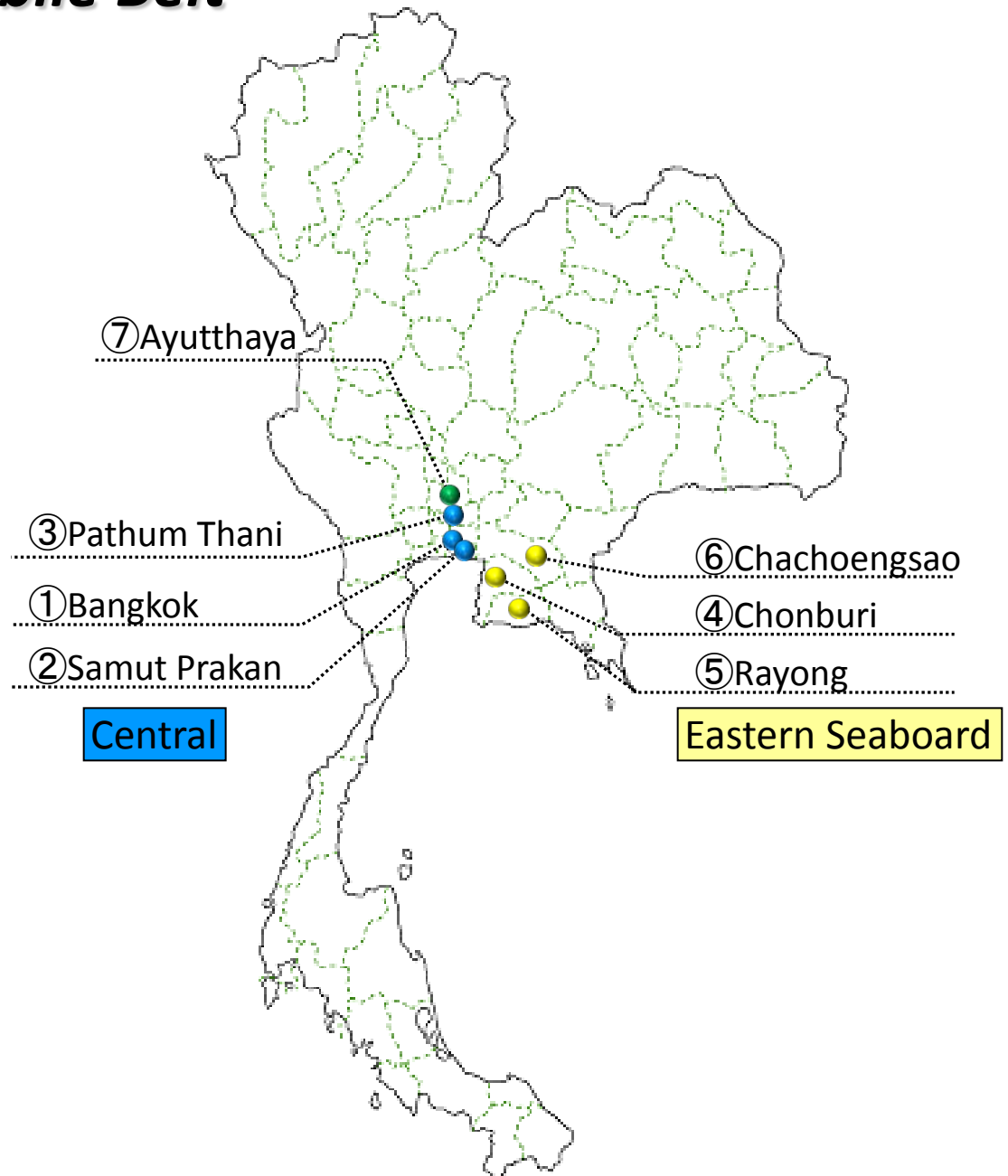
Development of Automobile Industry in Thailand



Drastic change of endowments:
Connectivity and logistics up-grading by infrastructure
Eastern Seaboard

- The Eastern Seaboard Infrastructure **created an export hub and the center for technology-intensive industries: 14 industrial estates; 360,000 workers; 1,300 factories;** and 516 automobile-related factories.
- Today, Leam Chabang is Thailand's largest port and plays a significant part in increasing trade in Thailand, and is where Thailand's automobile industry is most heavily concentrated, with many automakers' and parts manufacturers' operations set up in the area.
- The Thai government introduced the **New Automobile Investment Policy in 2002, which aimed to develop Thailand into a regional center of the automobile industry in Southeast Asia.** Two years later, a further automobile development plan was introduced, the so-called **“Detroit of Asia”** plan, which was later renamed the **“Production of Asia”** plan.

Thai Automobile Belt





① The Eastern Seaboard at Rayong became a 'Detroit of the East' as a few global manufacturers set up factories there to make pick-ups



② New Mitsubishi Motors Thailand production 'Mirage'



③ Auto plants in Thailand include Ford-Mazda AutoAlliance (center) and GM behind it



④ Honda Thailand announced to build a second assembly & engine plant (2013)



⑤ Factory workers

Brazil: Miracle of Cerrado

- The Portuguese word *cerrado* refers to “closed” land, or land that was for many years regarded as being unfit for agriculture. The total area of this vast region is about 240 million hectares, or **5.5 times the land area of Japan**. This land was considered to be unsuitable for agriculture because the soil has extremely high acidity, and because lack of potassium and phosphoric acid, and damage caused by aluminum, hinder crop growth.
- Recent discussions on the Cerrado point out that Brazilian Agricultural Research Corporation (**EMBRAPA**)’s greatest contributions were **soil improvement in the Cerrado and breeding improvement for soybeans and other crops**.
- Soybeans, a crop suited to temperate regions, bloom and sprout by sensing differences in day length (photoperiod), and soybean cultivation was therefore difficult in the tropical region.
- Finally, in **1980, the first soybean variety was completed for cultivation in the Cerrado**.
- Soybean varieties adapted to tropical zones were essential not only as a new crop but also for soil improvement in the Cerrado.

Cerrado

**Scenery before the Cooperation for
Cerrado Agricultural Development**



**Scenery after the Cooperation for
Cerrado Agricultural Development**

(Source : Yutaka Hongo, Senior Consultant of JICA)



Comments on “Cerrado Agriculture”



“The Miracle of the Cerrado”

(28.08.2010)



“Agricultural Revolution ”

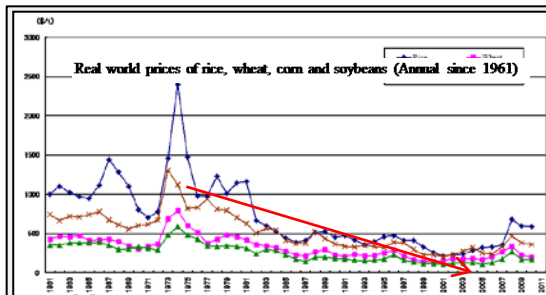
2006 World Food Prize Laureates



2006 World Food Prize Laureates Edson Lobato of Brazil, Alysson Paolinelli of Brazil, and Dr. A. Colin McClung of the USA

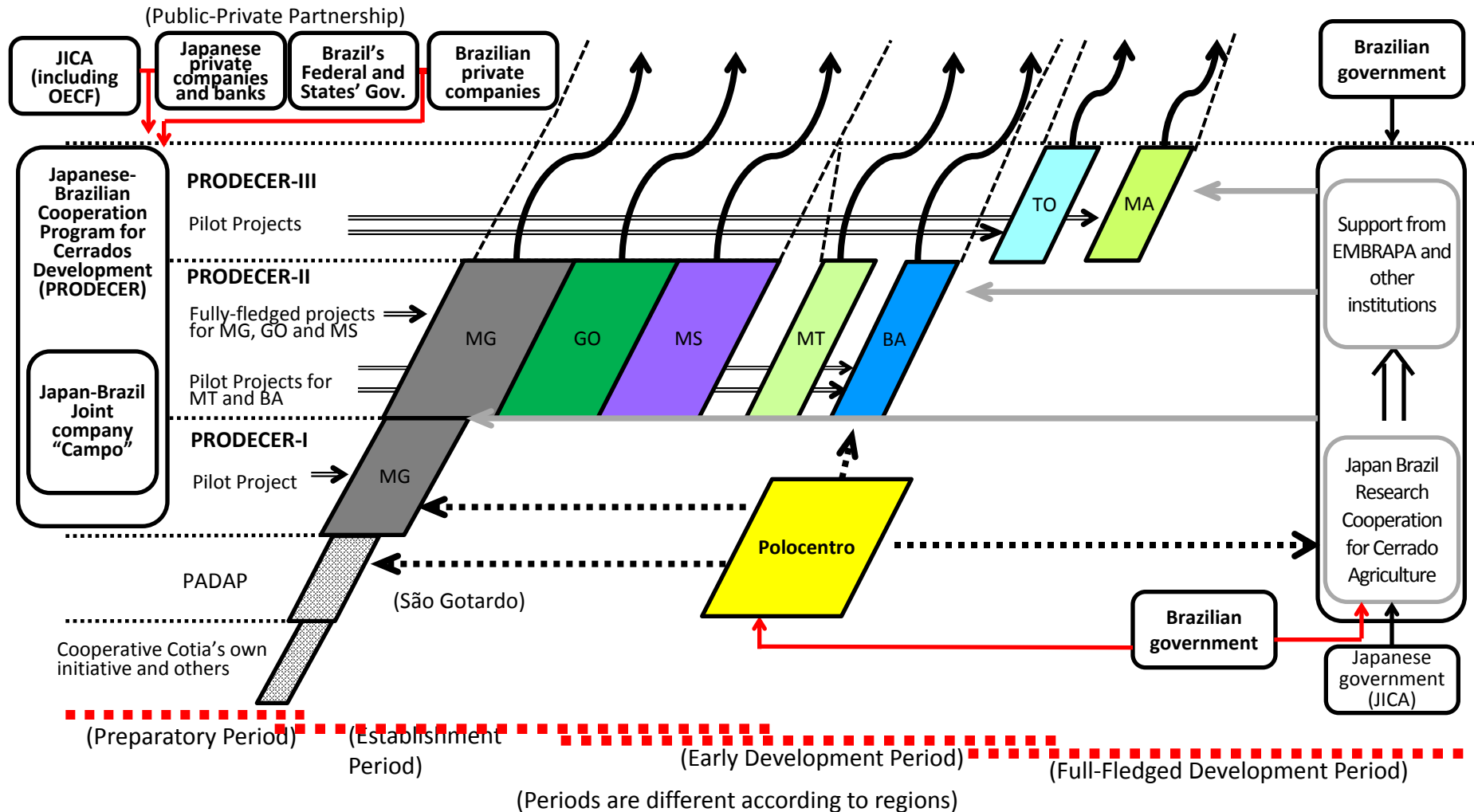


World Food Prize Founder Dr. Norman E. Borlaug, who is credited with saving more than one billion lives as the Father of the Green Revolution, called the development of the Cerrado “one of the great achievements of agricultural science in the 20th century,” which, over the past 40 years, “has transformed a wasteland into one of the most productive agricultural areas in the world.”



“The first successful case in human history of rainfed - large scale - grain production in the tropical region”

Development of Cerrado Agriculture



State names and abbreviations

MG: Minas Gerais, GO: Goiás, MS: Mato Grosso do Sul, MT: Mato Grosso, BA: Bahia, TO: Tocantins, MA: Maranhão

Cerrado and PRODECER Project Sites

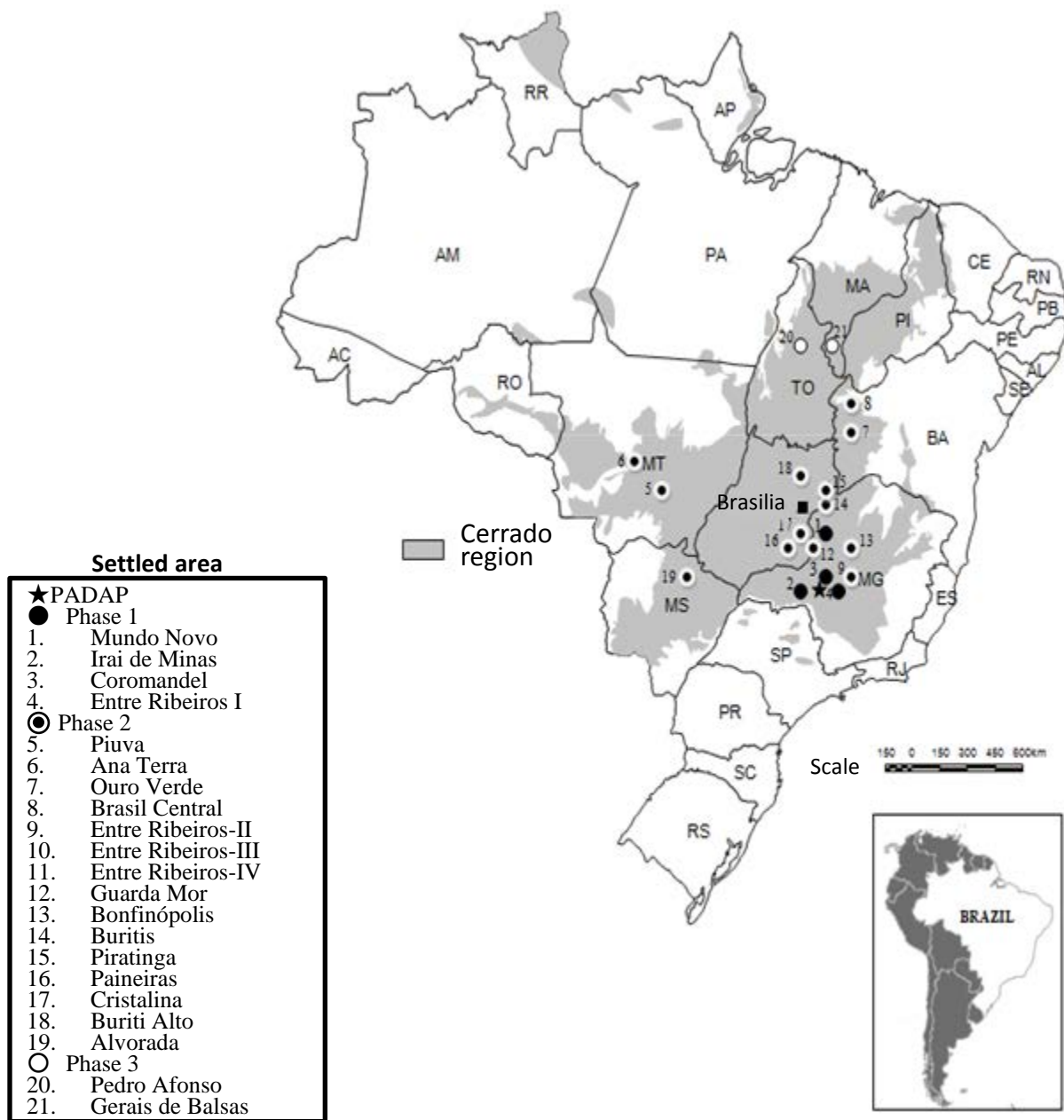
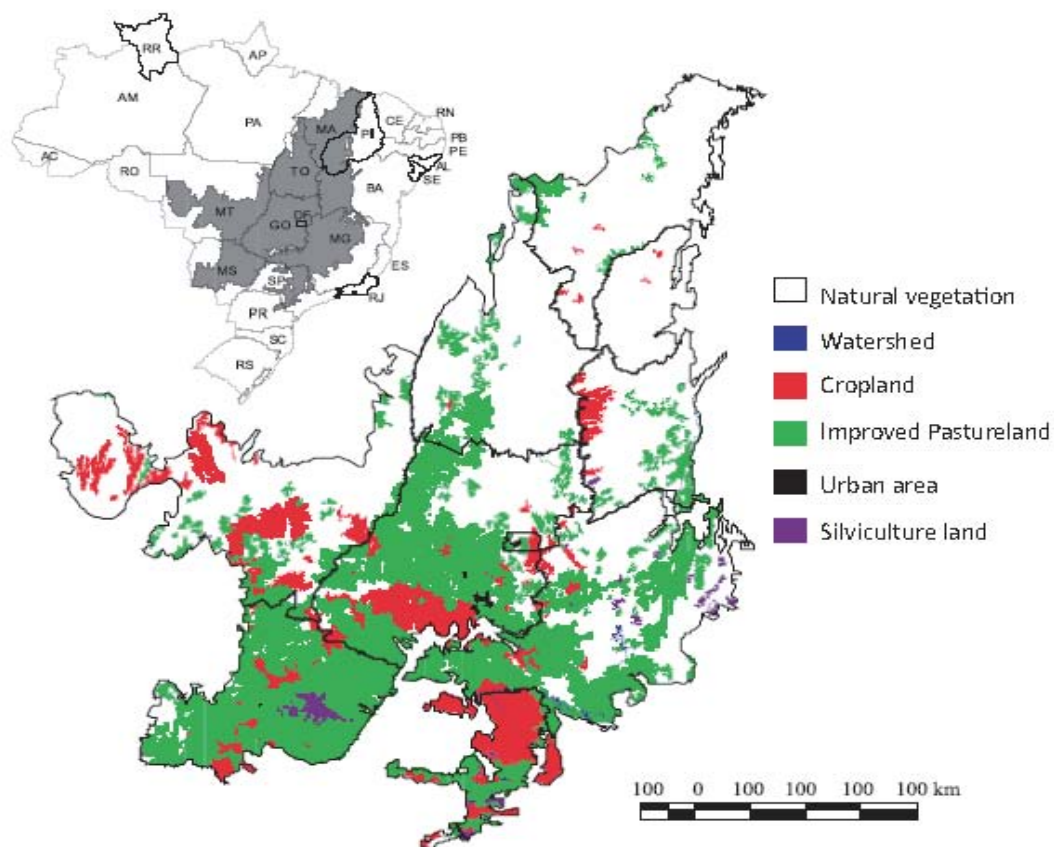
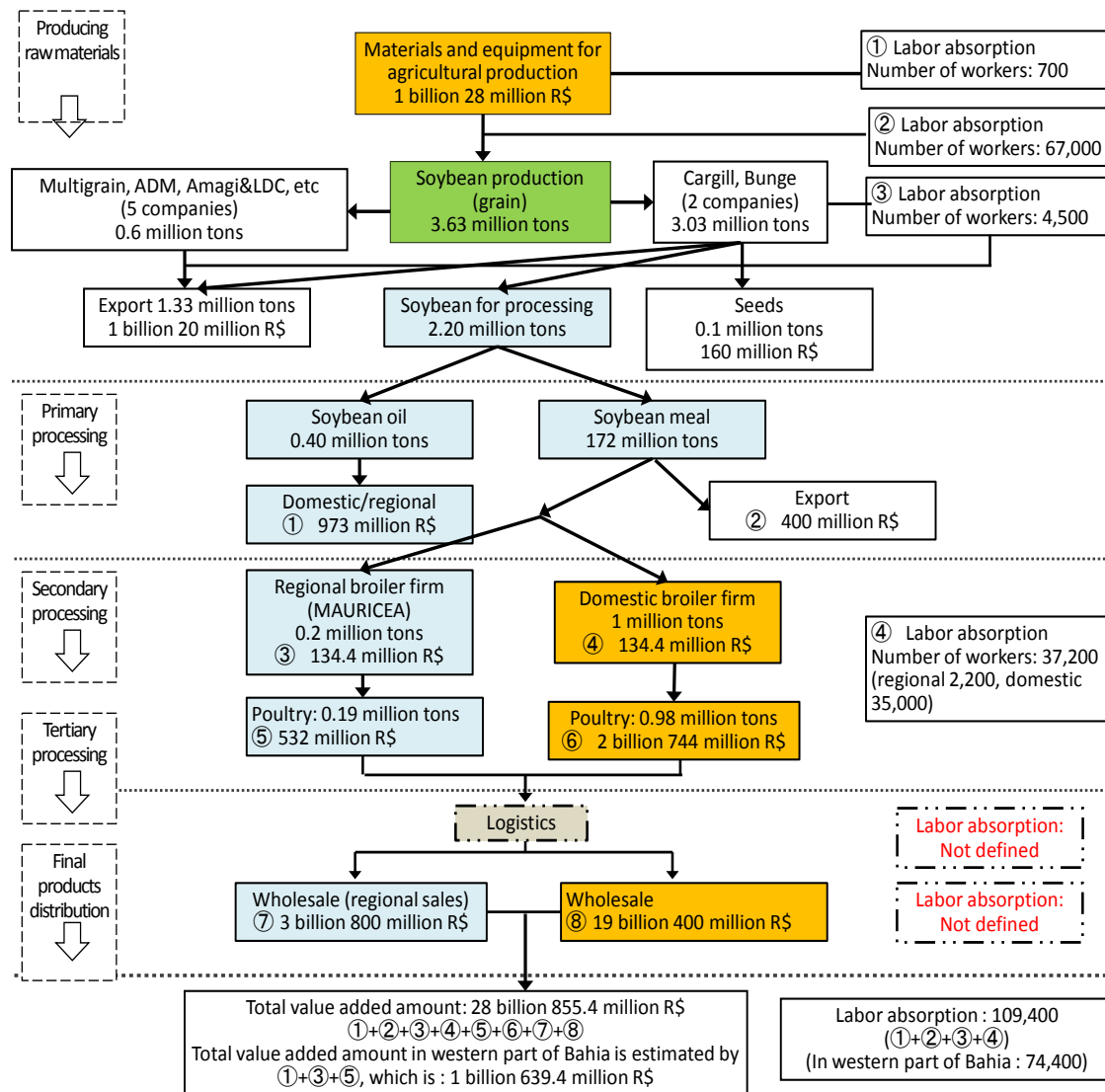


Figure 3.14 Spatial Distribution of Land Use in the Cerrado



Source: Edson Eyji Sano et al, Mapeamento semidetalhado do uso da terra do Bioma Cerrado, P.153

Value chain of Soybean Products in the Western Part of Bahia



Notes:

Export value of soybean : Export quantity 1.33 million tons * export value 828 R\$/ ton (FOB at Port Paranagua, 2010, <http://www.abiove.com.br>)

Seed production value : Seed production quantity * seed price 1.6 R\$ / kg (Agrianual, 2011)

Soybean oil value : Quantity * oil value 2,432 R\$ (Agrianual, 2011)

Soybean oil production quantity was calculated at 18% of total processing soybeans, and soybean meal quantity was calculated at 78% yield rate.

Soybean meal production quantity : Quantity * export value 744 R\$/ton (FOB at Port Paranagua, 2010, <http://www.abiove.com.br>)

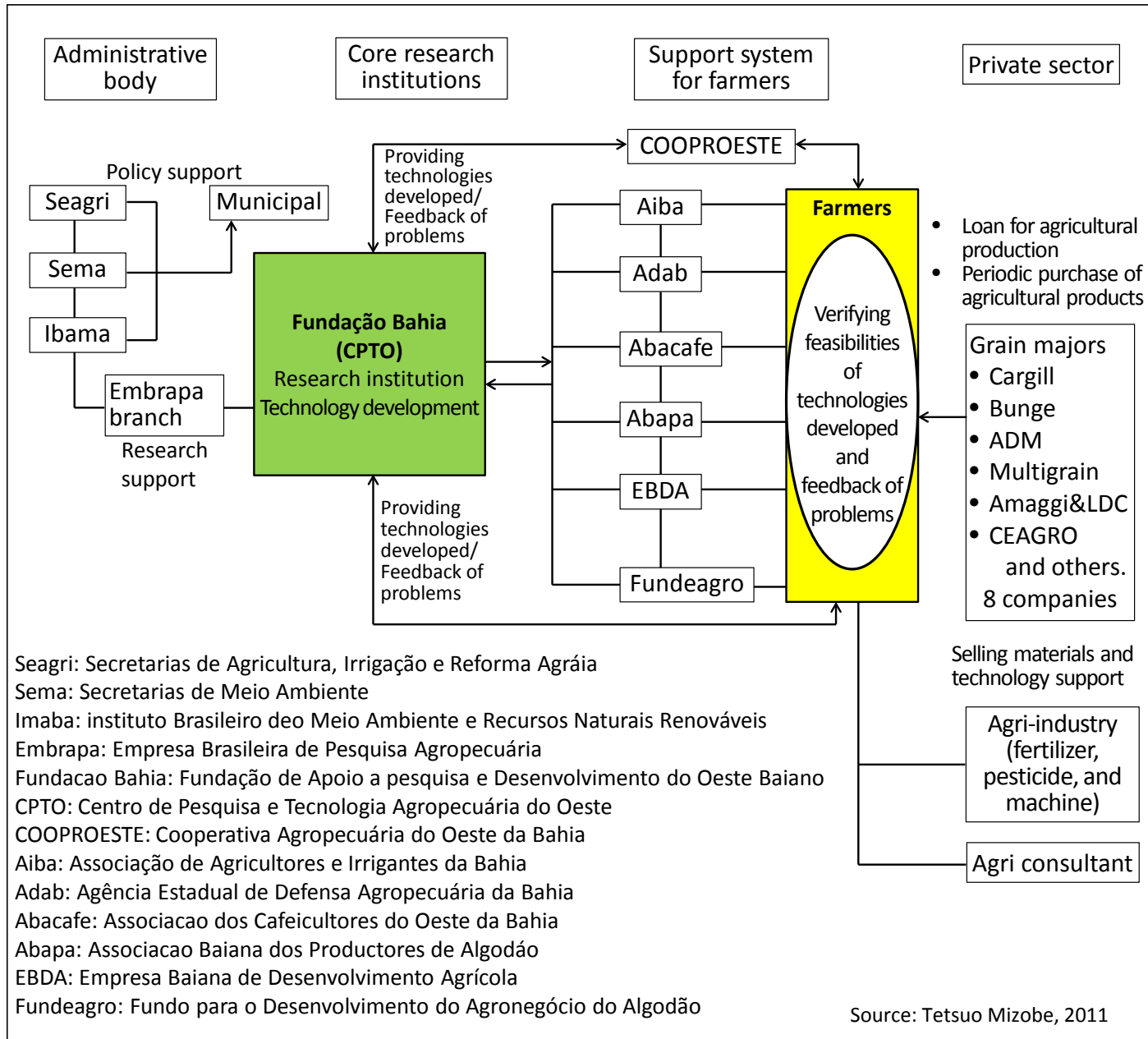
Poultry production value: Shipping amount * value at plant 2.8R\$/ kg (Value based on an interview with MAURICEA in Bahia)

Wholesale: Sales * retail price 20 R\$/ kg (Price based on interviews with retail stores in Sao Paulo)

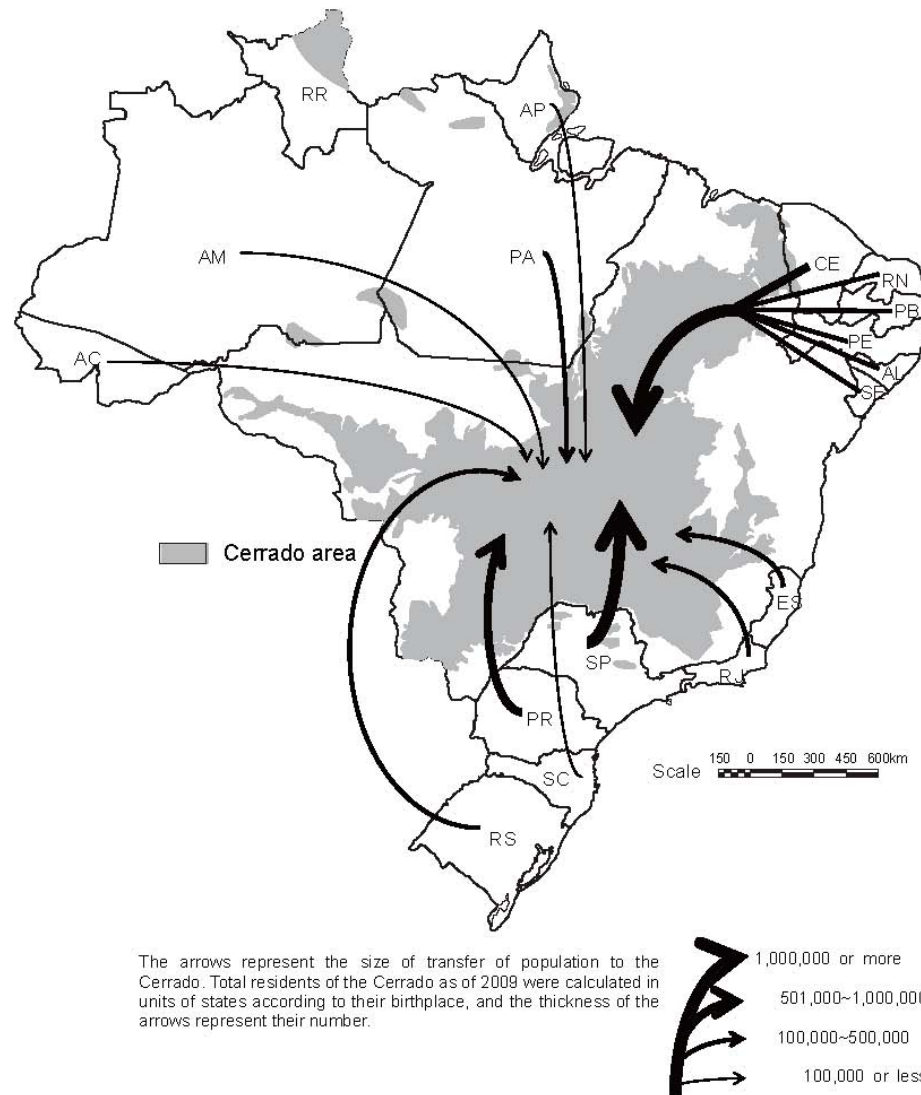
Logistics is excluded from calculating total value added amount due to difficulty of calculation, and the same for labor absorption.

Labor absorption: ① Fertilizer company, Galvani, 500, fertilizer and agricultural machinery agents, 200 (50 agents * 4 persons/ each) ② # of workers in agricultural fields was calculated by total payroll/minimum wage ③ Local grain companies were based on interviews. ④ Broiler companies were based on interviews..

Connections between Government, Agri-business, and Farmers in the Western Part of Bahia



Migration to Cerrado region





① The center pivot irrigation system with a radius of 200-500 meters. Movable water pipes encircle a field.



② Loading soybeans onto a barge at the Upper Amazon port of Porto Velho



⑤ The city of Lucas de Rio Verde, one of the focal points of the cerrado agricultural development by PRODECER, as it appears today (2011).



④ Center pivot irrigation facilities seen from the air.



⑥ Hosono (center) and Hongo (left) meeting with Tocantins State Governor José Wilson Siqueira Campos.

Key factors for economic transformation

(Case of Cerrado agriculture)

Triggers that change endowments and/or competitiveness	Technological innovations: related to soil improvement and new varieties for tropical climate Institutional innovations: PRODECER
Incremental changes that prepare endowments and other basic conditions	accumulation of capabilities: capable and diligent farmers of Southern states
Driving forces to keep momentum of development	private enterprises, dissemination of technology, etc.
Roles of government and market (private sectors' spontaneous activities) (Roles changes over time according to phases of development)	Generally speaking, government could play important role in enabling decisive triggers, preparing conditions, leadership, strategy formulation, etc.
Industrial development strategy, vision, strong leadership	

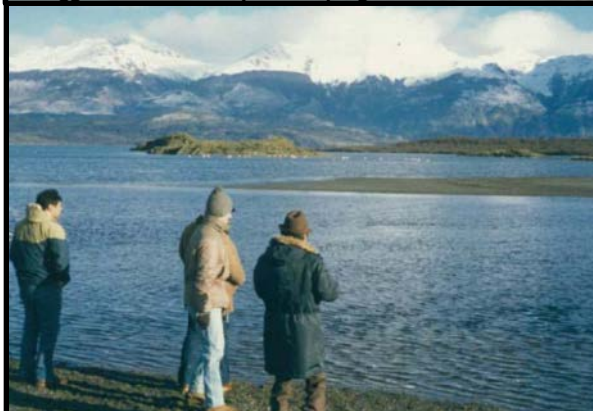
Chilean Salmon Industry

- Long-standing vision among Chileans has been the establishment of a new industry for development of the Southern region of Chile
- Salmon sea farming industry developed from scratch
- Government started the Salmon project in 70s and Fundacion Chile, a public-private entity, achieved 1000 ton production scale, confirming the salmon culture's commercial feasibility in the Southern region of Chile
- Today, Chile and Norway are the largest exporters of salmon and salmon products in the world

NAGASAWA Ariaki
Expert



② Nagasawa expert was checking the condition of the eggs which normally-developing and about hatched.



③ The river where chum salmon was found. The name of this bay is Ultima Esperanza (Last Hope).



① Fertile eggs arrived at Santiago Airport after traveling 70 hours from Hokkaido (Japan).

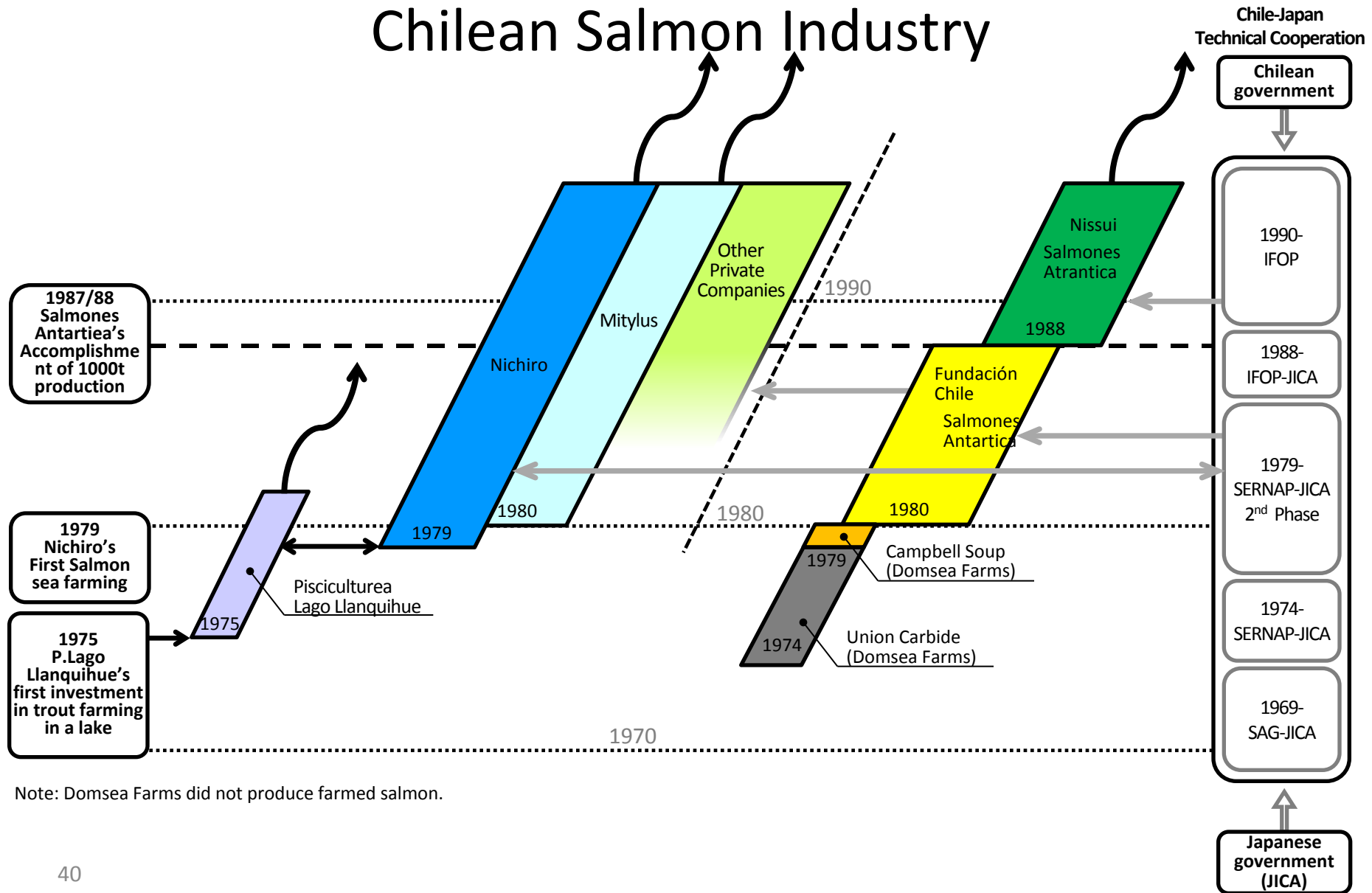


④ The hatchery completed in 1976. The facilities were gradually improved.

» Evolution of the World Production in Salmon and Trout Farming (millions of tons)

Years	World Production	Norwegian Production	Chilean Production	Chile's % in the world
1995	612	262	128	21
1998	926	387	258	27,8
2001	1.327	478	450	34
2004	1.586	602	601	37,8
2005	1.617	632	614	38
2006	1.820	709	709	39

Pioneer Companies and Institutions of Chilean Salmon Industry





⑤ Fish preserve installed on the opposite shore of the hatchery.



⑥ Forage Development Lab. Japanese government assisted the equipment and training program.



⑦ Forage Development Lab. Which has been used after 30 years.



⑧ SHIRAISHI Hatchery (1986)



⑨ SHIRAISHI Hatchery (2008)

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JICA Project
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<https://libportal.jica.go.jp/fm/i/xsl/library/public/ProjectHistory/ProjectHistory-p.html>

Key factors for economic transformation

(Case of Chilean Salmon Farming)

Triggers that change endowments and/or competitiveness	Achievement of <i>Fundación Chile</i> 's sea farming at 1,000t. scale confirming the commercial feasibility of salmon culture; Nichiro's first venture of sea farming
Incremental changes that prepare endowments and other basic conditions: R&D; accumulation of capabilities	accumulation of capabilities: Preparation of salmon culture specialist and R&D on national eggs production, feed production as well as on diseases by Japan-Chile Salmon Project, <i>Fundación Chile</i> and others.
Driving forces to keep momentum of development	private enterprises, dissemination of technology, etc.; Formation of salmon clusters
Roles of government and private sectors (changes over time)	Establishment of public-private entity " <i>Fundacion Chile</i> ", International cooperation Chile-Japan
Industrial development strategy	Ministry of Agriculture's vision; <i>Fundacion Chile</i> 's strategy and business model;



⑩ Well boat for transferring salmon



⑪ Salmones Antártica Forage factory in Los Angeles.



⑫ Transferring salmon using vacuum pipe.



⑬ Farms are growing and their facilities became larger

For more
information

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<https://libportal.jica.go.jp/fm/i/xsl/library/public/ProjectHistory/ProjectHistory-p.html>

Singapore's approach to economic transformation

- Cross-cutting industrial strategy from cheap-labor based manufactured exports to technology and high skilled labor based exports
- Strategy to strengthen transport and logistics hub

Country without natural resources and with large number of unemployed: Background of Productivity Initiative in Singapore

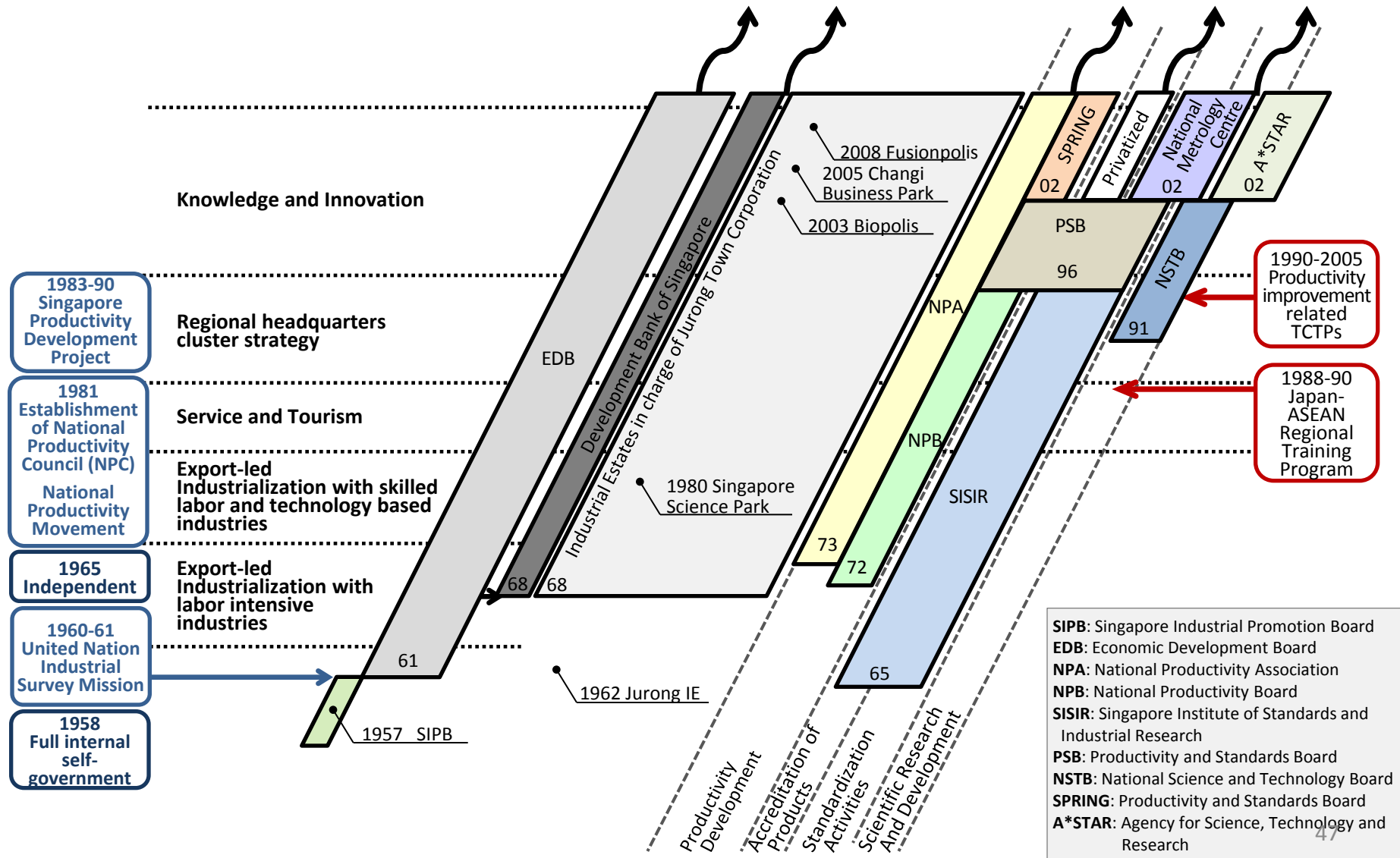
- Singapore, a country without natural resources and of large number of un-employed when it got independence, is one of the first South East Asian countries to promote export-led growth instead of import substitution-led one. However, in late 70s, faced with increasingly stronger competition from late comers whose wage rate was lower, Singapore decided to transform cheap-labor-based export economy into skilled labor-/knowledge-based and higher value-added export one. For this transition, it was considered essential to increase productivity.
- Economic Development Board (EDB) accomplished the leading role and promoted “knowledge based FDIs”. But, FDIs would not have invested in Singapore if the country did not have high productivity labor and other outstanding advantages.

Economic Development Board (EDB)

- EDB was an agent and catalyst of the **development of a broader set of capabilities** that Singapore has displayed over the decades (Schein (2001), p.2)
- The initial leadership team assumed that the government had to play a lead role and be business oriented. If economic development was to succeed, **the key resource would be Singapore's own people.** (Ibid., p.236)
- The primary function of EDB was to **promote the establishment of new industries** in Singapore and to accelerate the growth of existing ones (Ibid., p. 38)

SINGAPORE

Singapore's development of high value-added goods and service sector

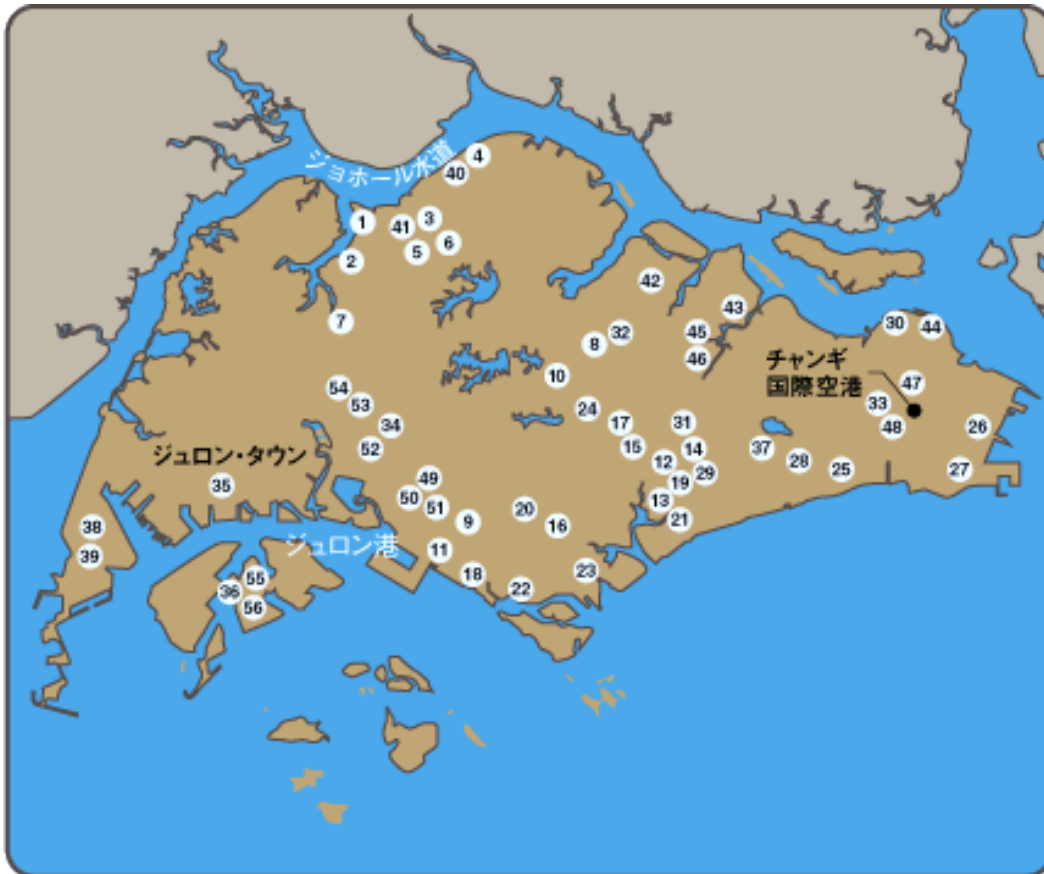


Vision of Lee Kuan Yew

- Productivity initiative was strongly promoted by top leaders of the country, especially, the first Prime Minister Lee Kuan Yew: “The shift to knowledge-intensive industrial structure with strong international competitiveness is only possible by human-resource development of 2.6 million people, the only resource Singapore has”, according to *Memories* of then Prime Minister Lee Kuan Yew. Japan Productivity Organization (1990, p.1)
- Through Singaporeans and Japanese mutual learning, with strong ownership of Singaporeans, Singapore Style Productivity Movement was born. For details, see JICA (2011)
- The institution in charge was developed vigorously adapting itself to the changing position of the country in the world.

- In April, 1981, the Singaporean Committee on Productivity was formed by representatives of enterprises, workers' organizations, government officials, and academia. The Committee reviewed the experiences of productivity movements in Japan, another country without natural resources but with abundant labor, and presented a report to the President of the National Productivity Board (NPB) of Singapore. NPB was designated as the main body for promoting productivity development in Singapore and in June 1983, the Singapore Productivity Development Project (SPDP) was launched with the support of the Japanese government. (JICA/IDCJ/IDJ (2010 p.4/30))

Singapore Industrial Estates



1. Kranji Industrial Estate	29. Kampong Ubi Industrial Estate
2. Sungei Kabut Industrial Estate	30. Loyang Industrial Estate
3. Woodlands Central	31. Tai Seng Industrial Estate
4. Woodlands East	32. Yio Chu Kang Industrial Estate
5. Woodlands West	33. Tampines Industrial Estate
6. Woodlands D	34. Clementi West Industrial Estate
7. Yew Tee Industrial Estate	35. Jurong Industrial Estate
8. Ang Mo Kio Industrial Estate	36. Southern Islands
9. Ayer Rajah Industrial Estate	37. Eunos Techpark & Eunos Technolink
10. Bishan Industrial Estate	38. Tuas View
11. Herderson Industrial Park	39. Tuas Biomedical Park I, II
12. Kallang Basin Industrial Estate	40. North Coast Wafer Fab Park
13. Kallang Park Industrial Estate	41. Woodlands Wafer Fab Park
14. Kampong Ampat Industrial Estate	42. Seletor Aerospace Park
15. Kolam Ayer Industrial Estate	43. Pasir Ris Wafer Fab Park
16. Redhill Industrial Estate	44. Airport Logistics Park of Singapore (ALPS)
17. St. Michael's Industrial Estate	45. Tampines Wafer Fab Park
18. Singapore Science Park	46. Advanced Display Park
19. Sims Avenue Industrial Estate	47. Changi International LogisPark (North)
20. Tanglin Halt Industrial Estate	48. Changi International LogisPark (South)
21. Tanjung Rhu Industrial Estate	49. Biopolis
22. Telok Blangah Industrial Estate	50. Fusionopolis
23. Tiong Bahru Industrial Estate	51. Media Polaris
24. Toa Payoh Industrial Estate	52. Clementi West LogisPark
25. Bedok Industrial Estate	53. Toh Tuck LogisPark
26. Changi North Industrial Estate	54. Toh Guan LogisPark
27. Changi South Industrial Estate	55. Banyan LogisPark
28. Kaki Bukit Industrial Estate	56. Meranti LogisPark

Experiences of creation of jobs with higher wage, productivity and international competitiveness in Singapore

- The institutional development in the area of quality, productivity and, now, innovation in Singapore is outstanding:
- Starting point: National Productivity Center under **Economic Development Board (EDB)**; National Productivity Board (NPB); Standard and Productivity Board (SPB); and, now, **Standards, Productivity and Innovation Board (SPRING)**

Outcome of SPDP

- Some 15,000 Singaporean engineers, managers, and other professionals participated in the project. Two hundred engineers, managers, and other professionals from Singapore took part in training courses in Japan. More than 200 Japanese experts were dispatched to Singapore.
- In 1990, when SPDP ended, 90 percent of workers in the country were involved in productivity development activities, compared with 54 percent in 1986. In 2001, 13% of the total labor force was participating in Quality Control Circles (QC Circles), in comparison with 0.4% in 1983 when SPDP started. QC Circles are considered to be the most effective vehicle for improving quality and productivity with the active participation of workers. Through this participatory approach, workers' ideas are incorporated into the production process with innovative solutions. Hence SPDP became one of the driving forces for productivity gains in Singapore.

Source: JICA/IDCJ/IDJ(2010),p.16 of Part 4 and p.22 of Part 4

Key factors for economic transformation (Case of Singapore)

Triggers that change endowments and/or competitiveness	Economic Development Board (EDB)'s efforts based on its 'strategic pragmatism'; Infrastructure for transport and logistics hub.
Incremental changes that prepare endowments and other basic conditions: R&D; accumulation of capabilities	Establishment of National Productivity Council (NPC) in 1981 (Singapore Productivity Development Project (SPDP) followed in 1983) Establishment of Productivity and Standards Board (PSB) (in 1996) and Standards, Productivity, and Innovation Board (SPRING)
Driving forces to keep momentum of development	Skilled workers, promising FDI with strategic pragmatism (EDB); enhancement of infrastructure of transport; industrial parks
Roles of government and private sectors (changes over time)	Government institutions and Public-private partnership
Strategy and vision	Political leaders' vision, strategy and leadership

Concluding remarks

Successful industrial strategy

- **Accumulation of capabilities** for years of efforts and learning by doing is, generally, essential for successful industrial strategy aiming at economic transformation: with **gradual change of factor endowments**
- Government, often with other actors (including private actors and international cooperation), could **trigger transformation process** by investment in infrastructure, technological and/or institutional innovation, etc.: with **rapid and drastic change of factor endowments**
- Once transformation started, **drivers** (investors, both local and foreign; increasing demand; etc.), are necessary **to keep the momentum of transformation**

Government's initiative and independent public institutions

- Governments' initiatives with **strategy or vision**, generally shared with the society as a whole, including private enterprises, served as a basic guideline
- **Public institutions, or public-private institutions**, played an important role
- These institutions are generally independent or **insulated from short-term political changes** and close public-private relationship is maintained

Examples of key public institutions

- **EMBRAPA**, in Brazil's Cerrado development, insulated from short-term changes of the government (*EMBRAPA Model*) and public-private bi-national entity, CAMPO, insulated as well (Hosono and Hongo (2012));
- **Fundacion Chile**, a public-private entity, in Chile's salmon industry development;
- **Eastern Seaboard Development Committee and technocrats of National Economic and Social Development Board (NESDB)**, etc. in Thailand (Shimomura and Mieno (2008) p.24);
- In Singapore, Economic Development Board (**EDB**) became the **instrument for developing an economic strategy and putting it into practice**. (Schein (2001), p. xi) Government build a **partnership between public and private sectors for productivity movement** in Singapore (Ohno and Kitaw (2011), p.59);

From strategy to policies and practices

- Generally, **strategy**, shared vision with strong ownership and awareness regarding challenges to address are crucial
- Strategy should be translated into policies and pragmatic measures and practices
- **Roles of government evolve over phases of process of transformation**: They are crucial particularly in early phases (as seen in the cases of Cerrado agriculture and Chile's salmon industry)
- Singapore established SME business assistance schemes for every stage of growth: start up, growth, expansion and going overseas stages (Schein (2001), p.57)

Thank you very much

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- Comments welcome
- For details, see Hosono Akio, “Industrial strategy and economic transformation: Lessons from five outstanding cases”, in *Working Papers: Africa Task Force Meeting (JICA and The Initiative for Policy Dialogue)*