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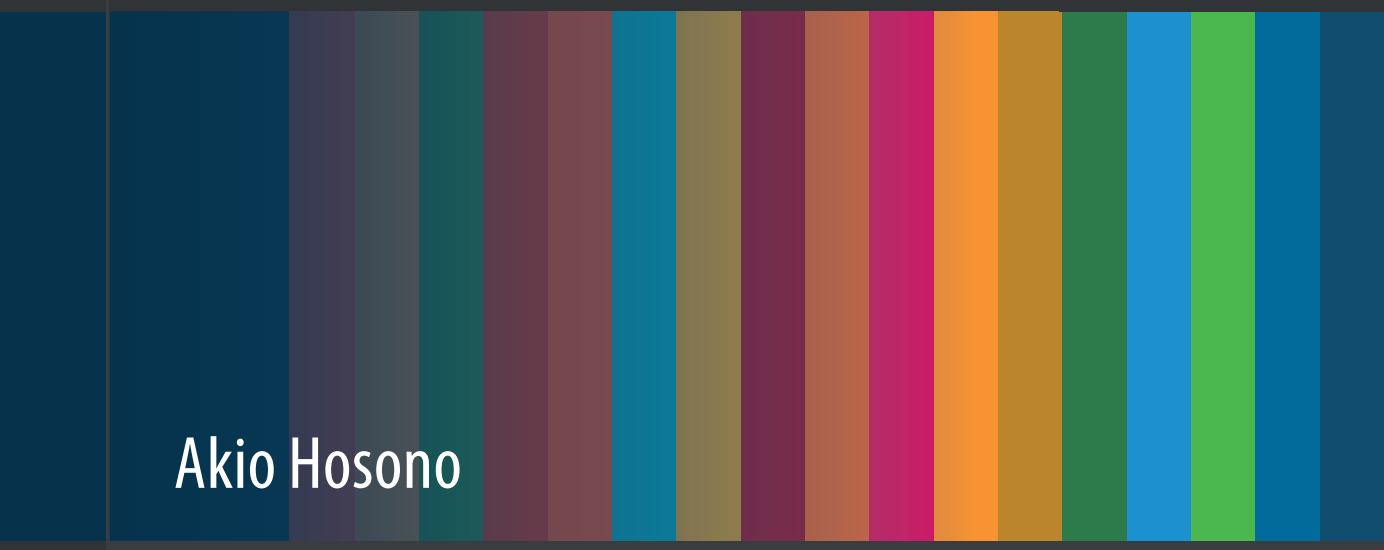

Akio Hosono

SDGs, Transformation, and Quality Growth

Insights from International Cooperation

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Foreword

We are witnessing a greater consensus on the need to focus on higher-quality growth that is consistent with the sustainable use of natural resources to address climate change, generates decent work, reduces poverty, and strengthens resilience against risks of pandemic shocks, natural disasters, and other threats. The United Nations document on Sustainable Development Goals (SDGs) states in its introduction that "[W]e resolve…to create conditions for sustainable, inclusive and sustained economic growth, shared prosperity and decent work for all.…" As such, it appears that the concept of quality growth is inherent in many aspects of the SDGs. A similar approach can be seen in the Development Cooperation Charter announced by the Japanese government in 2015. According to the Charter, one of the most important challenges of development is quality growth and the reduction of poverty achieved through such growth. The approach in the Charter emphasizes inclusiveness, sustainability, and resilience.

Quality growth is closely related to the concept of human security, the guiding principle that lies at the foundation of Japan's development cooperation. As the Development Cooperation Charter states, human security is a concept that pursues the right of individuals to live happily and with dignity, free from fear and want, through their protection and empowerment. Decent work and inclusive growth, attributes of quality of growth, for example, are critical for dignity as well as freedom from want. Decent work is defined by the ILO as opportunities "for women and men in conditions of freedom, equity, security and human dignity" to obtain decent and productive work. Sustainability and resilience, other attributes of quality growth, are essential for freedom from fear, protection, and empowerment. The Japan International Cooperation Agency establishes as its mission that, in accordance with the Development Cooperation Charter, it will work on human security and quality growth.

This volume is a pioneering study on quality growth, with its main objective being to seek out insights into the concept of high-quality growth. The book explores its essential attributes, such as inclusiveness, sustainability, and resilience, by drawing principally on illustrative cases and experiences of international cooperation. It provides insights on strategies to attain quality growth, along with effective approaches for implementing them. Each country faces its own challenges in attempting to develop and implement its own quality growth agendas. In this context, lessons learned from the experiences of other countries in achieving quality growth may not

be directly applicable, but they can be useful in formulating strategies and determining effective approaches for addressing quality growth agendas.

This book is a result of a research project conducted at the Japan International Cooperation Agency Ogata Sadako Research Institute for Peace and Development (JICA Ogata Research Institute), entitled "Study on Quality Growth." Its content also reflects the achievements of several other research programs in which researchers of the JICA Ogata Research Institute participated, such as those of the Initiative of Policy Dialogue (IPD) at Columbia University, the Brookings Institution, and the Global Development Network (GDN). We would like to express our sincere gratitude to these institutions for carrying out the research programs successfully to advance studies on quality of growth and related issues.

We hope this volume will contribute to a deeper understanding of the key issues related to SDGs and quality growth.

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Akio Hosono

Contents

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SDGs, Transformation, and Quality Growth: An Overview

1

The world is currently facing multiple challenges, including pandemics of contagious diseases such as COVID-19, persistent extreme poverty, severe impacts of global warming and climate change, as well as rising inequality in many countries. Under these circumstances, few people would disagree with the idea that the values and practices embodied in the concept of "quality" of growth are now needed more urgently than ever. The "quality" of growth concept can be applied to addressing many of our key contemporary challenges, such as jobs, equity, the environment, resilience, human security, and so forth.

Quality of growth is a concept that has been growing in importance over the past twenty years. It was a central pillar of the "APEC (Asia Pacific Economic Cooperation) Growth Strategy" agreed by APEC leaders in 2010 (APEC 2010). It emphasizes balanced growth, inclusive growth, sustainable growth, innovative growth, and secure growth. The United Nations document on "Sustainable Development Goals (SDGs)" states in its introduction that "We resolve to create conditions for sustainable, inclusive and sustained economic growth, shared prosperity and decent work for all" (UNGA 2015, 2). As such, it appears that the concept of quality growth is inherent in many aspects of the SDGs.

On the other hand, in recent policy debates on growth and development, including the post-2015 discussions, there has been a stronger focus on economic and social transformation. The SDG document cited above states that, "On behalf of peoples we serve, we have adopted a historic decision on a comprehensive, far-reaching and people-centered set of universal and transformative Goals and targets" (UNGA 2015, 2). "In these Goals and targets, we are setting out a supremely ambitious and transformational vision" (UNGA 2015, 3).

Likewise, focusing on economic transformation, the flagship report of the Asian Development Bank (ADB 2013) argues that development is distinct from aggregate growth, which can occur without significant transformation, as has happened in some oil-rich economies. The report highlights five key components of transformation: "(1) reallocation of factors of production; (2) diversification, upgrading, and deepening of the production and export baskets[1]; (3) use of new production methods and processes and different inputs; (4) urbanization; and (5) social changes" (ADB 2013, 3–5). Therefore, there now seems to be more of a consensus on the importance of quality of growth on the one hand, and economic and social transformation on the other.

Another aspect under consideration is the centrality of the transformation process for quality growth. McMillan et al. (2017) reiterate this aspect in the following way: "The quality of economic growth matters. For the majority of today's developing countries, a change of gear from steady but low-quality growth to a process of economic transformation is the only secure route to sustained poverty reduction" (ix).

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Accordingly, the relationship between quality growth and transformation becomes crucial to policy debates on development and international cooperation.

The main objective of this book is to seek out insights into the concept of high 'quality growth'. We will explore its essential attributes, such as inclusiveness, sustainability and resilience, as well as its relationship with transformation, by drawing principally on illustrative cases and experiences of international cooperation. Each country faces its own challenges in attempting to develop and implement its own quality growth and transformation agendas. In this context, lessons learned from the experiences of other countries in achieving quality growth may not be directly applicable, but they can be useful in formulating strategies and determining effective approaches for addressing transformation agendas. The experiences of other countries could therefore be relevant in establishing each country's 'quality growth strategy.'

In the next section, I summarize some of the basic aspects of quality growth, transformation, and the relationships between them. These are areas in which there has been growing consensus in recent years.

1.1 Key Attributes of Quality Growth and Its Definition

Haddad et al. (2015) state that the United Nations Development Programme (UNDP), through both its Human Development Reports and Human Development Index, has brought the idea of the quality of growth into the mainstream policy discourse since 1990. One seminal work in the development of the concept, *The Quality of Growth* by Thomas et al. was published in 2000. However, as Haddad et al. (2015) stress, trends and events of the last decades have moved debates on quality growth from being a largely academic exercise to becoming an urgent matter of public policy.[2] Recent significant trends and events demonstrating the current relevance of quality of growth include the global financial crisis of 2007–08, the more compelling evidence on climate change, and potential tradeoffs between economic growth, poverty reduction and environmental costs, and the consequences of inequality. Indeed, the debates related to the APEC Growth Strategy emphasizing quality of growth started in the aftermath of the 2007–08 crisis.

Haddad et al. (2015) identify three agreed-on key attributes of quality growth as follows: "(i) growth that manages environmental tradeoffs, (ii) growth that supports equity and inclusiveness, and (iii) growth that is less susceptible to shocks" (3). A similar approach can be seen in the "Development Cooperation Charter" announced by the Japanese government in 2015. According to the Charter, one of the most important challenges of development is "quality growth" and the poverty reduction achieved through such growth. The approach in the Charter emphasizes inclusiveness, sustainability, and resilience (Cabinet Office, Japan 2015).

Most recently, Kanbur et al. (2019) establish the following as attributes of quality growth: "(i) the distribution of the income gains from growth; (ii) the translation of economic growth into nonincome dimensions of well-being, such as employment, health, education, and security; (iii) the structural transformation of the economy, so that the sources of growth and employment are diversified away from dependence on low-productivity primary commodities and informal activities toward modern manufacturing (including "industrial agriculture") and services; (iv) management of the urbanization process so that it enhances the quality of life; and (v) environmental sustainability" (3).

For each of the attributes of quality growth, such as inclusiveness, sustainability, and resilience, years of academic research and public debates have been made. Haddad et al. (2015) and Kanbur et al. (2019), for example, provide an overview of this research and debates. From these discussions, it is clear that an in-depth analysis of the attributes of quality of growth is crucial for formulating a comprehensive definition of "quality growth." I will discuss these specific attributes throughout this volume, focusing on inclusiveness in Chaps. 4 and 5, sustainability in

Chap. 7, resilience in Chap. 8, and the management of the urbanization process in Chap. 6. I will consider transformation and its relationship with quality growth in Chaps. 2 and 3.

1.2 Dimensions of Transformation and Its Definition

"Transformation" has multiple dimensions that vary according to context. It refers very often to industrial or industrial structure transformation.[3] It also refers to broader dimensions of economic and social changes. The "supremely ambitious and transformative vision" of the UN document cited above is related to the broader and multiple dimensions of transformation. In this regard, the above-cited ADB definition of transformation, with its five key components, appears to be highly relevant. The first three components are related to industrial (structure) transformation: (i) reallocation of factors of production; (ii) diversification, upgrading, and deepening of the production and export baskets; and (iii) use of new production methods and processes and different inputs.[4] The other two components, urbanization and social changes, are concerned with broader transformation. Industrial transformation, urbanization, and social changes are intrinsically interrelated. Industrial transformation accelerates urbanization and social change and vice-versa.

Thus, with its multiple dimensions, transformation could contribute to quality growth. Through this process, a society can transform continuously to become a more inclusive, sustainable, and resilient one.

1.3 How Transformation Takes Place and What Triggers It

ADB (2013) identified the following factors likely to affect the direction and pace of transformation: (i) demand and supply change; (ii) demographic and geographic variables (such as resource endowments and population density) and country size; (iii) good organization capabilities (capabilities encompassing all the tacit knowledge necessary to produce a good or deliver a service); (iv) specific policies and actions (including those pertaining education and technological learning); (v) institutions; and (vi) politics.

Regarding demand and supply change, international trade and investment (FDI) are overwhelmingly crucial factors in a globalizing world and, because of this, dynamic comparative advantage matters. According to Noman and Stiglitz (2012), the "old" policies focused on improving economic efficiency within a static framework, "but the essence of development is dynamic. What matters, for instance, is not comparative advantage as of today, but dynamic comparative advantage" (7). Lin (2012), likewise, discusses 'changing comparative advantage,' arguing that "the more effective route for their learning and development is to exploit the advantages of backwardness and upgrade and diversify into new industries according to the changing comparative advantages determined by the changes in their endowment structure" (73).

Based on the literature and cases in practice, essential endowments for dynamic comparative advantage are, among others, learning capacity and human capital in which learning capacity is embedded, infrastructure, and institutions (see Chaps. 2 and 3). In short, the enhancement of essential endowments is a driving force of industrial transformation. The essential endowments, along with standard factor endowments, enable changes in dynamic comparative advantage.

Essential endowments, such as learning capacity and human capital, infrastructure, and institutions, among other factors, strongly affect the direction and pace of both transformation and quality growth. Learning contributes to growth and competitiveness through increases in productivity and innovation. Growth can be genuinely inclusive and innovative when it takes full advantage of the talents of the entire population. The case studies in Chaps. 7 and 8 also demonstrate how learning is critical for sustainable growth and resilience. Infrastructure such as transport and communication networks that encompass remote populations and provide a

connection to domestic and world markets support growth across sectors, geographic areas, and households, creating opportunities for quality growth. The SDGs (Goal 9) refer to quality, reliable, sustainable and resilient infrastructure to support economic development and human well-being, with a focus on affordable and equitable access to all. Thus, quality of infrastructure is crucial for achieving quality growth.

Also relevant here are institutions to promote good governance, macroeconomic stability, the rule of law, and efficient administration, since they promote growth opportunities that do not discriminate. For instance, progressive tax regimes, as well as inclusive education and universal health-care institutions, provide the foundations for inclusive growth. Thus, inclusive institutions matter. In short, the above-mentioned essential endowments contribute directly, as well as indirectly through transformation, to quality growth. I discuss the nexus between changing endowments, transformation, and quality growth further in Chaps. 2 and 3.

1.4 The Case Studies Approach

Case studies are presented in each of the remaining chapters of this volume. They provide valuable insights into the key issues discussed. The case study approach distinguishes this volume from some previous literature that discusses quality growth within the framework of general policy. Instead, in this volume, concrete cases and experiences will provide insights into hands-on 'ingredients.'[5] Through the case studies, we can see more clearly that transformation and quality growth is not something that happens automatically, but something that requires specific, properly designed strategies and approaches.

1.5 The Organization of This Volume and Its Main Pillars

This volume starts with a comprehensive discussion of the conceptual and analytical aspects of quality growth and transformation (examined in the first part of Chap. 2), and of the main strategies for attaining transformation with quality growth (covered in the latter part of Chap. 2). Based on the findings of Chap. 2, I analyze five outstanding cases of economic transformation to obtain insights into how crucial factors interact in practice, producing synergies (Chap. 3). Then, in Chap. 4, I focus on learning capacity, which is considered the most important endowment for transformation. With these analyses in mind, I suggest strategies that could prove promising for sub-Saharan countries (Chap. 5). The subsequent three chapters focus on issues related to urbanization, sustainability, and resilience. I first review the relationship between transformation, urbanization, and quality growth (Chap. 6). In Chap. 7, I discuss the sustainability aspects of quality growth, exploring several cases of transformation and growth with the use of natural capital, green growth with agroforestry and conservation of forests, and environmentally friendly consumption and production. Following that, I discuss the resilience aspects of quality growth, focusing particularly on cases of disaster risk management (Chap. 8).

1.5.1 Strategies for Transformation and Quality Growth

Chapter 2 aims to provide insights into some of the main strategies for attaining transformation with quality growth and explore effective approaches for implementing them. It begins by presenting an overview of the growing concern with and current policy debates related to transformation and quality of growth in academic writings, as well as in international and regional organizations and think-tanks. Chapter 2 examines emerging literature emphasizing that development is achieved by transformation of the productive structure of the economy and accumulation of requisite capabilities. It stresses that learning capacity, infrastructure, and institutions, along with standard factor endowments, are critical determinants of dynamic comparative advantage. Based on this, I discuss key issues, identifying seven main, but not exhaustive,

promising strategies: those required to enhance each of the three essential endowments necessary for transformation, and those necessary to catalyze transformation and quality growth, through (i) sequential catching-up, (ii) integration into regional and global value chains, (iii) innovation, and (iv) development of inclusive business.

It is clear that the enhancement of endowments and transformation do not take place automatically. These processes are normally endogenous, but they need to be catalyzed or facilitated by industrial strategies and policies. As a corollary, it might be realistic to design policies and measures to attain the desired attributes of quality growth alongside the development of specific industries and their value chains while remembering specific transformation paths and quality growth agendas.

1.5.2 Industrial Development and Transformation: Insights from Outstanding Cases

Chapter 3 analyzes five outstanding cases of industrial development that resulted in a remarkable economic and social transformation in a country or regions of a country in order to explain how essential endowments and other crucial factors interact in practice. These cases are highly varied both in terms of the type of sectors as well as country contexts. The chapter looks at (i) the automobile industry in Thailand; (ii) the transformation of the 'Cerrado' tropical savanna in Brazil from a huge tract of barren land to a source of high productivity agriculture and agro-industry value chains; (iii) the garment industry in Bangladesh; (iv) the salmon farming and processing industry in Chile; and (v) Singapore's upgrading of its industrial sector from a labor-intensive sector to a knowledge-intensive one.

I seek to extract insights from these five case studies on how the various considerations that go into the making of industrial strategies and policies interact in practice in successful cases. I focus in particular on the acquisition of capabilities, the creation of a learning society, development of infrastructure, the use and alteration of endowments to move from static to dynamic comparative advantage, the compensation for the positive externalities generated by the costs of discovery by pioneer firms, and the management of the pressures generated by globalization and other factors.

The five case studies illustrate how the general principles of good industrial strategy and policies vary in their translation into different contexts. They also illustrate the mutual causality between "industrial development and economic transformation" on the one hand and the "constant development of capabilities and knowledge through learning" on the other. In the case of Singapore, in particular, I emphasize the crucial role of "learning to learn." These cases reveal that reasonably good institutional "islands" can be highly effective when created for specific purposes, as distinct from an overhaul of the entire institutional structure. This chapter also highlights the important role that the development of physical infrastructure plays as an instrument of industrial strategy and policies.[6]

1.5.3 Learning Capacity for Quality Growth

Chapter 4 aims to provide insights into effective approaches to strengthen learning capacities and create a learning society for quality growth. First, it presents an overview of the literature on the critical importance of learning and innovation for growth and development. In particular, it discusses approaches to initiate and maintain momentum and scale-up the learning process, drawing from cases of international cooperation for capacity development. These cases are analyzed from a 'learning perspective.' I do so by examining five outstanding cases of highly varied approaches, which I classify into two categories: learning a specific capacity/capability and learning to learn. The case studies pertain to (i) small-scale farmers in horticulture in Kenya; (ii) rural infrastructure development in Bangladesh; (iii) rural livelihood improvement (*seikatsu*

kaizen) programs in Japan and some developing countries; (iv) the One Village, One Product (OVOP) initiative in Japan and its dissemination to Thailand and Malawi; and (v) *Kaizen*, 'Just in Time' (JIT), Total Quality Management (TQM), and so forth, in Japan, the United States, Singapore, and some other countries. This last point, case (v), receives the greatest attention.

I identify several common features of these different approaches, e.g.: (i) easy entry points are available to initiate the learning process; (ii) the costs and risks are low; (iii) the focus is on learning by doing and mutual learning to cocreate innovative solutions; and (iv) learning makes an intrinsic (endogenous) contribution of learning to the particular objectives being pursued. These cases illustrate how learning and the accumulation of knowledge and capabilities play a vital role in quality growth. They have not necessarily produced transformation directly, but have still had a significant impact on the learning process of a society and thereby enabled changes in individuals, companies or organizations, as well as local or regional economies, and even national economies.

1.5.4 Transforming Economies for Jobs and Inclusive Growth

Chapter 5 argues that three strategies are relevant for supporting inclusive growth in the agrarian economies of sub-Saharan Africa: increasing the productivity of staple food crops, diversifying agriculture to higher-value crops while building stronger agro-industry value chains, and promoting light-manufacturing industrialization in conjunction with agricultural development. The total process constitutes a structural transformation that could be triggered, sustained, and accelerated by investments in infrastructure, human capital, technology, and inclusive finance. These strategies for promoting jobs and inclusive growth agendas are mutually reinforcing but must be explicitly articulated. It is clear from past experiences in sub-Saharan Africa that jobs and inclusivity do not necessarily accompany the growth of GDP alone.

The case studies on the three strategies show, first of all, that many successful experiences have confirmed the feasibility of dynamic and inclusive growth in sub-Saharan Africa. Second, they show that human capacity development, especially of farmers, workers, and SME entrepreneurs, is essential. There is a strong interrelationship between the creation of job opportunities on the one hand and the people's capacity to respond to those opportunities on the other. Capacity development is needed for people as well as institutions. Third, in the seven cases studied, different measures were taken to scale up the impact of programs. Pilot projects have been scaled up to cover geographically wider areas, diversify activities, and disseminate proven technologies and practices from the local to the regional and national levels. In some cases, they have been shared with other countries through South-South cooperation. In many of the cases, the roles of government, public institutions, and public–private partnerships have been important.

1.5.5 Addressing Challenges of Urbanization for Quality of Growth

Industrial structure transformation and urbanization are intrinsically self-reinforcing. Because urbanization is one of the most important enablers of rapid growth, countries that want to grow fast must learn how to make urbanization work well. However, as ADB (2013) argues, there are two challenges related to urbanization: "The first challenge is to foster the growth of high productivity activities that benefit from agglomeration and scale economies in developing-country cities. The second involves managing the likely side effects of the economic success of cities, i.e., urban poverty, pollution, congestion, and high prices of land and housing, as well as regional inequality" (25).

From a quality of growth perspective, one of the effective approaches to address these urban challenges could be "re-urbanization with land readjustment." Chapter 6 aims to discuss the effectiveness, advantages, and challenges of land

readjustment. First, it discusses the main characteristics and relevance of land readjustment for urbanization, drawing from experiences in Japan. The chapter then analyzes how land readjustment could enhance inclusiveness, sustainability, and resilience of urban development. Third, it discusses experiences of land readjustment in developing countries. The chapter provides some substantive insights into recent initiatives and their outcomes. For example, land readjustment was applied to urban slums in Medellin, Colombia, together with several other concurrent measures. This led to substantial improvements within informal settlements in high-risk areas. In general, pro-poor policies, infrastructure for better access to jobs, education and health, and land readjustment could produce synergies and effectively address the challenges faced by urban slums.

1.5.6 Quality Growth Focusing on Environmental Sustainability

'Transformation and sustainability' is one of the central themes of the quality growth agenda. Chapter 7 discusses effective approaches toward quality growth, focusing particularly on environmental sustainability. The cases discussed in this chapter, especially those related to the 'circular economy' and the 'green economy,' demonstrate that inclusive approaches, in which consumers and/or producers as well as other stakeholders, actively participate, is crucial. At the same time, innovative technologies and the accumulation of capabilities are both key aspects. Moreover, easy entry points can be identified in circular economies, such as 3R (reduce, reuse, and recycle) initiatives for both producers and consumers, in *Kaizen* (or continuous improvement) activities, as well as in green economies.

In cases where natural capital is the main endowment that enables the transformation, one of the key challenges for sustainable growth is to create institutions that are capable of monitoring and managing resources while supporting inclusive growth and poverty reduction through such growth. The activities of these institutions need to be supported by scientific research on the environmental, ecological and social impacts of the transformation, as well as developing effective monitoring systems.

1.5.7 Quality Growth Focusing on Resilience to Disaster Risks

Quality growth is expected to enable people and society to strengthen their resilience. It will also help to transform economies, making them also more resilient. Addressing the risk of disasters is of particular urgency and critical importance for quality of growth, particularly in developing countries. With their financial, technical and social constraints, they are more vulnerable to disasters than developed countries. In Chap. 8, starting with a reflection on the experiences of the East Japan Great Earthquake and Tsunami, as well as the floods that hit Thailand in 2011, I present three levels of capacity needed to deal with possible disasters. I then look at how programs for disaster prevention, called BOSAI, worked in enhancing such capacity and resilience to disasters, taking cases from Central America.

The determinants of learning discussed in Chap. 4 can also be observed in the cases of disaster risk management. Easy entry points and low-cost solutions were identified in BOSAI Projects. First, risk literacy was enhanced, with the focus on making the residents fully understand the risks of their own community and take actions on their own. These experiences confirm that resilience is indeed about learning to live with risks. Effective learning by communities and their members has taken place in BOSAI programs. BOSAI at the community level is effective only when the process is inclusive, whereby all members contribute to and receive benefits from BOSAI activities. This chapter also illustrates how the programs succeeded in mobilizing local knowledge and wisdom, resulting, for example, in a highly indigenous way of flood prevention using locally available materials.

In BOSAI, Taishin, and Gensai Projects, capacity development to strengthen resilience

through organizational learning and institution-building took place. As such, learning, including learning to learn, effectively contributed to innovative and inclusive development, enhancing resilience in El Salvador and other Central American countries.

We can confirm that learning, resilient infrastructure, and institutions are, among other things, crucial in the process of transforming societies into more resilient ones.

1.6 Closing Remarks

1.6.1 From Diagnoses to Actions

The key issues, strategies, and case studies discussed in this volume show that quality growth needs to be discussed in the context of transformation, which is the key driver of growth and a determinant of the multiple attributes of quality growth. As discussed in Chaps. 2 and 3, it is clear that the enhancement of endowments, transformation, and quality growth do not take place automatically. These processes are normally endogenous, but they need to be catalyzed or facilitated by well-designed strategies and effective approaches to implement such strategies. Case studies provide insights into such strategies, approaches, and the main actors involved in the process of transformation.

In order to identify appropriate and promising strategies, this volume studies the relationship between essential endowments, transformation, and quality growth (with its attributes intimately related to SDGs) from three angles. First, it discusses strategies for enhancement of each of the three above-mentioned essential endowments as well as strategies to trigger and catalyze transformation given such endowments (Chap. 2). Second, it focuses on outstanding cases of transformation to analyze how essential endowments and other crucial factors interact in the process of transformation (Chap. 3). Third, it studies the case of sub-Saharan Africa, where jobs and inclusivity have not necessarily accompanied the growth of GDP as expected, identifying three strategies to address the challenges they face (Chap. 5).

Insights from case studies of these three chapters suggest that the endowment changes are mainly enabled by the long-term process of learning and accumulation of knowledge and capabilities (or human capital in which learning capacity is embedded), investment in infrastructure and technological innovation, and enhancement of institutions. Case studies illustrate how learning and the accumulation of knowledge and capabilities play a vital role in attaining inclusive, innovative, and quality growth. This confirms the assertion of Stiglitz and Greenwald (2014, 26) that a country's policies have to be shaped to take advantage of its comparative advantage in knowledge and learning abilities, including its ability to learn and to learn to learn, and to help develop those capacities and capabilities further. Change of endowments is also attained by infrastructure construction and technological innovation. They often trigger or accelerate industrial and agricultural development and transformation. Institutions in general —and new effective institutions in particular— are critical as well. In many cases, reasonably good institutional "islands" created for specific purposes, as distinct from an overhaul of the entire institutional structure, are highly effective.

Needless to say, when the entire population participates in quality growth, they are all likely to benefit. Case studies illustrate how the government or public institutions, as well as public and private partnerships, can catalyze and facilitate the process of transformation and quality growth. Enterprises are among the main protagonists in promoting quality growth. Furthermore, they are now much more conscious about their contribution to the achievement of the SDGs and committed to environmental, social and governance (ESG) investments. It is worth mentioning that Japan's Development Cooperation Charter considers it important to catalyze private sector investments to contribute to inclusiveness, sustainability, resilience, and capacity building so that such investments facilitate high-quality growth (Cabinet Office, Japan 2015, 13).

1.6.2 Synergies, Tradeoffs, Priorities, and Sequences

Strategies for promoting transformation and quality growth are mutually reinforcing and could produce synergies but must be explicitly articulated. In this regard, it is necessary to recognize that not all attributes of quality of growth and transformation can be achieved simultaneously and in the short term. Synergies, tradeoffs, priorities and sequences could be important for both transformation and quality growth agendas. With their transformational vision, the SDGs aim to achieve diverse goals (attributes of quality growth) and transformation in a comprehensive manner. Long-term vision with a holistic view matters.

For example, in the short term, quality growth could need external resources to assure people of equal access to opportunities through, among others, education and health. At the same time, the necessary resources could be endogenously generated in the medium and long-term through transformation and quality growth, due to increases in tax and other revenues derived from the expansion of industries and other productive activities, urbanization, and so forth. Transformation-led growth is distinct from, for example, commodity boom-led growth. Transformation-led growth could generate further transformation and growth. This implies that a virtuous circle of transformation and high-quality growth could take place. Furthermore, case studies of this volume show that many approaches for attaining quality of growth, especially for learning and learning to learn, do not demand high costs, while risks are low. Moreover, case studies also show that easy entry points are available to initiate the learning process.

1.6.3 Quality Growth Strategy for Each Context

Finally, as the transformation agenda differs between countries with their own distinctive characteristics, measures to transform their economies and attain desired attributes of quality growth may be different. Countries with different characteristics include those with a high proportion of subsistence agriculture, urbanizing economies, early industrializing economies, those caught in the middle-income trap, and so on. There is no standard model of strategies to address challenges of transformation with growth with improved quality.

Notes

1. ADB (2013) explains the significance of this component as follows: "Diversification of the economic structure is probably the most conspicuous feature of economic development, and is a chief difference between it and aggregate economic growth. Upgrading refers to the capacity to produce higher quality, more distinctive, and more complex products. Deepening involves the formation of local linkages and complementarities by creating a robust local supplier base and expanding ancillary services" (4).
2. It should be remembered that the emphasis and priorities in international development cooperation policy have changed significantly since the end of the Cold War. In the last three decades, dominant policy has shifted from macro-oriented structural adjustment to poverty reduction with concrete social sector targets, and then subsequently to a search for a new source of growth (Ohno 2013). As the World Bank (2012) reminds us, the conventional wisdom was then to focus on growth and assume that improved living standards will follow. This is the main tenet behind "growth strategies", "growth diagnostics" and "binding constraints analysis," all of which aim to identify and remove obstacles to economic growth (87).
3. This volume uses the terms "industry" and "industrial sector" very broadly to refer not only to the manufacturing sector, but also agro-business, modern agriculture, aquaculture, transport, logistics, tourism, and any other activities that produce goods and services.

4. In relation to these three components, it is worth mentioning that McMillan et al. (2017) define economic transformation as the continuous process of (a) moving labor and other resources from lower- to higher-productivity sectors (structural changes) and (b) raising within-sector productivity growth (4). They explain that transformative within-sector productivity growth happens as a result of shifts amongst firms in a sector as well as shifts within firms and farms through enhanced technologies, such as improved seed varieties and improved management practices such as 'just in time' inventory management (3). They propose a framework for measuring transformation in developing countries (12).
5. For 'framework' and 'ingredients,' see Yanagihara (1997, 9–10).
6. This paragraph draws heavily on Noman and Stiglitz (2015, 17–18).

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Strategies for Transformation and Quality Growth

2

The United Nations plan of action, *Transforming Our World: The 2030 Agenda for Sustainable Development*,[1] states at its beginning, "We envisage a world in which every country enjoys sustained, inclusive and sustainable economic growth and decent work for all" (United Nations 2015, 4). The emphasis on the desired attributes of economic growth expressed in this vision of the Sustainable Development Goals (SDGs) coincides with the recent growth in attention toward the concept of quality growth. In the Asia–Pacific region, Asia Pacific Economic Cooperation (APEC) leaders agreed on an "APEC Growth Strategy" in 2010, which stressed that the quality of growth needs to be improved to ensure that it will be more balanced, inclusive, sustainable, innovative, and secure (APEC 2010).[2] APEC leaders further agreed on the "APEC Strategy for Strengthening Quality Growth" in 2015, which "will bring more synergy between the APEC Growth Strategy and the Sustainable Development Goals" (APEC 2015, 1). The "Development Cooperation Charter of Japan," also released in 2015, states that one of the most important challenges for development is "quality growth" and "poverty reduction through such growth," in which inclusiveness, sustainability, and resilience are stressed (Cabinet Office 2015, 5–6).

Along with this emphasis on quality, increasing attention is being paid to the importance of transformation, considered essential for development. As the Asian Development Bank (ADB) asserted, development is distinct from aggregate growth, which can occur without significant transformation, as in some oil rich economies (ADB 2013).

In this chapter, I provide insights on strategies to attain transformation with quality growth, along with effective approaches for implementing them. First, I present an overview of recent policy debates related to transformation and quality growth. On the basis of this discussion, I provide an analytical perspective and discuss key issues, identifying seven main strategies: three to address endowments and four to catalyze transformation. In subsequent sections, I discuss each specific strategy, drawing insights from relevant effective approaches. In the final section, I offer concluding remarks.

2.1 Key Issues from an Analytical Perspective

2.1.1 Overview of Transformation and Quality of Growth in East Asia, Latin America, and Africa

The Report of the High-Level Panel of Eminent Persons on the Post-2015 Development Agenda, "A Global Partnership: Eradicate Poverty and Transform Economies through Sustainable

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Development" (High-Level Panel 2013), concluded that the post-2015 agenda needs to be driven by five transformational shifts, including a call for the transformation of economies for jobs and inclusive growth. The United Nations 2030 Agenda declares that "we are determined to take the bold and transformative steps which are urgently needed to shift the world on to a sustainable and resilient path" (United Nations 2015, 2).

Thus, these governing bodies seem to have reached more of a consensus on the importance of quality of growth on the one hand, and transformation on the other. This consensus is reflected in the recent publications of regional institutions pertaining to their region, including the Asian Development Bank (ADB), UN Economic and Social Commission for Asia and the Pacific (UNESCAP), Inter-American Development Bank (IDB), UN Economic Commission for Latin America and the Caribbean (UNECLAC), African Development Bank (AfDB), African Union, UN Economic Commission for Africa (UNECA), and the African Centre for Economic Transformation (ACET).[3] In this section, after elaborating on this trend in Africa, I will discuss the relationship between "quality of growth" and "transformation" (see Further Discussion 2.1)

In the African region, heads of state and governments endorsed the African Union's transformation vision for 2063. The AfDB's long-term strategy, "At the Center of Africa's Transformation," has the goal of establishing Africa as the next global emerging market. Moreover, UNECA's Economic Report on Africa 2013 details what will be required to promote competitiveness, reduce dependence on primary commodity exports, and enable Africa to emerge as a new global growth pole. Therefore, as ACET states, economic transformation is now the consensus paradigm for Africa's development. ACET's flagship report, *2014 African Transformation Report: Growth with Depth*, is considered to be the pioneering comprehensive study on transformation of the African economy.[4]

Behind the recent tendency in each of these three regions to emphasize transformation and quality of growth are concerns that growth does not necessarily enable development when it is not accompanied by transformation or by the attributes of the quality of growth. ACET's *2014 African Transformation Report* agrees that, to "ensure that growth is sustainable and continues to improve the lives of many, countries need to vigorously promote economic transformation" (ACET 2014, 1). In short, quality growth needs to be discussed in the context of transformation because it is both a driver of growth[5] and affects different attributes of growth.

2.1.2 Transformation and Changing Endowments

This section summarizes the basic aspects of economic, industrial, and structural transformation on which there has been growing consensus in recent years. First, regarding the definition of transformation, a well-established body of literature affirms that development is about transforming the productive structure of the economy and accumulating the capabilities necessary to undertake this process (ADB 2013). This process can be best described by ACET's concept of growth with depth. On the basis of various studies, I identify four strategies for transformation.

Second, regarding how transformation can be achieved, consensus seems to be growing that structural transformation is closely related to changes of endowments or assets and changes in comparative advantage as well as to innovation and technological progress (e.g., see Noman and Stiglitz 2012; see also Lin 2012a).

Accordingly, endowments are extremely important for transformation based on changing or dynamic comparative advantage. In this regard, recent studies identified critical endowments for transformation. Along with the growing recognition of the importance of inclusiveness and innovation in quality growth, discussions on the importance of learning, as well as the accumulation of knowledge and capabilities, have deepened.

Stiglitz and Greenwald (2014) present a systematic and holistic analysis of what constitutes a

learning society, arguing that "the most important 'endowment' from our perspective, is a society's learning capacities" (26). They further state that a country's policies have to be shaped to take advantage of its comparative advantage in knowledge and learning abilities in relation to its competitors, including its ability to learn and to learn to learn, and to support those capacities and capabilities further. Noman and Stiglitz (2017) reaffirm the importance of learning capacity, together with that of institutions: "Perhaps the most important 'endowment' of a country was assets that were not mobile—institutions and learning capacities that were embedded in local institutions. It was these that countries needed to take into account as they struggled to shape their long-term (dynamic) comparative advantage" (13).

Another important endowment could be infrastructure, both hard and soft. Lin (2012b) states that "economic development is a dynamic process that requires industrial upgrading and diversification along with corresponding improvements in 'hard' and 'soft' infrastructure at each new level." He further argues that "Such upgrading entails large externalities to firm transaction costs and the returns to capital investment. Therefore, in addition to an effective market mechanism, the government should coordinate or provide the improvements in infrastructure and compensate for the externalities to facilitate industrial upgrading and diversification" (10). Hard infrastructure consists of highways, telecommunications networks, port facilities, and power supplies, while soft infrastructure is made up of institutions, regulations, social capital, value systems, and other social and economic arrangements.

These endowments—namely, learning capacities (as defined by Stiglitz and Greenwald), infrastructure, and institutions (including other soft infrastructure as discussed by Lin)—are not mobile. These three essential endowments, along with standard factor endowments such as labor, land, and capital,[6] are critical for the dynamic comparative advantage of a country.

These three essential endowments bear a close relation to the elements Japan's Development Cooperation Charter considers important: "Japan will attach importance to building the foundations of self-help efforts and self-reliant development such as human resources, socio-economic infrastructure, regulations and institutions" (Cabinet Office 2015, 5).[7] This view has been incorporated into Japan's Official Development Assistance policies for decades (Ministry of Foreign Affairs [MOFA] 2005).[8]

It is worth mentioning that Japan's ODA policy emphasis on "human resources" has a close relationship with its emphasis on the importance of "learning" and "learning capacity." As Kato, senior vice-president of Japan International Cooperation Agency (JICA), states, "Another characteristic of Japan's ODA is its very strong—almost "obsessive"—emphasis on human resource development. Human resource development is an absolute priority unanimously upheld by those working in development. It is a kind of 'collective wisdom' shared among Japanese society. … In practical terms, 'human resource development', means two things: one is the belief in the vital importance of formal education… the other meaning of human resource development for Japan's development practitioners, which perhaps sets Japan apart from other donors, is the importance placed on nurturing people's *practical problem solving capacity* (emphasis in original). This includes many things: to be disciplined at work, be able to identify and solve problems using available resources and knowledge, to have an attitude to try to improve things gradually (*kaizen)* rather than expecting drastic changes, and to work collaboratively with people" (Kato 2016, 11) (For these aspects of Japanese approach, including Kaizen, see Chap. 4). Similarly, as discussed in the Section on "Strategy for investing in quality infrastructure" later in this chapter, the emphasis on infrastructure in Japan's ODA is well known.

Thus, from the lens of quality growth through transformation, the three essential endowments—learning capacity, infrastructure, and institutions, among others—need to be enhanced, taking into account inclusiveness, sustainability, and resilience. From this, I can derive three strategies to enhance each of the essential endowments necessary for transformation for quality of growth. The other challenge lies in finding ways to

catalyze transformation for quality growth. To address this challenge, I identify four additional strategies.

Transformation agendas differ among countries, such as countries with a very high proportion of the population living in rural areas, early industrializing countries, urbanizing countries, and countries that need to transform from a labor-intensive to a knowledge-intensive economy to overcome the middle-income trap. There is no one-size-fits-all model for transformation. Each country has its own transformation agenda and needs to identify the most appropriate strategies to achieve its goals.

2.1.3 Virtuous Circle of Endowments, Transformation, and Quality Growth

Transformation normally generates growth, as it did in East Asia, but growth is not always accompanied by transformation. Transformation-led growth is distinct from, for example, commodity boom-led growth. Transformation-led growth could be high-quality growth and could generate further transformation. This implies that a virtuous circle of transformation and high-quality growth could take place.

Generally speaking, given its attributes, quality growth enhances endowments, enabling further transformation. Inclusive growth, for example, could take the form of the participation of workers in the process of learning. Workers not only contribute to production but at the same time learn on the job, improving their learning capacity. Enterprises increase production, contribute to growth, and simultaneously achieve organizational learning and, often, innovation. Thus, if growth is genuinely inclusive and innovative, learning capacity should be strengthened through such growth. In this way, the quality of growth enhances the most important endowment, learning capacity, for further transformation and higher quality growth.

Furthermore, high growth is more likely to be sustained when it is inclusive because the strategy for such growth has wide social and political support. The report of the Growth Commission emphasizes this, arguing that "The Commission strongly believes that growth strategies cannot succeed without a commitment to equality of opportunity, giving everyone a fair chance to enjoy the fruits of growth" (Commission on Growth and Development 2008, 7). On the basis of an analysis of thirteen successful countries of long-term high growth (of which nine are East Asian economies), the report states that policy makers "must be trusted as stewards of the economy and their promise of future rewards must be believed. …. Their promise must also be inclusive. … Governments forged an implicit or explicit social contract in support of growth, offering health, education, and sometimes redistribution. …Absent this kind of political foundation, sustaining policies that promote growth is very difficult if not impossible" (26–27).

Similarly, sustainability—especially in terms of environment (another attribute of quality growth)—is indispensable (Hosono 2013a; b). Outcomes of high-quality growth, with all its attributes, could enhance essential endowments and enable further transformation and quality growth, generating a virtuous circle. Therefore, a growth strategy and industrial strategy with policies pertaining to endowments and transformation are vital for high-quality growth.

Andreoni, Chang, and Estevez's view on the relationship between quality of growth, transformation, and endowments is closely related to the virtuous circle among those elaborated above. The three authors "conceptualize quality of growth as a development process of production transformation led by the expansion of collective capabilities and resulting in the creation of good quality jobs and sustainable structural change" (Andreoni et al. 2019, 128).

A recent study on the estimation of wealth of nations by Lange et al. (2018) facilitates a better understanding of the relationship between endowments, transformation, and quality of growth from a scheme of capital assets accumulation similar to that proposed by Vinod et al. (2000) (see Further Discussion 2.2).

2.2 Strategies for Enhancement of Essential Endowments for Transformation and Quality Growth

This section identifies three strategies to enhance each of the essential endowments.

2.2.1 Strategy for the Enhancement of Learning Capacity

Quality growth depends on learning capacity in several ways. Low learning capacity impedes the creation of new industries that take advantage of opportunities for transformation, even if other endowments, such as hard infrastructure, exist. If learning capacity is limited to a small part of the population of a country, inclusive growth is unlikely to be attained. More important, from a learning society perspective, inclusive growth has an intrinsic relationship with innovative growth. Growth can be really inclusive and, at the same time, innovative, when it takes full advantage of the talents of its entire population. Stiglitz and Greenwald (2014) point out that "our argument for why inclusive growth is so important goes beyond the standard one that it is a waste of a country's most valuable resource, human talent, to fail to ensure that everyone lives up to his or her abilities" (468).

Learning contributes to growth through increases in productivity as well as innovation. Learning enables the development of innovative, and specific, ways to make more efficient use of existing endowments. At the same time, learning enhances learning capacity—especially learning to learn as the most important endowment. This contributes to dynamic comparative advantage, thereby enabling industrial transformation and high-quality growth.

Learning and learning to learn are also essential for the green economy, which results in improved human well-being and social equity, while significantly reducing ecological risks and scarcity (Chap. 7). Widespread learning capacity facilitates sustainable growth because active participation is necessary for the success of many initiatives in areas such as preserving the environment and conservation of eco-diversity. Waste treatment, energy saving and efficient use of energy and resources, agroforestry, and management of water resources are also helped by inclusive learning. To enhance resilience to cope with disaster risks, innovative and inclusive approaches are indispensable. Disaster risk management is possible only with the participation of all residents and other stakeholders who, through mutual learning, have to find locally specific innovative solutions. Resilience is about learning to live with risks (Chap. 8).

To enhance capacity for learning, both quality education and learning by doing are key. As Stiglitz and Greenwald note, "One should see formal education and on-the-job training as complements, with the former designed to enhance the productivity of the latter" (2014, 57).

Ensuring complementarity between quality formal education (learning at school), on the one hand, and initiatives to strengthen learning by doing (learning at work), on the other, is one of the crucial challenges to create a learning society. From this point of view, one of the most effective approaches is enhancement of learning capacity to learn through formal education and through increasing opportunities of learning, especially learning to learn at the workplace. I elaborate on this by presenting the following case studies. I will discuss the intrinsic relationship between learning, transformation and quality growth further in Chap. 4.

2.2.1.1 Case 2.1: Effective Approaches Toward Improvement of the Quality of Education in Science and Math Education

In Central America, a regional program, "Me Gusta Matemática,"[9] and related programs have been implemented since 2006 based on the experiences of years of cooperation in Honduras and other countries. These programs have been

built on three fundamental approaches. First, the student-centered teaching method was introduced to stimulate interest, curiosity and deepen the understanding of students by incorporating experiments, exercises, etc., instead of didactic teaching methods by teachers. Second, new ways of preparation of teaching plans and lesson materials were introduced. Third, efforts to improve teaching methods have been made with the participation of both the teaching staff of the school and members of the local community, adopting the method of "lesson study,"[10] as is widely practiced in Japan (Hosono et al. 2016, 41; Nishikata 2017).

With these approaches, new textbooks were prepared and the student-centered approach was introduced. For example, as the staff of the Honduras project members learned about Japanese textbook design, such as using figures and tables beside the main text, they started to recognize the importance of creating an easy-to-understand textbook for children. After comprehensively reviewing any problems that they had experienced, they brainstormed a range of creative ideas: e.g., teaching young children how to use money and control spending is regarded as very important in Honduras. On the back of this, they suggested enriching the quality and quantity of practical calculation problems in first-grader's textbooks, and a more child-oriented textbook was created (JICA 2015, 9). Consequently, new textbooks, guidebooks for teachers and workbooks for students have been prepared for primary and lower secondary school students in Central American countries (Hosono et al. 2016).

The "Strengthening of Mathematics and Science Education" (SMASE) program that JICA has been promoting in Africa is based on two conceptual thrusts. The first is the idea that science and mathematics education in Africa must be upgraded by introducing a student-centered approach to lessons in classrooms. The second is the idea that in-service teacher training (INSET) can provide an effective opportunity to motivate teachers to brush up on their knowledge and skills.[11]

In science and mathematics classrooms in some African countries, teachers rarely undertake experiments or use teaching materials; instead, they write on blackboards and talk at their students, while the students simply listen and take notes. This way of conducting classes, often called "Chalk & Talk," is rather common. Taught this way, students tend to develop a passive attitude in class without any willingness to engage with other students or think on their own. "Based on this observation, JICA has recognized the need to transform the teaching style of teachers in such a way that students are encouraged to participate in group activities, create hypotheses, do experiments, and to think on their own" (Shibuya 2013, 256). From the perspective of enhancement of learning capacity in formal education, the emphasis of SMASE on students' capacity to think on their own is particularly relevant.

SMASE-WECSA (SMASE Western, Eastern, Central and Southern Africa) network is a platform by which math and science educators across Africa can share and create practical wisdom through the exchange of each country's experiences and knowledge in math and science education. Approximately 60% of the 54 African countries have been involved in the network (Ishihara 2012, 84–85).

2.2.1.2 Case 2.2: Effective Approaches to Strengthening Capacity to Learn to Learn by Learning by Doing

Chapter 4 will review several capacity development (CD)–related programs implemented through international cooperation from the perspective of the enhancement of capacity for learning to learn. In all these programs, individuals and organizations learned to learn by learning by doing and by learning from others (i.e., mutual learning), and they co-created innovative solutions to the issues they needed to address.

The aim of the life improvement program is primarily to enable rural women to become

aware of the numerous problems that exist in daily life and to address them as problems to be solved. As such, the objective of this program is learning to learn through learning by doing and making efforts to improve quality of life in its multiple dimensions. Rural women were encouraged to actively identify problems in their living conditions, set the issues, and formulate living improvement plans. As such, this initiative was not just about life improvement but also comprised a learning process that was particularly designed to enhance the capacity for learning to learn.

In the One Village One Product (OVOP) program, participants and their groups take part in multiple stages along a value chain, including production of raw materials, processing, marketing, and servicing. This provides a vehicle for maximizing learning opportunities. Such comprehensive knowledge, based on these experiences of learning by doing and mutual learning, has helped them to generate new ideas and create innovative products. By enhancing learning opportunities in their activities and sharing ideas among members of the OVOP group, they work constantly toward reaching a better marketing mix.

Through *kaizen* and related initiatives,[12] quality control circles are an effective approach for frontline workers to contribute to and receive the benefit of mutual learning and to enhance capacity for learning to learn. Total quality management is also an effective approach for organizational learning. These approaches ensure that everyone lives up to her or his abilities and enables genuine inclusive and innovative growth (Chap. 4).

These programs have several common features: (1) easy entry points are available to initiate the learning process; (2) the costs and risks are low; (3) the focus is on learning by doing and mutual learning to cocreate innovative solutions; and (4) learning makes an intrinsic contribution to the particular objective being pursued—that is, life improvement, inclusive business, quality and productivity improvement, and incremental innovation, while at the same time enhancing the learning capacity to learn. I will elaborate more on these programs in Chap. 4.

2.2.2 Strategy for Investing in Quality Infrastructure

Regarding the relationship between infrastructure and growth, as Égert et al. (2009) emphasize, infrastructure investments can have a positive effect on growth that goes beyond the effect of the capital stock because of economies of scale, the existence of network externalities, and competition-enhancing effects. They argue that the evidence from cross-section regressions suggests that greater provision of infrastructure is associated with higher subsequent growth rates and that the link is nonlinear, with a potentially higher impact of additional infrastructure in countries with initially lower levels of provision. Infrastructure may not only have a positive impact on growth but also on some attributes of quality growth. Infrastructure such as transport and communication networks that encompass remote populations and provide a connection to world markets supports growth across sectors, geographic areas, and households, creating opportunities for quality growth. Seneviratne and Sun (2013) found that better infrastructure, both in quantity and quality, improves income distribution. This result, along with the proven role of infrastructure in enhancing productivity and growth, suggests that infrastructure development can double the effects on poverty reduction and inclusive growth. According to Seneviratne and Sun, for the five original member countries of the Association of Southeast Asian Nations (the ASEAN-5), removing infrastructure gaps not only raises potential growth but also spreads the benefits of growth more evenly.

Addison and Tarp (2016) focus on structural transformation and its interconnection with infrastructure and employment. They provide an overview of why infrastructure comprises an especially important dimension of transformation. Well-designed infrastructure encourages private investment, and infrastructure is intimately linked to job creation. Addison and Tarp state that "Aid in the livelihoods area is typically project-based, small-scale, and uncoordinated (UNU-WIDER 2014). It might create hundreds of jobs, but not the millions required to have

impact at scale. In contrast, impact at scale is achieved by infrastructure of the right kind…. Infrastructure also creates jobs indirectly by stimulating economic activity, and trans-border transport infrastructure that reduces costs of exporting is a valuable job-creator…. Infrastructure is closely linked to industrial policy in building the capacities of countries to compete in the global economy for manufacturing and high-value services, thereby creating good jobs (Page and Shimeles 2014). This is an area where Japanese aid has long-standing experience and has achieved considerable success in Asia (Shimomura 2016)" (Addison and Tarp 2016, 301).

Indeed, "Japan has been a consistent, and sometimes lonely, advocate of infrastructure development, even when other DAC donors and the World Bank reduced their resource allocation to this sector. From the Japanese perspective, it is encouraging that the international community is making a turnaround and starting to recognize the centrality of infrastructure, as seen, for example, in the recent debate on the post-2015 development framework" (Kato 2016, 9–10).

As such, from the quality growth perspective, quality infrastructure becomes one of the most featured aspects of the recent policy debate. First, Goal 9 of the SDGs aims to "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation" and Target 9.1 refers to "quality, reliable, sustainable and resilient infrastructure to support economic development and human well-being, with a focus on affordable and equitable access for all" (SDG9.1). In keeping with this goal, the declaration of APEC leaders meeting in Lima in 2016 under the theme of Quality of Growth and Human Development states that "We affirm our commitment to promote investment with a focus on infrastructure in terms of both quantity and quality. We reiterate the importance of quality infrastructure for sustainable economic growth. …., [and] [we] are committed to translate this concept into actions including in ICT, energy and transport" (APEC 2016a, 8).[13]

In this regard, two APEC reports have identified the basic aspects of quality infrastructure (APEC 2014b, 2016b) coinciding with the *G7 Ise-Shima Principles for Promoting Quality Infrastructure Investment*. These G7 principles are closely related to attributes of quality growth —especially inclusiveness, sustainability, and resilience:

> Principle 1: Ensuring effective governance, reliable operations and economic efficiency in view of life-cycle cost as well as safety and resilience against natural disaster, terrorism and cyber-attack risks; Principle 2: Ensuring job creation, capacity building and transfer of expertise and know-how for local communities; Principle 3: Addressing social and environmental impacts; Principle 4: Ensuring alignment with economic and development strategies including aspects of climate change and environment at the national and regional levels; and Principle 5: Enhancing effective resource mobilization including through PPP (G7 Summit 2016, 1–2).

On the basis of these five principles, many effective approaches to constructing quality infrastructure can be envisaged. *Michinoeki* (Case 2.3) is one such approach. Many of the "corridors" programs discussed later (see Case 2.5) are examples of quality infrastructure as well. Numerous outstanding cases of quality infrastructure in diverse sectors, including railways, roads and bridges, airports and ports, energy, traffic systems, and disaster management, have been incorporated into the "Quality Infrastructure Investment Casebook" (MOFA 2015).

2.2.2.1 Case 2.3: Effective Approaches to Constructing Quality Infrastructure: Michinoeki

Michinoeki is a kind of public road infrastructure constructed in roadside areas. It is also a form of community infrastructure that promotes and contributes to the vitality of the region. Thus, Michinoeki should be planned and operated with the direct participation of local communities.

According to the "Study for Roadside Stations Master Plan" for Vietnam (JICA 2009), Michinoeki have the following five basic functions: road traffic management, local socio-economic development promotion, information provision, landmark, and rest and relaxation.[14] Michinoeki

are particularly related to secure growth and inclusive growth. The study states that Michinoeki may contribute to safety, comfortableness and convenience of road traffic thanks to the provision of resting spaces, as well as useful road traffic information. For inclusive economic development, Michinoeki may promote local employment, income generation, and economic development through sales of local products, job creation, and tourism promotion in surrounding areas. For social inclusion, Michinoeki may have positive impacts on local society through, for example, promotion of social participation by women, income generation of the poor or ethnic minorities, raising awareness of hygiene, improvement of information accessibility, and increasing training opportunities. They may also contribute to landscape improvement.

The Master Plan contemplated the targets for the distribution of Michinoeki (networks), accreditation, technical development for planning, construction and operation/management, development of database and information networks, establishment of Michinoeki development promotion organizations, budgetary planning, and provincial master plans.

The World Bank published guidelines for Michinoeki in 2006, drawing from experiences in Japan, Thailand, and pilot studies in Kenya and China. In the foreword and preface, it states:

This guideline brings together more than ten years of successful Japanese experience and practical work …in East Asia and Africa. Today in Japan, there are more than 700 michi-no-eki road stations (michinoeki), and their positive impact on local economies, job creation, provision of public services for the local community (such as health care, education and training, and cultural activities) and regional integration is evident throughout the country… [Michinoeki] are different from other roadside services around the world for three reasons: (i) They are designed with the help of the communities and provide much stronger links between local communities and the users of the roads; (ii) they provide business opportunities for local residents; and (iii) they are possible venues for the provision of multiple public services such as, health care (including HIV/AIDS care), education and training activities, and cultural activities, as well as for the provision of the normal restaurant and commercial services. Given this unique structure, they have great potential as a tool for reducing poverty in many of the countries where the World Bank is working. All too often, inter-city roads effectively bypass the communities through which they pass without directly benefiting them (Yokota 2006, i, iii).

2.2.3 Strategy for Strengthening Institutions

Institutions are considered the basic determinants for long-term sustained economic growth (e.g., North 1990). From this perspective, Johnson et al. (2007) define good economic institutions as those that create effective property rights for most people, including protection against expropriation by the state (or powerful elites), and enforceable contracts between private parties.[15] They also state that good economic institutions are essential in creating markets and sustaining efficient market transactions. This definition of institutions appears to be a narrow interpretation in terms of the quality of growth perspective. They recognize that "although this definition is far from requiring full equality of opportunity in society, it implies that societies where only a small fraction of the population have well-enforced property rights do not have good economic institutions" (2007, 7–8). de Soto (1989, 2000) asserts that a formal legal system is essential for poverty reduction to protect the property rights of the poor effectively and to enhance opportunities for them to engage in economic activities.

From a broader perspective, institutions matter for the most basic aspects of quality growth. Institutions to promote good governance, macroeconomic stability, the rules of law, and efficient administration are relevant since they promote growth opportunities that do not discriminate. For instance, progressive tax regimes as well as inclusive education and universal health-care institutions are foundations for

inclusive growth. Acemoglu and Robinson (2012) made an important distinction between inclusive and extractive institutions. This distinction is useful for analyzing how types of institutions can determine the long-term prosperity of a locality, region, or nation. They claim that inclusive institutions can cause a virtuous circle of economic activities over a long period of time (Iizuka et al. 2016). In this virtuous circle, learning and innovation under inclusive institutions could be critical. Needless to say, institutions also matter for sustainability and resilience.

From an inclusive growth perspective, institutions related to small and medium enterprises are crucial. The Report of the High Level Panel of Eminent Persons on the Post-2015 Development Agenda (High Level Panel 2013) identifies priorities for the transformation of economies for jobs and inclusive growth. The report highlights the following first priority: "[to] create opportunities for good and decent jobs and secure livelihoods, so as to make growth inclusive and ensure that it reduces poverty and inequality" (8). The HLP report emphasizes the necessity of education, training and skills for people to respond to demands by businesses for more workers and to be successful in the job market (8–9).

Now in this "opportunities and capacities nexus," small and medium enterprises (SMEs) play a fundamental role. People, even if highly skilled, cannot take advantage of new opportunities alone. They need to start up enterprises to participate in opportunities or to be employed by large enterprises or SMEs to enjoy the benefits of such opportunities.

The opportunities/capacities nexus can be self-reliant when opportunities induce capacity development of enterprises and individuals. The increased capacity that results from this process, due to strengthened competitiveness, creates new opportunities and capacities—part of a 'virtuous circle' in which growth generates more growth. The second priority of the HLP report is to accelerate this autonomous process. The report states that "A second priority is to constantly strive to add value and raise productivity, so that growth begets more growth. Some fundamentals will accelerate growth everywhere—infrastructure and other investments, skills development, supportive policies towards micro-, small- and medium-sized enterprises, and the capacity to innovate and absorb new technologies, and produce higher quality and a greater range of products" (9).

Here, the report recognizes the necessity of supportive policies towards micro-enterprises and SMEs, together with infrastructure and other investments, skills development and so on. In other words, policies, especially towards SMEs, are considered needed to trigger and accelerate the process of growth generating more growth.

The Sustainable Development Goals (SDGs) emphasize the importance of SMEs in achieving the SDGs. One of the goals is to promote development-oriented policies and support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage formalization and growth of micro-, small- and medium-sized enterprises (Target 8.3). Another goal is to increase access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets (Target 9.3).[16]

JICA, based on years of cooperation in this area,[17] published guidelines for SME promotion in 2013 (JICA 2013). This document suggests ways that institutions (as discussed above) could be established and strengthened in this particular area. It is a comprehensive and structured framework to achieve mid-term objectives and sub-targets with the following strategic goals: (1) Development of policies and institutions for SME promotion, including legal systems and institutional arrangements for policy implementation as well as the financial system; (2) Enhancement of competitiveness of businesses, including horizontal and vertical relationships among industries strengthening value chains, supporting businesses and human resources, technology and access to finance, and training of business and technical human resources.

2.2.3.1 Case 2.4: Effective Approaches to Strengthening Institutions that Facilitate Participation of Small and Medium Enterprises in Industrial Development

From the perspective of 'institutions' for transformation and quality growth, the case of cooperation with Vietnam could provide a relevant example. In the early 1990s, as Vietnam took positive steps to rejoin the international community and rebuild a market-based economy, Japan provided substantial development assistance in such a way as to underpin and spur growing private investment in the country. Most of this development aid focused on infrastructure such as roads, railways, hydroelectric power generation and telecommunications. However, through technical assistance, Japan also offered valuable assistance toward economic policy formulation. Over a five-year period from 1995, a group of 20 academics led by Professor Shigeru Ishikawa worked closely with the Vietnamese government to design and develop proposals for a national economic policy. "The group's recommendations had an enormous impact on the Five Year Plan for Socio-Economic Development 2001–2005, which emphasized, among other things, the importance of domestic as well as foreign capital mobilization, rural and agricultural development alongside industrialization, and fostering the growth of SMEs as well as heavy industry" (JICA/JBIC 2008, 59).[18] From the end of the 1990s, cooperation for SME promotion programs started focusing on implementation of the SME policy, SME promotion planning, and on strengthening of functions for supporting SMEs. Technical cooperation projects for education and training institutions were implemented in the 2000s and 2010s including programs for the Hanoi Industrial College, SME Technical Assistance Center, and Hanoi University of Industry. In the same period, technical cooperation projects (TCPs) for business personnel development, for local industry promotion for regional development, for industry statistics development, and for the creation of a legal system, were carried out (JICA 2013, 89).

2.3 Strategies to Catalyze Transformation and Quality Growth

Given the enhancement of essential endowments, and because of other factors, transformation takes place, but it does so along different paths.[19] The strategies of transformation could be different depending on these paths. Among others, some of the main paths of transformation could be (1) catching-up transformation, (2) transformation through integration into regional or global value chains (GVCs), (3) transformation led by innovation, and (4) transformation with development of inclusive business. The following sections discuss one possible strategy for each of these types of transformation.

2.3.1 Strategy for Catalyzing Sequential or Catching-Up Transformation

In East Asia, a sequential or catching-up transformation well known in the region as the flying-geese pattern (FGP) has taken place for decades. The process was enabled by dynamically changing endowments and comparative advantage. The three essential endowments for transformation for quality of growth played crucial roles.

Asia has grown faster than any other developing region, and a few of its economies have undergone a rapid and remarkable transformation. East Asian countries are most outstanding in this respect. "In the four decades from 1956 to 1996, East Asian living standards, as measured by real (inflation-adjusted) output per person, rose at a rate faster than has ever been sustained anywhere" (ADB 2008, 27). Of the ten economies around the world that recorded average increases of 4.5% a year or more during that period, eight were in East Asia[20] (ADB 2008). This long-term high growth trend was not limited

to East Asia, however. Other Asian economies rank in the upper tiers of world growth distribution: over those four decades, living standards in the sixteen "integrating Asian economies"[21] analyzed in the ADB study (2008) grew at an average of 5% a year, whereas the world as a whole averaged only 1.9% Growth

The ADB study states that "East Asian economies specialized in simple, labor-intensive manufactures. As the more advanced among them graduated to more sophisticated products, less developed economies filled the gap that they left behind. The Japanese economist Akamatsu (1962) famously compared this pattern of development to flying geese" (ADB 2008, 26). The study elaborates on these aspects: "As Japan's exports shifted to more advanced products, East Asia's newly industrializing economies—Hong Kong, China; Republic of Korea; Singapore; and Taipei, China—filled the gap for labor-intensive products. In time, South East Asia and the People's Republic of China (hereafter, PRC) followed the similar trajectory" (ADB 2008, 29). These waves produced dramatic spurts of growth. Thus, "by the time the East Asian model had become widely celebrated (World Bank 1993, hereafter the *East Asian Miracle* study), it had been at work for four decades" (ADB 2008, 29).

In the same year that the ADB study was published, the Commission on Growth and Development published its report. It identified some of the distinctive characteristics of thirteen high-growth economies that have been able to grow at more than 7% for periods of more than twenty-five years since World War II. Of the thirteen economies, nine are East Asian economies (high performing Asian economies [HPAEs] and China).[22] Referring to these economies of the "Growth Report," Lin argues that in East Asia there has been a sequential process of catching-up. He states that "the newly industrializing East Asian economies, for instance, exploited endowment structures similar to Japan's to follow that country's development in a flying-geese pattern" (Lin 2012b, 94). Aoki (2013, 2014) argues that the dynamics of the FGP are accompanied by a change of institutions. He proposes that the complex dynamics of demography, economy, and institutions—which are taking place in East Asia—could be conceptualized as FGP version 2.0, compared with FGP version 1.0 (based on Aoki's definition) originally proposed by Akamatsu (1962).

Although there has been an accumulation of literature on the FGP[23] in Asia, the most remarkable fact is that FGP demonstrates the sequence of transformation among the economies of East Asia and is intrinsically related to the long-term high economic growth of these economies as a whole. In terms of public policy, this fact indicates the relevance of the strategy and policies of industrial transformation adopted by East Asian countries. After almost four decades of high rates of growth, and improvement of welfare with inclusive development (to be discussed later) in most of the East Asian economies, which account for more than 30% of the world's population, this growth was not just a coincidence. The *East Asian Miracle* study confirms this: "If growth were randomly distributed, there is roughly one chance in ten thousand that success would have been so regionally concentrated" (World Bank 1993, 2).[24]

Asian tigers started to pursue industrial development strategies as early as the 1960s, with other Asian countries following. As a Japan International Cooperation Agency/Japan Bank for International Cooperation (JICA/JBIC) study (2008) summarizes,

> From the 1960s through to the 80s, the Asian countries promoted industrialization in a strategic manner by adopting import substitution policy (ISP) and export oriented policy (EOP)[25] for light and heavy industry at different times and sometimes in a cyclical manner, thus fostering domestic productive capacity while promoting export. During the second ISP period (for heavy and chemical industry), many countries pursued EOP simultaneously. After this period, most Asian countries shifted to EOP in the 1990s. (JICA/JBIC 2008, 33)

In the mid-1980s, ASEAN countries were desperately attempting to transform their primary goods-based export structure to one oriented toward labor-intensive light manufacturing goods and further to technology-intensive manufacturing (Shimomura 2013).

Since the 1980s, this FGP transformation has been reinforced by the development of electronics, automobiles, and other related industries, based on continuous innovation with consecutive expansion and deepening of regional and global value chains as well as supply chains. This process could be called "FGP + GVC-type transformation." I will elaborate later on this type of transformation.

The major driving force of East Asia's remarkable long-term growth has been industrial transformation from agriculture to labor-intensive light industries, and later, to knowledge-intensive industries led by FGP and the FGP + GVC process. This growth is affirmed by the fact that the reallocation of labor across sectors has been an important driver of productivity growth in several fast-growing East Asian economies. In China, it contributed 4.1% of 7.3% annual growth in aggregate labor productivity over the past decade (1999–2008); in Vietnam, it accounted for 2.6% out of 4.2% (World Bank 2012).

This sequential and catching-up transformation-led growth is closely related to the attributes of quality of growth in East Asia. Asian countries first promoted agricultural and rural development with the Green Revolution of the 1960s and 1970s and then started the intensive process of industrialization. From the end of the 1960s, in just a single decade, the introduction of high-yield rice and other primary crops, subsidies for fertilizers and other agricultural inputs, and the expansion of investment in irrigation improved agricultural productivity (JICA/JBIC 2008). From 1965 to 1988, growth in both agricultural output and agricultural productivity was higher in East Asia than in other regions. The *East Asian Miracle* study highlights the ways that East Asian governments have actively supported agricultural research and extension services to speed the diffusion of agricultural revolution technologies (World Bank 1993). This transformation has had substantial effects both on inclusive and pro-poor growth and on further transformation in these countries.

Increased agricultural output and productivity have direct effects on the welfare of rural populations. At the same time, increased production normally results in a fall in the real price of food, contributing to improvements for both urban and rural populations. Furthermore, higher agricultural productivity allows excess rural workers to migrate to urban areas, which enables the expansion of labor-intensive industries, generating further transformation.

The essence of the East Asian miracle was "rapid growth with equity" (World Bank 1993, 8) for at least the first three decades of sequential and catching-up transformation-led growth.[26] Thus, we could say that "transformation with equity," considered the goal of development by UNECLAC (1990), was achieved in East Asia at least in the period between 1960 and 1990. The East Asian Miracle study emphasizes that "the HPAEs are unique in that they combine this rapid, sustained growth with highly equal income distributions" (World Bank 1993, 8).

The Growth Commission's 2008 report highlights the reasons why long-term high growth was achieved: the strategy for such growth was inclusive and was supported by a wide range of people in East Asia.

In spite of transformation-led long-term high growth, challenges remain in Asia. Regarding some of its attributes, such as inclusiveness and sustainability, certain setbacks can be observed in some economies of East Asia. This is why the quality of growth in Asia has been hotly debated, according to Haddad et al. (2015), who explain that this is understandable because Asia is a region that has achieved remarkable economic development. The "APEC Strategy for Strengthening Quality Growth," agreed on in 2015 by APEC leaders, in which most East Asian economies participate, articulates that, "while APEC as a region has made progress in achieving growth in all its attributes, much still remains to be done, particularly in making sure that the gains already achieved are further expanded and sustained" (APEC 2015, 1).

2.3.1.1 Case 2.5: Effective Approaches to Facilitate Regional Networks and Integration Through Development Corridors

According to JICA, "Urban unipolar concentrations of economic activities and populations lead to an expansion of regional disparities and a reduction of national growth" (2016b, 1–2). The "corridors" approach considers a trunk corridor as the key development axis that will stimulate and increase economic activity in countries and regions. By combining the development potential of a region with corridor infrastructure improvement, a strategic regional development plan can enable the revitalization of an entire region and create a virtuous spiral of investment promotion and market expansion. Economic infrastructure such as roads and ports are of first importance to support the socio-economic activities in regional development. However, development of such infrastructure is not sufficient to reduce transportation costs due to imbalanced export–import demands. In addition, a region with a limited economic scale is unattractive as a market and not able to call for substantive investments. Therefore, it is important to push development forward by drawing an inclusive economic growth scenario, which realizes balanced national development and poverty reduction, by combining the development potentials of the region with corridor infrastructure improvement (JICA 2016b).

In Asia, the ADB launched the "Greater Mekong Sub-region (GMS) Development Program" in 1992.[27] Six countries in the Mekong region—Thailand, Vietnam, Laos, Cambodia, China, and Myanmar—participated. The ADB secretariat functioned as an intermediary between the member countries and donors, while also coordinating eleven programs, including economic development corridors in the region's North–South, East–West, and Southern areas. These programs covered nine priority areas: traffic and transportation, energy, communication, tourism, environment, human resource development, trade, investment, and agriculture. These development corridors promoted poverty reduction and economic growth by creating a belt that would link impoverished inland areas to port cities that had access to world markets. Moreover, electricity and communication infrastructure was developed in parallel with roads, bridges, and other transport infrastructure. Linkages to agriculture, mining resources, and tourism also were created based on this infrastructure. Free trade zones were established in the border areas and industrial parks were constructed. Because the success or the failure of the GMS corridor depended on collaboration between governments and the private sector, the GMS Forum took a number of steps to facilitate this collaboration. It sponsored workshops for the private sector, nurtured the development of regional resources and processing industries in all countries along the corridor, and proposed private investment to form industrial clusters at locations along the corridor.

JICA/JBIC (2008) emphasized that the GMS program was not originally launched by drafting and finalizing multilateral cooperative agreements, but rather it was based on a results-oriented approach. It focused on the cooperation already established by bilateral agreements in areas where something could realistically be achieved. The agencies further stressed that, "as both parties benefited, the framework was gradually expanded to other countries and built upon the principle of comparative advantages. Such flexible pragmatism was a principle factor behind the comprehensive and synthetic GMS framework in the Mekong area development" (JICA/JBIC 2008, 55–56). Japan provided ASEAN countries "with support on the basis of the following pillars: (1) Strengthening connectivity (East–West and Southern economic corridors); (2) Promoting trade and investment (supporting energy supply, investment promotion and intellectual property rights enforcement); (3) Ensuring the sustainability of human security and the environment (disaster prevention, infectious disease control and so on)" (JICA 2016b, 4).

In Africa, in accordance with the framework of the Tokyo International Conference on African Development VI (2016–2018), as a part of the initiative "Quality Africa: Promoting

Structural Economic Transformation through Economic Diversification and Industrialization," corridor developments are now being promoted. The three priority areas are the Northern Corridor of East Africa, the Nacala Corridor, and the West Africa Growth Ring. The initiative aims to accelerate trade expansion by promoting a corridor development approach to comprehensively integrate industrial development, social sector development, and economic infrastructure development, encouraging public–private partnerships from the master planning stage to the project implementation stage (JICA 2016b).[28]

2.3.2 Strategy for Transformation Through Integration into Global Value Chains

East Asian economies have been pioneers in transforming their industrial structure through participation in GVCs. East Asia was best able to take advantage of the expanding electronics industry. Although the share of electrical and electronic products in world trade of manufactured goods increased from 13.0 to 29.7% between 1970 and 2000, in East Asia, this share increased from 14.3 to 48.4% over the same period. In developing East Asia (i.e., East Asia except Japan), the share increased from 14.4 to 52.7% (to 55.7% in 2007) (Kumakura 2010). Later, the automobile industry significantly deepened GVCs.

This FGP + GVC-type transformation has been facilitated by intra-regional trade agreements in East Asia since the mid-1990s. Moreover, this type of transformation has been extended to other Asian countries. In "integrating Asian economies,"[29] the share of parts and components trade in manufacturing trade increased from 24.3% in 1996 to 29.4% in 2006. The ADB (2008) study considers this a remarkable rise, because worldwide its share scarcely increased, edging up from 19.6 to 20.2% over the same period.

GVC trade grew rapidly from the 1990s and today its share of world trade increased to about 50%. This growth is due to technological advances in transportation, information, and communications—as well as lower trade barriers—which together induced manufacturers to extend production processes beyond national borders. GVC growth was concentrated in machinery, electronics, and transportation, and the regions specializing in those sectors: East Asia, North America, and Western Europe (World Bank, 2019, 2).

Participation in GVCs creates opportunities for industrial transformation. Several features of GVC enable this. "In contrast to 'standard' trade carried out in anonymous markets, GVCs typically involve long-term firm-to-firm relationships. This relational nature of GVCs makes them a particularly powerful vehicle for technological transfer along the value chain. Firms have a shared interest in specializing in specific tasks, exchanging technology, and learning from each other" (World Bank 2019, 70). In short, through technological transfer and mutual learning, participating firms, including SMEs of developing countries, could improve the quality and productivity of their products. In the long run, trade through GVCs could facilitate industrial transformation. In this sense, GVCs with this feature can establish *transformative (or transformational)* relationships among participants, in contrast to the anonymous *transactional* relationship of most traditional trade. Furthermore, "through firm-to-firm relationships, GVC firms can also play an important role in on-the-job learning, and employer-sponsored training within GVCs can be an effective mechanism for skill development, economic growth, and wage increases… A case study of the impact of a Japanese multilateral company on skilled labor in Malaysia shows that the integration of the subsidiary's production network into its GVC spurred greater needs for skill development, particularly in management and engineering services" (World Bank 2019, 71). Case 2.6, presented below, on the Mexican car industry is closely related to these aspects of GVCs highlighted above.

The integration of small and medium enterprises (SMEs) into global and regional value chains is critical to making GVC-led transformation inclusive and innovative. A recent study

by the Organization of Economic Co-operation and Development (OECD) and the World Bank (2015) focuses on inclusive GVCs, highlighting the policy options in trade and complementary areas for GVC integration by SMEs. As the report states, "Enhancing the integration into global markets of goods, services, investment, and knowledge of small and medium enterprises … represents a challenge for growth and job creation in all countries, at all levels of economic development" (OECD and World Bank 2015, 14).

Regional aspects of inclusive value chains are emphasized in a study by UNECLAC (2014), which argues that the rise of value chains in the global economy has brought renewed attention to the centrality of the regional space. The main global production networks are structured around specific regions, largely because of the importance of geographic proximity when it comes to organizing production processes that are fragmented across a number of countries.

2.3.2.1 Case 2.6: Effective Approaches for SME Participation in GVC Through Expansion of Supporting Industries

The automobile industry provides a highly relevant case for exploring SME participation and regional aspects of GVCs. Opportunities will be increased by investments of automobile companies, which require high-quality and competitive automobile parts and services. Development of an automobile industry requires skilled labor and supporting industries to provide up to thirty thousand parts and components. Supporting industries and automobile assembly plants are closely related and provide mutual externality.

Development of supporting industries, composed mostly of SMEs, is essential for a competitive automobile industry. If the industry becomes more competitive, production and exports will increase, demanding more parts and services. This is a typical case of growth begetting more growth when it is accompanied by higher productivity or higher value-adding, which often is achieved through technology transfer and innovation. Supporting industries are structured with supply chains that normally incorporate three or more tiers of suppliers in the case of the automobile industry.

The ratio of exported cars to cars produced in Mexico was around 80% in 2014. The increase of production and export of cars from Mexico has been remarkable: from less than 2.0 million cars in 2005 to over 3.4 million cars in 2014, of which 2.6 million cars were exported. This growth was enabled by years of efforts by the Mexican government and the private sector in such areas as human resource development, infrastructure development for highly efficient transport and logistics, automobile industry development policies, free trade agreements (North American Free Trade Agreement, European Union–Mexico Free Trade Agreement, and Japan–Mexico Economic Partnership Agreement), as well as institution-building of public and private entities related to the automobile industry.[30]

These factors have been extremely important for Mexico to receive foreign direct investment in support of its automobile industry and to enhance opportunities for SMEs to participate in the industry's development. SMEs had to improve their capacity to respond to opportunities for industries supporting car production so that they could develop and make the country's car industry competitive. To strengthen SMEs, laws on the development of competitiveness of micro, small, and medium enterprises were enacted in 2003.

Japan's role in automobile industry value chains has been growing. In the decade since the signing of the Japan-Mexico Economic Partnership Agreement (EPA), Japanese automakers have invested nearly US$6 billion in Mexico. During the five-year period from 2012 to 2017, Mexico's car production increased from 3 to 4 million, while Japanese car manufacturers' participation expanded from 800 thousand to 1.33 million vehicles, an increase of 66%. This increase in Mexico's car production has been accompanied by a rapid expansion of auto parts

production in Mexico. The number of auto parts makers in the country increased from 956 to 2229 between the end of 2009 and the end of 2017. Behind this process of the growing participation of auto parts makers in automobile value chains, public and private cooperation programs between Mexico and Japan have played a key role in facilitating this process.

The main aspects of this process are elaborated by an Inter-American Development Bank study (IDB 2016, 27):

> In the case of Japanese auto firms in Mexico, public agencies on both sides have worked together on a variety of projects aimed at helping Mexican firms become suppliers for Japanese investors. These include efforts to overcome informational barriers—the Mexico office of the Japan External Trade Organization (JETRO) maintains an extensive database of local providers with the help of Mexico's trade promotion agency, ProMéxico—and providing direct capacity building for SMEs. In 2012, JICA initiated a program, with the help of Japanese firms, to increase the productivity of potential Mexican suppliers, through training in Japan's Kaizen management practices. In addition to these activities, the two governments established a "Committee on the Improvement of the Business Environment" in the context of the EPA, which meets regularly to discuss issues arising in the operations of Japanese firms in Mexico, from public security to support from local governments and tax issues. This committee has helped resolve issues and fostered a positive view of Mexico's business environment in Japan, encouraging Japanese SMEs to venture into the Mexican market.

In this context, several joint projects between Mexico and Japan for promoting industrial development, strengthening SMEs, and training workers have been implemented. This cooperation reflects the priorities of Mexico's industrial policy.[31] Several cooperation projects have led to the realization of more structured and innovative cooperation to strengthen local supporting industries (i.e., SMEs) of the automobile industry, while adhering to the supply chain structure. The projects include "Support for Formation of Automobile Industry Cluster and Supply Chain," "Technical Support for Universities and Colleges of Engineering," "Automotive Supply Chain Development Project," and "Improvement of Quality and Productivity of Small and Medium Supporting Industries for Automobile Production."

2.3.3 Strategy for Innovation-Led Transformation

Although these cases of transformation (sequential and catching-up transformation and participation in GVCs) are closely related to technological innovation in many ways, other cases of transformation have been led mainly by technological innovation. In these cases, technological innovation, along with other factors or endowments, was the key enabling factor of transformation. Although the former cases often are characterized by the adoption and adaptation of foreign technology, the latter cases often are characterized by breakthrough innovations or incremental innovations, which are normally not available elsewhere in the world at the time. An example of this is evident in the tropical agriculture and agroindustry, as well as agroforestry in tropical rainforests, for which industrial countries cannot provide technological innovation. Because the private sector cannot fully take the risk of investment in innovation, they underinvest in innovation activities, especially in developing countries (UN Industrial Development Organization [UNIDO] 2016, 151). To address this situation, governments need to lead or support investment in innovation. UNIDO (2016) lists the objectives, source, and agents of such support.

Hosono et al. (2016) have analyzed the case of Cerrado agriculture, in which technological innovation produced a profound transformation in the Central-West region of Brazil. In effect, agriculture, livestock, and agroindustry transformation in some Latin American countries has been outstanding. Brazil was a net importer of grain until the 1980s, when the country achieved a major breakthrough to become a net exporter of grain after converting its vast barren land into some of the most productive agricultural fields in the world. Further transformation was achieved

by a deepening of the agroindustrial value chains, especially of meat and dairy products.

In the case of the Cerrado agriculture, from its inception through the early development phases, the public or semipublic sector took the initiative and made the necessary investments in research and development and in infrastructure. Later, public and private partnerships became essential for the formation of clusters and value chains as well as learning and innovation ecosystems around clusters. In the case of the Brazilian Cerrado, breakthrough innovations enabled the start-up of the Cerrado agriculture and continuous and incremental innovation followed, allowing agricultural production and agroindustry value chains to scale up (see Chap. 3).

Cases of agroforestry in Brazil, Panama, and Kenya illustrate the transformation enabled by farmers and their community with mainly incremental innovations for years of learning by doing in the tropical regions (see Chap. 7).

2.3.4 Strategy for Inclusive Business–Led Transformation

In addition to the strategies discussed thus far, people-centered transformation strategies deserve special attention. These strategies proactively support inclusive and sustainable activities in which the base of the pyramid (BOP) can participate. The use of inclusive business models, as proposed by the United Nations Development Program (UNDP/Growing Inclusive Markets 2008), could provide one such strategy. These models include the poor on the demand side as clients and customers (*first category*), and on the supply side as employees, producers, and business owners at various points in the value chains (*second category*) (emphasis added).

Inclusive business is an important pathway to realize industrial transformation and quality growth locally and also to focus on the BOP. For the first category of inclusive business, it is critical to produce goods at scale to make their price affordable for the poor and to expedite delivery. BOP businesses are different from a normal commercial business for a variety of reasons, including the limited purchasing power of low-income customers, the required innovative technology for consumption needs, the normally high levels of upfront investments, awareness and acceptance by users, and the difficulty of delivery (Kato and Hosono 2013). A comprehensive approach to addressing the constraints of inclusive businesses for the BOP is needed because (1) an affordable price is normally enabled by production at scale, which requires finance for scale; (2) delivery at scale is essential to make available new products for the BOP; and (3) partnership at scale with governments, NGOs, international organizations, and other stakeholders is needed as well.

For the second category of inclusive business, it is essential to create and commercialize competitive products and services based on local resources, to support self-reliance and creativity, and to develop human resources. By learning about improvements to their livelihood, communities and their members will become more conscious of their needs (and challenges) and of BOP products to satisfy them. This approach enables communities to become involved in "participatory platforms for inclusive products and service design" (Caneque and Hart 2015, 8) on the demand side of inclusive business. At the same time, it enables and strengthens their capacity on the supply side to become employees, producers, and business owners at various points in the value chains by participating in inclusive business. OVOP programs have resulted in a promising model of inclusive business from the supply side (i.e., the second category) (Chap. 4).

2.3.4.1 Case 2.7: Effective Approaches to Catalyzing Local Transformation Through Inclusive Business

As regards inclusive business for the demand side of the BOP (first category), the case of long-lasting insecticide-treated mosquito nets (LLINs) appears to be highly relevant. Looking at the history of the mainstreaming of LLINs, we can extract several dominant factors that enabled successful scale-up. First, the invention of the

Olyset net by Sumitomo Chemical was an indispensable technological breakthrough at the core of the scaling-up process. It was a major technical innovation that resolved the problems that traditional insecticide-treated nets (ITNs) could not overcome. This technology was transferred royalty-free to a local company in Tanzania. A second enabling factor was the WHO's decision to mainstream LLINs as a means of fighting malaria. A third factor was the partnership of a wide range of actors as represented by the Olyset Consortium, without which the technological innovation would not have become commercially viable in developing countries (Kato and Hosono 2013).

The partnership provided an important contribution to making this technological innovation marketable. It enabled local production in Africa, leading to cost reductions and increased affordability for local residents, as well as systems to be developed for distribution and follow-up. Meanwhile, partly due to global initiatives to achieve universal coverage, the market for LLINs has expanded considerably. The number of suppliers with the recommendation of the WHO Pesticide Evaluation Scheme (WHOPES) has increased from three in 2007 to ten in 2011. The total number of ITNs supplied annually (mostly LLINs) increased from 5.6 million in 2004 to 145 million in 2010 (Kato and Hosono 2013, 227).

Another example of an inclusive business on the demand-side can be seen in the performance of the Yakult system.[32] This model was introduced to Grameen Danone in Bangladesh, a joint venture of Microfinance Institution Grameen and the French Dairy Company, Groupe Danone.[33] Grameen Ladies deliver a yogurt fortified with micro-nutrients to decrease malnutrition for the children of Bangladesh. The first plant started production in 2006 (UNDP 2010, 39).

Several points can be considered as factors that have enabled the success of this model on the demand side (first category). First, at the base of the company's success was its unique business model, which was able to tap into people's latent demands for beverages with health benefits at affordable prices. This business model comprised, most notably, an attractive product (quality and price) and the company's unique home delivery system using the Yakult Ladies. This home delivery system enabled customers to purchase the product without needing to make trips to the supermarket or other shops, in small quantities, from people with whom they were acquainted and on whom they could rely, while at the same time receiving information on the possible benefits of the product. Communication with customers was greatly facilitated by the Yakult Lady system. The system also provided new job opportunities, particularly to women (many of them single mothers), making them more self-reliant in economic terms. The company's success in developing countries shows that the product has succeeded in tapping into the latent demands of people, especially the poor.

The rapidly growing sesame value chain in Paraguay can be considered as an example of inclusive business for the supply side of the BOP (second category). Indeed, it is a case of inclusive business-led transformation with strong effects on social inclusion. The pioneering company was Shirosawa Co., which started the experimental production of sesame in 1989. The company decided to work with small farmers in 1993. It took four years to develop a high-quality variety, Escoba. This technological innovation achieved a breakthrough in creating a new and competitive food value chain in Paraguay. Between 1995 and 1996, this variety was rapidly disseminated and production of sesame increased from 120 t in 1994 to 1200 t in 1996, and to 8343 t in 1999/2000 (UNDP 2008, 54). Other companies participated in sesame production, following the inclusive business model of Shirosawa Co., and the amount of production in Paraguay increased steadily to 51,219 t. in 2008/2009 (USAID 2009, 25).

The number of small farms producing sesame increased from 5000 in 1999 to 35,000 in 2005 and to around 50,000 in 2015. Each farm cultivates sesame over 1–2 h. Sesame is today one of the most important export products of Paraguay. Shirosawa and seven other sesame companies provide technical assistance to farmers through their extension experts, provide finance to

farmers, and buy sesame from them. USAID (2009) highlights the importance of the contribution of Shirosawa Co.: "It demonstrated that sesame production is adequate for small farmers; it diffused the "culture of quality" among farmers; and it introduced a system of traceability involving farmers." Today around 70% of white sesame imported to Japan is from Paraguay.

2.4 Conclusion

The strategies and case studies discussed in this chapter show that quality growth needs to be discussed in the context of transformation, which is the key driver of growth and a determinant of the various attributes of growth. As transformation is closely related to changing endowments and dynamic comparative advantage, the central theme has to be the relationships among these endowments, transformation paths, and attributes of quality growth.

It is clear that the enhancement of endowments and the transformation do not take place automatically. These processes are normally endogenous, but they need to be catalyzed or facilitated by industrial strategies and policies. As a corollary, it might be realistic to design policies and measures to attain the desired attributes of quality growth alongside the development of specific industries and their value chains, as transformation is taking place, while remembering specific transformation paths and quality growth agendas.

Transformation and quality growth need to be considered in a holistic manner, as a comprehensive target to be achieved. The APEC Growth Strategy could be regarded as a pioneering initiative with a holistic framework for attaining such a target. In developing a distinct transformation agenda for each country, the nature of quality growth should be fully taken into account, bearing in mind the interrelationships, synergy, sequences, and trade-offs among them.

As the transformation agenda differs between countries with distinctive characteristics, policies and measures to transform these different economies and attain the desired attributes of quality growth also would be different. No standard model addresses the challenges of transformation and quality growth. Each country requires a distinct combination of strategies as well as effective approaches toward realizing such strategies. The approaches discussed in this chapter may provide some means of envisioning alternative strategies.

The interrelationships among endowments, transformation, and quality growth are highly complex, and this chapter has covered these aspects only in part. Therefore, they deserve further in-depth analysis.

2.5 Further Discussion 2.1: Overview of Recent Trend of a Consensus on the Importance of Transformation and Quality of Growth in East Asia, Latin America, and Africa

In recent policy debates on growth and development, economic transformation has featured, together with quality of growth. The Report of the High-Level Panel of Eminent Persons on the post-2015 Development Agenda is titled "A Global Partnership: Eradicate Poverty and Transform Economies through Sustainable Development" (hereafter referred to as "The Report of HLP"). The panel concluded that the post-2015 agenda needs to be driven by five big transformational shifts, including a call for the transformation of economies for jobs and inclusive growth. The above-cited United Nations 2030 Agenda declares that "We are determined to take the bold and transformative steps which are urgently needed to shift the world on to a sustainable and resilient path"(United Nations 2015, 2).

Thus, there now seems to be more of a consensus on the importance of quality of growth, on the one hand, and transformation on the other. We can also confirm this trend in some of the main developing regions of the world, including East Asia, Latin America, and Africa.

Some East Asian countries have been pioneers of industrial transformation. Over the last four decades, Asia has grown faster than any other developing region, and a few of its economies have undergone a rapid and remarkable transformation (ADB 2013, iii). In East Asia, as early as the 1960s, countries started to implement policies to transform themselves from agriculture-based to industry-based economies, and then from labor-intensive industries to knowledge-intensive ones. The first movers were Asian tigers such as Korea, Chinese Taipei (Taiwan), and Singapore. Other East Asian countries followed. However, in spite of this remarkable trajectory, concerns over economic transformation have now been renewed in Asia. The Asian Development Bank Annual Report 2013 feature was "Asia's Economic Transformation: Where to, How, and How Fast?" The report states: "Developing Asia needs to make a significant and qualitative leap in structural transformation" (xxix). Almost simultaneously the United Nations ESCAP published a report titled "Shifting from Quantity to Quality: Growth with Equality, Efficiency, Sustainability and Dynamism." It presented a holistic framework that distinguished between three dimensions of quality of growth: environmental, social, and economic (UNESCAP 2013, 7).

In Latin America, the United Nations ECLAC's flagship report 2012, titled "Structural Change for Equality: An Integrated Approach to Development," featured the theme of transformation with equality. This drew on ECLAC's seminal proposal titled "Transformación Productiva con Equidad," published in 1990.[34] The 2012 report states that "social equality and economic growth that transforms the production structure are not incompatible, and that the challenge lies in finding the synergies between them" (UNECLAC 2012, 14). Here, the relationship between transformation and growth with equality is the central theme. In 2014, the Inter-American Development Bank (IDB) published its flagship report, "Rethinking Productive Development: Sound Policies and Institutions for Economic Transformation." This report states that in Latin America, "while the accumulation of factors of production, both physical and human capital, has helped to narrow the gap with the United States, productivity is low and its poor performance continues to be a drag to income convergence," and that "in contrast, other successful developing regions such as the East Asian tigers have been able to sharply close their productivity gap." The report focuses on the "important role of active policies for advancing economic transformation and sustained growth" in Latin America (IDB 2014, 3).

I elaborated on the recent trend of stronger consensus on the importance of transformation and quality of growth in Africa at the beginning of this chapter, referring to documents of AU, UNECA, and ACET.

2.6 Further Discussion 2.2: Transformation and Quality of Growth from Capital Assets Accumulation Perspective

The relationship between endowments, transformation, and quality of growth could be discussed from a "capital assets accumulation" perspective. Vinod et al. (2000) proposed a simple scheme of how human capital, natural capital, and physical capital contribute to economic growth and welfare: "Physical capital contributes to welfare through economic growth." "Human (and social) capital and natural capital (and environmental) capital also do that; they are also direct components of welfare." The three capitals have mutual externalities: "Human, and natural capital also contribute to the accumulation of physical capital by increasing its returns. Physical capital increases returns to human capital and natural capital and, if markets reflect this, their accumulation." Furthermore, the three capitals could contribute to technological progress and total factor productivity growth: "Investments in physical, human, and natural capital, together with many policy reforms, contribute to technological progress and the growth to total factor productivity, thereby boosting growth" (xxxvi).

Related to this scheme is "wealth account" based on measurement of capital assets accumulation, in which the amount of the three types of capital, natural capital (R), intangible capital (H), and produced capital (P), is estimated (World Bank 2011; Lange et al. 2018).[35] In this estimation, natural capital comprises agricultural land, protected areas, forests, minerals, and energy; produced capital comprises machinery, structures, and equipment; intangible capital includes measures of human, social, and institutional capital (World Bank 2011, 4). Although intangible capital is measured as a residual, and agricultural land is not included in the estimation of natural capital, this wealth account facilitates the understanding of changing endowments and quality of growth.

Investment in (H), (R), and (P), and their mutual externalities change part of endowments. The above "growth accounting" type framework illustrates how (H), (R), and (P) interact, and how a part of the process of "changing endowments/transformation/quality growth (CTG)" takes place. In this process, changing endowments through investments in (H) and (P), together with externalities and technological progress, produce industrial structure transformation with a reallocation of labor across sectors and subsequent increase of total factor productivity (TFP) growth (productivity-enhancing structural change). It has been one of the most commonly observed processes as an important driver of productivity growth (and consequently sustained growth) in several East Asian countries. "In China, it contributed 4.1 percentage points of the 7.3% annual growth in aggregate labor productivity over the past decade; in Vietnam, it accounted for 2.6% out of 4.2." (World Bank 2012, 100).

On the other hand, according to the estimation of the wealth of nations, intangible wealth is the largest single component of wealth in all income groups of countries, and the fastest growing one as well (World Bank 2011, 4, 6). On the other hand, the impact of overexploitation of natural capital has been sizable in some countries. In 1997, gross domestic savings were about 25% of gross domestic product (GDP) in the developing world. Corrected for the depletion of environment capital, however, genuine domestic savings were only an estimated 14% of GDP (Vinod et al. 2000: xxvii).

Summing up, estimation of the wealth of nations by Lange et al. (2018) is related to the scheme of Vinod et al. (2000) and facilitates understanding of changing endowments and quality of growth as well as transformation.

Notes

1. This UN plan of action on Sustainable Development Goals (SDGs) was adopted by the UN General Assembly in 2015; see United Nations (2015), "Transforming Our World: The 2030 Agenda for Sustainable Development," https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pd.
2. The APEC Growth Strategy's definition of quality of growth, which focused on five desired attributes, appears to be one of the most widely agreed-on and most comprehensive definitions. It draws on the outcome of discussions on these attributes over a decade, and is reviewed in the following sections.
3. See, for example, Asian Development Bank, *Key Indicators for Asia and the Pacific 2013: Asia's Economic Transformation: Where to, How, and How Fast?* (ADB 2013); UN Economic and Social Commission for Asia and Pacific, *Shifting from Quantity to Quality: Growth with Equality, Efficiency, Sustainability and Dynamism* (UNESCAP 2013); UN Economic Commission for Latin America and the Caribbean, *Structural Change for Equality: An Integrated Approach to Development* (UNECLAC 2012); Inter-American Development Bank, *Rethinking Productive Development: Sound Policies and Institutions for Economic Transformation* (IDB 2014); UN Economic Commission for Africa, *Making the Most of Africa's*

Commodities: Industrializing for Growth, Jobs and Economic Transformation (UNECA 2013); African Center for Economic Transformation, "2014 African Transformation Report: Growth with Depth" (ACET 2014).

4. The report emphasizes that what African countries need is growth with depth: "More Diversification, more Export competitiveness, more Productivity increase, more Technological upgrading, and more improvements in Human well-being" (the title of the ACET report, "Growth with Depth" is itself an acronym drawn from the names of the five elements). It states: "Only by doing so can they ensure that growth improves human well-being by providing more productive jobs and higher incomes and thus has everyone share in the new prosperity" (ACET 2014, 1).
5. Aggregate productivity increases when the most productive sectors expand. This effect, referred to as productivity-enhancing structural change, is well documented in the case of labor shifts from agriculture to industry and services. Reallocation of labor across sectors has been an important driver of productivity growth in several fast-growing East Asian countries; see *World Development Report 2013: Jobs* (World Bank 2012, 100).
6. Regarding factor endowments, it is essential to take into account mobility of capital and highly skilled labor, rapid technological change, and evolving global value chains. For a discussion of this aspect, see Noman and Stiglitz (2017 12–13). Demographic transition also matters for long-term comparative advantage.
7. This is based on Japan's view of economic development and its experiences (see Hosono 2016, 173). In a similar manner, JICA/JBIC (2008, 17) considers infrastructure, human resources, and credit markets as fundamental growth-driving functions. See Hosono (2016) and JICA/JBIC (2008).
8. Japan's Official Development Assistance white paper states that achieving economic growth requires improving the investment environment, which involves policy and institution building, human resources development, strengthening basic infrastructure, attracting foreign direct investment, and expanding trade. Japan has long insisted that economic growth through infrastructure development, etc., is crucial to poverty reduction, and has incorporated this viewpoint in its ODA policies. See *Japan's Official Development Assistance 2005* (MOFA 2005, Part I, Sect. 2).
9. This means "I like mathematics" in English.
10. "Lesson study" is a method in which teachers observe classes with related persons inside and outside of school and consider approaches to improve classes and their own teaching skills. In Japan, it has spread gradually since the Meiji Era, and is now commonly practiced at schools. Japan's experience is being used in faraway countries, including African countries, in order to provide children with a better education (JICA 2015, 5; Isoda et al. 2007).
11. This and the next paragraphs draw heavily from Shibuya (2013).
12. *Kaizen* is a management philosophy and know-how system that brings about continuous improvement of productivity and quality. It is a philosophy that has contributed to the development of Japan, especially in manufacturing industries. More recently, it has proved to be valid for use in other countries, cultures, and sectors. *Kaizen* is a human-centered approach that fosters teamwork, self-reliance, creativity, and ingenuity; see JICA (2016a).
13. The concept of "quality infrastructure" was first used in the APEC Leaders Declaration in 2013. The APEC Connectivity Blueprint was adopted the following year; see APEC (2014a).
14. Service areas on expressways are not exactly the same as Michinoeki, but similar in the way that they are installed for traffic safety and comfort of drivers and passengers.

15. They compared Africa today with countries that were similarly weak in the past in terms of their institutional development and yet managed to escape from poverty. Inherited institutional weaknesses persist in Africa, and internal conflict and societal fractionalization remain concerns. However, the East Asian experience demonstrates that some institutional weaknesses can be escaped; see Johnson et al. (2007, 36–37).
16. From this perspective, East Asian experiences seem highly relevant because financial institutions played an important role in industrialization and inclusive growth in the region. The East Asian governments created financial institutions to provide long-term loans at low interest rates, helping their countries to promote economic development through industrialization and infrastructure building. At the same time, they encouraged inclusive development by providing credit to agriculture and small and medium firms. The World Bank (1993) highlighted the following three aspects: East Asian governments created a wide range of financial institutions to fill perceived gaps in the types of credit provided by private entities. They addressed the need for long-term credit for industry by creating development banks. Most have also created specialized institutions that provide credit to agriculture and small firms.
17. JICA (2013, 86–223) summarizes all cooperation programs for SME promotion carried out by JICA since the 1970s and presents lessons learned from several such programs.
18. In this context, cooperation programs related to industrial development including SME promotion in Vietnam implemented by JICA were "Technical Cooperation for Development Planning and Research (DS) for Development of Industries in the Hanoi Region" and later "DS for the Hoa Lac and Song May Regions" (1990s); "DS for Steel Industry Promotion" (1990s). In the 2000s and 2010s, cooperation programs for the "Food Industries Research Institute" for the "Master Plan Formulation for the Electronics Industry," and for "Establishment of a Skill Testing System" were implemented.
19. The ADB report on transformation explains: (1) countries' structural transformation (ST) is driven by demand and supply factors; (2) demographic and geographic variables and country size shape the pattern of ST; (3) good organizational capabilities that encompass all of the tacit knowledge necessary to produce a good or deliver a service allow faster ST; and (4) specific policies and actions, institutions, and politics often work jointly to determine the direction and pace of ST (ADB 2013, 5).
20. The eight economies are the People's Republic of China, Japan, Malaysia, Thailand, and so-called Asian tigers (Hong Kong, Republic of Korea, Singapore, and Chinese Taipei). The eight high-performing Asian economies (HPAEs) of the World Bank's study on the East Asian Miracle (cited later) are the Asian tigers, and Indonesia, Japan, Malaysia, and Thailand.
21. The sixteen "integrating Asian economies" are, in addition to the eight economies, the other ASEAN countries (Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Myanmar, Philippines, and Vietnam) and India.
22. Regarding HPAEs, see footnote 20.
23. FGP is also referred to as flying wild geese (FWG); see Ippei Yamazawa, "Flying Wild Geese Pattern in Pacific: Pattern of Industrial Development among Asian Countries" (Yamazawa 1990). For literature on FGP, see Hosono (2017), *Asia Pacific and Latin America*: *Dynamics of Regional Integration and International Cooperation*.
24. In addition, The *East Asian Miracle* study states that, since 1960, the HPAEs have grown more than twice as fast as the rest of East Asia, roughly three times as fast as Latin America and South Asia, and five

times faster than sub-Saharan Africa. They also significantly outperformed the industrial economies and the oil-rich Middle East—North Africa region. Between 1960 and 1980, real income per capita increased more than four times in Japan and the Four Tigers and more than doubled in the Southeast Asian NIEs (World Bank 1993, 2).

25. IS and EO were used instead of ISP and EOP in the cited document.
26. The *East Asian Miracle* study classified countries of the world by a combination of the levels of GDP growth rate per capita and income inequality between 1965 and 1989: "There are 7 high growth, low-inequality economies. All of them are in East Asia," namely HPAEs except Malaysia (World Bank 1993, 30). The HPAEs have also achieved 'unusually low and declining levels of inequality, contrary to historical experience and contemporary evidence in other regions' (Kuznets 1955)" (World Bank 1993, 29–30; Kuznets 1955, 1–28).
27. This paragraph draws heavily from JICA/JBIC, *Report of the Stocktaking Work on the Economic Development in Africa and the Asian Growth Experience* (JICA 2008).
28. In compliance with the commitment made at TICAD V, Japan cooperated in formulating ten strategic master plans for comprehensive corridor development in Africa. "The comprehensive corridor development master plan elaborates a relatively long-term (20 to 30 years) policy, as well as identifies short-term priority projects, considering rapid population growth and urbanization trend. It enhances the feasibility and effectiveness of corridor development by strategically connecting natural and human resources with industries and infrastructure along corridor(s) in region-wide crossing borders. It also strategically aims at improving the investment attractiveness of the region, and strengthening regional connectivity and integrity" (JICA 2016b, 3; JICA 2019, 4).
29. See footnote 21 in regard to integrating Asian economies.
30. For further information on Japanese investments and cooperation with the Mexican car industry, see *Japan and Latin America and the Caribbean: Building a Sustainable Trans-Pacific Relationship* (IDB 2013, 33–35); and *A Virtuous Cycle of Integration: The Past, Present, and Future of Japan-Latin America and the Caribbean Relations* (IDB 2016, 25–27).
31. These projects of cooperation are "Study on Promotion and Development Plan of Supporting Industries" in 1996–1997, "Study on Technology Transfer" in 1997–1999, "Press Process Technology Improvement Project" in 2006–2009, "Study on SMEs' Human Resources Development" in 2008–2009, and "Plastic Molding Technology Human Resources Development Project" in 2010–2014.
32. Yakult Honsha, Co., Ltd. is a Japanese fermented-milk drink manufacturer founded in 1935. Its main product is a probiotic drink (live microorganisms that provide health benefits by improving the balance of intestinal flora), sold under the brand name of Yakult, which contains a fortified lactic acid bacterium with benefits for human health. It is considered an effective drink for preventive health care, especially for children, to address infectious disease and malnutrition. Though a mid-sized company by Japan's standards, the company is quite well known for its unique business model, both in Japan and abroad. Currently, the company's overseas operations cover 32 countries, and the number of overseas Yakult Ladies amounts roughly to 42,300, many of whom are in developing countries.
33. For this initiative, Katsuhiro Hirano, Executive Director of Yakult, was invited to be a visiting director of Danone from 2004 to 07. In India, Yakult Danone India, a joint venture, was formed in 2005.
34. The English version of this publication is titled "Changing Production Patterns with Social Equity" (UNECLAC 1990).
35. New estimation of 'Wealth of Nations'.

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3 Industrial Development and Transformation: Insights from Outstanding Cases

Industrial policy and economic transformation have been attracting renewed attention in recent years. Several studies in the past decade or so have focused on industrial development—especially industrial structure upgrading and diversification—as a basis for sustained economic growth and development.

These studies have emphasized such aspects as the accumulation of knowledge and capabilities and the creation of a learning society (Cimoli et al. 2009; Stiglitz and Greenwald 2014); the exploiting and changing endowments and comparative advantage (Lin 2012); the need to compensate for information externalities generated by pioneer firms (Rodrik 2007); and pragmatic policymaking for developing countries that must cope with the strong pressures of market orientation and globalization in our times (Ohno 2013).

The main objective of this chapter is to obtain insights into how these crucial factors interact in practice, focusing on five outstanding cases of what we call "industrial strategy" that resulted in a remarkable economic transformation in a country or in regions of a country. These five cases are: (1) the automobile industry in Thailand; (2) the transformation of the "Cerrado" in Brazil from barren lands to a source of high-productivity agriculture; (3) the garment industry in Bangladesh; (4) the salmon farming and processing industry in Chile; and (5) the upgrading of Singapore's industrial sector from labor to knowledge-intensive. These case studies, which are the main focus of this chapter, can be found below in the section titled "Case Studies."

As these five cases suggest, we use the terms "industry" and "industrial sector" very broadly to refer not only to the manufacturing sector but also agro-business, modern agriculture, aquaculture, transport, logistics, tourism, and any other activities that produce nontraditional or "modern" goods and services that require significant human and/or physical capital. Similarly, industrial strategy refers not only to narrowly defined "industrial policy" targeted at manufacturing, but also other policy areas, such as education policy, fiscal policy, financial policy, trade policy, and labor policy, which encourage the development of the aforementioned productive activities[1].

The next section briefly reviews the major findings of some recent studies related to industrial policy and economic transformation and outlines the analytical perspective of this chapter. This is followed by the case studies. Finally, the concluding section attempts to extract lessons that could be derived from these cases. In the Further Discussion section, I will examine the insights and implications that can be derived from the case studies presented in this chapter in regard to the catalytic role of international cooperation for industrial development and transformation.

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3.1 An Analytical Perspective

Major Findings of Recent Studies Related to Industrial Strategy and Economic Transformation.

3.1.1 Change of Endowments and Dynamic Comparative Advantage: The Focus of Industrial Strategy

As discussed in Chap. 2, quality of growth needs to be considered in the context of changing endowments and transformation. This is because industrial transformation is a driver of growth and could be related to different attributes of growth. As such, industrial strategy needs to address enhancement of endowments including, among other aspects, infrastructure, human capital, social capital, natural capital, financial capital, institutions, and learning capacity related to the accumulation of knowledge and capabilities. It needs to catalyze or facilitate industrial transformation, taking full advantage of changing endowments, through creation of new industries, deepening of value chains, diversification, and so on. Industrial strategy also needs to attain the desired attributes of quality growth in the process of industrial transformation. In sum, the nexus between changing endowments, industrial transformation, and quality growth needs to be the main focus of an industrial strategy.

Now, in this nexus, changing of endowments are essential for attaining dynamic comparative advantage, which is intimately related to new industries and industrial transformation. According to Noman and Stiglitz (2012), the "old" policies focused on improving economic efficiency *within a static framework*: "But the essence of development is dynamic. What matters, for instance, is not comparative advantage as of today, but dynamic comparative advantage" (7). JICA and JBIC (2008, 48–55) review some cases of the industrial development of Asian countries through "developing new comparative advantage." This concept of *new* comparative advantage appears to be similar to *dynamic* comparative advantage.

Lin (2012), while discussing the "changing comparative advantage," argues that "The more effective route for their learning and development is to exploit the advantages of backwardness and upgrade and diversify into new industries according to the changing comparative advantages determined by the changes in their endowment structure" (73).

Lin goes on to explain, "Conceptually, it is useful to add infrastructure as one more component in an economy's endowments. Infrastructure includes hard infrastructure and soft infrastructure" (22). The new structural economics, which he advocates, "considers human capital to be one component of a country's endowment" (36). Here it should be underlined that several components are endogenous. It includes infrastructure and the human capital in which learning capacity is embedded. These are crucial in changing comparative advantage.

In addition, we should emphasize the fundamental differences between "hard infrastructure" and "soft infrastructure" in this context. First, while the former (roads, ports, airports, energy plants, and so on) can be realized through intensive investments in a relatively short period, the latter is achieved only through a longer-term, incremental process, and is essentially path dependent. Second, investments in learning are high risk, and risk markets are absent (especially in developing countries), which also discourages such investments (Greenwald and Stiglitz 2012, 6). Moreover, the feasibility and rate of return of investments in hard infrastructure can be measured. Nevertheless, both soft infrastructure and hard infrastructure tend to have a public good dimension and, as Greenwald and Stiglitz (2012) argue, "markets by themselves are never efficient in the production and utilization of public goods" (5).

In Chap. 2, I highlighted learning capacity (and human capital in which learning capacity is embedded), infrastructure, and institutions as essential endowments for industrial transformation. In the next sub-section, I will discuss how countries enhance and change these endowments.

3.1.2 Leading Industries, Economic Transformation, and the Role of Government and Institutions

Now two basic questions need to be answered in this context: How and under what conditions do countries change endowments? How and under what conditions do countries take advantage of a changing comparative advantage to develop new industries? Endowments could be changed dynamically. As soft and hard infrastructures—important components of endowments of a country—are endogenous and essentially public goods, and as the market is often not efficient in the production and utilization of public goods, government and/or public and private institutions have to play an important role in the dynamic change of endowments.

The Commission on Growth and Development's Report (2008) studied the experience of thirteen countries that had achieved annual growth rates of 7% or more for at least twenty-five years. The report identified having "committed, credible, and capable governments" as one of five characteristics of high-performing countries. These governments, except for that of Hong Kong, were more hands-on, intervening with tax breaks, subsidized credit, directed lending, and other such measures. These interventions may have helped them to discover their comparative advantage (Noman and Stiglitz 2012, 12).

However, the role of governments referred to by the Growth Commission's report is basically related to the static comparative advantage of countries. Rodrik's (2007) view on "self-discovery" can likewise be said to bear mainly on static comparative advantage. As the dynamic change of endowments that transforms long-term comparative advantage is endogenous, the governments also have an important role to play in relation to dynamic comparative advantage. Noman and Stiglitz (2012, 12 and note 15) refer to this point. In short, the government's role is twofold: (1) facilitating "self-discovery" of static comparative advantage and (2) investing in learning and soft and hard infrastructures that are endogenous components of endowments for dynamic (long-term) comparative advantage.

This chapter's objective is to generate insights into both of these aspects, but with special reference to the second aspect, based on case studies of countries that were able to realize outstanding economic transformation rather than just high performance in terms of growth. I will focus on (1) how endowments dynamically changed in terms of hard and soft infrastructures; (2) how investment in hard infrastructure was made and how learning, as well as the accumulation of knowledge and capabilities, was achieved; (3) how the transformation was triggered (initiated) with the change of endowments; (4) what kind of drivers (driving forces) kept the momentum of transformation; and (5) what kind of strategy/vision was behind the process and what policies and institutions promoted it.

The World Bank (2012, 218) summarizes the current discussion on "industrial policy," highlighting three schools of thought: (a) new structural economics; (b) an approach that emphasizes the policy process and especially a public–private partnership; and (c) a school of thought that stresses spillovers of productive knowledge—mastering ways of doing things. The document cites views of opponents regarding, among others, the practicality of implementing such a policy, doubting especially whether the public sector has the capacity to identify industries with potentially sizable knowledge spillovers and dynamic scale economies.

This chapter addresses basic questions of the "industrial strategy and economic transformation agenda" focusing on the five aspects discussed in this section. This will also provide some insights into aspects of the controversy among the three schools of thought, as well as the opposing arguments.

3.1.3 Typology of Industrial Development and Transformation Challenges

Challenges facing countries differ as they move along the development path, with new challenges

emerging and endowments changing. Industrial development strategies could be different depending on the challenges that countries face. Countries may focus in different ways on infrastructure, human resource development, technological innovation, or other investments. In some countries, industrial challenges are shaped by special circumstances affecting particular groups such as resource-rich countries, small countries, and post-conflict countries[2].

A typological approach could be useful in addressing these diversities. JICA and JBIC (2008) distinguish, first of all, resource-rich countries and resource-poor countries. The World Bank (2012) identifies eight categories of "job challenge," including resource-rich countries, urbanizing countries, and conflict-affected countries.

From the point of view of the "economic transformation agenda," meaningful categorization could be accomplished according to the endowments of almost-fixed or exogenous factors such as mineral and energy resources on the one hand. On the other hand, meaningful categorization could result from the endowment of endogenous factors such as hard and soft infrastructure. With regard to the former type of endowments, we need to introduce the two categories of resource-rich countries and resource-poor countries. For the latter we need to take into account the development phases reflecting human resource development as well as physical infrastructure endowment such as (1) agrarian countries, (2) urbanizing and early industrializing countries dependent on labor-intensive sectors, (3) industrializing countries with higher skills and technology, and (4) countries with high-level technological and innovative capabilities.

These categories are not mutually exclusive and might not cover all types of divergence among countries. Having this endowments-based categorization in mind, three resource-poor Asian countries in different phases of development–Bangladesh, Thailand, and Singapore—were selected. From Latin America, two resource-rich countries were also included: Brazil and Chile. All of the selected countries have been at least fairly high-performing countries for roughly two decades.

3.1.4 Research Questions for Case Studies

Based on the research questions set out on page 41, the most important questions to be answered in the case studies of selected countries are how economic transformation was achieved with endowment changes, and how such endowment changes were attained. More concretely, the case studies examine how learning and accumulation of knowledge and capabilities took place, how hard infrastructure was constructed, and what kinds of policies and institutions enabled the process of change and transformation. These practical aspects need to be analyzed in order to obtain insights into successful industrial strategies with impacts on economic transformation.

As mentioned earlier, how the transformation process was triggered (initiated) with the change of endowments and what kind of drivers (driving forces) maintained the momentum of transformation are important research questions as well.

3.2 Case Studies

3.2.1 Case 3.1: Thailand's Automobile Industry

In 1995, Thailand's annual automobile exports were less than half a billion U.S. dollars, well below exports from India and Malaysia. By 2008, exports approached twenty-eight billion U.S. dollars, making Thailand the largest automobile exporter in the Association of Southeast Asian Nations (ASEAN) region, the third-largest in Asia, after Japan and South Korea, and the seventh-largest exporter in the world. Production reached 1 million cars in 2005 and 2.5 million cars in 2012. Automobile assembly and autoparts industries account for more than 10% of the GDP of the country and employ approximately 1 million people.

It is estimated that as of 2010 there were about 690 first-tier parts makers, 30% of them Thai majority joint venture companies, 23% of them pure Thai companies, and 1700 second- and third-tier parts makers, most of them locally owned small and medium enterprises (SMEs) supporting the automobile industry in Thailand (Natsuda and Thoburn 2011, 8). As such, "Thailand is not a country where carmakers assemble their products. Most parts come from local companies. At more than 80%, the country has the highest localization in South East Asia.... Thailand also exports parts worth about $5 billion" (T. J. 2013). At present, the automobile industry is the principal engine for growth in Thailand's economy. "The Detroit of Asia" envisaged once by the Thai government is now a reality and the "automobile belt" has been established from Ayutthaya to the Eastern Seaboard.

3.2.1.1 Accumulation of Knowledge and Capabilities, Prerequisite for Development of an Automobile Industry

As Athukorala and Kohpaiboon (2011) argue, "The automobile industry has been the target of industrial development in many countries as a growth driver—a source of employment, technological expertise, and a stimulus to other sectors through backward linkages.... But only a handful of developing countries have managed to develop an internationally competitive automobile industry"[3].

Development of an automobile industry requires skilled labor and supporting industries to provide twenty to thirty thousand parts and components. Supporting industries and automobile assembly plants are closely related and provide externality to each other. Accordingly, in many countries, the lack of supporting industries made the installation of automobile assembly plants difficult, while supporting industries were constrained by the demand for parts and components of assembly plants, a clear chicken and egg conundrum. Furthermore, the development of supporting industries for automobile industries takes years because they need a prolonged process of accumulation of knowledge and capabilities, especially the formation of human resources and learning about technology.

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. In the 1960s, the board of investment (BOI) introduced the Industrial Investment Promotion Act, and with Thai capital, six major foreign automobile joint ventures were established by the end of the decade. However, the production of vehicles remained very limited, accounting for only 18.5% of the total sales of automobiles in the country in 1969, and the process depended heavily on assembly operations using imported completely knocked down (CKD) kits that created a serious imbalance of trade and payment deficits (Natsuda and Thoburn 2011, 13).

The specific policies for the automobile industry, introduced for the first time in 1971, established, among others, a local content requirement (LCR) of 25%, which became effective in 1973, and conditions for new market entry of over 0.2 million baht for investment (except for land). There was also a production capacity of 30 units per day in order to achieve economies of scale– essential for competitive development in the automobile industry[4]. The LCR encouraged car assemblers to produce locally or to purchase parts from local companies. This was not easy because the supporting industries in Thailand did not exist. Assembling companies had to start the process of localization from scratch. Following this, the LCR was raised incrementally through 1994 up to 60% for pickup trucks with gasoline engines and 72% for those with diesel engines. The LCR was abolished in 2000 in consideration of WTO rules[5].

Techakanont (2008) considers that "the most important policy of the Thai state was the implementation of the LCR" (8). In order to comply with the LCR, automobile assembly companies in Thailand had to increase the local

content of components that they produced themselves, ask their component suppliers in their countries of origin to invest in Thailand, or support local Thai firms to produce components with the required quality standards. Based on his extensive field research, Yamashita (2004) concludes that "the process of adapting to the LCR enabled the accumulation of a very wide range of automobile parts industries and the training of skilled technicians and engineers, both of which are indispensable for the development of the automobile industry" (5)[6]. Through this process, assembly companies have offered continuous technological support to local supporting industries.

In this context, it should be emphasized that "most of the policies in the early 1980s were deliberated in a formal public–private cooperation committee (PPCC) before they were officially declared as government policy" (Techakanont 2008, 12). Doner (1991) explains: "The policy makers were quite flexible for assemblers to choose how to produce parts: either produce them locally or assemble components from imported parts"[7]. Assembly companies asked the Thai government to revise the LCR policy when they reached the 54% level because any further increase of the LCR percentage would make it difficult to assure the safety of the cars and further reduce the cost of production. Responding to this request, the government switched its policy from the LCR to one requiring the local production of specific important components such as engines (Techakanont 2008, 9).

3.2.1.2 Formation of Automobile Clusters and Industrial Estates

The government facilitated the formation of industrial clusters by establishing the infrastructure for manufacturing activities, especially automobile assembly and parts production. Automakers and their components suppliers enhanced their competitiveness when they were agglomerated as a cluster with articulated value chains.

For this purpose, the Industrial Estate Authority of Thailand (IEAT) was established in 1972 and many industrial estates (IEs) were constructed, firstly around Bangkok and later on the Eastern Seaboard and its vicinities. The agglomeration of assemblers and part makers in IEs began in the 1970s. The establishment of IEs, leading to cluster formations, has been an important instrument through which the Thai government attracts foreign investors by providing infrastructure and tax incentives (Lecler 2002, 802).

3.2.1.3 Eastern Seaboard: Infrastructure that Triggered the Rapid Expansion of Thailand's Automobile Industry

The automobile industry requires efficient ports and logistics facilities in order to be competitive in the export market. From this perspective, the most important milestone for Thailand's automobile industry was the construction of infrastructure on the Eastern Seaboard.

The development of this infrastructure created an export hub and the center for technology-intensive industries: 14 industrial estates, 360,000 workers, 1300 factories, and 516 automobile-related factories. The explosive emergence and concentration of new machinery and metal and non-metal industries with FDI inflows in the early 1990s, which occurred around Leam Chabang, became possible only through the completion of such large-sized infrastructure as the Eastern Seaboard Development Plan, which became a synergetic production nexus and a hub for the shipment of products (Shimomura and Mieno 2008, 14–16).

The Eastern Seaboard Development Plan is a leading large-scale development scheme that the Thai government implemented in the 1980s with assistance from Japan and the World Bank. It had the twofold purpose of boosting international strength and inviting direct overseas investment in export-oriented industrial fields, and easing the over-concentration of economic activity in Bangkok. The large-scale project, which extends

over three provinces in the coastal area southeast of Bangkok, consists of a composite industrial site formed by two deep sea ports, Leam Chabang and Map Ta Put, supported by harbors, roads, railways, dams, service pipelines, and other facilities[8].

Today, Leam Chabang, Thailand's largest port, plays a significant part in increasing trade in Thailand and is home to a heavy concentration of Thailand's automobile industry, with many automakers' and parts manufacturers' operations set up in the area. In 2013, the Eastern Seaboard region accounted for 16% of Thailand's GDP, making it, along with the Bangkok metropolitan area, a key source of the country's economic strength (*The Japan Journal* 2014, 7). Figure 3.1 illustrates how these activities have moved into the Eastern Seaboard and demonstrates that this infrastructure produced a major change in the endowments' structure in Thailand, playing a crucial role in this country becoming the "Detroit of Asia."

3.2.1.4 "Detroit of Asia" Vision

The Thai automobile industry experienced different phases of development, namely the introduction of the localization policy (1971–1977), the strengthening of localization capacity (1978–1990), and liberalization (1991–1999) (Natsuda and Thoburn 2011, 13–20). A new phase started after the Thai government abolished the LCR in 2000 and 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 (22). However, the government's first "product champion," the pickup truck, was considered insufficient to meet the targets of this plan by 2016. To attract additional foreign investment from automobile producers, the "Eco Car" project was introduced as the second "product champion" in 2007 (23). At the same time, a

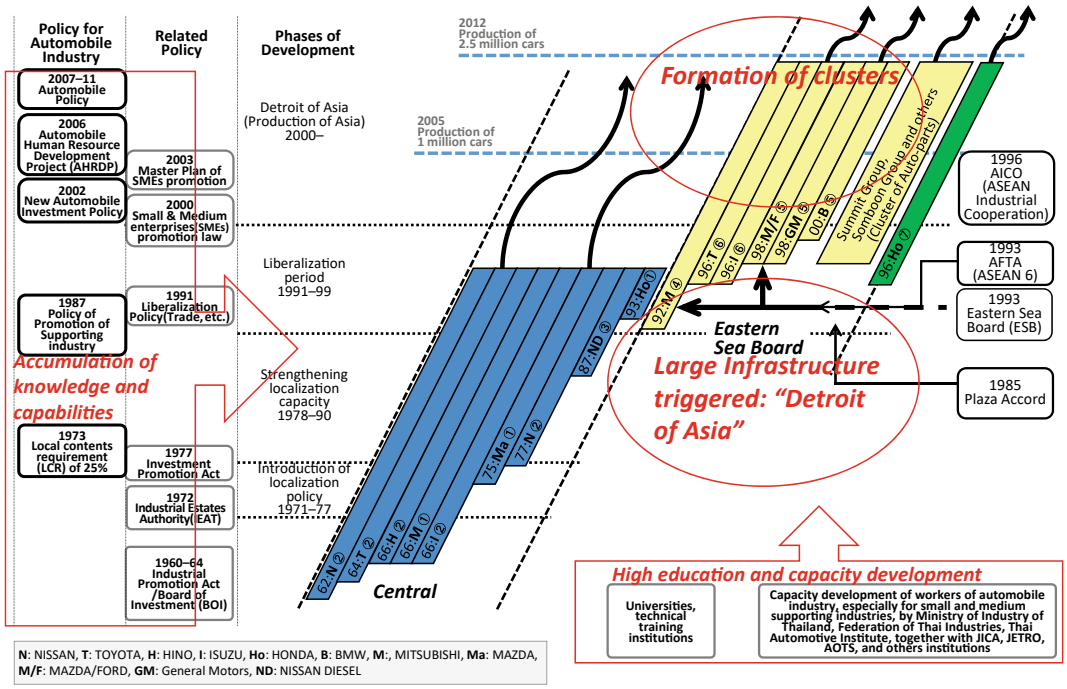

Fig. 3.1 Development of Automobile Industry in Thailand

policy to strengthen supporting industries through the promotion of SMEs was established: the SMEs promotion law of 2000 and the Master Plan of SMEs promotion of 2003. In addition, the Automotive Human Resource Development Project (AHRDP) was launched in 2006.

3.2.1.5 Institutions that Facilitated Changes of Endowments

There are two public institutions, among others, that have contributed to the development of Thailand's automobile industry. One is the Automobile Development Committee and the other is the Eastern Seaboard Development Committee (ESDC), a cabinet-level national committee chaired by the prime minister together with the Office of ESDC (OESD).

The Automobile Development Committee provided an effective institutional setting for mid-level and senior officials to formulate policies in consultation with firms and business organizations. Interference by political leaders and top-level policymakers was virtually absent in the decision-making process (Athukorala and Kohpaiboon 2011, 12). Thai authorities adopted a consensual and pragmatic approach to setting the LCR target in consultation with automakers, as mentioned earlier. Athukorala and Kohpaiboon highlight that the consensual approach to policymaking and the absence of abrupt policy shifts created stable expectations and confidence in the overall business environment.

Evaluating the Eastern Seaboard, JICA/JBIC (2008, 51) states:

> The reasons behind the success of the Thai government's plans for the Eastern Seaboard Development are (1) the consistent skill level of the technocrats and their independence from politics; (2) the unique checks and balances structure in Thailand (several players sharing influence means that mutual checks are continuous); (3) the development-centered orientation of the Prem administration, and (4) "the unintended transparent and open political process" created by the intervention of the media[9].

3.2.1.6 Other Factors

In addition to the factors that enabled the outstanding development of the automobile industry of Thailand, we should include the advancement of economic integration among ASEAN countries via the ASEAN Free Trade Area (AFTA), ASEAN Industrial Cooperation (AICO) and other initiatives, and the size of the country's automobile market (the largest among ASEAN countries).

3.2.1.7 Summary of the Industrial Development Process

Figure 3.1 roughly illustrates the development of the automobile industry in Thailand. It details investments by global automobile companies in chronological order, indicating the year of each company's investment. Characteristics of different phases of the development process are shown together with relevant policies of each phase (left-hand side). The construction of infrastructure in the Eastern Seaboard, the establishment of the ASEAN Free Trade Area (AFTA), and other initiatives triggered investments in the Eastern Seaboard and other zones outside of Bangkok, further accelerating the development process.

3.2.1.8 Challenges Toward Further Transformation

As discussed above Thailand achieved a remarkable transformation by establishing a competitive automobile industry. However, the country needs a further transformation to overcome the middle-income trap and become a high-income country. From this perspective, the Thai government's program for Thailand 4.0 (Industry 4.0) deserves special attention. It is a comprehensive package, encompassing infrastructure plans, new policies and institutions, including incentives and facilitation, as well as regional and urban development. For the program, the Thai government has placed the top priority on development of the Eastern Economic Corridor (EEC), comprising the three provinces of Chachoengsao, Chonburi, and Rayong, in the hinterland of the Eastern Seaboard. A new institution, EEC Office, which is expected to accomplish the role of ESDC/OESD for Eastern Seaboard, has been established.

The program focuses on ten promising industrial sectors: (1) Next-generation cars (electric vehicles, EV; plug-in hybrid vehicles, PHEV and others); (2) Robotics for industry; (3) Smart electronics; (4) Digital technology; (5) Biofuels and biochemicals; (6) Logistics and aviation; (7) Affluent, medical, and wellness tourism; (8) Medical services; (9) Agriculture and biotechnology; and (10) Food products. SMEs, local industry development, and eco-friendly industry development are also prioritized in the program. Six major infrastructure projects for the development of the EEC are: U-Tapao airport; Bangkok-Rayong high-speed railway; double-track railway; Pattaya to U-Tapao motorway; Map Ta Phut Deep Sea Port; and Laem Chabang commercial port.

It appears that the program will take advantage of what has been achieved so far in previous programs, including the Eastern Seaboard Development and automobile industry development. Infrastructure, human resources with advanced learning capacity, and institutions that have been constructed, enhanced, and consolidated through these programs are now important endowments for the dynamic comparative advantage of Thailand and are critical for its program of further transformation.

3.2.2 Case 3.2: Cerrado Agriculture and Agro-Industry Value Chains in Brazil

Starting in the mid-1970s, the tropical savanna of Brazil, called the Cerrado, was transformed into one of the world's most productive grain-growing regions in just a quarter of a century, realizing modern upland farming in a tropical region for the first time in human history[10]. This remarkable transformation has become known throughout the world as the "Cerrado Miracle" (*Economist* 2010). Today, Brazil is one of the world's major grain-producing countries, and in 2012 exported the world's largest volume of soybeans. In 1975, the Cerrado region produced just over 8 million tons of grain, but by 2015, the region was producing 100 million tons of grain, which accounts for about 55% of domestic production. The agricultural trade surplus for Brazil in FY2013 reached US$82.9 billion, far surpassing that of the United States, which stood at US$40.1 billion (Mizobe 2019, 97).

Dr. Norman E. Borlaug, who received the Nobel Peace Prize for his work related to the green revolution, rated the development of agriculture in the Cerrado as one of the great achievements of agricultural science in the twentieth century. The World Food Prize, founded by Borlaug, was awarded in 2006 to the two Brazilians who contributed most to Cerrado agriculture. This agricultural transformation not only increased the production of competitive commodities such as soybeans, corn, coffee, sugar, and cotton, but also enabled the development of food value chains both inside and outside the Cerrado region. While the production of broiler chicken and pork had been growing steadily in the 1990s, this growth accelerated at the end of the decade, with a sharp increase in meat exports.

The Portuguese word *cerrado* refers to "closed" land, or land that was for many years regarded as 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, lacks potassium and phosphoric acid, and contains large amounts of aluminum, all of which hinder crop growth.

3.2.2.1 Change of Endowment by Technological Innovation, Achieving "A New Comparative Advantage"

For the development of Cerrado agriculture, three technological aspects appear to have been essential. First, soil improvement and the development of new crop varieties suited to the tropical zone were crucial. These constituted the core technological innovations needed to launch Cerrado agriculture from a base of practically

zero. Second, the effective dissemination of new technologies and practices to an increasing number of farmers who were the main actors in Cerrado agriculture was necessary. This was because this new industry was undertaken by a large number of farmers and enterprises instead of a limited number of companies, as is the case in some manufacturing industries. Third, a solid and highly effective system was indispensable to continue achieving the technological innovations required for Cerrado agriculture.

The vast land of the Cerrado had a drastic value change, which produced a "new comparative advantage"as defined by the JICA and JBIC study (2008). Here technological innovation was crucial, but the inland transport infrastructure built before and after the transfer of the national capital from Rio de Janeiro to Brasilia, located in the center of the Cerrado, may have been another factor.

The Brazilian government "invested in learning," to borrow a term from Noman and Stiglitz (2012). However, as emphasized earlier, investments in learning are highly risky, and risk markets are normally absent in developing countries. Therefore such investments are discouraged (Noman and Stiglitz 2012, 6). For Cerrado agricultural development, the government took the initiative. The Brazilian Agricultural Research Corporation (EMBRAPA) and its Cerrado Agricultural Research Center (CPAC) were established in 1973 and 1974, respectively, and did in fact achieve a lot of innovations: recent discussions on the Cerrado point out that EMBRAPA's greatest contributions were soil improvement in the Cerrado and breeding improvements in soybeans and other crops. In particular, success in developing new varieties of soybeans that were fit for the tropical climate was a significant technological breakthrough.

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. Cultivation is even more difficult in lower-latitude areas in the Cerrado because the day length is nearly constant year-round. Dr. Plínio Itamar de Mello de Souza developed the revolutionary varieties of soybeans suited to the tropical region. Dr. de Mello collected three thousand soybean varieties from the southern United States, the Philippines, Japan, and other parts of the world, chose those with low sensitivity to changes in day length, then selected those that grow tall in tropical regions and crossbred them with varieties with high yields. Finally, in 1980, the first new soybean variety was ready 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. Soybeans fix nitrogen in the soil through root nodule bacteria and facilitate the absorption of fertilizers in the soil. Therefore, soybeans paved the way for other plants to be introduced to the Cerrado.

3.2.2.2 Accumulation of Knowledge and Capabilities

Although the technology for Cerrado was developed from scratch, there had been years of efforts to establish Cerrado agriculture, beginning even before the establishment of EMBRAPA. Initiatives of farmers with experience in the southern region outside of the Cerrado were crucial as well. They undertook pioneering experimental work in the Minas Gerais Cerrado region. Drawing on their experience, the Program of Guided Settlement of Alto Paranaiba (PADAP) was implemented by the state of Minas Gerais together with the Cooperative Cotia. It was the first structured program to prove the feasibility (for business development) of Cerrado agriculture. The starting point was São Gotardo, in the state of Minas Gerais, in 1974.

In 1975, in its efforts to prepare systems for Cerrado development, the Brazilian government formulated the Central-West Region Development Program (POLOCENTRO) as a national policy. This program combined the construction of roads, storage facilities, local public services, and agricultural credit, in targeting areas of the region. As mentioned above, EMBRAPA established the Cerrado Agricultural Research Center (CPAC) a year before.

On the basis of the successful PADAP experience, the Japan-Brazil Cooperation Program for Cerrados Development (PRODECER) was launched in 1979 to extend Cerrado agriculture to other areas of Minas Gerais. The pilot projects of the first phase of PRODECER fully demonstrated the feasibility and high potential of Cerrado agriculture. The second phase of PRODECER carried out full-fledged projects in Minas Gerais as well as in the states of Goiás and Mato Grosso do Sul. At the same time, PRODECER also started pilot projects in the states of Bahia and Mato Grosso. The third phase of PRODECER covered the states of Tocantins and Maranhão.

In this way, PRODECER was scaled up and outwards from the core regions to the frontier regions of the Cerrado. In this process, there has been continuous learning and the accumulation of knowledge and capabilities for both the researchers and farmers. How did these groundbreaking technologies developed by EMBRAPA spread? How did the pioneers of Cerrado agriculture improve their technological capabilities after they settled in the Cerrado, once believed to be sterile, and strove tirelessly to establish agricultural land? As noted by Alves (2012), who is known as the father of EMBRAPA, many of the farmers who migrated to the Cerrado from southern Brazil had experience in agricultural production and were proactive about adopting new technologies. Cooperatives such as Cotia contributed greatly to the process of technological dissemination.

The Brazilian Enterprise for Technical Assistance and Rural Extension (EMBRATER) was initially in charge of disseminating technologies developed mainly by EMBRAPA. EMBRATER was dissolved as a part of administrative reform and deregulation policies in 1992. A recent study by the Inter-American Development Bank (2010, 320) points out that, after the organization was liquidated, producers utilized technological innovations through cooperatives and other organizations. In PRODECER, the growth pole strategy was adopted at Cerrado frontiers. Cotia and other cooperatives provided detailed technological consultations for individual farmers, contributing greatly to raising their technological capabilities.

3.2.2.3 Institutions that Facilitated Changes of the Endowment

The single most important institution that enabled the amazing change in the Cerrado and the establishment of Cerrado agriculture is considered to be EMBRAPA. The research begun by EMBRAPA in 1973 progressed steadily, making it one of the largest agricultural research institutes in the southern hemisphere and one of the largest tropical agricultural research institutes in the world. As of 2010, there were over 8637 people working with the institute, 2116 of whom were researchers, 1622 holding doctorates. Only three researchers with doctorates were with the institute at its founding in 1973. Since then, EMBRAPA has dispatched three thousand people to study at higher educational institutions in Western countries, and it now has forty-three affiliated research centers. EMBRAPA is today highly appreciated overseas for its distinguished research. Analyzing the factors behind its success reveals some clues on how to develop institutions capable of research and development activities suited to a country's conditions, which at the same time generate technological innovations, cultivate human resources, and produce "miracles" similar to that in the Cerrado.

EMBRAPA set the development of Cerrado agriculture as its core mission, made important advances thereby establishing its eminent position, thus succeeding in steadily securing and increasing its research budget while maintaining political neutrality. Consequently, as additional research results were obtained and translated into practical results, its position became increasingly stronger. Alves' (2012) comments on the success of EMBRAPA can be summarized as follows: What solidified the position of EMBRAPA was the achievement of transforming the Cerrado into a modern agricultural region. EMBRAPA's

contributions are at the core of Cerrado agriculture, and society recognized that its involvement is vitally important for the region's success.

In addition, Alves and other authors emphasize other factors that made the EMBRAPA model successful: close relations between researchers and farmers, meritocratic incentive system and structure, transparency, and so on.

3.2.2.4 Summary of Agricultural Development Process

Figure 3.2 roughly illustrates the development process of the Cerrado agriculture in Brazil. It shows how experiences from the pioneering efforts of PADAP were scaled up to the first phase of PRODECER in Minas Gerais (MG) state, which was successfully expanded to the full-fledged projects in other zones of MG and the neighboring Goias (GO) and Mato Grosso do Sul (MS) states, and ultimately extended to other states of Cerrado (Mato Grosso, MT; Bahia, BA; Tocantins, TO; and Maranhão, MA). In this process, technological development and dissemination by EMBRAPA, established in 1973 and continuously strengthened in the whole process, has been crucial. The POLOCENTRO program carried out since 1975 by the Government of Brazil contributed a lot to the Cerrado agriculture during its establishment period.

3.2.3 Case 3.3: Bangladesh Garment Industry

In 1981, ten years after Bangladesh achieved independence, raw jute and jute goods made up 68% of the country's total exports. By 2011, garments and textiles constituted 85% of total exports, of which 76% was comprised of garments. Business engaged in the clothing industry amounted to 50% of all manufacturing establishments in the country (UNCTAD 2012, 11). Today, the garment industry has five to six thousand factories with seven to eight million workers employed in assembly line clothing production. The wages of the workers in these industries are around 35% higher than the

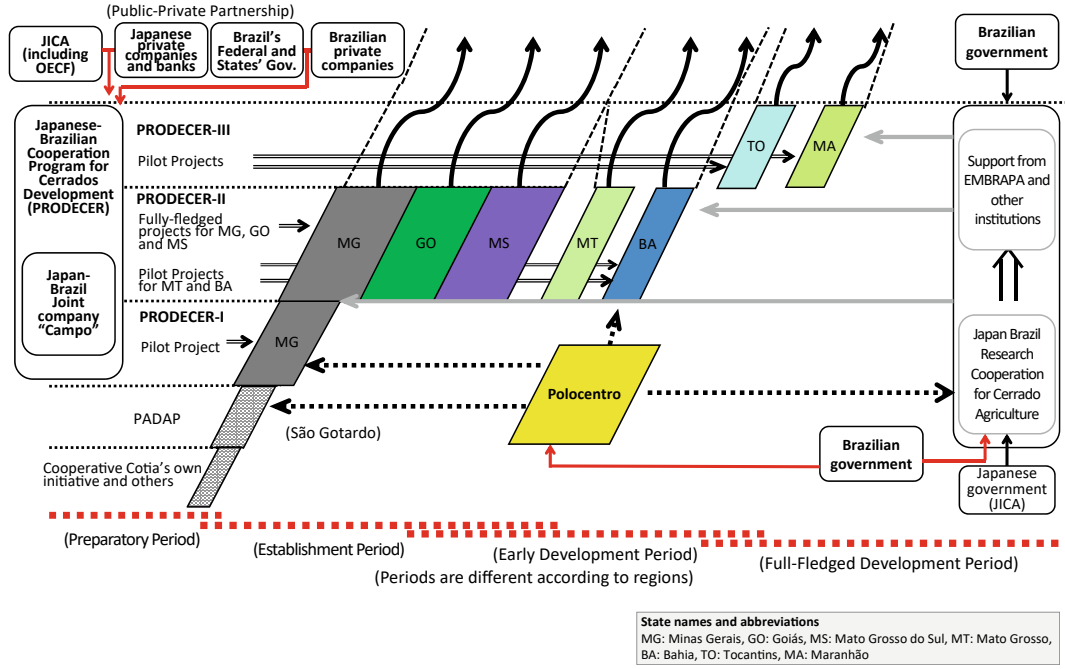

Fig. 3.2 Development of Cerrado Agriculture, Brazil. *Source* Prepared by the author, based on Hosono et al. (2016b)

national average (11). Exports as a percentage of GDP tripled between 1990 and 2010, with much of the increase in the thriving ready-made garment industry with a largely female labor force. (World Bank 2012). This success story from Bangladesh is remarkable because, as a recent World Bank study highlighted, "the country was often held out in the development literature as a hopeless case" (197).

3.2.3.1 Learning, Accumulation of Knowledge, and Capabilities

Rhee (1990) undertook extensive research on how this country's garment industry started. In 1978 Daewoo of Korea proposed to the government of Bangladesh an ambitious joint venture involving the development and operation of tire, leather goods, cement, and garment factories. As it turned out, the Bangladesh government actually prioritised the garment industry first. Although the public and private sectors were particularly interested in the garment industry, Bangladesh was not exporting garments because of a total lack of domestic production technology and marketing knowhow, and had no apparent means of acquiring them from overseas (336). In this context, Noorul Quader, who had been introduced to the foreign business world as a senior official in the previous government, founded the Desh Garment Company and expressed the desire to collaborate with Daewoo in a new garment venture in the country (336). Quader and Daewoo signed an agreement to collaborate on technical training, purchase of machinery and fabric, plant start-ups, and marketing. Desh recruited 130 workers for training at Daewoo's Busan plant. Over seven months in 1979, "they received some of the most intensive on-the-job training in garment production ever seen in the history of developing countries" (337).

In addition to receiving in-depth, excellent skills training, Desh workers were also given a wide-ranging, high-quality education involving a look at the entire operations of a highly successful, multifaceted international company and the corporate culture that created and supported its superior performance, which Rhee emphasized as one of the most outstanding features of this training (338). The 115 Daewoo-trained workers who left Desh in the latter half of 1981 proved a very powerful medium for transferring knowhow throughout the whole garment sector and for significantly improving garment exports. By 1985, there were more than seven hundred garment export factories in Bangladesh, compared with only a few such factories in 1979. Rhee mentions that many new garment firms have been able to handle production and marketing without involving expatriates or foreign companies because they have been staffed by former Desh workers who had fully mastered production and marketing (342). However, he also recognizes the continuous need for many of these new factories to collaborate to some degree with foreigners in the areas of marketing and technology (342).

Another noteworthy feature of Daewoo's training was that there were fourteen women among the trainees. Rhee explains, "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" (337).

In terms of the learning and knowledge creation achieved through the Desh-Daewoo collaboration, Easterly (2002, 149) noted that "Creating knowledge does not necessarily mean inventing new technologies from scratch. Some aspects of garment manufacturing technology were probably several centuries old". Bangladesh has the legacy of Dhaka Muslin. "The relevant technological ideas might be out there floating in the ether, but only those who apply them can really learn them and teach them to others"(149). In this regard, Mostafa and Klepper (2010, 3) emphasize that tacit knowledge seeding was essential for the initial establishment and subsequent expansion of the Bangladesh garment industry. They contend that the 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. These workers organized

an assembly line production process, trained workers, and supervised production, effectively diffusing vital tacit knowledge to new garment producers. Despite having limited literacy, Bangladesh had a sufficient number of educated entrepreneurs with some prior business experience who could gather the relevant resources and establish garment factories (29).

The process of learning and the accumulation of capabilities continued after this impressive transfer of technology from Korea. Mottaleb and Sonobe (2011, 4–5) conjectured that highly educated entrepreneurs were attracted to the garment industry by high profitability, which was boosted initially by the Desh-Daewoo infusion of Korean skills and knowhow. Their analysis indicated that the high-level education of manufacturers and enterprise performance were closely associated. This is because manufacturers have to continuously upgrade their skills and knowhow in order to survive the intense competition in the world garment market and because high levels of general human capital are necessary for the entrepreneur to manage an increasing number of managers and experts (20–21).

3.2.3.2 Change of Endowments: Rural Development and Mobilization of Female Workers with Low Opportunity Cost

The World Bank (2012, 197–199) classifies Bangladesh as an urbanizing country. Indeed the changes in rural society in this country have been profound and are closely related to the massive mobilization of female workers by the garment industry located mainly in two big cities: Dhaka and Chittagong. Generally speaking, urbanizing countries are endowed with abundant unskilled labor, and these countries' integration into the world economy can lead to the development of light manufacturing industries. In the case of Bangladesh, several factors interacted in order for this change to take place. Among the major factors that changed the rural society of Bangladesh was the modernization of agriculture based on technology that enabled farmers to shift from low-yield, single-crop, deep-water rice to the double cropping of short maturity, high-yield rice. Another factors were well-known rapid spread of microfinance and construction of rural infrastructure (197). More specifically, rural roads, irrigation, market facilities, and other rural infrastructure, microcredit, 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. In this process, the rural development programs of the government and donors were implemented effectively by the Local Government Engineering Department (LGED), which played a critical role in the provision of rural infrastructure[11]. Microcredit and related services were also effectively extended by NGOs, including BRAC and Grameen Bank.

This process enhanced the mobility and readiness of low-opportunity-cost labor in rural Bangladesh and gradually but steadily changed the endowments of the country. We should remember that a pessimistic appraisal was common regarding women's role in the labor market in Bangladesh, which caused pessimism about the country's growth, due in part to the fact that most East Asian countries had the advantage of a high female labor force participation rate at the start of the growth process. As Hossain et al. (2012, 29) emphasize, none of the predictions could anticipate that women would offer the secret ingredients of the success achieved in Bangladesh, from exports to schooling to microcredit use. The dramatic nature of the increase in female participation in the growth of ready-made garment (RMG) workers is a case in point.

The mobilization of this labor was triggered by the Desh-Daewoo garment project. As Rhee (1990) explains, "Development is a dynamic process in which self-generating mechanisms may emerge once action is initiated.... To start on the path of development in an outward-oriented direction, a first spark must be created" (45). That spark was the collaborative effort of a domestic catalyst (Desh) to mobilize the necessary local resources, and a foreign catalyst (Daewoo). It

was a process of self-discovery of the changing comparative advantage of the country.

As such, the self-generating dynamic process of the garment industry was possible due to the changing comparative advantage with the mobility and readiness of low-opportunity-cost labor, particularly women, in rural Bangladesh. At the same time, the positive externalities the garment industry brought to the economy in terms of the empowerment of women, their increased schooling, use of microcredit, and so on, cannot be overemphasized.

Hossain et al. (2012) contend that in a predominantly agricultural economy with high population density and high population growth, the critical challenge is to reduce the burden of surplus labor in agriculture. They argue that "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" (5; italics in original).

3.2.3.3 Change of Endowments: Connectivity and Logistics Upgrading 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 spanning the rivers that cross Highway No. 1, which connects the capital city with Chittagong. As trucks had to use ferries, the transport between Dhaka and Chittagong was constrained by 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.

The 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, as well as enhancing the labor mobility of the western region (Hossain et al. 2012, 11).

3.2.3.4 Institutions that Facilitated Garment Industry Development

Initial conditions in Bangladesh, when the garment industry started with the Desh-Daewoo initiative, were affected by high levels of policy distortions and weak institutions. However, in spite of the rigidity of the government's response in terms of the adaptability of ideas coming from private entrepreneurs, which is very common in developing countries, in the case of Bangladesh, innovative ideas and strategies from entrepreneurs were well accommodated by government policymakers (Yunus and Yamagata 2012, 5). A back-to-back letter of credit (L/C) system[12] and special bonded warehouse facilities were two of the most important features and were formulated based on the prescription of the leading entrepreneurs.

The special bonded warehouses were critical to the initiation of garment export production. According to Rhee (1990), "It appears that Daewoo's intimate knowledge of the nuts and bolts of the successful bonded warehouse system in Korea, its ability to transmit that knowledge to Desh staff, and the advice that Desh's senior manager gave to administration officials on the new system were instrumental in the design and implementation of the special bonded warehouse system" (339). Although the government did not provide any import financing facility, it did allow the back-to-back L/C, which was a very effective instrument given the system of strict foreign exchange controls in the country at that time. Here again, Daewoo and Desh's influence on the public agencies was instrumental (340).

The consequent accelerated development of the garment industry was enabled by learning and the accumulation of the capabilities, as mentioned earlier. The government facilitated its development through infrastructure investment,

construction of export processing zones, policies for the free importation of machines, bonded warehouses, and back-to-back L/C, followed by other general policies such as the new industrial policy (1982), revised industrial policy (1986), and credit facilities (1991). At the same time, the multifiber agreement (1985) and its quotas, as well as preferential access to the EU market, have been important factors.

On the other hand, a comprehensive set of labor market and social policies need to be introduced, as a recent study by the International Labor Organization (ILO) Research Department (2013) warns. A garment factory fire in November 2011, which killed 117 workers, and the April 2012 collapse of a building housing several factories on the outskirts of Dhaka, in which 1129 workers were tragically killed and another 2500 were injured, brought the issue of occupational safety of the Bangladesh garment industry to the world's attention.

3.2.3.5 Summary of the Industrial Development Process

Figure 3.3 roughly illustrates the development of the garment industry in Bangladesh. It shows the evolution of a number of garment factories from the 1980s to today, together with the introduction of industrial policies and international frameworks related to the garment industry, such as the multifiber agreement and its expiration (see the right-hand side of the figure). The process has also been facilitated by infrastructure investments such as bridges and export processing zones (left-hand side of the figure). The figure also refers to incremental changes of endowments such as the accumulation of capabilities by small business owners, the mobility and readiness of female workers, changes in rural society, and so on.

A recent publication by Sawada et al. (2018) aimed to provide a comprehensive picture of the development of Bangladesh that is often termed a

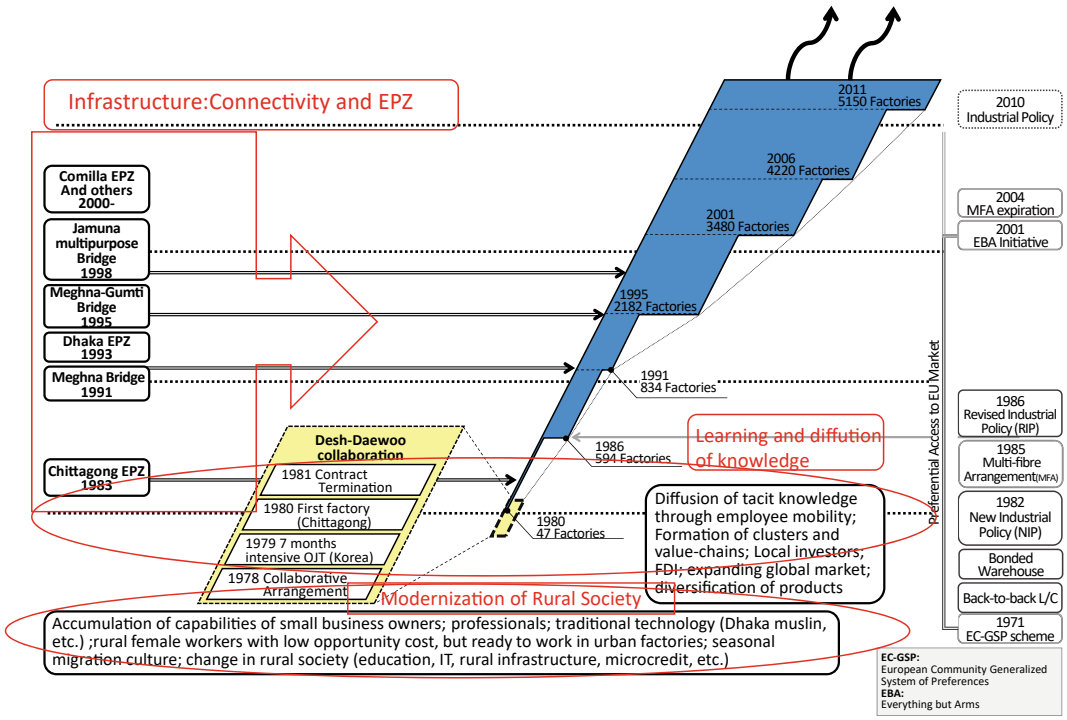

Fig. 3.3 Bangladesh Garment/Apparel Industry. *Source* Prepared by the author, based on BGMEA (2013), ILO (1993), Islam and Mukhtar (2011), Rhee (1990), Yunus and Yamagata (2012)

Miracle" (xxvi, emphasis in original). The authors found that:

> Bangladesh's development transformation was fueled by three country-specific mechanisms: the penetration of microfinance institutions (MFIs) and other non-government organizations (NGOs) into rural communities that led to relaxed credit and other binding constraints on rural poor households; the spectacular development of the ready-made garment industry resulting in the rapid transformation of the economy from an agriculture-based to an industry-oriented one; and the significant investments in infrastructure, particularly in roads and bridges, which has helped to connect the formerly fragmented spatial economy.

Based on insights from this and other studies, it is clear that the garment industry has been the driving force that has led the transformation of Bangladesh's economy and industrial structure. It has been a key to its *Miracle*.

3.2.4 Case 3.4: Chile's Salmon Industry[13]

Aquaculture is growing globally and makes up almost 50% of the global fish harvest in what is called the "blue revolution" (drawing a comparison with agriculture's green revolution) (OECD 2008, 85). One of the most impressive cases of the blue revolution is Chile's salmon farming and processing industry.

Salmon did not exist in Chile four decades ago. Now, Chile is one of the world's top salmon-exporting countries, producing approximately 40% of the world's farmed salmon, and is ranked on par with Norway. Chile is a resource-rich country highly dependent on copper exports, faced with the challenge of diversifying its exports. In 2011, exports of mineral ores and their refined products corresponded to more than 60% of total exports, 52% of which were copper ore and refined copper. The ensuing export revenue from rich resources led to a strong real exchange rate appreciation and deterioration in competitiveness in sectors exposed to international competition (World Bank 2012, 199). Salmon is the second-largest export sector of Chile after copper, and its export value amounted to $3517 million in 2013. The sector employs more than sixty thousand people in four southern regions of the country[14].

3.2.4.1 Change of Endowment by Technological Adaptation/Innovation

Chile's comparative advantage in salmon sea farming was definitively affirmed when a subsidiary of the Chile Foundation, Salmones Antártica, demonstrated the commercial feasibility of salmon aquaculture at a scale of one thousand tons per year in 1988. The Chile Foundation (Fundación Chile in Spanish) is a public–private corporation that aims at developing technologies for establishing new industries, setting up businesses, and selling successful ones for profit. This unique organization, which has no equivalent elsewhere in Latin America, was created through compensation consultations undertaken by the Chilean government in the mid-1970s with an American multinational corporation that had been nationalized by the previous government.

In general, for a new industry to be established so that it grows in a self-sustaining manner, the industry must demonstrate its feasibility and international competitiveness as a sustainable profit-making business. This requires, as a precondition, technology development, which in turn calls for sizable investment. Many venture businesses invest in the development of such technologies and new products. Although technology development itself carries the risk of failure, the guarantee that the founder's profits will be secured under the protection of patent rights provides a substantial incentive for creating a new industry. This is not to say, however, that the founder's profits in a new industry are always protected by patents or other means, and there are in fact many cases to the contrary.

There are difficulties specific to developing countries that are trying to catch up with developed countries. For example, entrepreneurs that are seeking to develop a new industry with the help of technology transfer from other countries usually find it difficult to protect the technologies gained through such transfers, as they will not be

protected by patents. As a result, as soon as a company succeeds in a technology transfer, others will soon follow in the successful company's footsteps. This will intensify competition. In this case, the profits the pioneer deserves may not be guaranteed. Or worse still, the investment may not be recouped. Therefore Rodrik (2007, 117) argues that the costs of "self-discovery" of pioneers should be subsidized.

This may be described as a case of market failure in that open access to the information in question discourages investment. Specifically, this is known as market failure associated with "information externalities." In the case of Chile in the 1970s and 1980s, the government did not take an interventionist policy of directly supporting the development of industries. However, it is clear that the Chilean salmon industry was not developed as a result of the private sector making voluntary investments from the outset. In this context, noting that the major export items for Chile include copper, grapes, fish, and lumber/wood, Rodrik stresses that the diversification of export products from copper had not been achieved in a laissez-faire market (109).

In the case of the Chilean salmon industry, market failure was averted by the Chile Foundation and Japan-Chile salmon project. The Chile Foundation, a newly created, semi-governmental foundation, made an investment large enough to support salmon production through sea farming on a major scale and successfully recouped this investment. The foundation thus demonstrated the commercial profitability of sea farming on that scale. In addition to proving the profitability of the venture, the Chile Foundation provided information on salmon farming as a public good for free or for a fee so as to allow many companies to invest in the salmon farming industry without having to make a sizable investment in research and development.

Two private companies had started salmon sea farming before the Chile Foundation started its salmon initiative. In 1978, Nichiro Fisheries of Japan, which had already accumulated salmon sea farming technologies in Japan, set up Nichiro Chile. In 1979, Nichiro launched salmon sea farming near the city of Puerto Montt, the first of its kind in the country. This was a groundbreaking event that surprised fisheries experts at home and abroad. Following Nichiro's groundbreaking success in salmon farming, the Chile Foundation acquired the facilities that Domsea Pesquera—a company under the umbrella of Campbell Soup of the United States—had owned in Chiloé Island and elsewhere. This represented the starting point for the Chile Foundation to enter the salmon industry in earnest.

Nichiro's success in pioneering mariculture and its commercialization in Chile had a great impact on the success of the semi-governmental Chile Foundation. According to Nichiro's corporate history, "The Chile Foundation of the Republic of Chile had been keeping an eye on our progress in coho salmon seafarming. Upon learning about our success, the foundation wasted no time in launching feasibility studies on sea farming" (Maruha-Nichiro Salmon Museum). Though it was a latecomer to the industry, following the trailblazing Nichiro and Mytilus (latter-day "Mares Australes"), the second entrant into the market, Chile Foundation's Salmones Antártica successfully put larger-scale salmon mariculture on track. What factors lay behind this success? In short, the Chile Foundation was a semi-governmental corporation capable of mobilizing ample risk capital. Originally designed to encourage venture businesses, the Chile Foundation was in a better position to promote salmon farming than private companies in general.

The Chile Foundation, following the successful achievement of the one-thousand-ton program, decided to sell the venture to a private company. This led to an international bidding contest in 1988, in which many companies participated. Nippon Suisan Kaisha (today Nissui), one of the major fisheries in Japan that operated in Chile at that time, won the bid. As a result, Salmones Antártica became wholly owned by Nippon Suisan Kaisha, which had been conducting salmon and trout businesses in the North Pacific Ocean since before World War II and had acquired advanced technical capabilities.

The Chile Foundation unexpectedly came up with the idea of offering corporate consulting

services, instigated by the broadcasting in 1986 of a TV program featuring salmon farming, made in cooperation with Salmones Antártica. Many Chilean entrepreneurs who watched the program made inquiries to the TV station; some of them later ventured into the salmon industry. In the mid-1980s, the Chile Foundation supported projects being undertaken by seven private companies.

3.2.4.2 Learning and Accumulation of Capabilities and Knowledge

In the case of the Chilean salmon industry, the natural conditions, capital, and labor were generally favorable. With technological adaptation and development, the value of these endowments changed, enabling Chile to attain a new comparative advantage. However, R&D professionals and trained industrial personnel were still scarce. Introducing and developing technology with high-level professionals is not an easy task for the private sector. Industrial personnel cannot be trained overnight, and such training is expensive for the private sector. In the preparatory phase of the Chilean salmon industry, these circumstances made it difficult for private companies to develop technologies and train industrial personnel by themselves.

This gap was filled by the Japan-Chile Salmon Project, which was implemented for twenty years, beginning in 1969, by the Japan International Cooperation Agency (JICA) and its counterparts, the National Fishery Services (SERNAPESCA) and Fishery Promotion Institute (IFOP), under an agreement between the Japanese and Chilean governments. Because the Japan-Chile Salmon Project was under the auspices of these two government agencies, technologies developed and personnel trained by the project were "public goods" and were available to what was to later become the salmon industry in Chile. This allowed salmon firms to save on the cost of investment in industrial personnel training. The Chile Foundation also played a similar role.

Between 1969 and 1989, twenty-eight Chileans received training in Japan under the salmon project, which was implemented by JICA and its counterpart organizations in the Chilean government: firstly, SERNAPESCA, including its predecessor the Agriculture and Livestock Service (SAG), and secondly, IFOP. The training participants to be dispatched to Japan were selected from Chilean professionals who had been assigned to the project in order of priority based on consideration of their work assignments. What the Chilean participants learned in Japan, where the technology of seed production and fry farming was advanced, as well as in the joint project, later translated into their own specialties. This in turn proved to be of great help in establishing and developing the salmon farming industry in Chile.

The Chilean fishery journal *AQUA* (2007) attracted the attention of people involved in salmon farming in Chile when it issued a twentieth-anniversary special issue in December of 2007. The article on the aquaculture pioneers in Chile carried pictures of familiar faces who had worked in the industry for more than two decades. In all, six out of the eleven pioneers in salmon farming in Chile had received training in Japan. Of the six, five played a central role in the Japan-Chile Salmon Project over a long period.

3.2.4.3 Institutions that Facilitated the Development of the Chilean Salmon Industry

As explained earlier, in order to establish the Chilean salmon industry, it was important to demonstrate that the salmon business was promising and commercially viable. This was accomplished through feasibility studies and investments in the salmon business by the Chile Foundation. In addition, the Chile Foundation's feasibility studies were partly supported by the Japan-Chile Salmon Project. Together with technology development, industrial personnel training was an important activity in this establishment phase.

It was not until the full-fledged development phase that salmon industry clusters increased their importance as an innovation system. It is worth noting here that the nascent form of this innovation system was already emerging in the establishment phase and that the Chile

Foundation and the Japan-Chile Salmon Project contributed to the process. Although industrial clusters in a wider sense include research institutes and universities, Chilean universities did little in the role as members of such clusters at the beginning. The scale-up of salmon production resulted in the deepening of the division of labor, the expansion of the value chain, and the development of salmon industry clusters involving a wide range of components, including salmon farming companies and their affiliated firms, government agencies, universities, and research institutes. One of the organizations that played an important role in this context was the Chilean Association of Salmon and Trout Producers (APSTCH, today SalmónChile). The Chile Foundation again made a significant contribution here, supporting the establishment of APSTCH.

The Chilean government, through its specialized entities SERNAPESCA and IFOP, and the Japan-Chile Salmon Project also served as a catalyst and played a facilitating role by contributing to technological development in the area of national salmon egg production, fish diseases management, and fry farming. Furthermore, the Japan-Chile Salmon Project contributed a great deal to the establishment and enforcement of relevant laws and regulations. The Office of the Undersecretary of Fisheries of the Ministry of Economy, Development and Tourism, established in 1978, played a pivotal role in establishing relevant laws and regulations, while SERNAPESCA assumed the responsibility for their enforcement.

Each of these two organizations served as the counterpart organization of JICA. SERNAPESCA, the Chilean counterpart organization for the Japan-Chile Salmon Project until 1987, put many of the project's outcomes to good use in establishing laws and regulations concerning the aquaculture industry in Chile. For example, technical cooperation in the area of fishery disease control has resulted in the development of regulations on the prevention of infectious disease epidemics associated with salmon and trout farming. Likewise, a Chilean Ministry of Economy ordinance issued in 1985 has imposed control over imported salmon eggs. The ordinance has also provided for the disinfection of hatcheries, among other control measures. In addition, it has prompted veterinary checks on farmed salmon, making the ordinance the starting point for salmon infectious disease control in Chile.

3.2.4.4 Summary of the Development Process of the Salmon Industry

Figure 3.4 roughly illustrates the development of the salmon industry in Chile. It shows the evolution of salmon industry companies from the 1970s, together with the research and development activities of Chilean National Fishery Services (SERNAPESCA) and Fishery Promotion Institute (IFOP) carried out with Japanese cooperation. After Nichiro Chile launched salmon sea farming in 1979, the Chile Foundation, a newly created, semi-governmental foundation, made an investment large enough to support salmon production through sea farming on a major scale and successfully recouped this investment, demonstrating the commercial feasibility at a scale of one thousand tons per year in l988.

3.2.5 Case 3.5: Singapore

Singapore, a country without natural resources and with a large number of unemployed people at the time of its independence, is today one of the world's most competitive countries. The experience of Singapore is particularly relevant as a small country that experienced highly successful industrial development and economic transformation. Its population was 2.6 million in 1985 and 5.7 million in 2019. A small country faces a different challenges than larger countries do and needs to adopt different strategies.

Singapore was one of the first Southeast Asian countries to promote export-led growth rather than import substitution-led growth. In the late 1970s, faced with rising competition from other exporters whose wage rates were lower, Singapore decided to transition from exports dependent on cheap labor into a knowledge economy based on skilled labor and higher value-added

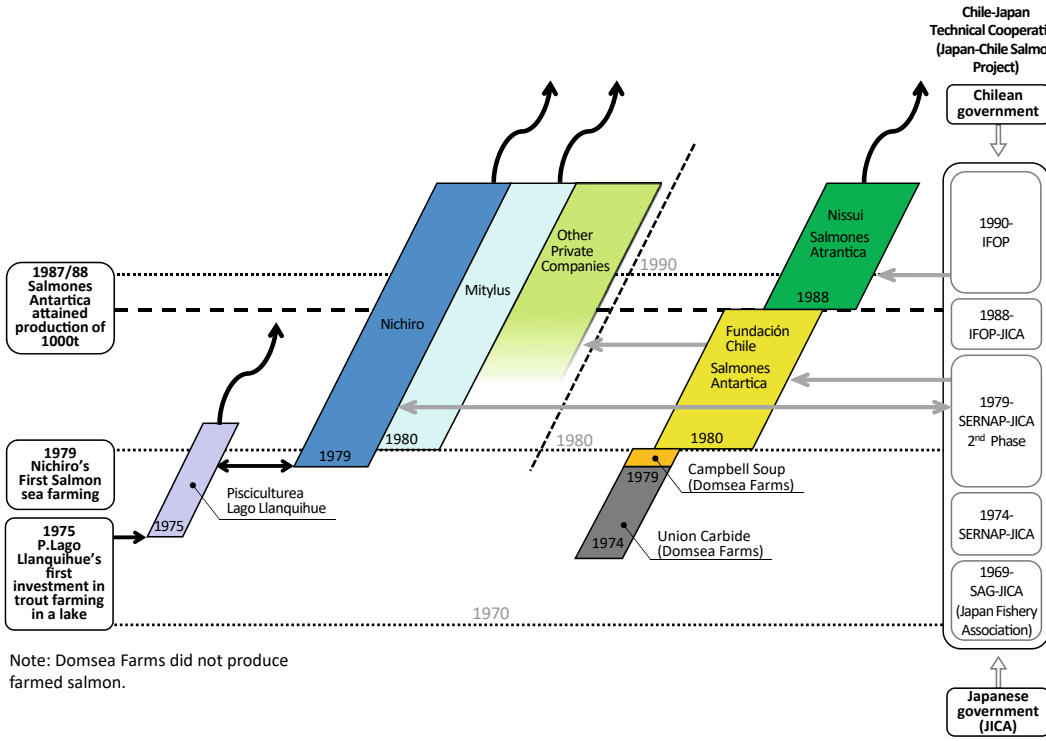

Fig. 3.4 Pioneer companies and institutions in the establishment and early development phases of Chilean salmon industry. *Source* Prepared by the author, based on Hosono (2015)

exports. During the last three decades, the country has continuously upgraded its industrial structure, overcoming the so-called middle-income trap. As Yusuf and Nabeshima (2012) note in their study on Singapore, Ireland, and Finland, by the 1980s it was becoming apparent that by betting on the technologically dynamic industrial subsectors—principally electronics, telecommunications, chemicals, and pharmaceuticals—small countries could improve their longer-term growth perspective.

In Singapore, rapid transformation demanded increasingly higher-level human resources and entrepreneurs. Foreign direct investment played an important role in transferring and disseminating cutting-edge technology, especially in the areas of electronics, the Internet, and biotech industries. In this case, transnational companies would not have been interested in investing in Singapore if the country had not had the human capital and knowledge base to absorb such technologies. This section provides insights into how human resource development and accumulation of capabilities was achieved. Following this the institutions that formulated the country's development strategy and facilitated the transformation will be discussed.

3.2.5.1 Human Resource Development and Accumulation of Knowledge and Capabilities

In the transformation process of Singapore, Yusuf and Nabeshima (2012, 34–36) emphasize the importance of general-purpose technologies (GPTs). They further argue that "The revolution caused by advances in semiconductors, electronics, and telecommunication technologies is widely associated with new products and the ways products are manufactured. Undoubtedly, these advances have contributed significantly to economic changes, but product innovation was

powerfully reinforced by numerous collaborative innovations in other areas—for example, in services, institutions, organizations, and habits and lifestyles. GPTs have proven to be an extraordinarily potent transformative force because the learning economy generated a cross-disciplinary matrix of supporting and intersecting innovations that enormously magnified the influence of core technologies."

Yusuf and Nabeshima (2012, 44) go on to highlight that, in embracing technology as a driver of long-term growth, Singapore, Finland, and Ireland successfully engaged in building capabilities. This success comprises the core of the three countries' models and has resulted in the making of a networked learning and innovation system of the highest rank. Such capabilities might be emcompassed by the concept of "learning to learn," coined by Greenwald and Stiglitz (2012). In this same publication, Greenwald and Stiglitz stress that development strategies need to be focused on "learning to learn," especially in an era with fast-changing technologies in which specific knowledge learned at one moment risks rapid obsolescence.

So how did Singapore succeed in building such capabilities? A close look at Singapore's national initiative to increase productivity, strengthen quality, and later, support innovation will help us to understand Singapore's experience. According to Prime Minister Lee Kuan Yew, "The shift to a knowledge-intensive industrial structure with strong international competitiveness is only possible through the human-resource development of 2.6 million people, the only resource Singapore has" (Japan Productivity Organization 1990, 1)[15]. Lee was concerned with how to organize and motivate Singapore's labor force in such a way as to make the most of plant modernization and skills development (JICA/IDCJ/IDJ 2010, 30). In April 1981, the Singaporean Committee on Productivity was formed, comprising 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. It then presented a report to the president of the National Productivity Board (NPB) of Singapore, which had been designated as the main body for promoting productivity development in Singapore. In June 1983, the Singapore Productivity Development Project (SPDP) was launched with the support of the Japanese government.

Some fifteen thousand 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, and more than two hundred Japanese experts were dispatched to Singapore. In addition, more than one hundred textbooks and other training materials were prepared specifically for the project. During the period of SPDP and beyond, labor productivity in manufacturing industries improved by an annual average rate of 5.7% (1981–1986), 3.0% (1986–1991), and 4.8% (1991–1996).[16]

In 1990, when SPDP ended, 90% of workers in the country were involved in productivity development activities, compared with 54% in 1986. In 2001, 13% of the total labor force was participating in quality-control circles, in comparison with 0.4% in 1983, when SPDP started. Quality control circles are considered 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, leading to innovative solutions to address ever-changing challenges. Hence, SPDP became one of the driving forces for productivity gains in Singapore.

NPB's activities gathered considerable momentum, progressing from the awareness stage (1982–1985), during which it created widespread awareness of productivity among companies and the workforce, to the action stage (1986–1988), when it translated awareness into specific programs to improve productivity in the workplace, and finally, the follow-up stage (1988 to the present), in which it encouraged ownership of the productivity movement (see Ohno and Kitaw 2011; Ohno 2013). The NPB merged with the Singapore Institute of Standards and Industrial Research in 1996 to create the Productivity

and Standards Board (PSB), bringing together the soft skills and the technical aspects of productivity. The PSB was later strengthened and reorganized into the Standards, Productivity, and Innovation Board (SPRING) in 2002.

Progressively, the NPB, PSB, and now SPRING has become a global center of excellence in the fields of productivity, quality, standards, and innovation. Other key factors that bolstered this institution include the transition from a public-sector-led entity to a private sector-led entity, active advocacy and publicity, human resource development inside and outside the institution, and the establishment of a skills development fund by the government. Singapore's productivity initiative was strongly encouraged by the country's senior leaders, especially Prime Minister Lee. He understood the need for institution-building and the need to promote creativity and the capacity to innovate in order to sustain growth for Singaporeans.

It should be emphasized here that the previously mentioned process enhanced the capabilities of both individuals and organizations. Ohno (2013, 190) reiterates that a nationwide productivity drive requires a paradigm shift, a mindset change by which all people strive for and acquire the habit of improvement, and systems and practices that translate such attitudes into action. He further emphasizes that new ways of thinking, living, and working must be firmly built in the minds and actions of all leaders and actors. This highlights the importance of strong political commitment from the top and solid organizational support.

3.2.5.2 Institutions that Enabled the Process of Transformation

Singapore's Economic Development Board (EDB) was a single agency given the task of delivering the key elements of a growth strategy (Yusuf and Nabeshima 2012, 105). It was established in 1961 with the original goals and organizational structure spelled out in its first annual report: "The primary function of the Board is to promote the establishment of new industries in Singapore and to accelerate the growth of existing ones" (cited by Schein 2001, 38). Schein, based on an extensive study of EDB, described the culture of EDB as "strategic pragmatism." He argued that Singapore displayed a remarkable adaptive and learning capability without sacrificing short-term problem solving (57–58).

Ohno (2013, 172–173) points out that EDB is a business-friendly, one-stop agency for domestic and foreign investors. In attracting FDI in priority sectors, EDB uses both broad-based approaches and targeted approaches. EDB also engages in individual negotiations with foreign companies to offer company-specific support and incentives in what is called the "Queen Bee" approach. Singapore held first position among more than 180 countries in the World Bank 'Doing Business Reports from 2007 to 2011.

Kuruvilla and Chua (2000, 40–41) argue that there are several major reasons behind Singapore's remarkable success in upgrading workforce skills. These include a general link between economic development needs and skill formation/development facilitated by an institutional structure that places the EDB at the center of the efforts with responsibility for both areas. There is also EDB's model of technological transfer that links FDI to skills development. And finally there is also joint government-private sector operation for skill training and educational reform for long-term skills development.

In the areas of productivity, quality, standards, and innovation, NPB, PSB, and now SPRING have played crucial roles in mainstreaming cross-cutting general-purpose technologies (GPTs) in Singapore's industrial development and economic transformation.

Furthermore, the provision of infrastructure for industrial development by Jurong Town Corporation (JTC), as the principal statutory board for industrial development, cannot be overemphasized. JTC is seen as a strategic developer of cutting-edge industrial spaces

bringing forth new paradigms in industrial planning and urban design (Kaushik 2012, 13). It now aims at strategic clustering and innovation, providing new estates, cluster hubs, paradigms, land creation, and eco-sustainability.

3.2.5.3 Summary of the Process of Development of Institutions for Accumulation of Knowledge and Capabilities

Figure 3.5 roughly illustrates the growth of institutions in Singapore responsible for economic development, productivity, standards and innovation, and infrastructure provision. It focuses on the evolution over fifty years of such institutions as the Productivity and Standards Board (PSB) and the Standard, Productivity, and Innovation Board (SPRING), with both considered essential for productivity development, accreditation of products, standardization, and scientific research and development in Singapore.

3.3 Concluding Remarks: Findings from the Case Studies

The five cases presented here show how distinctive critical factors identified by several recent studies interact in practice. Learning and accumulation of knowledge and capabilities are essential, and occur in a gradual, incremental, and generally path-dependent process. However, the process is critical for changing the endowments to attain dynamic comparative advantage. Our case studies also bring out how the government or public institutions can facilitate the process. In Thailand, Bangladesh, and Singapore, the constant improvement of the capabilities of those involved in the new industries was crucial.

Change of endowments is also attained by infrastructure construction and technological innovation. Both factors can often trigger or accelerate industrial development and transformation. The Eastern Seaboard was crucial for the expansion of the automobile industry in Thailand, which eventually enabled the country to be labeled the "Detroit of Asia." In Bangladesh,

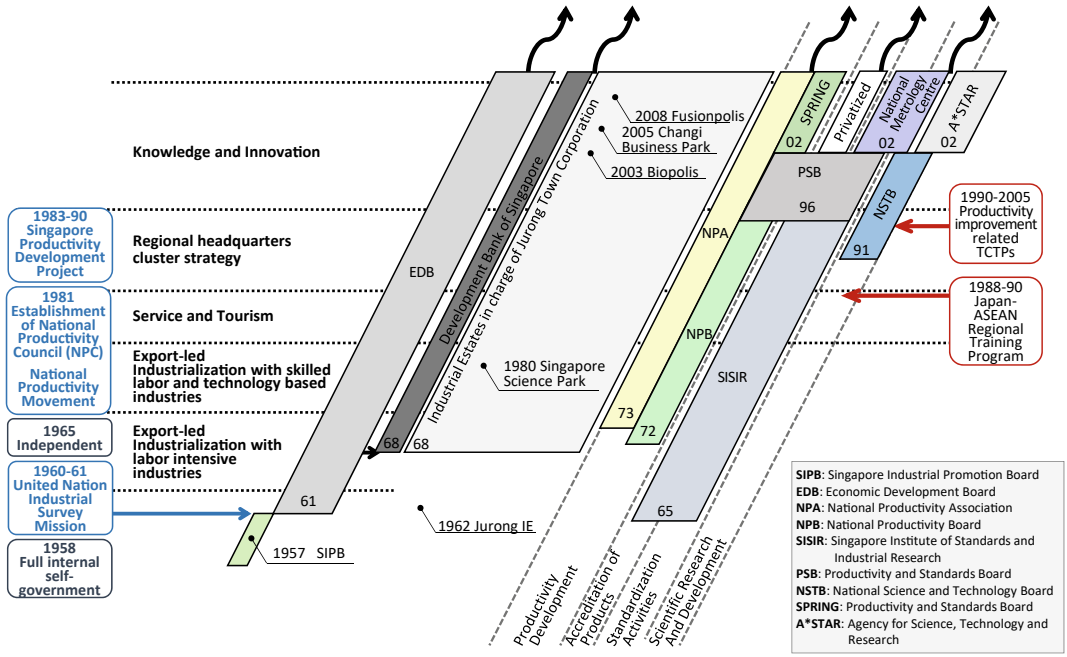

Fig. 3.5 Development of high value-added goods and service sector in Singapore. *Source* Prepared by the author

construction of more efficient transport and logistics infrastructure facilitated and accelerated the process of transformation. In Brazil, technological breakthroughs changed the endowments and comparative advantage of the country and, together with institutional innovations, triggered the transformation of the Cerrado from barren land into one of the most productive agricultural regions in the world. In Chile, technological adaptation and development changed the endowments. But in all of these cases, industrial development and economic transformation could not have happened without constant development of capabilities and knowledge through learning. In Singapore, "learning to learn" was a key factor in the country's rapid and profound transformation.

Thus, in all outstanding cases studied, economic transformation was achieved with changes in endowment and comparative advantage. The endowment changes were enabled both by the long-term process of accumulation of knowledge and capabilities and by investment in infrastructure and in technological innovation. In particular, the technology and knowledge necessary for new economic activities, especially in agriculture and aquaculture, are normally considered public goods. These public goods were provided by public institutions or via public–private collaboration.

In all five cases, effective institutions accomplished the role of facilitator or catalyzer of transformation. First of all, many of the institutions were created for specific purposes and had long-term visions and missions. Second, most such institutions regarded public–private interaction, consultation, and coordination to be of the highest priority, as was seen in the cases of Thai automobile industry policymakers, the Brazilian Agricultural Research Corporation, Bangladesh garment industry policy-makers, the Chile Foundation, and Singapore's Economic Development Board and Standard, Productivity, and Innovation Board. Third, most of these institutions adapted flexibly to changes in the global market and phases of industrial development.

These findings generally confirm the conclusion of JICA/JBIC (2008) regarding drivers of economic growth found in the Asian experience, drawing from many other remarkable cases of changing endowments and transformation in the region. Particularly noteworthy are mid- to long-term visions for development and associated strategies; flexibility in responding to a changing environment; the government's close ties with the private sector; and harnessing the private sector's capacity to the maximum.

3.4 Further Discussion (3.1)

3.4.1 Catalytic Role of International Cooperation

The insights derived from the analysis of this chapter could provide policy implications regarding the catalytic role of international cooperation for industrial development and transformation. The UN High-Level Panel of Eminent Persons on the Post-2015 Development Agenda (hereafter UN HLP) called for a quantum leap forward in economic opportunities and a profound economic transformation to end extreme poverty and improve livelihoods (UN HLP on the Post-2015 Development Agenda 2013, 8). The report further states that there must be a commitment to rapid, equitable growth—not growth at any cost or just short-term spurts in growth—but sustained, long-term, inclusive growth that can overcome the challenges of unemployment. In achieving this, the donor community now faces a challenge: "how to respond to the challenges of the UN High-level Panel, which has called for a 'quantum leap' to 'improve livelihoods', and become more ambitious in using aid for structural transformation—using the insights of the new industrial policy to use aid in a more concerted strategy for employment generation" (UNU-WIDER 2014, xi).

While the literature on aid growth relations is abundant, studies on the effectiveness of aid on economic transformation for jobs and inclusive growth are scarce. Analysis of aid–employment relations is not identical with aid–growth relations because, as we can observe in some sub-Saharan countries, for example, growth is not necessarily accompanied by an increase in

employment nor by economic transformation. For both the aid–growth nexus, especially from a long-term perspective, and the aid–employment nexus, it is structural transformation that really matters. Therefore, the UN HLP on the post-2015 Development Agenda called for a transformation of economies for jobs and inclusive growth.

3.4.2 Aid and Transformation Focusing on Inclusive Growth

This chapter is written from this "economic transformation perspective." In order to discuss the aid-transformation-employment nexus, I consider the following hypotheses critical: (1) the effect of aid on employment needs to be assessed from an economic transformation point of view; (2) aid plays a catalytic, not a leading, role in development, especially through economic transformation; and (3) the "economic transformation for jobs and inclusive growth" agenda differs between countries due to the diverse challenges of transformation that are related to the phases of development, endowments, and many other factors, and therefore there is no "one-size-fits-all" strategy.

Because of the first hypothesis, an appropriate analysis of the aid-transformation–employment nexus could be the "meso" or "sector" level, focusing on the creation of new industries and diversification of existing industries, as well as the deepening of value chains consisting of related industries. The aid–growth issue has been addressed through an aggregate macroeconomic approach (UNU-WIDER 2014, x). As the UNU-WIDER Position Paper on Aid, Growth and Employment emphasizes, "aggregate aid-growth research typically does not generate policy recommendations beyond suggestions that either provide broad empirical evidence as to whether the theoretical rationales for aid stand up in practice or not … [I]t does not in and by itself provide detailed insights into what to do, what not to do, and what to do better in aid practice" (UNU-WIDER 2014, 5). The findings in this chapter support the view of UNU-WIDER, in that "One must look beyond standard aggregate macro-economic research, for example along the lines of Arndt et al. (2013), or by drawing on a wider range of more qualitative evidence related to the provision of aid" (5).

The second hypothesis refers to the catalyst role of aid in at least two aspects, drawing on Kharas et al. (2011). Firstly, developing countries are responsible for their own development and aid can only play a catalytic role. Development will not happen because of aid, but aid can make a difference. Secondly, aid is but one of many instruments of development and the catalytic impact of aid is often seen when other forces, like trade and private investment, are unleashed because of better economic policies and institutions supported by aid programs (2).

The third hypothesis refers to the different economic transformation agendas between countries due to the distinctive "transformation for jobs and inclusive growth" challenges they face. The transformation agendas of most agrarian countries are related to improvement of the productivity of agriculture and diversification of the industrial structure into higher value-added sectors like agro-industry and other light manufacturing, thereby overcoming the low-income equilibrium[17]. Many countries of East Asia have to address the middle-income trap through transformation. Ways of responding to challenges of transformation for jobs and inclusive growth could differ due to a range of specific characteristics inherent in each country, such as natural resource endowments, with the corresponding possibility of Dutch disease and resource curse, demographic transition accompanied by the possibility of a demographic bonus, landlockedness, connectivity to large external markets, and so on.

Economic transformation, or structural transformation, is widely understood as the change of an economic structure from low- to high-productivity sectors. It is achieved by creating new industries with higher productivity, diversifying industries, and extending and deepening value chains. Change of endowments and other factors could trigger economic transformation

and could provide drivers (driving forces) to maintain the momentum of transformation. Therefore, change of endowments through investment in soft and hard infrastructure, technological innovation, institution-building, learning and accumulation of knowledge and capabilities, and so on is essential for economic transformation (Chap. 2). In short, aid could be catalytic in changing endowments, as well as triggering the transformation process and maintaining its momentum.

3.4.3 Opportunities and Capacity Nexus for Inclusive Growth

As mentioned above, the UN HLP on the Post-2015 Development Agenda (2013, 8) called for a transformation of economies for jobs and inclusive growth. This implies that economic transformation should be intrinsically related to jobs and inclusive growth. The report highlights the following first priority: "[to] create opportunities for good and decent jobs and secure livelihoods, so as to make growth inclusive and ensure that it reduces poverty and inequality." It also emphasizes the necessity of education, training, and skills for people to respond to the demands by businesses for more workers and to be successful in the job market (8–9). Thus, the UN-HLP report highlights the importance of opportunities and capacity nexus for jobs and inclusive growth.

Among literature on inclusive growth, the Framework of Inclusive Growth Indicators (FIGI) published by the Asian Development Bank (ADB 2013) presents a similar view. It asserts that the outcomes of inclusive growth are achieved through three policy pillars: the sustained economic growth and development of productive jobs and economic opportunities, social inclusion to ensure equal access to economic opportunities by expanding human capacities, and, finally, social safety nets to protect the chronically poor and address the risks and vulnerabilities of the population. FIGI is illustrated in Fig. 3.6, in which related factors not included in FIGI, as well as the role of ODA, are added to FIGI to adapt it to the purpose of this study.

The first pillar of FIGI is mainly attained by creation of new industries, diversification and upgrading of existing industries, and deepening value chains consisting of related industries. This process will generate employment opportunities that can be responded to by workers who have accumulated capabilities, through actions related to the second pillar. Typically, in manufacturing industries, micro-, small-, medium-, and large-scale enterprises play an essential role in this process by recruiting and training workers. However, in other industries—typically in agriculture and fishery—but also often in services and even in manufacturing, individuals or families have to accumulate capabilities themselves because, in these sectors, they are the principal actors of productive units.

FIGI's second pillar, "social inclusion to ensure equal access to economic opportunity," includes the directive "access and inputs to education and health." This is a fundamental component of the pillar, because basic education is essential for human capital to enhance its capacity. However, in order for workers to respond to changing demand in the process of industrial transformation, advanced capacity development is required. As Cimoli et al. (2009, 2) argue: "A 'great transformation' entails a major process of accumulation of knowledge and capabilities … Certainly, part of such capabilities builds on education and formally acquired skills. However, at least equally importantly, capabilities have to do with the problem-solving knowledge embodied in organizations—concerning, for example, production technologies, marketing, labor relations, as well as 'dynamic capabilities' of search and learning." This view is related to the complementarity between learning at school (formal education) and learning at work to strengthen the capacity of learning to learn (Chap. 2).

The first two policy pillars of FIGI—the development of productive jobs and economic opportunities and social inclusion to ensure equal

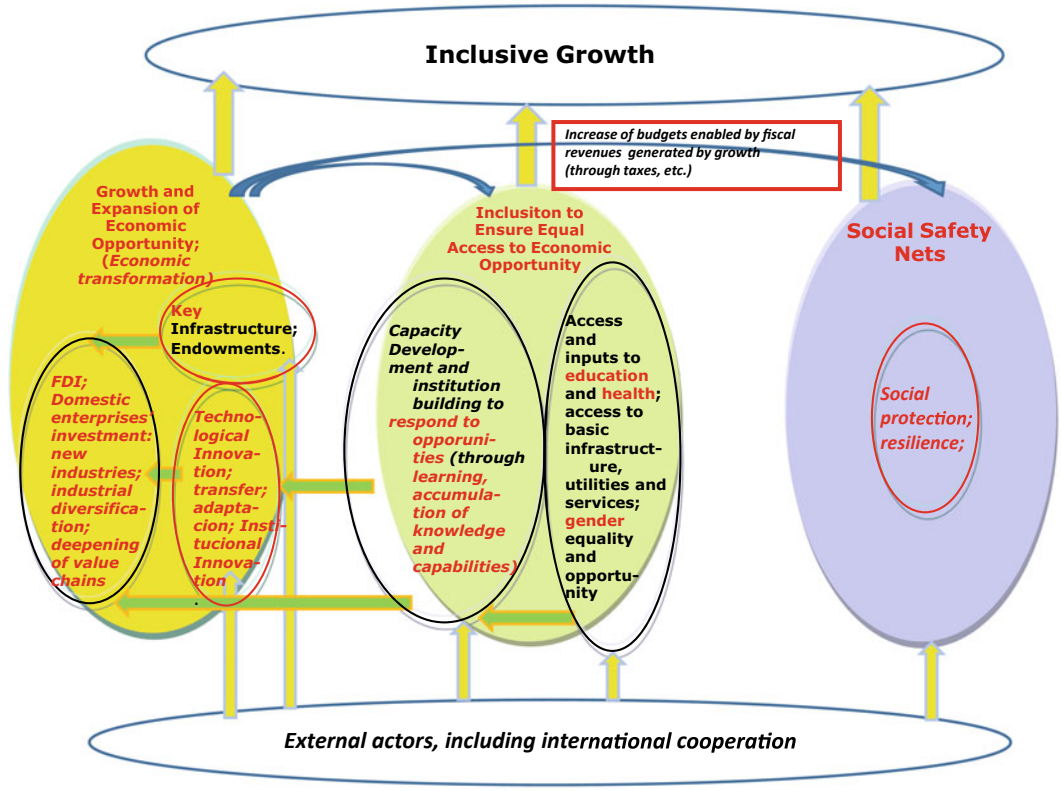

Fig. 3.6 Relationship between transformation and inclusive growth. *Note* This figure roughly illustrates the relationship between the main components of "inclusive growth." Words in italic are added by the author. *Source* Author. Based on discussion of Hosono (2015) and ADB (2013: p. 4)

access to economic opportunities by expanding human capacities—are intrinsically related. Furthermore, FIGI, as well as the UN HLP on the Post-2015 Development Agenda, emphasize that the two pillars are mutually reinforcing, enabling the virtuous circle of these two pillars. Aid can play a catalytic role in economic transformation as mentioned above and, in particular, for economic transformation for jobs and inclusive growth. For example, it can do this through support for efforts to expand human capacities, which enables people to respond effectively to economic opportunities. It can also support industrial development, which increases employment opportunities.

3.4.4 Japan's View and Experiences

This view coincides with Japan's view on ODA's role in development. The following statement of Japan's ODA White Paper (MOFA 2005, Part I), for example, explains concisely the view that: "Achieving economic growth requires improving the investment environment, which involves policy and institution building, human resources development, strengthening basic infrastructure, attracting foreign direct investment, and expanding trade. Japan has long insisted that economic growth through infrastructure development, etc., is crucial to poverty reduction, and has incorporated this viewpoint in its ODA policies."

The importance of this viewpoint has been increasingly recognized by the donor community. For example, DAC Peer Review on Japan (OECD-DAC 2004) stated that "OECD considers FDI a major catalyst to development and suggests that developed countries can contribute to the promotion of these benefits by using ODA to leverage investments" (36). This peer review highlighted "Japan's comparative advantage in [the] infrastructure-FDI model" (32).

Japan's aforementioned viewpoint dates back to the mid-1980s when the so-called "trinity development cooperation" concept, meaning comprehensive economic cooperation packages with the trinity of aid, direct investment, and importation (from developing countries), was launched. It was formally announced in January 1987 by the Minister of International Trade and Industry of Japan under the title of "New AID Plan (New Asian Industries Development Plan)" (Shimomura 2013, 156). This concept was announced against the backdrop of the ASEAN countries' strong desire for economic transformation. As Shimomura put it, "they were desperately attempting to transform their primary goods-based export structure to one oriented towards labor-intensive light manufacturing goods, and further to technology-intensive manufacturing" (156).

After 20 years of implementation, Japan International Cooperation Agency's (JICA) Annual Evaluation Report (2006, 85) stated that the strategy utilizing trinity of aid, trade, and investment ultimately contributed toward the economic growth of developing countries. The report also explained how this strategy was carried out in practice.

In the case of Thailand's automobile industry, Japan's ODA provided support for infrastructure and human capital development, among other things, which substantially changed the endowments of Thailand and facilitated its economic transformation. The cooperation for the construction of infrastructure in the Eastern Seaboard could be considered a concrete example of the catalytic role of ODA leveraging investment for economic transformation toward higher value-added and more competitive activities.

Increasing numbers of skilled workers in this process responded to employment opportunities created by the development of car assembly industries and supporting industries that provide parts, components, and services. Indeed, transformation with jobs and inclusive growth took place in Thailand. JICA has dispatched experts to Thailand to provide technical and financial aid to small and medium enterprises (SME) since the early 1980s. Since the mid-1990s, several projects for the promotion of SME/"supporting industry" have been conducted by JICA (see Fig. 3.1).

Here, the catalytic role of aid, discussed above, is clear. Through its contribution to change endowments, ODA catalyzed the process in which investment, both domestic and FDI from countries, including Japan, and trade were dramatically increased, enabling the development of a competitive automobile industry. Regarding this catalytic role of Japan's ODA, the DAC Peer Review on Japan (OECD-DAC 2004) elaborated "Japan's comparative advantage in infrastructure-FDI model," referring to the case of Asian countries' development as follows: "Japan has promoted FDI in the Asian region, developing its own model for enhancing economic growth by linking trade and investment policies with development co-operation" (36).

Nevertheless, the "infrastructure-FDI model" constitutes only a part of Japan's approach, which is much wider and includes other crucial components such as human resource development, thereby enabling workers to respond effectively to employment opportunities, and institution building, which is essential for economic transformation. Together with the general vision of Japan on aid (as cited above), Japan's ODA White Paper (MOFA 2005, Part I) stated the following, referring to the East Asian experience: "Direct investment from Japan's private sector and the resulting increase in exports and formation of markets, coupled with human resources development through ODA, spurred the East Asian economy to high growth. This expansion of private sector economic activity contributed to the improvement of the income of the poor through increased employment. On the

basis of tax income from companies and citizens, the countries of East Asia expanded the delivery of public services, such as health care and education, leading to poverty reduction through human resources development."

As regards the agricultural development of the Cerrado in Brazil, the Inter-American Development Bank (IDB 2013, 41) highlighted the features of Japan's ODA in a similar manner as the DAC Peer Review (OECD-DAC 2004), cited above: "JICA has been a leader in providing aid for trade (AfT), which aims to develop countries' capabilities to integrate in the global economy through the development and enhancement of physical infrastructure, building private sector capacity, and supporting enabling policies and institutions …. Japanese cooperation has in fact played a central role in launching some of the region's most successful export sectors. Japanese technical assistance was critical in transforming Brazil's Cerrado region into the country's agricultural heartland" (IDB, 25–6).

Japan's view on quality of growth and poverty reduction through such growth as well as the catalytic role of cooperation is explained concisely in the Development Cooperation Charter of Japan (Cabinet Office, Japan 2015). Figure 3.7 roughly illustrates basic aspects of this Charter's view related to quality of growth and industrial development (for details, see the extracts below from the Charter related to these two points, as well as the catalytic role of aid/international cooperation).

Summing Up

In the five cases analyzed in this chapter, aid played a catalytic role in the process of transformation for inclusive growth, through support for investment in infrastructure and technological innovations, human resources and capacity development, as well as institution building. Although the aid was but one of many instruments of development, the catalytic impact of aid was seen because other forces like trade and private investment were unleashed, as the

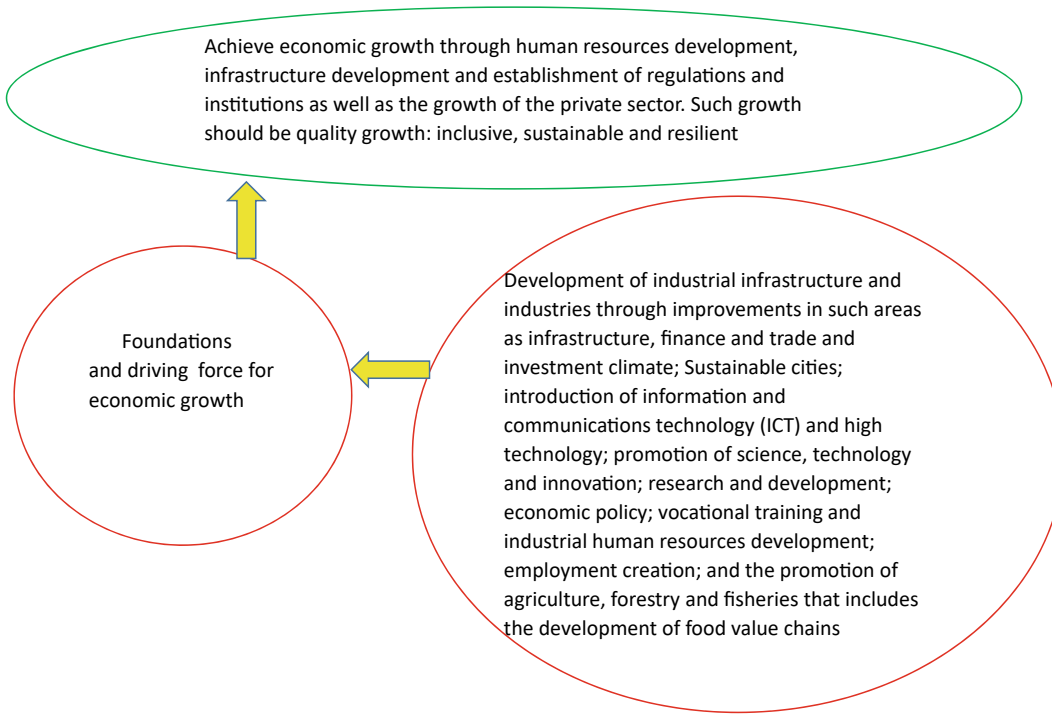

Fig. 3.7 International cooperation for the foundations and the driving force for economic growth. *Source* Author, based on *Development Cooperation Charter* of Japan

process was underpinned by infrastructure, human resource development, appropriate policies and institutions, and so on, supported by aid programs.

[Extract from the Development Cooperation Charter of Japan related to "Quality of growth and poverty eradication through such growth"] (Cabinet Office, Japan 2015, 5–6).

> The world's poor population is still large in number, and reducing poverty, especially eradicating absolute poverty, is the most fundamental development challenge. Especially as regards fragile states that have not been able to grasp the opportunities for development for different reasons and as regards people in vulnerable situations, it is important to provide both assistance from a humanitarian point of view and assistance designed to set the development process in motion and overcome vulnerability.
>
> At the same time, in order to resolve the poverty issue in a sustainable manner, it is essential to achieve economic growth through human resources development, infrastructure development and establishment of regulations and institutions as well as the growth of the private sector enabled by the aforementioned actions, which are aimed at self-reliant development of developing countries. However, such growth should not be merely quantitative in nature, given that some of the countries that have achieved a measure of economic growth face challenges such as widening disparities, sustainability issues, inadequate social development, and political and economic instability. Rather, it should be "quality growth". Such growth is inclusive in that the fruits of growth are shared within society as a whole, leaving no one behind. It is sustainable over generations in terms of consideration to, among other aspects, harmony with the environment, sustained socioeconomic growth, and addressing global warming. And it is resilient, able to withstand and recover from economic crises, natural disasters and other shocks. These are some of the challenges Japan has tackled in its postwar history. Japan will take advantage of its own experience, expertise and technology as well as lessons learned in order to provide assistance to realize "quality growth" and poverty eradication through such growth.
>
> From this perspective, Japan will provide assistance necessary to secure the foundations and the driving force for economic growth. Its scope includes: the development of industrial infrastructure and industries through improvements in such areas as infrastructure, finance and trade and investment climate; sustainable cities; introduction of information and communications technology (ICT) and high technology; promotion of science, technology and innovation; research and development; economic policy; vocational training and industrial human resources development; employment creation; and the promotion of agriculture, forestry and fisheries that includes the development of food value chains. At the same time, Japan will provide assistance necessary to promote people-centered development that supports basic human life, taking full account of the importance of human and social development. It encompasses health care, safe water and sanitation, food and nutrition, quality education for all, disparity reduction, empowerment of women, culture and sports that brings about spiritual affluence.

[Extract from the Development Cooperation Charter of Japan related to catalytic role of cooperation] (Cabinet Office, Japan 2015, 4–5).

> In its development cooperation, Japan has maintained the spirit of jointly creating things that suit partner countries while respecting ownership, intentions and intrinsic characteristics of the country concerned, based on a field-oriented approach through dialogue and collaboration. It has also maintained the approach of building reciprocal relationships with developing countries in which both sides learn from each other and grow and develop together. These are some of the good traditions of Japan's cooperation which have supported self-help efforts of developing countries and aimed at future self-reliant development. On the basis of these traditions, Japan will continue to provide cooperation aimed at developing countries' self-reliant development by emphasizing their own initiatives and self-help efforts, as well as further deepening dialogue and collaboration with them while taking advantage of Japan's experience and expertise. In these processes, Japan will attach importance to building the foundations of self-help efforts and self-reliant development such as human resources, socio-economic infrastructure, regulations and institutions. It will also go beyond waiting for requests from partner countries by focusing on dialogue and collaboration with diverse actors not limited to governments and regional agencies of these countries, including proactively presenting proposals while giving full consideration to policies, programs and institutions related to development in the country concerned.
>
> In the present international community, various actors including private companies, local governments and non-governmental organizations (NGOs) play an increasingly important role in addressing development challenges and supporting sustained growth of developing countries. It is therefore important to mobilize a wider range of resources that are not limited to ODA. In this context, ODA, as the core of various activities that contribute to development, will serve as a catalyst

for mobilizing a wide range of resources in cooperation with various funds and actors and, by extension, as an engine for various activities aimed at securing peace, stability and prosperity of the international community.

Notes

The author would like to express his gratitude to Yasuo Fujita, Go Shimada, and Ayako Otaguchi of JICA Ogata Sadako Research Institute for Peace and Development for their valuable comments. Errors and omissions are the responsibility of the author.

1. Greenwald and Stiglitz (2012) use a similar definition: "Industrial policies are what we call those policies that help shape the sectoral composition of an economy. The term is used more broadly than just those policies that encourage the industrial sector. A policy which encourages agro-business, or even agriculture, is referred to as an industrial policy" (3). For further discussion on "industrial policy," see Hosono (2022).
2. This typological approach is inspired by World Development Report 2013 (World Bank 2012, 18–19).
3. It goes without saying that the automobile is a complex product consisting of a large number of parts and components that involve different production processes and factor proportions. Many of these parts and components are manufactured by independent suppliers in other industries such as textiles, glass, plastic, electronics, rubber products, and steel and other metals (Athukorala and Kohpaiboon 2011, 1).
4. Regarding this new policy, see Natsuda and Thoburn (2011, 13).
5. Starting in 1978, the LCR for passenger cars was increased from 25 to 35% in the first two years and was then raised by 5% every year until 1983, eventually reaching 50%, and for commercial vehicles from 20 to 45%. The new policy also required assemblers to localize the production of specific parts by introducing a "mandatory deletion" scheme targeting specific parts such as brake drums and exhaust systems. In 1994, the LCR was further raised to 60% for pickup trucks with gasoline engines and 72% for those with diesel engines. In 1996, the government announced the abolition of the LCR by 1998, prior to the WTO target date, although the period was eventually extended to 2000 (Natsuda and Thoburn 2011, 15).
6. Translation is by the author.
7. Cited in Techakanont (2008, 9).
8. This summary is based on JICA/JBIC (2008, 50).
9. Another study reached a similar conclusion: "It was the cumulative synergetic effect of a number of factors that had contributed to pushing the Eastern Seaboard Development Program forward. These included: Effective leadership to ensure the public's interest, competency of technocrats, powerful central economic agencies, special institutional settings, functioning coordination mechanisms, and external global factors" (Ohno and Shimamura 2007, 131; Shimomura 2017).
10. This case study is based on Hosono et al. (2016b, 2019).
11. The role of LGED in the rural development cannot be overemphasized. LGED is one of the largest public sector organizations in Bangladesh, with a staff exceeding ten thousand and a development budget accounting for 14% (fiscal year 2009–2010) of the total development budget of the government. For details of LGED, see Fujita (2011).
12. For details of this system, see Easterly (2002, 149).
13. This case study is based on Hosono et al. (2016a).
14. See the SalmonChile (The Salmon Industry Association of Chile) website (www.salmonchile.cl). This figure does not include people employed by upper-stream and downstream industries of salmon farming and processing value chain.
15. Remarks made by the prime minister when he visited Kohei Goshi, honorary president of Japan Productivity Center in June 1981.

16. The figures and those of the following paragraph are from JICA/IDCJ/IDJ (2010, 16 and 22).
17. Chapter 5 of this volume discusses strategies for inclusive growth in agrarian countries where extreme poverty is high, with a focus on sub-Saharan Africa.

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Industrial Strategies and Learning Capacity for Quality Growth

4

Chapter 3 analyzed five outstanding cases of industrial development and transformation that each illustrated the mutual causality between transformational development, and the constant development of capabilities and knowledge through learning. It was for this purpose that, in each of the cases, the respective governments facilitated learning and capacity development, and in most cases, effective institutions fulfilled the role of facilitator. The linkage between learning, innovation, and growth is something that has become an increasing focus of analysis among scholars, development policymakers, and practitioners. In their 2014 book, *Creating a Learning Society: A New Approach to Growth, Development, and Social Progress*, discussed previously in this volume, Stiglitz and Greenwald highlight the centrality of learning and argue that there is an important role for government to play in shaping an innovative economy and promoting learning (Stiglitz and Greenwald 2014, 7). This chapter draws from these conclusions.

In this chapter, I aim to provide insights into effective approaches for creating a learning society for quality growth. Bearing in mind that the outstanding cases of transformation from the previous chapter were accompanied by a learning process and enabled by learning capacity, in this chapter, I discuss effective approaches to initiate and maintain momentum and to scale up the learning process, building on cases of international cooperation for capacity development. These cases are analyzed from a "learning perspective." They have not necessarily produced transformation directly, as with the above-mentioned outstanding cases, but have still had a significant impact on the learning process of a society and thereby enabled changes in companies or organizations, local or regional economies, or even national economies. This chapter also recognizes that each society or country has its own distinctive development agenda and different combinations of endowments, as well as its own particular development challenges.

Based on the above discussion, I pose the following research question: What industrial development strategies and approaches are effective in promoting learning to attain transformation along with good growth of quality, given the challenges countries face and the changing endowments they count on?

In the next section "Key Issues from an Analytical Perspective," I discuss major issues and provide an analytical perspective. In the subsequent two sections, "Cases of Learning for Specific Capacity," and "Cases of Learning to Learn and Enhancing Core Capacity," I present and discuss some relevant cases focusing on the above-mentioned research question. In the conclusion, I offer some final remarks based on lessons from the case studies. In a final section, titled Further Discussion, I elaborate on the relationship between *Kaizen* (including related approaches), learning, and innovation for the achievement of the SDGs and quality growth.

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4.1 Key Issues from an Analytical Perspective

4.1.1 Knowledge, Learning, and Transformation

Noman and Stiglitz (2012) emphasize that "long-term success rests on societies' 'learning'—new technologies, new ways of doing business, new ways of managing the economy, new ways of dealing with other countries" (7). Related to this notion of a "learning society" is Cimoli et al.'s (2009) view that great industrial transformation "entails a major process of accumulation of *knowledge* and *capabilities*, at the level of both *individuals* and *organizations*" (2; italics in original). I find a lot of similarities between this view and the capacity development (CD) approach in international cooperation. Capacity development is the process by which people, organizations, and society as a whole unleash, strengthen, create, adapt, and maintain capacity over time (OECD/DAC 2006). Knowledge and learning in a CD process have increasingly been a feature of recent discussions (Hosono et al. 2011, 180–181).

Cimoli et al. (2009) contend that "capabilities have to do with the problem-solving knowledge embodied in organizations—concerning, for example, of [sic] search and learning" (2). Here again, we find similarities between their ideas and the concepts of CD. The problem-solving knowledge could be considered a core capacity in terms of CD, which could include problem-identifying and problem-solving capacities (Hosono et al. 2011, 180).

Regarding this aspect, Greenwald and Stiglitz (2012) further elaborate: "The discussion so far has focused on 'learning,' but even more important is 'learning to learn.' Industrial and trade policy can enhance an economy's learning capacities, its underlying 'capabilities,' and development strategies need to be focused on that, especially in an era with fast-changing technologies, where specific knowledge learned at one moment risks rapid obsolescence" (18).

As stated in previous chapters, most recently, Stiglitz and Greenwald (2014, 26) presented a more systematic and holistic analysis of what constituted a learning society, stating that "the most important 'endowment,' from our perspective, is a society's learning capacities (which in turn is affected by the knowledge that it has; its knowledge about learning itself; and its knowledge about its own learning capacities)." They further state that a country's policies have to be shaped to take advantage of its comparative advantage in knowledge and learning abilities, including its ability to learn and to learn to learn, in relation to its competitors, and to help develop those capacities and capabilities further (Stiglitz and Greenwald 2014, 26).

4.1.2 Learning Society and Capacity Development

In recent discussions on aid effectiveness and later development effectiveness, especially among aid practitioners, capacity development has emerged as a central issue. The *Accra Agenda for Action*, adopted in 2008 at the Third High-Level Forum on Aid Effectiveness, emphasized *capacity development* (CD) even more strongly than the Paris Declaration, which incorporates CD as a key cross-cutting theme in aid effectiveness.[1] The outcome document of the United Nations summit on its Millennium Development Goals (MDGs) in September 2010 repeatedly asserts the importance of capacity and capacity development. Underlying this trend is a growing recognition among donor organizations, donor governments, and partner countries that lack of capacity has been, and will likely remain, a major obstacle in translating policy into development results (Hosono et al. 2011, 179).

Knowledge and learning in a CD process have increasingly been a feature of recent discussions. Clarke and Oswald (2010) argue that mutual learning might even be considered to be CD. If CD is perceived as a mutual learning process, this demands that we shift our idea of what

knowledge is and how it can be generated away from the traditional transfer-of-knowledge model toward a co-creation-of-knowledge model (Hosono et al. 2011, 181). As such, international cooperation for CD processes with a stronger focus on learning and co-creation of knowledge or innovative solutions could be considered one effective approach in creating a learning society within developing countries.[2]

4.1.3 Learning for Specific Capacity and Learning to Learn for Enhancing Core Capacity

Stiglitz and Greenwald (2014) distinguish between learning abilities, stating that "Learning abilities can, of course, be specific or general" and that "We can direct our efforts at enhancing specific abilities. These may serve an economy well if it is pursuing a narrow niche; or efforts can be directed at more general learning abilities that may serve it well in periods of rapid transition and great uncertainty" (50). They further mention that "Just as *knowledge* itself is endogenous, so is the ability to *learn*. Some economic activities (conducted in certain ways) not only facilitate learning, they may facilitate *learning to learn*" (50; italics in original). Several studies on capacity development also refer to the two types of capacity. Capacity embodies not only specific technical elements, such as particular health care or road construction skills, but also so-called core capacities (Hosono et al. 2011, 180). These core capacities include generic and cross-cutting competencies and the ability to commit and engage; to identify needs and key issues; to plan, budget, execute, and monitor actions; and most importantly, to acquire knowledge and skills (UNDP 1998; ECDPM 2008; JICA 2006, 2008). Learning for specific capacity could enable learning to learn, while the capacity of learning to learn could facilitate learning for a specific capacity.

4.1.4 Determinants of Learning

Stiglitz and Greenwald (2014, 56–57) identified the following major determinants of learning: (1) learning capabilities; (2) access to knowledge; (3) the catalysts for learning; (4) creating a creative mindset—the right cognitive frames; (5) contacts (i.e. people with whom one interacts) who can catalyze learning, help create the right cognitive frame, and provide crucial inputs into the learning process; and (6) the context of learning.

An emerging view regarding CD sees knowledge as the product of continuous human interaction within specific contexts, in which knowledge and innovative solutions are co-created through a mutual learning process and acquired through practical experiences (Hosono et al. 2011, 182). In this process, five factors are considered essential: stakeholder ownership, specific drivers, mutual learning, pathways to scaling up, and catalyzers (including external actors) (Hosono 2013, 257).

Figure 4.1 roughly illustrates capacity development as a dynamic, endogenous, and continuous process through which learning for both specific capacity and learning to learn (core capacity) take place. The above-mentioned "determinants of learning" are extremely important in this process, although the sequences and relationships among them could be different from those indicated in this figure, depending on different contexts.

4.2 Industrial Strategy and Effective Approaches for Learning

4.2.1 Research Questions

So the relevant question for this exercise is: What industrial strategies and approaches are effective in promoting learning to attain the desired quality of growth, given the various challenges countries face and the endowments they count on? I will

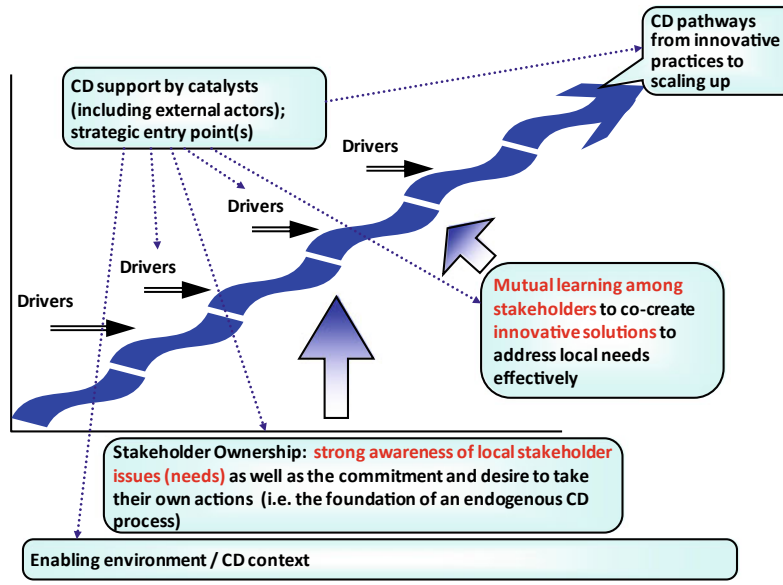

Fig. 4.1 Capacity development (CD) as a dynamic, endogenous, and continuous process. *Source* Author, based on Hosono et al. (2011)

draw from experiences of international development cooperation to discuss this research question. Cases have been selected from widely applied approaches in diverse learning contexts. This chapter focuses especially on how, in practice, the determinants of learning interact to initiate, catalyze, and maintain momentum in the process of learning and learning to learn.

4.2.2 Learning for Inclusive and Innovative Growth

In recent years, the idea of *inclusive development* has attracted increasing attention in the international community. In 2007, the World Bank president declared that contributing to inclusive and sustainable globalization was the vision of the World Bank Group. The Japan International Cooperation Agency (JICA) incorporated the term *inclusive* into its vision statement in 2008. A year later, ADB positioned inclusive growth as one of the three agenda items in its long-term strategic framework of Strategy 2020 (ADB 2009). The APEC Growth Strategy was agreed upon in 2010, with *inclusive growth* featured in the document as one of the five desired attributes for growth.[3]

In these documents, inclusive growth has two interrelated aspects: With inclusive growth, all people participate in growth, and at the same time, all people benefit from growth.[4] But, from a learning society perspective, inclusive growth goes far beyond the above-mentioned aspects and has an intrinsic relationship with innovative growth. Growth could be really inclusive and, at the same time, innovative, when growth takes full advantage of the talents of all. As noted in Chap. 2, Stiglitz and Greenwald (2014) state that "Our argument for why inclusive growth is so important goes beyond the standard one that it is a waste of a country's most valuable resource, its human talent, to fail to ensure that everyone lives up to his or her abilities" (Stiglitz and Greenwald 2014, 468). They suggest that policies that promote more inclusiveness may promote greater learning (Stiglitz and Greenwald 2014, 381).

Table 4.1 highlights some relevant approaches to international cooperation programs that aimed to promote learning for specific capacities or learning to learn for general or core capacity. From this perspective, these approaches are analyzed below to obtain some indication of how inclusive and innovative growth might be attained through learning. First, I present two cases related to learning for specific capacities.

Table 4.1 Approaches to learning for specific capacity and learning to learn

	From learning for specific capacity to learning to learn	Focusing directly on learning to learn (enhancing specific capacity as well as core capacity)
Mainly focusing on individuals' learning	Capacity development for specific purposes, which gradually enables learning to learn (e.g., smallholder horticultural empowerment project)	Learning to learn for improvement of livelihood
Focusing on both individuals' and groups' learning (associations, cooperatives and so on)	Capacity development for specific purposes, which enables individuals' and groups' learning to learn	"Learning to learn" for creation and development of inclusive business through One Village One Product (OVOP) initiatives
Mainly focusing on organizations' learning and institution building	Capacity development for specific purposes, which enables the organizations' learning to learn (e.g., local government engineering dept.)	Learning to learn in organizations through *Kaizen, Just in Time (JIT),* TQM, knowledge management, and other initiatives

Source Author

One is the case of the Smallholder Horticultural Empowerment Project (SHEP) in Kenya, focusing on individual farmers' learning. The other is the case of the Local Government Engineering Department (LGED) in Bangladesh, which focuses on organizational learning.

Following these two cases, I provide an additional three cases focusing on learning to learn or general/core capacity. In the first case, I examine livelihood improvement programs that focus on improvements other than those stemming from raising incomes (e.g., improved cooking stoves), because they primarily aim to enable rural women to become aware of the numerous problems that exist in daily life, and address them as problems that need to be solved. As such, the objective of these programs is *learning to learn* through *learning by doing* and making efforts to improve livelihood in its multiple dimensions. This approach has an advantage because the initiatives related to livelihood improvement are much less risky than initiatives of income improvement through production. However the process of finding solutions to livelihood problems and the uplifting of rural livelihood can lead to learning to learn and later the advancement of production activities. In Oita, Japan, where the One Village One Product (OVOP) initiative was born, women with experiences of livelihood improvement programs later effectively promoted OVOP's production activities. I discuss the OVOP programs in Japan, Thailand, and other countries as the second case. Finally, the third case of learning to learn, or of acquiring core capacity, is a series of approaches normally utilized by enterprises and organizations, such as *Kaizen*, just in time (JIT), Total Quality Management (TQM), and knowledge management.

4.3 Cases of Learning for Specific Capacity

4.3.1 Case 4.1: Learning for Inclusive and Innovative Growth Enabled by Capacity Development of Small-Scale Farmers with Increased Responsiveness to Market Needs: Initiatives of SHEP in Kenya[5]

Kenya has considerable potential for commercial agricultural diversification thanks to good market access and the empowerment of farmers. Demand for horticultural products has been increasing in Africa. In Kenya, horticultural production has achieved an average annual

growth rate of 20% since the 2000s. More than 60% of horticultural products are produced by small-scale farmers who have benefited from higher incomes from the sale of horticultural products. Compared to grain production in Kenya, horticulture is more labor-intensive, requiring more complex techniques and bigger inputs, including seeds, fertilizer, and pesticides. Land productivity is higher under properly managed horticulture. Based on this premise, the Kenyan government launched the Smallholder Horticultural Empowerment Project (SHEP) in 2006 (Aikawa 2013, 144–145). SHEP aimed mainly at developing the capacity of smallholder horticulture farmer groups.

Aikawa (2013) explains the learning process of SHEP as follows:

> Various techniques were introduced in the project. They were simple and applicable, using materials easily available to the farmers. In fact, in Kenya, a country where they have reached a certain level of technological know-how at the research station, the issue was not how to develop new technologies, but how to validate existing technologies from the farmers' perspective and put them to practical use. Based on this understanding, the project focused on the introduction of techniques that were immediately usable the moment they were learned, such as the technique for correct planting using twine. The guidance on these techniques was provided jointly by Kenyan experts with abundant experience in horticulture and by Japanese experts who could provide advice from an outsider's point of view. Even when introducing technologies quite new to the farmers, the project made sure that they would be applicable with the materials and techniques already existing locally. Such technologies included road maintenance using sand bags (Do-no), fermented organic manure (Bokashi), and easy-to-handle weeding tools (154).

Aikawa (2013) further states that farmers' skills improved significantly because farmers' intrinsic motivation was significantly enhanced when they determined the target crops to produce based on the result of a market survey they themselves had conducted. This, in turn, increased awareness and motivated the farmers to learn techniques more thoroughly through in-field training. When the farmers succeeded in marketing their products, this successful experience further promoted their sense of competence, leading to even greater motivation. Thus, the whole process can be described as an interaction between enhanced intrinsic motivation and increased skill levels complementing and reinforcing each other, leading to sustained growth (Aikawa 2013, 159).

The SHEP approach can be roughly divided into four steps: (1) Selecting target farmers and sharing aims; (2) Creating opportunities for awareness; (3) Farmer-led decision-making; and (4) Providing technical solutions (JICA 2020).

From a learning perspective, the second step appears to be essential. Activities included in this step are the participatory baseline survey, stakeholder forum, gender and family budgeting training for both men and women, and farmer-led market surveys. The market survey carried out by the farmers themselves is considered to be the most important activity in this step. During the participatory baseline survey, farmers develop a clear grasp of their current situation by analyzing various kinds of data on farming operations, including yield. They carry out the survey themselves with the help of extension workers and others. During the stakeholder forum, farmers' associations and those involved in the horticulture industry exchange information for the purpose of building business linkages. The gender and family budgeting training is a session that both male and female farmers and extension workers participate in together. During this activity, husbands and wives are encouraged to work together as agricultural partners, sharing farm work and operations in order to boost productivity. During the market survey, they make in-person visits to markets in order to conduct the survey. They collect information not only on prices, but on quality and volume demands, price trends, items that are selling out, and more.[6]

During the third step, the members of the farmer's group decide which crops to grow while discussing shipping periods and other issues. During the fourth step, farmers learn the techniques they need to produce the crops that are in demand in their selected markets. Based on their work in steps 1–3, farmers decide for themselves

which crops to plant. They then team up with extension workers to establish which techniques they will need to cultivate those crops. Because technical solutions are provided in response to what farmers need, farmers are motivated to learn, which in turn results in high adoption rates.

4.3.2 Case 4.2: Learning for Inclusive and Innovative Growth Through Capacity Development in Rural Infrastructure Development: Local Government Engineering Department (LGED) of Bangladesh[7]

The development and maintenance of rural infrastructure is a priority of the Bangladesh government, as stated in its National Rural Development Policy (NRDP), formulated in 2001, and in its first (2005) and second Poverty Reduction Strategy Papers (PRSPs) (2008). The semiautonomous Local Government Engineering Department evolved through a series of organizational changes from the Rural Works Cell (the "Cell"), which had inherited the infrastructure components of the famous "Comilla model" of the 1960s.[8] According to Fujita (2011), LGED has displayed remarkable progress in organizational development. During this period, a highly decentralized LGED, with over 10,000 staff, firmly established a reputation for professionalism and excellence in rural infrastructure provision and maintenance (World Bank 2009). LGED has worked closely with local stakeholders (governments and beneficiaries) to ensure broad participation at all stages of projects. It has also adopted labor-based technologies to create employment for the poor and has used local materials in construction and maintenance. As such, LGED has been playing a growing role in the capacity development of local government and local community groups in the context of decentralization of central government functions. Rural infrastructure projects have now been extended nationwide. Today, LGED is one of the largest public sector organizations in Bangladesh, with a budget accounting for 14% (FY 2009–10) of the total development budget of the government (Fujita 2011).

LGED's business model is conducive to organizational learning. Rural infrastructure, such as roads, village markets, and communal irrigation, is individually relatively small and can therefore be implemented quickly—in one to two years—and is of low risk to LGED, even if some fail. These characteristics have enabled LGED to distinguish project successes and failures within a short time and to adopt new technologies. These elements have contributed to knowledge and experience accumulation. A 2008 report on LGED's assessment exercise pointed out that "The organization has quickly adapted itself to new experiments, technologies," reflecting a process of mutual learning among the agency's staff at various levels (Wilbur Smith Associates 2008). Mutual learning through interaction among stakeholders is vital for a clear understanding and identification of local needs. This enables local knowledge and resources to be identified and innovative solutions to be developed in partnership with local beneficiaries. This case shows that mutual learning and trust are vital to discovering locally appropriate innovative solutions to meet the needs of beneficiaries and stakeholders.

4.4 Cases of Learning to Learn and Enhancing Core Capacity

4.4.1 Case 4.3: Learning for Inclusive and Innovative Growth Through Rural Livelihood Improvement (*Seikatsu Kaizen*) Programs in Japan and Developing Countries[9]

Rural life improvement programs were implemented throughout Japan in the post-WWII period for about 20 years. Sato (2003, 34–35) emphasizes that the process of economic and social development in postwar Japan would have

been impossible without a scheme for "social development," particularly in terms of the achievements obtained by various life improvements in rural areas. The keyword for social development in rural areas of Japan at that time was *seikatsu-kaizen* (life improvement). Thus, Japan was able to quickly and broadly distribute the fruits of rapid growth because social development programs, referred to as the *rural life improvement movement*, had laid the groundwork over the 20 years prior to the period of rapid growth.

In the summer of 1945, Japan was encountering the same array of problems faced by many developing countries today, such as food shortages, malnutrition, health deterioration, and poor sanitary conditions (Sato 2003, 36). Amid these circumstances, livelihood improvement initiatives were implemented. This involved an approach in which women themselves were encouraged to actively take part in identifying problems in their own living conditions, determining issues, formulating living improvement plans, and applying and monitoring these policies (JICA 2003, 1). Livelihood improvement extension workers in Japan were expected to play the role of facilitators who enabled rural women to become aware of the numerous problems that existed in their daily life and recognize them as problems.

In fact, many of the problems in rural Japan were rooted in everyday living—for instance, the cooking stove. Rural women used to bend down low to use a kitchen stove located on the floor. They had to stoop while cooking, a physically grueling posture, and because there was no ventilation in the houses, the smoke resulted in eye problems. Such improvements as waist-high stoves and chimneys were introduced countrywide as solutions to everyday problems. Other innovations, such as improved work clothes and more nutritious food, were also introduced. However, it was not until village women became aware of the problems of the cooking stoves they were using, the inconveniences of their work clothes, and the problems of their daily diet that they started exploring ways for improvement. In other words, the extension workers did not impose the improved cooking stoves from the outset (Sato 2003, 39).

One of the most important factors behind the success of the rural livelihood improvement movement was the dedication of the women who became livelihood extension workers (or "home advisers"). Female home advisers worked together with male farm advisers (agricultural extension workers) in extension programs. According to Mizuno (2003, 24), the purpose of rural life improvement for farm households was to "improve the lives of farm households and foster thinking farmers," through the improvement of livelihood skills of farm households. Behind this was the notion that improvements in both production and livelihood are on equal footing and that solutions to livelihood problems and uplifting of rural livelihood would lead to the advancement of production activities. This can be compared to the production-oriented approach, which argued that improving the existing production would automatically improve the quality of life.

Issue-focused specialists were posted in each prefecture to provide support to livelihood extension workers. This established a system in which specialists in food, clothing, and shelter offered advice to livelihood extension workers. Extension programs were designed by the Ministry of Agriculture, Forestry, and Fisheries, but part of the expense was borne by prefectural governments. For this reason, while unified instructions were issued from the central body, programs unique to each prefecture were also carried out to the extent that the local government budget permitted. Other ministries, such as the Ministry of Health and Welfare (nutritional improvement, birth control, and maternal and child health care) and the Ministry of Education (social education, etc.), also supported the rural life improvement movement. While green bicycles were provided as a means of transportation for rural livelihood extension workers, public healthcare nurses rode on white bicycles.

In terms of the initial results of rural life improvement programs in postwar Japan, there were 5461 home living improvement practice groups as of the end of March 1956. The most

common target of improvement was cooking stoves, followed by the preparation of preserved foods and the making of improved work clothes. For example, according to the results of the 1956 national survey on cooking stove improvement, 2.2 million households (38% of all farm households) had already improved their cooking stoves, 1.58 million households (27%) had improved their cooking stoves after the introduction of the rural life improvement movement, and 1.47 million households (25%) were planning to improve their cooking stoves within one year (Mizuno 2003, 26).

This approach has been introduced in several developing countries in Latin America and Africa as well as Asia (APO 2003; Instituto de Desarrollo 2013; JICA 2013a). In particular, eight Central American and Caribbean countries (Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and Panama) assimilated the approach to the extent that they have promoted networking in the region for better dissemination of knowledge. The Dominican Republic has gone so far as to establish a government bureau to promote coordinated efforts for better regional development (JICA 2013a, 2015).

4.4.2 Case 4.4: Learning for Inclusive and Innovative Growth in Incubating Inclusive Business: One Village One Product (OVOP) Initiatives

The One Village One Product movement began in 1979 in the Japanese Prefecture of Oita (population 1.23 million). The area was going through difficult economic times that resulted in many young people leaving. In light of this, OVOP was actively used to promote economic progress.

The original concept was to encourage local areas to create and sell special products in their communities. OVOP was based on the idea of local initiatives, which depend on the energy, creativity, and desire of local citizens using local resources to restore their economies. To achieve global recognition, the quality of local products must meet internal and international market standards. Thanks to the constant efforts of local communities, many new products from Oita were brought to market, revitalizing the economy there. Rather than award subsidies to local areas (something that had been found to reduce the spirit of independence in other parts of the country), the prefecture's government encouraged each community by providing technical assistance (to improve production quality), market research, and advertising. To increase sales, the Oita One Village, One Product Corporation was set up to assist and identify new markets. This type of initiative could be considered as a potential model for incubating and promoting inclusive businesses[10] and clusters.

The three principles of the OVOP movement are (1) the creation of globally acceptable products and services based on local resources, (2) self-reliance and creativity, and (3) human resource development. Kurokawa et al. (2010, 7) state that "The feature common to all three is an emphasis on local ownership." They further explain: "The first principle is best expressed through the motto 'think globally, act locally.' Local residents are expected to create globally marketable products and services that embody people's pride in the material and cultural richness of their home areas. The 'story' behind any product or its development helps to attract consumer attention. Such homegrown flavor adds value to local products while the use of local human and material resources helps to make economic activities sustainable." In the OVOP movement, self-reliance and creativity are considered crucial in the development of marketable products and services, since local knowledge and instinct can aid in the discovery of local "buried treasures." Everything local is potentially valuable, but whether that potential becomes a reality depends on the initiative and effort of local people.

As such, learning to learn could be considered one of the core elements of OVOP. Haraguchi (2008, 12) emphasizes that the process of interactive learning in their activities makes OVOP an

effective and sustainable rural development method. He states that "For OVOP farmers, delivering their products to markets is not the end process of their production activities. It goes beyond, to the extent that it involves having direct interaction with retailers and consumers, obtaining feedback on product quality, prices and production volumes for continuous improvement." This learning dimension appears to be similar to that of SHEP, discussed above.

Haraguchi further states that

> To enhance their learning capabilities, some OVOP farmers have strengthened their ties with consumers by having their own cooperative shops and restaurants, which serve dishes using their products. These venues allow producers to interact with consumers and also provide opportunities to directly receive comments on their products, which helps to increase added value and promote their products by introducing innovative dishes made with their products. The feedback from customers is pooled together and shared within a producer group for joint learning and continuous improvement of products and marketing.

Haraguchi (2008, 14–15) concludes that, "In essence, taking part in the multiple stages along a value chain from production of raw materials, processing, selling and servicing, OVOP producers can maximize their learning opportunities … Moreover, such comprehensive information, together with their direct experience in different stages of a value chain, helps them to generate new ideas. By enhancing learning opportunities in their activities and sharing ideas among members of an OVOP group, they constantly work toward the goal of reaching a better marketing mix."

The Thai government launched the official One Tambon One Product (OTOP) Development Policy in 2001 as a measure to revitalize and diversify the rural economy as a part of its national economic restructuring. OTOP, like OVOP, aims to encourage the development of rural economies through the use of local resources with community members' participation. Although OTOP was a top-down approach compared to OVOP's bottom-up approach, some important impacts have been acknowledged. For example, Wattanasiri (2005) stated that "The benefits of OTOP have not only been economic. Local community leadership and pride have also grown as a result." As knowledge of local conditions is only available at the local level, the role of OTOP subcommittees under the auspices of the Ministry of the Interior in facilitating the process of decentralization has been crucial (Kurokawa et al. 2010, 13).

Malawi introduced the OVOP approach in 2003. It was the first country to do so in sub-Saharan Africa. It was expected to support the economic empowerment of rural communities and contribute to attaining the Millennium Development Goals (MDGs) through helping to add value to local raw materials and promote import substitution wherever it could be achieved efficiently (Kurokawa et al. 2010, 20). In 10 years, the number of participants in OVOP in Malawi increased to 28,000 (more than 100 groups).[11]

Note that OVOP initiatives are inclusive not only because community members' participation in its activities is overwhelming but also for the significant participation of women. Nearly 90% of OTOP members in northeast Thailand were women, and in Malawi and Japan, a large number of women are members of OVOP groups (Kurokawa et al. 2010, 38). Based on the experiences of Japan and other countries, OVOP initiatives have been introduced in many Asian, African, and Latin American countries.

4.4.3 Case 4.5: Learning for Inclusive and Innovative Growth Through *Kaizen*, Just in Time (JIT), Total Quality Management (TQM), and Beyond, in Japan, the United States, Thailand, and Other Countries

4.4.3.1 Experiences in Japan[12]

Most Japanese manufacturing companies implemented quality and productivity initiatives for the first time after Dr. William Edwards Deming, a

U.S. statistician and consultant, gave a series of lectures on the statistical process control of production and quality for hundreds of Japanese engineers and managers in 1950. Only a few Japanese companies, such as Toyota, were aware of the importance of the U.S.-derived statistical control of quality before Dr. Deming came to Japan in 1947. He came at the request of the U.S. Armed Forces to assist in the planning of Japan's National Census, to be carried out in 1951. Accordingly, Japanese companies first introduced the statistical quality control (SQC) approach, which was developed from the U.S. practice of sampling and inspecting products in order to eliminate defective ones. Efforts were made to reduce the rate of defective products, or to improve yield rates (known in Japan as *budomari*). The quality control (QC) processes to attain these goals also improved productivity at the same time.[13]

4.4.3.2 Quality Control Circles with *Kaizen*: An Effective Approach to Learning to Learn at the Front Line

The Japanese way of QC was gradually consolidated when it was applied at the factory floor level. Instead of the top-down approach common in the United States and other countries, a bottom-up approach was adopted in Japan. A team commonly known as the quality control circle (QCC) is either organized spontaneously or follows the guidance of QC specialists in many Japanese companies. Several workers (normally more than three and up to ten) from the factory floor participate in each QCC. They identify the causes of defective products and possibilities for improving products or production methods. According to Ishikawa (1990),[14] the basic philosophy of QC circle activities carried out as part of companywide quality control activities is (1) to contribute to the improvement and development of the corporate culture, (2) to create cheerful workplaces that make life worthwhile and where humanity is respected, and (3) *to exercise people's capabilities and bring out their limitless potential*" (Ishikawa 1990, 78–79; italics added). Here we find exactly what Stiglitz and Greenwald (2014) emphasized regarding the real meaning of inclusive growth, which is intrinsically innovative growth in the sense that "*it is a waste of a country's most valuable resource, its human talent, to fail to ensure that everyone lives up to his or her abilities*" (Stiglitz and Greenwald 2014, 468; italics added).

The number of QCCs registered at the Union of Japanese Scientists and Engineers (JUSE) increased from 50,000 in the mid-1970s to 420,000 in 2001. The number of participants of QCCs increased from 500,000 to 3,200,000 during the same period (DBJ and JERI 2003, 59). Together with QCCs, many Japanese methods of quality and productivity improvement have been developed and continuously improved. One of the most widely implemented in Japan is known as "5S," which consists of *seiri*, *seiton*, *seiso*, *seiketsu*, and *shitsuke*; these terms stand for, respectively, sort, set in order, shine, standardize, and sustain.[15] Today, 5S is considered to be an effective and smooth entry point to *Kaizen*, a Japanese approach of continuous improvement for quality, productivity, and beyond. *Kaizen* is a Japanese concept that can be translated, literally, as "improvement" or "continuous improvement." It is not easy to define *kaizen* in a strict sense, since it corresponds to evolving initiatives and activities in the quality and productivity areas and can be adapted very flexibly to the context of each factory floor. Several methods, including 5S, are commonly practiced by teams like QCCs.

4.4.3.3 Total Quality Management: An Effective Approach to Organizational Learning

The Japanese way of QC was gradually scaled up from the factory floor level to the whole company. QC was introduced to cover design, marketing, after-service, purchase of materials and machinery, and other company departments. At the same time, all company employees, including managers, engineers, supervisors, office-workers, and frontline factory workers, participated in QC. This bottom-up holistic approach developed in Japan is called the Japanese-type *companywide*

quality control (CWQC) or *total quality control* (TQC).

Total quality management (TQM) is a kind of management system and strategy based on CWQC or TQC, and it was widely promoted in the 1980s. However, the term TQM was first used in the United States when US companies learned TQC from Japan. In 1996, Union of Japanese Scientists and Engineers (JUCE) decided to substitute TQC and move to TQM (Fujimoto 2003, 302). The *Handbook for TQM and QCC*, edited by the Development Bank of Japan and the Japan Economic Research Institute (DBJ and JERI 2003, vii), explains that "Total Quality Management includes a number of management practices, philosophies and methods to improve the way an organization does business, makes its products, and interacts with its employees and customers. Kaizen (the Japanese word for continuous improvement) is one of those philosophies." According to this handbook, "The success of Japanese business in Canada, Latin America, and the United States as well as in Europe is attributable to TQM, a concept now widely practiced throughout Asia."

4.4.3.4 Impacts of TQC/TQM and Creation of a Learning Enterprise

One of the significant impacts of Japanese TQC/TQM is often explained through descriptions of the development of the car industry after the oil crises in the 1970s. During this period, TQC was extended to activities for energy conservation and measures for resource maintenance. It greatly impacted various industries and became more securely established as a valuable quality framework for Japanese industrial development.

The Toyota Production System (commonly called TPS) can be considered one of the most systematic and advanced Japanese TQC or TQM systems. As Liker (2004, 4), the author of *The Toyota Way*,[16] stated, "Toyota invented 'lean production'—also known as 'the Toyota Production System' or TPS—which has triggered a global transformation in virtually every industry to Toyota's manufacturing and supply chain philosophy and methods over the last decade." He further states that "TPS is often known as 'lean' or 'lean production,' since these were the terms made popular in two best-selling books: *The Machine That Changed the World: The Story of Lean Production* (Womack et al. 1990) and *Lean Thinking* (Womack and Jones 1996). These authors make it clear that the foundation of their research on lean production is TPS and its development by Toyota" (Womack et al. 1990, 3–4; Liker 2004, 15).

In the 1990s, through the work of the Massachusetts Institute of Technology's (MIT's) International Motor Vehicle Program (IMVP) and the above-mentioned best-selling works based on the MIT research, "the world manufacturing community discovered 'lean production'—the authors' term for what Toyota had learned a decade earlier through focusing on speed within its supply chain: *shortening lead time by eliminating waste in each step of a process leads to best quality and lower cost, while improving safety and morale*" (Liker 2004, 25; italics in original). The idea of shortening the lead time by eliminating waste in each step is related to the concept of Just-in-Time (JIT). "Simply put, JIT delivers the right items at the right time in the right amounts. The power of JIT is that it allows you to be responsive to the day-by-day shifts in customer demand, which was exactly what Toyota needed all along" (Liker 2004, 23).

Liker (2004) highlighted the importance of learning in TPS: "I believe Toyota has raised continuous improvement and employee involvement to a unique level, creating one of the few examples of *a genuine learning enterprise in human history*—not a small accomplishment" (Liker 2004, xv; italics added). He further states: "The highest level of the Toyota Way is organizational learning. Identifying root causes of problems and preventing them from occurring is the focus of Toyota's continuous learning system" (xvi). This concept of learning enterprise is similar to the exploration by Stiglitz and Greenwald (2014, 88) of the learning firm that, together with a learning macro-environment, constitutes a critical aspect of learning architecture.

The importance of the learning firm is emphasized by them "because so much learning occurs within organizations and because so much knowledge resides within firms." Related to this view is that of Nonaka et al. (2008, 3), who stated, "We need a theory of the knowledge-based firm that can explain how firms perceive and interpret realities, interact with various players both inside and outside the organization, and synthesize various subjective interpretations into a collective knowledge that becomes objectified and validated as a universal knowledge asset of the firm."

4.4.3.5 Experiences in the United States

DBJ and JERI (2003, 46–47) summarized the TQM dissemination process in the United States as follows.[17] During World War Two, the U.S. Army and Navy actively introduced quality control to maximize their military hardware production. The American National Standards Institute (ANSI) established military standards and conducted seminars to disseminate those ideas. Yet in the 1970s, U.S. industry was losing its competitiveness in the world market.

In 1980, an NBC broadcast coined a famous saying: "If Japan can, why can't we?" The program concluded that Japanese success was attributed to the teachings of Deming and Japanese adherence to his principles (Anschutz 1995, 17). Prior to this broadcast, Deming had not been widely recognized, yet the broadcast provided the springboard to a wider and far more receptive U.S. audience for Deming's ideas. Soon after the broadcast, the U.S. government started its catch-up movement under the Reagan presidency. TQM was introduced by the Ford Motor Company, and many others followed. Later, President Reagan established the Malcolm Baldrige National Quality Award in 1987, aiming to expedite quick recovery actions to go beyond the quality level that Japan had achieved by the year 2000.

Late in 1986, MIT convened its first commission on a major national issue since World War Two, the Commission on Industrial Productivity. The goals of the study were to address the decline in U.S. industrial performance, then perceived to be so serious as to threaten the nation's economic future (Dertouzos et al. 1989, xiii). The sixteen commissioners were all members of the MIT faculty. The ultimate aim was to formulate a set of recommendations that would help the nation to sustain strong growth in productivity (Dertouzos et al. 1989, 3). The Commission's report, *Made in America: Regaining the Productive Edge*, found that an area in which U.S. firms often lagged behind their overseas competitors was in exploiting the potential for continuous improvement in the quality and reliability of their products and processes (Dertouzos et al. 1989, 74). The report noted that "The cumulative effect of successive incremental improvements and modifications to established products and processes can be very large and may outpace efforts to achieve technological breakthroughs." It further states that, "In the long run, technological progress rests on a foundation of both incremental improvements and radical breakthroughs, and finding the right balance between them is a constant challenge. Branscomb (1987, 74) has suggested that Japanese firms have been more effective in combining the two approaches."[18]

On the other hand, Womack et al. (1990, 3–4) discussed the motivation for engaging in the above-mentioned research of MIT's International Motor Vehicle Program (IMVP):

> We concluded that the auto industries of North America and Europe were relying on techniques little changed from Henry Ford's mass production system and that these techniques were simply not competitive with a new set of ideas pioneered by the Japanese companies, methods for which we did not even have a name … [T]he Western companies didn't seem to be able to learn from their Japanese competitors. Instead, they were focusing their energies on erecting trade barriers and other competitive impediments, which we thought simply delayed dealing with the real issue … [W]e feared that North America and Europe would seal themselves off from the Japanese threat and, in the process, reject the opportunity for the prosperity and more rewarding work that these new techniques offer. We felt that the most constructive step we could take to prevent this development from occurring would be to undertake a detailed study of the new Japanese techniques, which we

> subsequently named "lean production," compared to the older Western mass-production techniques.

However, TQM was not well organized when it first was disseminated in the United States, according to DBJ and JERI (2003, 47):

> Dr. J. M. Juran mentioned that only gradually did it become clear to upper-tier managers that the quality leadership could not be achieved by a pecking away—by merely bringing in this or that tool or technique. They learned that, instead, it was necessary to apply the entire array of quality knowhow (the quality disciplines) throughout the entire company, to all functions and at all levels of all departments in a coordinated way. At the outset there was no agreed standardized definition for TQM. As a result, the concept of TQM became a blur among companies and even in the general literature. This confusion has since been reduced by the publication of the criteria used by the National Institute of Standards and Technology, which was used to evaluate the applications for the United States Malcolm Baldrige National Quality Award (Baldrige Award). By the early 1990s, this wide exposure had made the Baldrige Award criteria the most widely accepted definition of what is to be included in TQM.

In this regard, Stiglitz and Greenwald (2014, 38) made an important observation. They discussed what is suggested by the performance of the U.S. manufacturing sector between the 1970s and early 1980s, on one hand, and the late 1980s and 1990s, on the other hand. Between these two periods, the annual rate of growth of U.S. manufacturing productivity rose by 2.0% from 0.9 to 2.9%. The improvement coincided with a marked rise in the U.S. real interest rate (normally associated with *less* investment in technology) and government deficits, a decline in U.S. research and development spending, and no detectable improvement in the performance of U.S. education (as measured by standardized tests). At the same time, it cannot be attributed to the availability of new technology. Such technology would have been equally available to other G7 economies. Over the period in question, the U.S. improvement in annual manufacturing productivity growth was 1.9% higher than that of the other G7 countries. The improvement was thus a U.S., not a global, phenomenon. What seems to have changed in U.S. manufacturing was an intensified focus on improved operations management through the rigorous implementation of procedures such as benchmarking, total quality management, and reengineering—in our language, an intensified focus on learning. America seemed to have learned how to learn. Stiglitz and Greenwald (2014, 528) further noted that, "interestingly, some of the learning involved learning from foreign firms, e.g., about quality circles and just in time production."

Regarding the car industry, the MIT IMVP study referred to above found that the US companies improved car assembly productivity from 24 man-hours/car unit to 20 between 1989 and 1993/1994, while Japanese companies improved from 16 man-hours/car unit to 15 in the same period, confirming the catch-up process of the US car industry to its Japanese counterpart (Fujimoto 2003, 283).

These experiences confirm that the learning process has been closely related to approaches such as TQM also in the United States. Together with experiences in Japan, this provides insights into effective approaches to create learning firms and learning societies, which are the drivers for good growth in quality.[19]

4.4.3.6 Experiences in Thailand and Other Developing Countries

JICA's full-fledged assistance in kaizen, quality, and productivity dates back to 1983 when it started to support the Singapore Productivity Development Project (SPDP) (see Chap. 3). Over about three decades, different kinds of cooperation activities to introduce kaizen were carried out by JICA in around fifty countries. Activities related to kaizen have been widely developed in Asia through the efforts of, among others, the Asian Productivity Organization (APO), Japan Productivity Center (JPC), Union of Japanese Scientists and Engineers (JUSE), the Overseas Human Resources and Industry Development Association (HIDA; formerly Association of Overseas Technical Scholarship, AOTS), and JICA. In Africa, several kaizen and related initiatives have been implemented (Shimada 2015).

In Asia, Japanese assemblers also played "a crucial role in the development of automobile production and supporting industries" (Techakanont 2015, 204). For example, the Toyota Production System (TPS) has been introduced in Thailand:

> Toyota facilitated interfirm knowledge-sharing through supplier associations, knowledge-transfer consultants and small-group learning teams (Dyer and Nobeoka 2000). Toyota created the Toyota Cooperation Club (TCC) and established a training center in 1982, when they had around thirty-five suppliers. This number increased to more than 160 members (as first-tier suppliers) in 2014. The TCC organized activities to increase capabilities in the TPS. It shared explicit and tacit knowledge on its System through company visits by Toyota's trained consultants. As a member, suppliers received free consulting services. Experts at Toyota Thailand also provided TPS training to parts manufacturers in other ASEAN countries. Another initiative was the coordination of learning activities in small groups, intended to encourage suppliers to learn and share specific tacit knowledge with each other. (Techakanont 2015, 205)

One of the largest public–private supplier development efforts, apart from private initiatives such as Toyota's, was the Thailand Automotive Human Resource Development Project (AHRDP) for first-tier and second-tier suppliers, which ran from 2006 to 2010. It was implemented with the support of JICA and four Japanese companies, including Toyota, which provided TPS training. In total, 233 SMEs and 7151 workers participated in AHRDP. According to Techakanont (2015), a poll of 200 case studies conducted by the Thai Automotive Institute (TAI) on the results of the AHRDP revealed that, on average, suppliers were able to improve productivity by 30–50%, reduce work-in-process inventory by 25–75%, and free up 30–50% of factory space (206–207).

Recent studies analyzed the effectiveness of *Kaizen* to facilitate the participation of local firms in global value chains (GVCs). Today, GVCs' share of world trade has increased to about 50%. Developing countries may derive benefits from participation in GVCs. The following remarks from the World Development Report 2020 are highly relevant in this regard: "In contrast to 'standard' trade carried out in anonymous markets, GVCs typically involve long-term firm-to-firm relationships. The relational nature of GVCs makes them a particularly powerful vehicle for technological transfer along the value chain. Firms have shared interests in *specializing in specific tasks, exchanging technology, and learning from each other*" (World Bank 2019, 70; Italics added). Due to these characteristics of GVCs, Kaizen could provide an effective vehicle for local firms to participate in GVCs: As Hosono et al. (2020) state: "the firms that persisted in the implementation of *Kaizen* appear to have moved up the value chain in the automotive sector" in Mexico and South Africa (20).

In short, through diverse experiences in many countries, it has been demonstrated that *Kaizen* and related initiatives can be put into practice in a variety of cultural and socioeconomic settings, not just some peculiarly Japanese characteristics (Ueda 2009, 63; Hosono 2009b, 29–36; Shimada 2015, 111–113).

4.5 Concluding Remarks: Lessons from Case Studies

We can identify several common features from the "learning to learn" perspective in the five cases discussed above, despite their diversity. The common features are, among others: (1) there are easy entry points to the learning process; (2) the costs and risks are low; (3) the focus is on learning by doing and mutual learning to co-create innovative solutions; (4) learning makes an intrinsic contribution to the objective, be it livelihood improvement, inclusive business, quality and productivity improvement, incremental innovation, and so on. Each of these is examined in greater detail below.

4.5.1 Easy Entry Points for Commencing the Learning Process

In the case of SHEP, at the research station, a certain level of technological know-how had

already been achieved. A preexisting knowledge base was already there—the issue was how to validate existing technologies from the farmers' perspective and put them to practical use. Based on this understanding, SHEP focused on the introduction of techniques that were immediately usable the moment they were learned. The project made sure that the techniques would be applicable and compatible with the materials and techniques already existing locally. In the case of LGED, the characteristics of rural infrastructure, such as its relatively small scale and comparatively low risk, enabled LGED to distinguish project success and failures within a short time and to adopt new technologies, contributing to learning and the further development of the knowledge base. In the case of the livelihood improvement approach, the most typical targets of improvement in Japan and other Asian countries were the construction of simple water supply systems, communal cooking and childcare during the peak agricultural season, improvement of cooking stoves and toilets, preparation of preserved foods, and the making of improved work clothes. In OVOP initiatives, local people and their groups have been encouraged to "self-discover" promising local products and start selling in local markets. In kaizen initiatives, the first activities are normally 5S strategies, which could be performed by any worker.

4.5.2 Low Cost and Low Risk

We need to take into account two types of costs. The first aspect is the cost of acquiring knowledge and technology. The second aspect is the cost of implementing activities (running costs) and other costs, such as new investments (start-up costs). In all five cases, knowledge and technology were free public goods. The cost of implementing activities in all five cases was almost nil or very low. The lowest-cost activities among the five cases were those of livelihood improvement, and at the same time, almost no risk was implied. In SHEP, the risk was lowered by market research undertaken by the farmers themselves. Farmers were able to apply techniques provided for free. OVOP activities were able to be initiated with few substantial investments, and costs were low because only the reasonable costs of production of local goods and services were needed. Kaizen and related initiatives normally do not imply significant investment, because 5S and other activities only require modifications to the organization, workflow, and so on, in spite of significant effects on quality, delivery, and productivity.

4.5.3 Learning by Doing, Mutual Learning, and Co-creation of Innovative Solutions, Strengthening Cognitive Skills and Capacity of Learning to Learn

As Stiglitz and Greenwald (2014, 52) state, "we learn by doing." In all five cases, individuals and organizations learned to learn through learning from others, or mutual learning, and they co-created innovative solutions to issues they needed to address. In the case of SHEP, farmers based their decisions on their own marketing survey, a process that may have strengthened farmers' cognitive capacities as well as their motivation. Farmers have been able to learn to learn. In the case of LGED, mutual learning through interaction among stakeholders was vital for a clear understanding and identification of local needs. At the same time, this enables local knowledge and resources to be identified and innovative solutions to be developed in partnership with local beneficiaries. This case illustrates the importance of mutual learning and trust for discovering locally appropriate innovative solutions to meet the needs of beneficiaries and stakeholders.

In the case of livelihood improvement, rural women themselves were encouraged to actively take part in identifying problems in their own living conditions, setting issues, formulating living improvement plans, and so on. As such, this initiative was not just about the improvement of livelihood, but a learning process, particularly to enhance the capacity of learning to learn. In

the case of OVOP, participants and their groups, can maximize their learning opportunities by taking part in multiple stages along a value chain, including production of raw materials, processing, marketing, and servicing. Such comprehensive knowledge based on experiences of learning by doing and mutual learning has helped them to generate new ideas and innovative products. By enhancing learning opportunities in their activities and sharing ideas among members of an OVOP group, they constantly work toward reaching a better marketing mix.

In the case of kaizen and related initiatives, quality control circles could be considered an effective approach for front-line workers to contribute to and receive the benefit of mutual learning through kaizen activities and to enhance the learning capacity to learn. Total quality management could be considered an effective approach to organizational learning. These approaches ensure that everyone lives up to her or his abilities and enables genuine inclusive and innovative growth.

4.5.4 The Impact of Learning on Innovative Solutions, Inclusive Business, Quality, Productivity, and Beyond

In the five cases studied, learning contributed, in diverse ways, to co-creating innovative solutions, starting up new industries through inclusive business, and industrial development through the continuous improvement of quality and productivity as well as incremental innovation. The livelihood improvement initiatives and LGED are cases where mutual learning facilitated the creation of innovative solutions to challenges that rural farmers faced. Learning is essential in incubating inclusive business, and enabling innovative and inclusive growth, as we observed in the cases of SHEP and OVOP initiatives.

Learning also contributes to productivity as well as quality and innovation. As the World Bank (2015, 128) states, increasing productivity is central to raising living standards, and productivity growth can arise either from augmenting the factors of production—human capital, physical capital, and technology—or from making better use of existing factors. "Learning" contributes to productivity growth in both ways. First, learning enables new and innovative ways to make more efficient use of existing endowments. Second, learning—especially learning to learn—through enhancement of learning capacity as the most important endowment contributes to changing comparative advantage, thereby enabling industrial transformation. Table 4.2 compares the different approaches mentioned above with the conventional technological transfer approach through the lens of learning.

4.6 Further Discussion (4.1)

4.6.1 Kaizen, Learning, and Innovation for Quality Growth

In this note, I elaborate on the relationship between Kaizen (including related approaches), learning, and innovation for the achievement of the SDGs and quality growth.[20]

4.6.1.1 Kaizen as a Participatory and Inclusive Approach

Much of the literature on *Kaizen* concurs that the utmost goal of *Kaizen* is the improvement of quality and productivity. For example, JICA's brochure, "*Kaizen* as a 'Japan brand ODA'," states that *Kaizen* is Japan's approach towards improved quality and productivity (JICA 2016). However, it should be emphasized that *Kaizen* is distinctive in its approach to improving quality and productivity and that there are other approaches to improving productivity. For example, employers typically turn to monetary incentives: performance pay, bonuses, or the threat of dismissal (World Bank 2015, Ch. 7). Nevertheless, any increase in productivity resulting from these approaches over a short period is normally not accompanied by learning. Where *Kaizen* differs from these approaches is in its process for achieving better quality and

Table 4.2 Comparison of different approaches to enhance learning capacity

	Conventional technology transfer	Capacity development (CD) approach	Livelihood improvement initiatives (individuals)	One Village One Product initiatives (groups and individuals)	*Kaizen, QCCs, JIT, TQM*, and related approaches (organizations)
Learning	Filling techno-logical gap, without learning	Mutual learning and cocreation of innovative solutions, addressing specific challenges	Mutual learning and cocreation of innovative solutions, achieving livelihood improvement	Mutual learning and cocreation of innovative solutions, incubating and promoting inclusive business	Mutual learning and cocreation of innovative solutions improving quality, productivity, and attaining incremental innovation
Learning to learn	No learning to learn is expected	Not always focusing on learning to learn	Focusing on learning to learn	Focusing on learning to learn	Focusing on learning to learn
Local conditions	Not considered	Fully considered	Fully considered	Fully considered	Fully considered
Inclusiveness and easy application	Not considered	Fully considered	Fully considered	Fully considered	Fully considered
Cost and risk	Relatively high	Relatively low	Very low	Low	Low
Implementing organizations		Donors including JICA	Asia and Latin America by JICA	Asia, Africa and Latin America by JICA and JETRO	Asia, Africa and Latin America mainly by JICA, APO, JPC, and HIDA

Note JETRO: Japan External Trade Organization; APO: Asian Productivity Organization; JPC: Japan Productivity Center; HIDA: Overseas Human Resources and Industry Development Association
Source Author

productivity through its distinctive focus on inclusive and participatory learning. Stiglitz and Greenwald (2014) contend that, "if it is true that productivity is the result of learning and that productivity increases (learning) are endogenous, then a focal point of policy ought to be increasing learning within the economy" (5–6).

The Asian Productivity Organization (APO), an inter-governmental organization committed to improving productivity in the Asia Pacific region, explains that the inclusiveness of the *Kaizen* process is centered around improvement efforts through the participation of all. Its "Handbook of Productivity" asserts that "Kaizen means improvement and encompasses the concept of never-ending efforts to improve by all of the people working in an organization." "Problem-solving in the kaizen approach is cross-functional, systematic, and collaborative." "It is a strategy that puts every member of the organization, from top management down, continuously on the watch for improvement options" (APO 2015, 9–10). JICA (2016) succinctly states that *Kaizen comprises* "an incremental effort starting from small steps involving all individuals from top managers to those working on the factory floor. However, commitment from the top management is essential."

4.6.1.2 Kaizen, Learning, and "Genuine" Inclusive and Innovative Growth

The next question concerns how *Kaizen* can facilitate learning. To answer this, we need to discuss the determinants of learning and how *Kaizen* is related to them. Referring back to the

Stiglitz and Greenwald work that I cited at the beginning of this chapter, the authors identified the following major determinants of learning: (1) learning capabilities; (2) access to knowledge; (3) catalysts for learning; (4) creating a creative mindset, or developing the right cognitive frames; (5) contacts—people with whom one interacts—who can catalyze learning, help create the right cognitive frame, and provide crucial inputs into the learning process; and (6) the context of learning (Stiglitz and Greenwald 2014, 56–57). They further argue that, "Just as *knowledge* itself is endogenous, so is the ability to *learn*. Some economic activities (conducted in certain ways) not only facilitate learning, they may facilitate *learning to learn*" (50; italics in original).

Kaizen tools/methodology and process bear a close relationship to the above-cited determinants of learning and, in particular, learning to learn. As JICA (2016) emphasizes, the *Kaizen* process (1) changes the mindsets of managers and workers; (2) fosters personnel who can think and act themselves; and (3) solves problems as a team, thereby promoting teamwork. This learning process is most visible in the activities of QC Circles (QCC). As stated in the second paragraph of Case 5, "[T]he basic philosophy of QC Circles is (1) to contribute to the improvement and development of the corporate culture, (2) to create cheerful workplaces that make life worthwhile and where humanity is respected, and (3) *to exercise people's capabilities and bring out their limitless potential*" (Ishikawa 1990, 78–79; italics added). Here we find exactly what Stiglitz and Greenwald (2014) emphasized regarding the real meaning of inclusive growth, which is intrinsically innovative growth in the sense that "*it is a waste of a country's most valuable resource, its human talent, to fail to ensure that everyone lives up to his or her abilities*" (468; italics added).

4.6.1.3 Kaizen and Innovation

The relationship between *Kaizen* and innovation deserves special attention, because it can help us to understand how *Kaizen* contributes to productivity through innovation, together with diverse *Kaizen* tools and methods. In this regard, we need to first discuss how *Kaizen* differs from the widely accepted notion of "innovation."

Imai's (1986) views on the difference between *Kaizen* and "innovation," as defined by him, are well known. This view could be summarized as follows: While the effect of *Kaizen* is long-term and long-lasting but undramatic, "innovation" is short-term and dramatic. *Kaizen* is attained by small steps through a continuous and incremental process. "Innovation," on the other hand, is attained by big steps with an intermittent and non-incremental process. *Kaizen* is based on group efforts and a systems approach, while "innovation" is based on individual ideas and efforts. And even as *Kaizen* depends on conventional knowhow and state of the art changes, "innovation" depends on technological breakthroughs, new inventions and new theories. Finally, *Kaizen* requires little investment but great efforts to maintain it, in comparison to "innovation," which requires a large investment, but little effort is required to maintain it. This comparison, emphasizing the difference between *Kaizen* and "innovation," is widely known, most probably because it very clearly shows the main characteristics of *Kaizen*.

However, we need to recognize there are many definitions of innovation. In his comparison, Imai refers to innovation as radical and dramatic. However, innovation can also be incremental (JICA 2018, 9 of Part 1). Moreover, the effect of incremental innovation may be comparable, especially in the long-term, to that of radical or breakthrough innovation. As noted in *Made in America*, a report of the MIT Commission on Industrial Productivity, the cumulative effect of successive incremental improvements and modifications to established products and processes can be very large and may outpace efforts to achieve technological breakthroughs. It further states that, in the long run, technological progress rests on a foundation of both incremental improvements and radical breakthroughs, and finding the right balance between them is a constant challenge (see Case 5 of this chapter).

The *Kaizen Handbook* (JICA 2018) notes that, more recently, some people have begun to associate *Kaizen* with incremental innovation (10 of Part 1). The relationship between *Kaizen* and innovation could be more comprehensively analyzed with the use of "function of innovation," which captures the extended concept of innovation, and presents a new approach to open the black box of innovation in the context of Cirera and Maloney's (2017) *Innovation Paradox*. The *Kaizen* mindset and many of the *Kaizen* tools can be considered effective innovation inputs. The *Kaizen Handbook* argues that the *Kaizen* mindset, by itself, enhances the capability of the firms, enabling them to take innovative actions, experiment with alternatives, adopt new technology and, hence, achieve innovative outputs (10 of Part 1). However, we recognize that further studies are still necessary to explore the relationship between *Kaizen* and innovation.

4.6.1.4 Kaizen and Sustainable Growth

A core method of *Kaizen* is to eliminate *muri* (overloading), *muda* (waste), and *mura* (inconsistency) from the worksite through the efficient utilization of labor, materials, and equipment. As such, the concept of environmental sustainability is intrinsically incorporated into *Kaizen*, TQM and related approaches from the beginning. In Japan, these approaches have focused more on activities for energy conservation and measures for resource management in the post-oil crises period. In this regard, the "Total Energy Management Handbook" prepared in 2005 by the Energy Conservation Center Thailand (ECCT) and Energy Conservation Center Japan (ECCJ), puts stress on such items as motivation techniques, energy conservation attitudes and small group activities (SGA) including TQM, all contributing to energy conservation through the participation of all the people working together (ECCT and ECCJ 2005, 4). The Asian Energy Efficiency and Conservation Collaboration Center (AEEC) was established by ECCJ in 2007. There have also been many initiatives to mainstream environmental sustainability in *Kaizen*, TQM, and so forth. For example, APO started to promote 'green productivity' by focusing explicitly on environmental improvement.

It should also be highlighted that the widespread dissemination of *Kaizen*, QCC, TQM and related approaches have contributed significantly to the sustainable growth of Japan since the 1970s. The extensive dissemination of these approaches coincided with the era following the first oil crisis. In Japan, public awareness of environmental issues gradually grew during the 1960s as air and water pollution worsened with accelerated industrialization. The subsequent 1973 oil shock was a major turning point in that it forced Japanese companies and the general public to take measures for improving energy efficiency. As DBJ and JERI (2003) emphasize, "One of the significant impacts of Japanese TQC/TQM is often explained through descriptions of the development of the car industry after the oil crises in the 1970s. During this period, TQC was extended to activities for energy conservation and measures for resource maintenance. It greatly impacted on various industries and became more securely established as a valuable quality framework for Japanese industrial development" (46).

According to *General Energy Statistics* published by Japan's Agency for Natural Resources and Energy (2005), energy efficiency in Japan improved 37% between 1973 and 2003. In this period, total energy consumption in the industrial sector has stayed at the same level (around 180 million kiloliters of crude oil equivalent), while real GDP doubled (from 250 to 520 trillion yen). The Energy Conservation Law, incentives offered by the government, company investments in energy-saving equipment and technologies, as well as their efforts through Kaizen-based QC activities, TQM and related approaches are likely to have enabled these achievements.

4.6.1.5 Kaizen and Secure Growth

The APEC Growth Strategy included 'secure growth' as an attribute of the quality of growth and stated: "We seek to protect the region's citizen's economic and physical well-being and to provide the secure environment necessary for

economic activity" (APEC 2010, 9). Secure working conditions are explicitly and implicitly included among the basic aims of 5S, elimination of *muri* and *mura*, as well as related approaches. As such, *Kaizen* aims to upgrade quality and productivity, improving the security and safety of workers at the same time. A study on the impacts of a Kaizen project implemented in eight countries in the Central America and the Caribbean Region found that the introduction of *Kaizen* improved working conditions and strengthened the social capital of workers (Shimada and Sonobe 2018).

Kaizen could contribute to the improvement of medical care services and human security when it is applied to the health sector, especially hospitals. As an example, I elaborate on the case of "Kireina Byouin" ("Clean Hospitals" in Japanese) program in Sri Lanka, Tanzania, and other African countries. Tanzania became a pioneer in introducing *Kaizen* and Total Quality Management (TQM) in hospitals. Building on the inspiration gained from Sri Lankan best practice, and witnessing the visible changes in the first pilots at Mbeya Referral Hospital (MRH), the Ministry of Health and Social Welfare (MoHSW) of Tanzania officially adopted the 5S-Kaizen-TQM approach to provide the core of the national quality improvement program as part of the National Health Sector Strategy. With many specific initiatives of MoHSW, this approach has started to take root in a number of hospitals in Tanzania.

As of September 2012, some 56 hospitals—including all national, specialized and regional referral hospitals as well as a number of municipal and district hospitals—have established quality improvement teams (QITs) and have implemented 5S. Of these hospitals, 13 have moved to the second step of *Kaizen*: evidence-based participatory problem-solving actions for service quality improvement. Through the cascade approach, well over 5000 health workers have been trained in 5S. Some of the achievements made through *Kaizen* include reductions of overstocked inventory, reductions in waiting time for patient consultations, increases in hospital incomes through better processing of insurance claims, and reductions in the number of patients developing phlebitis (Honda 2012, 117–119; Takizawa 2013; JICA 2015). This experience demonstrates the effectiveness of the *Kaizen* approach in improving the quality and productivity of health care services.

More than five years of continuous efforts have made Tanzania a center of excellence in quality improvement of hospital care through the application of 5S-Kaizen-TQM in Africa. JICA is working in partnership with Sri Lanka in applying this approach to improve hospital management in over 15 countries in Africa (Takizawa 2013, 259). Several countries have mainstreamed or are in the process of mainstreaming the approach in their strategies and framework of quality assurance for health services. As such, Tanzania emerged as a pivotal country in this approach by providing an example for other African countries to emulate (Honda 2012, 119–120).

4.6.1.6 Summing Up

The case studies of experiences presented here illustrate the application of *Kaizen* in a variety of contexts with significant impact. As *Kaizen* and related approaches do not demand large investments, they enabled the Japanese manufacturing industry to improve productivity and competitiveness during the post-war period, when the availability of funds for investment was severely limited. During the post-1973 oil crisis era, a time when Japanese companies were seriously affected by energy price hikes, *Kaizen* and related approaches were introduced very widely—not only into manufacturing industries but also into finance, insurance, construction, health care, and other sectors. In the United States, improved operational management systems, including TQM, were widely introduced to manufacturing industries. In Singapore and Thailand, where *Kaizen* was introduced—at least into some of the sectors that are leading their economic growth—the increase in productivity was crucial to the transformation of their industrial structure. In Singapore, *Kaizen* and related approaches contributed to the transformation from unskilled labor-intensive industries to skilled labor-

intensive or knowledge-intensive industries. In Thailand, the scaling-up of supporting industries for the automobile industry was facilitated by the development of small and medium parts industries that benefited from, among other things, *Kaizen* and related approaches such as TPS. The competitive automobile industry contributed to the transformation of the industrial structure of the country. Experiences in the hospitals of Tanzania and other African countries clearly demonstrate the possibility of introducing Kaizen and related approaches to sectors other than the manufacturing industry, as has occurred in Japan and other Asian countries. These diverse experiences provide evidence of some other important features of Kaizen and related approaches. For example, they are inexpensive without the need for much investment and are easily applied. The sizable dissemination of QCC in the 1970s and 1980s in Japan was possible because of these features.

Kaizen, TQM, and related approaches are able to contribute to growth—and in particular to high-quality growth—by increasing productivity through learning. They also enable transformation through enhancing learning capacity, especially learning how to learn ("learning to learn" in terms of Stiglitz and Greenwald 2014), the essential endowment for industrial transformation. These approaches are intrinsically inclusive, because they are approaches in which participation and learning by all are essential. They are also able to contribute to sustainable growth because they reduce the use of materials and improve energy efficiency by eradicating *muda*. Such approaches improve security and safety for workers as well through the elimination of *muri*, *mura* and so forth. Therefore, *Kaizen*, TQM, and related approaches can contribute to the achievement of Goals 8 and 9 of SDGs by facilitating—directly and indirectly—quality growth, namely, sustained, inclusive, sustainable, and secure growth, and productive employment and decent work.

Most recently, we observed a series of new initiatives regarding the focus of firms' activities. The New York Times (Aug. 19, 2019) reported that the Business Roundtable, which represents many of America's largest companies, had issued a statement on "the purpose of a corporation." Breaking with decades of long-held corporate orthodoxy, the Roundtable argued that companies should no longer only advance the interests of shareholders. Instead, the group said, they must also invest in their employees, protect the environment, and deal fairly and ethically with their suppliers. They stated that we share a fundamental commitment to all of our stakeholders. In December 2019, Klaus Schwab, Executive Chairman of World Economic Forum (WEF), pointed out: "Stakeholder capitalism is gaining the momentum … It offers the best opportunity to tackle today's environment and social challenges. The WEF is launching a new 'Davos Manifesto'" (Schwab 2019).[21] Kaizen, TQM, and related approaches could be revisited from the perspective of these new initiatives. However, it should be recognized that there are challenges to implementing these approaches in the many diverse contexts and that further in-depth studies are needed to address these challenges effectively.

Notes

1. For a literature review on CD, see Hosono et al. (2011).
2. This perspective is reflected in Japan's development cooperation approach. The *Development Cooperation Charter of Japan* states: "In its development cooperation, Japan has maintained the spirit of jointly creating things that suit partner countries while respecting ownership, intentions and intrinsic characteristics of the country concerned based on a field-oriented approach through dialogue and collaboration. It has also maintained the approach of building reciprocal relationships with developing countries in which both sides learn from each other and grow and develop together. These are some of the good traditions of Japan's cooperation which have supported self-help efforts of developing countries and aimed at future self-reliant

development" (Government of Japan, Cabinet Office 2015, 4–5).

3. For a definition and recent discussion of inclusive growth, see Kozuka (2014) and Chap. 5.
4. For a more extensive discussion on transformation and inclusive growth, see Hosono (2015).
5. This case draws heavily on Aikawa (2013).
6. This and next paragraphs draw on JICA (2020).
7. This case draws heavily from Hosono et al. (2011, 188–194) and Fujita (2011).
8. Wilbur Smith Associates (2008) and Government of Japan, MOFA (2006).
9. This part draws from Hosono (2009a).
10. UNDP (2010, 3) defined *inclusive business* as models which include poor people into value chains as producers, employees, and consumers.
11. One of the most popular items to come out of Malawi's One Village, One Product initiative was moringa powder. Made from the leaves of the highly nutritious moringa tree, the powder is said to contain twice as much protein as yogurt, seven times more vitamin C than oranges, and four times as much calcium as milk. The powder can be boiled and then applied to the body as a medicine, drunk as tea, or added to food. Another Malawian product is the 100% natural *mapanga* honey, which comes from the nectar of mango flowers in the south of the country. Another noteworthy example is the growing lineup of products made from the baobab tree. In Malawi, oil extracted from the fruit of the baobab tree is commonly used as a cooking ingredient. In Japan, the vitamin-rich oil is popularly used as a moisturizing ingredient in cosmetics. A sweet-and-sour jam made from the fruit is also popular (JICA 2013b).
12. This part draws heavily from Hosono (2009b, 23–29) as well as DBJ and JERI (2003). It is also based partly on the author's experiences in some Japanese cooperation projects in the areas of *kaizen*, quality, and productivity improvement, such as the Chairman of the Advisory Committee for the "Technical Cooperation for Brazilian Institute of Quality and Productivity Project" from 1995 to 2000.
13. The close relationship between quality and productivity was widely recognized in Japan, and the two words, *quality* and *productivity* (quality control and improved productivity), have often been referred to together. In defining the concept of quality, it is necessary to establish industrial norms or standards. This is so because a product is considered defective only when it does not satisfy the quality norm or standard. The Japan Industrial Standard (JIS) and Japan Agricultural Standard (JAS) were introduced by law in Japan in 1949 and 1950, respectively. JIS defines QC as a part of quality management. At the worldwide level, ISO 9000, established by the International Organization for Standardization (ISO), is well known as the international standard relating to quality management systems.
14. Dr. Kaoru Ishikawa, ex-rector of the Musashi Institute of Technology (recently renamed Tokyo City University), is considered the founder of quality control in Japan as well as the father of the QC circle, as a result of the important theoretical and practical contributions he made. His book *Introduction to Quality Control*, first published in 1954 (Ishikawa 1954), is one of the most widely read books in Japan in this field. The third edition (1989) was translated into English and published in 1990 (Ishikawa 1990). There are a large number of well-known engineers and managers who have promoted quality activities in many Japanese companies. One of the most prominent is Taiichi Ohno, ex-vice president of Toyota Motor Company. He is one of those who consolidated the Toyota Production System (TPS). Another prominent Japanese engineer who contributed substantially to quality activities is Dr. Shigeo Shingo, a consultant for Toyota and Panasonic, among other companies. In

recognition of his work, Utah State University created the Shingo Prize. Imai, who once worked for Japan Productivity Center in Washington, DC, founded the Kaizen Institute Consulting Group in 1986 and wrote, in the same year, *Kaizen: The Key to Japan's Competitive Success*.

15. While these five watchwords have been translated in various ways, they roughly refer to removing unnecessary things, arranging tools and parts for easy view, keeping the workplace clean, maintaining personal hygiene, and exhibiting disciplined behavior.
16. According to Liker (2004, xi–xii; italics in original):

> The Toyota Way can be briefly summarized through the two pillars that support it: 'Continuous Improvement' and 'Respect for People.' Continuous improvement, often called kaizen, defines Toyota's basic approach to doing business. Challenge everything. More important than the actual improvements that individuals contribute, the true value of continuous improvement lies in creating an atmosphere of continuous learning and an environment that not only accepts but actually embraces change. Such an environment can only be created where there is respect for people—hence the second pillar of the Toyota Way. Toyota demonstrates this respect by providing employment security and seeking to engage team members through active participation in improving their jobs.

17. This and the following paragraphs draw on DBJ and JERI (2003).
18. In this regard, Imai (1986) compares *kaizen* and *innovation*. The terms correspond, respectively, to "incremental innovation" and "breakthrough" in terms of Dertouzos et al. (1989). According to Imai, *kaizen* is of long-term and long-lasting effect, with small steps and the involvement of everybody, based on conventional know-how and state-of-the-art practices that require little investment. *Innovation* is of short-term but dynamic effect, with big steps, with the involvement of a selected few "champions," based on technological breakthroughs, new inventions, and new theories, requiring large investment (Imai 1986, 25).
19. According to a recent study on productivity gaps for Japanese and U.S. industries by Jorgenson et al. (2015, 21–26), total factor productivity (TFP) gaps were very large both in manufacturing and nonmanufacturing sectors in 1955. The gap for manufacturing productivity relative to the United States (U.S. = 100) disappeared by 1980, peaked at 103.8 in 1991, and deteriorated afterward, leaving a current gap that is almost negligible. The gap for nonmanufacturing also contracted between 1955 and 1991, when the gap reached 8.9%, but expanded afterward. Japanese "motor vehicles," "primary metal," and "other electrical machinery" sectors have higher levels of TFP than their U.S. counterparts. In machinery, computer, and electronics products, U.S. levels of TFP are higher than Japan's. In nonmanufacturing sectors, the U.S. TFP is generally higher, especially in agriculture, forestry, and fishery. However, in medical care and communications, Japan's TFP is higher.
20. This section draws heavily from Hosono (2020).
21. This shift comes at a moment of increasing distress in corporate America, as big companies face mounting global discontent over income inequality, harmful products and poor working conditions (New York Times, Aug. 19, 2019). In the same year, Professor Joseph Stiglitz published a book titled, *People, Power, and Profits: Progressive Capitalism for an Age of Discontent*.

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Transforming Economies for Jobs and Inclusive Growth

5

Although "inclusive development" is a relatively new term, the concept has deep roots. In one of its first appearances as a concept, Kuznets discussed links between economic growth and income inequality (Kuznets 1955). Two decades later, Ahluwahlia et al. (1974) made "growth with equity" a principal concern of the World Bank. This tradition continued with many later studies, including the *World Development Report 2006: Equity and Development*. More recently, several pioneering studies on inclusive development have been published, including Ali (2007), World Bank (2009), and AfDB (2012).[1] In these studies, the concept of inclusive development encompasses the provision of full, productive and decent employment to maximize economic opportunity; equal access to economic opportunity through development of human capital; and social safety nets to protect the chronically poor and vulnerable.[2] The Asian Development Bank has operationalized this concept through its Framework of Inclusive Growth Indicators (FIGI) (ADB 2013).

As Chap. 4 demonstrated, growth is more desirable and beneficial to societies if the benefits are widely shared. However, some people, some areas, and some sectors may be left behind, even during periods of rapid growth. Jobs can be a useful lens through which to examine inclusive growth. The World Bank's *World Development Report 2013: Jobs* (World Bank 2012), stresses that jobs are a cornerstone of development, with benefits that extend far beyond income. The same report, however, also emphasizes that the benefits from jobs depend on the country's level of development, demography, endowments, and institutions (190). It calls for an inclusive development agenda that differentiates between countries according to the challenges they face. Approximately 80% of the world's extremely poor people live in rural areas and 60% work in agriculture (Chandy et al. 2015, 24). In countries with a high proportion of people under the poverty line, jobs and inclusive growth are of high priority in their "quality growth" agenda.

In this regard, diversification—building new firms and industries from scratch, and the expanding and upgrading existing firms and value-chains—is essential because it creates jobs and opportunities that allow people to participate in economic growth. People's capacity to respond to new opportunities is a crucial prerequisite for job creation and the promotion of inclusive growth. In other words, the first two policy pillars of FIGI—developing productive jobs and economic opportunities and ensuring equal access to economic opportunities by expanding human capital—are intrinsically related.

A similar vision is presented in the report of the High-Level Panel of Eminent Persons on the Post-2015 Development Agenda (2013) (hereinafter, the HLP report) which gives priority to "creat[ing] opportunities for good and decent jobs and secure livelihoods, so as to make growth inclusive and ensure that it reduces poverty and inequality" (8). It also emphasizes educating, training, and providing people with skills to respond to the demands of businesses for workers and succeed in the job market (8–9).

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Addison and Tarp (2016) discuss the relationship between transformation, jobs, inclusive growth and human security. This view is important because it suggests the intrinsic link between quality growth (with a strong focus on inclusive growth) and human security:

> Structural transformation entails the creation of new sectors with greater value added than traditional sectors and the movement of capital (and especially labor) from low- to higher-productivity occupations. This in turn raises productivity and per capita income over time. Agriculture's share of total output and employment falls (although agriculture's total output may still grow as agricultural productivity rises). The economy diversifies away from commodity exports to manufactured products (and increasingly services) of rising skill-intensity, with more formal-sector jobs. Whereas improved basic service delivery can improve education and health outcomes at low levels of per capita income, sustained progress depends on growth providing additional resources. Successful transformation therefore helps to widen humanity's fundamental freedom in all its forms[3]—a core tenet of Japan's doctrine of human security [Kamidohzono et al. 2014]. (Addison and Tarp 2016, 298–299)

This chapter discusses strategies for jobs and inclusive growth in countries where extreme poverty is high, with a focus on sub-Saharan Africa. It begins by exploring why the need for inclusive growth is so great on the continent. It reviews the analytical drivers of the need for inclusive development. It also provides lessons from Asia and case studies of how development cooperation has contributed to inclusive growth. The East Asian experience has often been characterized as focused on labor-intensive manufactured exports; less well-appreciated is the role played by agriculture and agro-industrial links in ensuring that Asian growth was truly inclusive. The case study approach distinguishes this chapter from other literature that focuses on the general policy and institutional context for inclusive growth. Through case studies, we can see more clearly that inclusive growth is not something that happens automatically, but something that requires specific, properly designed strategies and approaches.

5.1 The Imperative of Inclusive Development in Sub-Saharan Africa

Every country has its own challenges to meet in order to achieve inclusive development, but three factors make this goal especially important and challenging in the African context: demographic transition, slow transformation of the economic structure, and natural resource curse.

5.1.1 Demographic Transition

In sub-Saharan Africa, the number of young people entering the labor force is growing rapidly. The working-age population (ages fifteen to sixty-four) in these countries will reach 616 million by 2030, a 74% increase from 353 million in 2010 (JICA Research Institute 2013, 74). This means roughly 13 million new jobs will be needed every year just to absorb these workers. In addition, the number of youths aged fifteen to twenty-four in Eastern, Middle, and Western Africa will double in the next forty years (2010–50) (73). Providing job opportunities for this growing working-age population, especially for young people, is one of the biggest challenges facing sub-Saharan Africa.

5.1.2 Slow Transformation of the Economic Structure

Chandy et al. (2015) argue that "Structural transformation is a catalyst both for raising labor productivity and for enabling poor workers to switch occupations" (17). However, "Among the constraints to the promotion of productive jobs is the absence of any significant change in the structure of most of the world's poor economies, especially those in sub-Saharan Africa, despite the fact that many have recorded impressive rates of growth over the past decade" (17). Kanbur et al. (2019) confirm this view, pointing out that

"On average, African growth was significantly faster during the first years of the new millennium. Annual growth approached 5% during this century, with six of the fastest-growing economies in the world during 2000–2010 … Most countries in the region lacked the structural transformation that is the hallmark of high-quality growth" (4).

Long-term trends in agricultural and manufacturing growth in sub-Saharan Africa have not been very encouraging. The industrial sector in sub-Saharan Africa employs only 10.6% of the overall labor force, and its share of GDP has been declining since the 1980s (Shimada et al. 2013, 175). Furthermore, sub-Saharan Africa's share of the world's manufactures and exports decreased from 0.4 to 0.3% and from 0.3 to 0.2%, respectively, from 1980 to 2005 (Dinh et al. 2012, 25). Rodrik (2013) warns about "premature deindustrialization" in developing countries, including many located in sub-Saharan Africa.

Increasing jobs in rural areas is one of the most promising avenues for inclusive development. Yet the amount of cropland per capita of the agricultural population in rural Africa decreased by 59% between 1960 and 2009 (Makino 2013, 77). What's more, sub-Sahara Africa's yields are lagging behind those in other world regions. Yield growth collapsed in the 1980s, and while they began to turn this around in the 1990s—especially after 2000—the rate of growth remains much slower than in Asia and Latin America (UNDP 2012, 31). This decrease in per capita cultivated cropland, together with stagnant or falling land productivity, resulted in a 13% reduction in per capita cereal production between 1961–63 and 2008–10, when per capita production rose by 44% in Asia and 48% in South America (Makino 2013, 77). Without growth in food production, rural incomes have faltered and few jobs in rural areas have been created.

Wage employment is not the most prevalent form of work in sub-Saharan Africa. Formal employment on average accounts for less than 10% of total employment (World Bank 2012, 191). Inclusive growth therefore has to consider how informal jobs are created in both rural and urban areas, where many jobs are now being created in services.

In short, the challenge of creating jobs facing sub-Saharan Africa cannot be underestimated: the expectations of many in the working population and the need to create entry-level jobs for young people must be reconciled within the context of slow or retrogressive economic transformation in which both premature deindustrialization and declining per capita cereal production restrict the creation of job opportunities.

5.1.3 Natural Resource Curse

Despite sub-Saharan Africa's strong growth rate in the last decade, wage-paying jobs have grown only modestly. Part of the explanation for this lies in natural resource exploitation. The natural resource sector has been an important driver of recent growth, but creates few jobs and has narrow links to other economic sectors that are pivotal to poverty reduction. Indeed, the connection between resource sector growth, jobs and inclusive development hinges on how government rents are managed. History suggests resource-driven growth can easily exacerbate income disparities between the rich and the poor, especially where initial land and property ownership is unequal. This kind of growth may also contribute to social instability and consequently undermine the sustainability of growth itself.

5.2 Strategies for Inclusive Growth: The Asian Experience

Generally speaking, growth opportunities can be created by adding to endowments or by developing technology, know-how, and institutions that make those endowments more productive. The most common approach to inclusive growth is to provide policies and infrastructure that support growth across sectors, geographic areas, and households. Building transport networks that encompass remote populations and provide a

connection to world markets, and investments in human capital are good examples. Institutional reforms to promote good governance, macroeconomic stability, the rule of law, and efficient administration are also relevant since they promote growth opportunities that do not discriminate. In order to transform economies to enable job creation and inclusive development, the HLP report envisaged triggering a virtuous circle of growth:

> A second priority is to constantly strive to add value and raise productivity, so that growth begets more growth. Some fundamentals will accelerate growth everywhere—infrastructure and other investments, skills development, supportive policies towards micro, small, and medium-sized enterprises, and the capacity to innovate and absorb new technologies and produce higher-quality and a greater range of products. (HLP 2013, 9)

From this perspective, in sub-Saharan Africa, one promising proposal to increase jobs and inclusive growth could be the construction of growth corridors. The New Partnership for Africa's Development (NEPAD) has advocated the creation of regional hubs and development corridors and poles, emphasizing linkages with mining, agriculture, tourism, and other economic activities (JICA/JBIC 2008).

As discussed in Chap. 2, Asia has had successful experiences in regard to inclusive job creation through the development of regional hubs and development corridors. The Greater Mekong Subregion (GMS) Development Program, which was launched by the Asian Development Bank (ADB) in 1992 with the participation of six countries in the Mekong region, is especially relevant. The aim of GMS was: "to implement poverty reduction and economic growth by creating a belt that would link impoverished inland areas with port cities, which have access to world markets" (JICA/JBIC 2008, 55). Electricity and communication infrastructure was developed in parallel with roads, bridges, and other transport infrastructure to support the agriculture, mining, and tourism sectors. A GMS Business Forum was established to facilitate collaboration between governments and the private sector. In Africa, in accordance with the framework of the TICAD VI (2016–2018), corridor developments are now being promoted (see Chap. 2).

Another potential vehicle for creating a virtuous circle of jobs and inclusive growth is "inclusive finance." The HLP report states: "Financial services are critical to the growth of business, but also raise the income of individuals. When people have the means to save and invest, or get insurance, they can raise their incomes by at least 20%" (HLP 2013, 97). Financial institutions played an important role in encouraging inclusive growth in East Asia (Hosono 2013). East Asian governments created financial institutions to provide long-term loans at low interest rates, facilitating economic growth through industrialization and infrastructure development. At the same time, they encouraged inclusive development by providing credit to agriculture and small and medium firms. The World Bank's *East Asian Miracle*, a notable study on the region's dynamic growth, highlighted the following three aspects of its growth: governments created a wide range of financial institutions to fill perceived gaps in the types of credit provided by private entities; they addressed the need for long-term credit for industry by creating development banks; and most also created specialized institutions to provide credit to agriculture and small firms (World Bank 1993).

In ASEAN countries, SMEs and agricultural enterprises have generally been financed by public financial institutions and local commercial banks. These sectors have been crucial for inclusive development in the region. In Indonesia, earnings from oil and mineral resources were recycled through investments in agriculture and rural development, providing a basis for long-term economic growth. Crucial to success was the strategy of combining supply-side support measures—such as provision of high-quality seeds, chemical fertilizers, irrigation infrastructure, and agricultural finance—with demand-side support measures, including producer price support to improve agricultural productivity (JICA/JBIC 2008, 40). In Thailand and Malaysia, small and medium enterprises were

developed to support the establishment of a competitive automobile industry (JBIC 2001).

5.3 Strategies for Inclusive Growth: A Case Study Approach

In this section, I present case studies illustrating three broad strategies for enabling inclusive growth that go beyond the general approaches to nondiscriminatory growth described previously. The first strategy is to increase the level of food production and smallholder productivity. This strategy directly raises rural incomes, thereby providing immediate benefits from growth. Indirectly, it leads to inclusive growth by helping to decrease food prices and raising real wages or employment levels in nonfood sectors. This strategy is most suitable for countries that have solid potential for increasing cropland, irrigation, and application of modern technologies that can improve yields.

The second strategy is to promote agricultural diversification toward higher value-added crops in a way that creates an agro-industrial value chain or a food value chain. This strategy is relevant for countries that continue to have large population shares in rural areas, as is the case in most low-income countries. Cramer and Sender's concept of "industrialization of freshness" or "industrial agriculture" is closely related to this strategy. Their concept "matters to low-income (and middle-income) developing countries because of the huge scope for productivity growth, export revenue growth, and employment creation in industrial agriculture" (Cramer and Sender 2019, 211).

The third strategy is to focus on industrialization for domestic and export markets. I demonstrate that sub-Saharan Africa has important differences in labor market structure compared to East Asia, and so cannot necessarily rely on low wages as a determinant of competitiveness. However, a structured approach can still deliver competitive industries in selected subsectors.

5.3.1 Strategy 1: Increasing Staple Crop Productivity

Both India and sub-Saharan Africa were trapped in a low-income equilibrium in the 1970s. However, India succeeded in escaping from it, and the two regions diverged significantly in the 1980s (Fujita 2010, 18–19). The breakthrough that enabled India's achievement was the second wave of the Green Revolution. The first wave, which occurred from the mid-1960s through the 1970s, was limited to increasing wheat yields in the northwest and in small delta regions of peninsular India (6–7). The second wave unleashed a rapid increase in rice production during the 1980s that was fundamental to the economic development of hitherto poverty-stricken rural areas. India achieved strong agricultural growth that spread across almost all regions and almost all its major crops.

The most important factor supporting rapid agricultural growth during the 1980s was the widespread diffusion of private tube wells for irrigation, especially small-scale, shallow tube wells, which enabled a highly productive system of double cropping of high-yield varieties (HYV) of rice and wheat over broad rural areas and double cropping of HYV rice in areas with plentiful rainfall. Based on a comparative analysis of India and sub-Saharan Africa, Fujita (2010, 19) concludes that

> The most important lesson for sub-Saharan Africa from the Indian experience, therefore, is that it should take steps to raise rural incomes and thereby to strengthen rural markets for non-agricultural products and services. Once this has been realized, sub-Saharan Africa will be in a position to proceed to the next stage of economic development: industrialization. To raise rural incomes to a certain level, productivity growth in agriculture should be increased, especially in terms of staple food output, rather than the horizontal expansion of farmland that has been the practice in most of sub-Saharan Africa. This argument is basically in line with that of Eswaran and Kotwal (1994).

At least two aspects of India's transformation since the 1980s deserve special mention. First,

the Green Revolution in India did not take place solely because of the introduction of high-yield varieties of crops. It took decades of incremental and sustained agricultural development following the country's independence for the benefits of the Green Revolution to be realized. Second, the remarkable increase in yields was achieved by combining the planting of HYV crops with increased use of fertilizer and irrigation. The availability of affordable fertilizer and the widespread diffusion of private tube wells for irrigation were essential (Yanagisawa 2014, 117–127). The remarkable nationwide increase in India's agricultural productivity and subsequent changes in rural society have helped enable India to achieve prolonged growth in its domestic and export markets since the 1980s. Those developments prepared India to respond competitively to globalization and the economic liberalization policies introduced after 1992, which led to India's successful integration into the world economy (10).

The experiences of Bangladesh also are highly relevant for sub-Saharan Africa. The major factors that changed the rural society of Bangladesh include the rapid spread of microfinance, the construction of rural infrastructure, and the modernization of agriculture based on the adoption of new technology, which enabled farmers to shift from low-yield, single-crop, deep-water rice to high-yield, double-crop, short-maturity rice. Increasing land and labor productivity in rice agriculture in the early 2000s had beneficial effects on the agricultural average wage and hence on rural poverty (Hossein et al. 2012, 6).

The changes in rural society in Bangladesh have been profound. As discussed in Chap. 3, higher labor productivity in agriculture made it possible for the massive employment of female workers in the garment industry in two big cities, Dhaka and Chittagong. Bangladesh is an example of a country that was able to rapidly urbanize and integrate into the world economy by absorbing unskilled labor into light-manufacturing industries (World Bank 2012, 197).

In the case of Bangladesh, several factors interacted to bring about that change, including investments in rural roads, irrigation, market facilities and other rural infrastructure, microcredit, and education. This enhanced the mobility and availability of low-opportunity-cost labor in rural Bangladesh.

Hossein et al. (2012) contend that in any predominantly agricultural economy that has high population growth and density, the critical challenge is to reduce the burden of surplus labor in agriculture—a "challenge that 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" (4; italics in original).

Chapter 3 highlighted the transformation of Bangladesh. In 1981, ten years after Bangladesh achieved independence, raw jute and jute goods constituted 68% of the country's total exports. Thirty years later, in 2011, garments accounted for 76% of total exports and textiles for another 9%. Businesses in these sectors accounted for 50% of all manufacturing establishments in the country (UNCTAD 2012, 11). Today, the garment industry encompasses 5000–6000 factories with 7–8 million workers using assembly-line production methods. The wages of workers in this industry are around 35% higher than the national average (see Chap. 3). The Bangladesh success story is even more remarkable because, as a recent World Bank study highlighted, "the country was often held out in the development literature as a hopeless case" (World Bank 2012, 197).

These South Asian experiences demonstrate that increasing rural incomes is crucial for structural transformation and that a key factor in achieving transformation is increasing staple food productivity. Although an Asian-type Green Revolution has not been realized in sub-Saharan Africa, several remarkable increases in staple food productivity have been observed. There is significant potential to focus on rice because the gap between production and consumption of rice in sub-Saharan Africa has been growing.

Currently, 40% of the rice consumed is imported. *The Economist* stated that "in Africa, where a third of the population depends on rice, demand is rising by almost 20% a year. At that rate, rice will surpass maize as Africa's main source of calories within 20 years" (Economist 2014, 21). Another reason to focus on rice is that rice cultivation is where the technological gaps (or "yield gaps") between sub-Saharan Africa and India and other Asian countries are especially high. The average yield gap for rice is similar to that of wheat and much larger than the modest yield gap for maize. There is no yield gap for sorghum and millet production (Otsuka 2013, 26).

Furthermore, rice could be considered an entry point for increasing productivity in the agricultural sector as a whole since, in most sub-Saharan African rice-producing countries, those working in the rice value chain are involved in other important crops as well (Kubota 2013, 10). General measures—such as strengthening the capacity of institutions and individuals for research and extension—benefit both rice and other crops. It might be thought desirable to pay more attention to maize because it is the principal subsistence crop among poor African farmers. However, as Otsuka (2013) states, "the prerequisite for a maize Green Revolution is the development of truly profitable and productive maize seeds and farming practices for this crop" (36). In other words, maize is not yet at a stage where research has developed seeds appropriate for Africa's ecology. That may come as a second wave of an African Green Revolution.

The public sector must be in the vanguard. Its efforts to invest in the development and dissemination of high-yield varieties are essential for increasing rice production. As explained by the World Bank (2012), since farmers can reproduce varieties of rice, private seed companies cannot reap the benefit of introducing new varieties and so tend not to make the effort (191–192).[4] Moreover, the costs of other basic necessities for food crop agriculture need to be reduced to make them affordable to small farmers. For example, the cost of fertilizer in sub-Saharan Africa is roughly double the cost in Asia.[5]

Addressing post-harvest losses (PHL) is another challenge. The World Bank (2011) estimated that the value of PHL in sub-Saharan Africa could reach nearly US $4 billion a year out of an estimated value of US $27 billion in total annual grain production. This is equal to the annual value of cereal imports of sub-Sahara Africa (xiii). The Bank emphasizes the importance of a value chain approach to identifying optimal interventions for reducing PHL losses.

5.3.1.1 Case 5.1: Agricultural Sector Development Program and Related Initiatives in Tanzania

The Agricultural Sector Development Program (ASDP), started in 2006, was the Tanzanian government's main agricultural initiative in the first decade of the 2000s, with some 60% of the agricultural sector budget going to the program in its first four years (Therkildsen 2011, 14). ASDP's aim is to increase productivity in the agricultural sector, increase agricultural incomes and food security, and alleviate poverty. ASDP has several distinctive features. Its largest component is irrigation, which accounts for some 80% of the total budget. Crucial elements in the program are both the empowerment and development of the capacities of farmers and the decentralization of implementation by providing local authorities with funds through central government transfers based on their performance (14–15). Several donors participate in ASDP, and it has become one of the first sector-wide approaches to agriculture in Africa.

Since the launch of the program, land under irrigation has increased by 15,000–20,000 ha per year, from a total of 264,000 ha in 2006 to 332,000 ha in 2010. That result is less than planned under ASDP, but is still a considerable achievement (Therkildsen 2011, 20). After 2011, per-year expansion increased to 30,000. The estimate of land under irrigation was 461,000 ha in 2013.[6] This increase is the result of enhanced technical capacity (irrigation institutions and individual technical irrigation officers), the government priority given to irrigation, and other

factors, including small-, mid-, and large-scale irrigation development funds.

Within ASDP's capacity development initiatives, emphasis is placed on improving the technical capabilities of central and local governments and farmer groups, and increasing the number of technical personnel such as central and local government engineers, technicians, and surveyors. At the same time, rice cultivation technology has been disseminated through the Technical Cooperation in Supporting Service Delivery Systems of Irrigated Agriculture program (Tanrice).[7] Tanrice is implemented by specialized training institutes,[8] providing training on irrigated rice farming for more than 40 irrigation schemes and 13,000 families. It covers a package of basic farming techniques, such as ridge management (enclosing paddies with low mud walls, or bunds), field leveling, straight-row planting (planting in straight lines and at specific intervals), use of handmade weeding machines, irrigation scheme management for women, and rice marketing. The training also includes the dissemination of NERICA (New Rice for Africa) varieties among key rice stakeholders.

Tanrice is based on the technologies, practices, and experiences in farming in the Moshi Rural District in the Kilimanjaro Region, where the resulting rice yield has already reached 6 tons per hectare due to improved farming techniques and irrigation, easily outpacing the national average, which is about two tons per hectare. The Kilimanjaro Agricultural Training Center (KATC) has played a key role since the 1990s, helping to augment that success by establishing and implementing various training programs for agricultural extension officers, irrigation technicians, and farmers.

Tanrice has been an important factor in the Tanzanian government's National Rice Development Strategy, launched in 2009, which aims to double rice production to 1.96 million tons by 2018 (from production in 2008) through the intensification of irrigated paddy production. During this period, yield per hectare is intended to increase from 2.13 to 3.5 tons in irrigated areas and from 1 to 2 tons in rain-fed lowlands.

Based on the achievements of Tanrice, the Project for Supporting Rice Industry Development in Tanzania (Tanrice 2) was initiated in November 2012. This project aims to further disseminate rice-farming technologies nationwide in partnership with seven agricultural training institutes. As rain-fed cultivation also needs to be improved to have the maximum impact on poverty reduction, approaches for disseminating the appropriate rain-fed rice cultivation technologies are being explored. This project also aims to promote the value chain of the rice industry.

There has been a significant increase in the proportion of crop-growing households receiving crop extension advice. The percent of total crop-growing households receiving advice on crops from government extension staff increased from 33% during the agricultural year 2002–03 to 60% in 2007–08. Meanwhile, the proportion of households receiving extension advice from NGOs or development projects increased from 5.3 to 7.9% (ASDP Monitoring and Evaluation Working Group 2011, 20). Positive changes have consequently been recorded in agricultural exports; the production or productivity (yield) of maize, rice, meat, milk, and eggs; and the proportion of farmers using improved seeds or chemical fertilizer and adopting mechanization (tractors and power tillers). ASDP is reported to be on track to achieve its objectives. The rice industry in Tanzania has grown rapidly over the last decade and is now largely self-sufficient. Local production meets 92% of consumption, despite a 21% price premium over imported rice because of the higher quality of local rice, which is aromatic, fresh and clear (Bill and Melinda Gates Foundation 2012).

ASDP's achievements are encouraging and offer an interesting experience to be shared among sub-Saharan countries. As Otsuka (2013) concludes, "It is clear that a combination of improved seeds, improved production practices, and irrigation leads to significantly high yields, resulting in a 'mini' Green Revolution in Tanzania" (29).

5.3.1.2 Case 5.2: The Coalition for African Rice Development Initiative

The Coalition for African Rice Development (CARD) was launched by the Alliance for a Green Revolution in Africa (AGRA) and the Japan International Cooperation Agency (JICA) in 2008 as an international platform for promoting rice development[9]; its initial goal was to double rice production in Africa in ten years. Since its inception, CARD has promoted the entire value chain, such as extension, production, post-harvest handling and marketing, through technical and financial cooperation and research activities in collaboration with other development partners. CARD has twenty-three African member countries: a first group of twelve countries where the importance of rice is relatively high, and a second group of eleven countries that are rapidly increasing their consumption of rice. These new member countries joined CARD later, as mentioned below.

Within the CARD framework, each country has drawn up a National Rice Development Strategy (NRDS). Additionally, a task force has been set up in each country, where stakeholders jointly produce a list of prioritized possible interventions (Kubota 2013). The development partners in CARD have agreed to jointly support the formulation and implementation of national strategies by drawing on their own comparative advantages and seeking out synergies across their interventions. JICA alone was implementing around sixty projects as of August 2012.

In 2008, the first group of twelve rice-producing sub-Sahara African countries and seven development partners jointly endorsed CARD's overall target of doubling rice production in sub-Sahara Africa in ten years from 14 to 28 million tons in 2018. The twelve countries accounted for about 85% of total rice production in sub-Saharan Africa as of 2008. A positive yield trend from 1.7 tons per hectare in the base period to 2.0 tons per hectare in the next five-year period was observed, which is the fastest yield improvement in the past few decades in the region, while still falling far short of yield rates in many Asian rice-producing countries (Kubota 2013, 20). Production of 26.14 million tons was achieved in 2016. As of March 2018, the skills of rice cultivation have been disseminated to 48,207 farmers and 3299 extension workers (JICA 2019a, 8).

Notable progress has been observed in the partnership among African rice-producing countries and their five Asian partners, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. CARD has organized a series of dialogues between African and Asian parties that have been instrumental in making development partners' interventions more flexible and wider in scope. For example, most of the rice-related projects formulated and implemented by JICA since the start of CARD in 2008 have a market orientation and components relating to post-harvest losses.

CARD achieved its target of doubling rice production in 2018. CARD Phase 2 started in 2019, with a renewed target of further doubling rice production in sub-Sahara Africa, from 28 to 56 million tons by 2030. In Phase 2, nine new member countries, and a new partner, the World Food Program (WFP), joined CARD. In order to achieve this target, CARD introduced the "RICE approach" based on the outcomes of past development cooperation. RICE approach consists of four activities: (1) Resilience, through addressing climate change and population increase; (2) Industrialization, by nurturing local industries based on rice in cooperation with the private sector; (3) Competitiveness, by improving the quality of local rice to compete with imported rice; and (4) Empowerment of farming families by improving their livelihood through the development of a production management system (JICA 2019b).

5.3.2 Strategy 2: Diversification of Agriculture to Include Higher-Value Crops and Enhancement of the Agro-Industry Value Chain

The feasibility of commercial crops is high in some areas because of geographic and/or climatic

conditions, including access to consumers and export markets. In most Southeast Asian countries, diversification to high-value crops and development of commercial agriculture has advanced inclusive growth. An example is Thailand, whose "newly agro-industrializing country" (NAIC) strategy became part of the country's economic development plan in the 1980s. The strategy aimed to establish the country as a net exporter of food as a basis for promoting industrialization.[10] In addition, it encouraged the development of agro-industry as an export industry based on Thailand's past achievements in exporting primary products.

Thailand has traditionally produced rice and natural rubber for export, but in the 1970s, it diversified to include tapioca and maize. With the introduction of modern quality control and production technologies, the list of export products continued to grow in size and diversity to include broiler, grilled, and skewered chicken; farmed prawns; tinned tuna; tinned fruit; and natural rubber. Specific measures adopted by the government to support this process included provisions for preferential investments for agro-industry and flexible financing by commercial banks for agriculture-related businesses.

5.3.2.1 Case 5.3: Smallholder Horticulture Empowerment Project in Kenya

Like Thailand, Kenya has considerable potential for commercial agricultural diversification thanks to good market access and the capacity of its farmers. As discussed in Chap. 4, the Smallholder Horticulture Empowerment Project (SHEP) was launched in 2006. Key components of SHEP include the introduction of market-oriented agriculture, based on market surveys, stakeholder forums, and demand-driven technical training. In 2010, encouraged by the effectiveness of the model, the Kenyan Ministry of Agriculture set up the Smallholder Horticulture Empowerment and Promotion Unit (SHEP Unit) (Aikawa 2013, 144–145). Since 2013, Kenya has been decentralized. Local governments, referred to as "counties," are now the main actor in implementing the SHEP approach. Under these circumstances, the "Smallholder Horticulture Empowerment and Promotion Project for Local and Up-scaling: SHEP PLUS" has been introduced from 2015 to 2020, aiming to assist local governments in improving and customizing the SHEP approach. Through this project, it is expected that the local governments will be able to manage their resources, such as budget and human resources, to incorporate the SHEP approach into their agriculture extension systems (JICA n.d.).

SHEP's main goal was to develop the capacity of smallholder horticulture farmer groups to raise their incomes. According to the SHEP final monitoring survey, carried out in October 2009, average horticulture-related net income among the 114 beneficiary farmer groups increased by 67% over the baseline while the average net income per-farmer increased by 106%.[11] While incomes increased for both men and women, the gap between them fell from 31 to 15% over the project's duration (Aikawa 2013, 151).

Aikawa (2013) submits that the skills of farmers improved significantly because they were empowered to conduct market surveys and to freely determine their target crops based on the survey results. This motivated the farmers to learn techniques more thoroughly during in-field training. When the farmers succeeded in marketing their products, their success further reinforced their sense of competence and motivation. This positive interaction between enhanced intrinsic motivation and increased skill levels provides a powerful model for sustained growth (see Chap. 4).

SHEP started with the premise that horticultural farming is an industry, no matter how small the scale of the market as a whole or how little the output of individual farmers. Based on that premise, the projects developed a series of activities designed to encourage farmers to develop the capacity to respond to the needs of the market, using these as both the starting point of their strategy and their ultimate goal. Many African countries are encouraging their farmers to transform their current subsistence-oriented agriculture into more explicitly commercially

oriented ventures. However, small-scale farmers in Africa did not necessarily know how to achieve this, though they had been practicing farming based on rational decision making, just as in a business. SHEP filled this gap (Aikawa 2013, 163–164).

Since the 1990s, many donors have been providing support for value chain development. Their support tended to focus on the downstream part of the supply chain from production through sales, or the portion close to postharvest processing and sales. In contrast, SHEP provided support to small-scale farmers through every step, from production to sales, covering various aspects of the activities in ways that were adoptable by the farmers. In doing so, the project always put the farmers at the center as it designed its activities and refined its methods (Aikawa 2013, 163–164). Based on these factors, SHEP achieved remarkable results.

At the Fifth Tokyo International Conference on African Development (TICAD V) held in June 2013, SHEP's region-wide development program was billed as a key approach in the future of agriculture in Africa for its success in boosting the incomes of small-scale farmers. The SHEP approach has currently spread to 23 countries in the African region, as well as Palestine and El Salvador. Between 2013 and 2017, 4330 technical staff members and 60,381 farmers were trained in Africa (JICA 2019a, 3).

5.3.2.2 Case 5.4: Diversification Through Agroforestry in Semi-Arid Kenya

About 83% of Kenya is covered by arid and semi-arid land (ASAL), which is vulnerable to global warming and climate change. These areas are also characterized by a high incidence of poverty.[12] Increasing staple crop productivity in these environments is difficult, if not impossible. Preventing the desertification of ASALs while reducing poverty requires fostering an inclusive green economy, as well as enhancing community resilience against drought.

Kenya relies on firewood and charcoal for more than 70% of its total energy consumption and about 90% of the energy consumption in homes. The increasing demand for firewood and charcoal—resulting from the doubling of the population in the last twenty years—overgrazing, and disordered cultivation have devastated forest areas. That devastation has not only greatly reduced the supply of firewood and charcoal but also resulted in a decline in the productive capacity of Kenya's land. In order to address these issues, in 1982, the government set targets for the production of 200 million seedlings a year in a strategy established by presidential order to increase rural tree growth. In June 1986, the Kenya Forestry Research Institute (KEFRI) was established as a parastatal institution. In 1994, the Ministry of Environment and Natural Resources of Kenya launched the Kenya Forestry Master Plan 1995–2000 (KFMP), which identified farm forestry as an important model for forestry development.[13]

Through the farm forestry model, with KEFRI as an implementing agency, local people were entrusted with the management and ownership of forestry resources. Basic tree nursery and tree planting technologies were strengthened. The Farmer Field School (FFS) approach, an existing and proven extension model in the agricultural sector, was adapted to forestry, through which techniques for seedling production, fruit tree planting (mango, grevillea, and others), poultry raising, vegetable cultivation, compost use, and woodlot creation were disseminated.

FFSs have promoted ownership, strengthened communities, and increased farmers' capacities by sharing knowledge about forestry. Beneficiary farmers and farmer groups have started to sell forestry products such as mangoes, seedlings, lumber, and firewood. FFSs have recently created networks to carry out market surveys, and Kenya Forestry Service and Equity Bank are facilitating farmers' production and marketing activities through the Support to Community-Based Farm Forestry Enterprises in Semi-Arid Areas of Kenya Project (SCBFFE). In this way, an increasingly self-sufficient agroforestry industry is being developed.

Through these activities, farmers are increasing their awareness of methods to improve their livelihoods. Wider extension activities are

expected as graduate farmers from FFSs share advice with farmers in surrounding areas, leveraging and strengthening social capital in the sector. At the same time, technological research to identify drought-tolerant tree species is being carried out at KEFRI.

These experiences in the semi-arid regions of Kenya demonstrate the possibility of creating opportunities for inclusive and sustainable growth while coping with the impacts of deforestation and climate change, as discussed in detail in Chap. 7.

5.3.3 Strategy 3: An Industrial Strategy with Links to Agriculture Development

Agricultural development alongside industrialization has taken place in most Asian countries, including the apparel industry in Bangladesh and the agro-industry in Thailand, as described earlier. Vietnam, one of the latecomers to industrialization among ASEAN countries, has achieved impressive progress. Its government has adopted a strategic approach since 2000, emphasizing the importance of domestic and foreign capital mobilization and rural and agricultural development along with industrialization and fostering the growth of small, medium and microenterprises, as well as heavy industry.[14]

Sluggish development of agriculture in sub-Saharan Africa has constrained industrialization in multiple ways—for example, by increasing the prices of agricultural inputs, and limiting the expansion of the consumer market in rural areas. The transition from an agrarian economy to an early industrializing economy or an urbanizing economy involves important interactions between rural and urban growth. The World Bank (2013) states that rural growth in Asia helped to lower food prices and real wages for urban areas and created demand for urban goods (102). It can also contribute substantially to export competitiveness and manufacturing growth.[15] Higher food prices partially explain the high wages for formal labor in sub-Saharan Africa compared to those in several East and South Asian countries. For example, in 2006–7, annual wages among manufacturing industry workers in Kenya ($3012) were higher than in Thailand ($2223) and those in Tanzania ($1709) were higher than in Indonesia ($1667) (Hirano 2013, 136). This is despite GDP per capita in Kenya and Tanzania being significantly lower than Thailand and Indonesia.

A more robust comparison requires an assessment of comparative skill levels across countries. This has been attempted by Dinh et al. (2012). They found that skilled and unskilled workers' monthly wages in Ethiopia were significantly lower than wages in Vietnam, while wages in Tanzania and Zambia were generally higher or the same as those for the equivalent labor in Vietnam but lower than in China (27). Hirano (2013) concludes that, while the level of wages in sub-Saharan Africa is not overwhelmingly lower than in some East and South Asian countries, there is great potential for the continent to become competitive in terms of wages in some light-manufacturing sectors.

Several measures to increase labor productivity could be carried out to overcome the disadvantage related to wages: human resource development to improve education and skill levels; infrastructure development to reduce energy and transportation costs; further regional integration to get better access to neighboring countries' markets; formation of business clusters and deepening of value chains to obtain economies of agglomeration, scale, and scope; improvements in management skills; and the introduction of *Kaizen*, the Japanese practice of continuous improvement of quality and productivity at the plant level.

Similarly, lowering the cost of production as well as increasing the quality of agricultural inputs for agro-industry and light manufacturing is essential for the formation of agro-industrial value chains. Dinh et al. (2012) emphasize that with inputs accounting for more than 70% of the total cost of light-manufacturing products, small variations in the prices paid for inputs can wipe out any labor cost advantages that a country may have (57).

Given this backdrop, in order for manufacturing industries to become competitive in export and domestic markets, a structured and coordinated approach for industrial strategy, which fully takes into account relationships between agriculture and manufacturing, appears to be crucial. At the same time, different pragmatic efforts are necessary to improve efficiency and competitiveness, such as (1) the promotion and facilitation of exports and foreign direct investment, with spill-over effects for technological transfers; (2) the formation of human resources, especially of skilled workers, engineers and other industrial personnel; (3) the formation of clusters in which the effects of agglomeration can be attained; (4) the improvement of productivity and quality through *Kaizen*; and the (5) enhancement of management capacity of entrepreneurs, among others.

To add to this understanding, Case 5, a structured approach for industrial strategy in Ethiopia, Case 6, Kenya's comprehensive approach for export promotion, and Case 7, initiatives for introducing Kaizen in Africa, are discussed below.

5.3.3.1 Case 5.5: Agricultural Development–Led Industrialization in Ethiopia

The industrial strategy of the Ethiopian government has been in place for more than two decades. Beginning in 1995, the concept of Agricultural Development-Led Industrialization (ADLI) was incorporated into the first and the second national development plans. ADLI initially targeted smallholder farmers. A rise in agricultural output was expected to stimulate industrial production by providing food and industrial materials, thus establishing a link between the rural and urban sectors. In turn, the industrial sector can produce inputs to agriculture, such as fertilizers and farming tools and equipment, as well as consumer goods for rural households (Ohno 2013, 271–272). Ohno (2013) calls this dynamic linkage *Core ADLI*. He states that the Plan for Accelerated and Sustained Development to End Poverty (PASDEP) 2005/06–2009/10 broadened the policy scope from smallholder agriculture to other sectors, especially industry and the urban sector. "In what may be called *Enhanced ADLI*, strong emphasis was placed on growth acceleration, which was to be attained through commercialization of agriculture and private-sector development" (Ohno 2013, 272, italics in original).

The expansion of agricultural extension services, mainly occurring during this PASDEP period, was remarkable. Ethiopia had finished training and assigning three specialists responsible, respectively, for agricultural technology, livestock management, and resource utilization in every village of the country, with 61,785 agricultural extension workers trained as of January 2010. A farmers' training center was also established in every village. The total number of centers amounted to 9265 as of 2010. As Ohno (2013) points out, "Comprehensive national extension networks such as this are relatively rare in Africa" (280). In the PASDEP period of 2005/06–2009/10, industrial performance was less than expected. Real GDP grew an impressive 11.0% per annum, but this was a result of overachievement of agriculture (8.4% against the base-case target of 6.0%) and services and underachievement of industry (10.0% against the base-case target of 11.0%) (Ohno 2013, 293–294).

In the framework of the Growth and Transformation Plan 2010/11–2014/15, industry was expected to be the major source of employment and foreign exchange by broadening the economy to include import-substitution industries, as well as export-oriented industries. In addition, new measures have been introduced to promote micro- and small enterprises, while eight selected medium- and large-scale industries are being actively promoted (textiles and garments, leather and leather products, sugar, cement, metals and engineering, chemicals, pharmaceuticals, and agro-processing). Additional policy instruments, such as the institutionalization of *Kaizen*, enhancement of the technical and vocational education and training system, and creation of industrial zones, were also employed (Ohno 2013, 294). Throughout this process, the

Ethiopian government has incorporated the diverse experiences of East Asian economies.

5.3.3.2 Case 5.6: Export Promotion in Kenya

Kenya's exports have traditionally concentrated on tea, coffee, petroleum products, and cement, although the country has recently begun expanding into nontraditional export industries such as commercial vessels and assembled automobiles and motorcycles. The promotion and diversification of exports have been among the main pillars of the Kenyan government's development strategy. In the past, the government implemented various export promotion measures, including the establishment of export processing zones, a partial reduction in sales taxes for the manufacturing industry, and the liberalization of exports and foreign exchange. However, these efforts failed to address the binding constraints to exports, such as inadequate infrastructure and insecurity (JICA/JBIC 2008).

Against that backdrop, an export promotion master plan was formulated, leading to the establishment of the Export Promotion Council in 1992. In 1997, the Kenyan government published a document titled "Industrial Transformation to the Year 2020," envisaging Kenya being among a select group of Newly Industrializing Economies (NIES) by 2020. To achieve this target, an Economic Recovery Strategy Paper was published in 2003, proposing wide-ranging policy measures. Under this framework, the Private Sector Development Strategy (PSDS), the Master Plan Study of Kenyan Industrial Development, and other initiatives have been carried out.

PSDS started officially in 2007 with five strategic goals: to improve the business environment; promote administrative reforms; develop the capacity of the trade sector through industrial development and trade promotion; increase productivity; and promote micro-, small, and medium enterprises. This strategy was implemented with the support of seventeen donors, coordinating 150 projects.

In view of the increased need for strengthening human resource capacity amid enhanced calls for export promotion, a program to build the capacity of small-scale exporters was implemented in 2007. It was designed to strengthen the trade-related business skills required of Kenyan exporters and the staff of the Export Promotion Council. This program is expected to contribute to the long-term goal of establishing Kenya as an economic hub for surrounding countries and create a strong export-oriented economic structure (JICA/JBIC 2008, 62).

5.3.3.3 Case 5.7: Introducing Kaizen into Sub-Saharan Africa

In 2009 a pilot project aimed at increasing productivity and improving quality (*Kaizen*) at small manufacturing plants started in Ethiopia with the support of the Japan International Cooperation Agency (Shimada et al. 2013, 187). The initial results of this project were promising: over six months, the thirty firms that introduced *Kaizen* obtained an average benefit equivalent to US $30,000, while the highest benefit achieved by a single company was around US $200,000. With an average of 402 employees per participating company, the pilot project generated benefits of US $74 per employee, which almost equaled the gross monthly wage of US $75 that prevailed at the time (Shimada et al. 2013, 184). The pilot project ended in June 2011. Encouraged by that achievement, in October 2011, the Ethiopian government established the Ethiopian Kaizen Institute (EKI) under the Ministry of Industry, with sixty-five technical staff. The Ethiopian government and JICA began the Phase 2 Kaizen Project in November 2011 in order to build the capacity of EKI and related organizations to disseminate *Kaizen* throughout the country.

EKI, the main promoter of *Kaizen* activities in Ethiopia, provided training to 68,954 trainees and established 9,658 *Kaizen* Promotion Teams (KPT; a customized version of the Quality Control Circle (QCC) in Ethiopia) in 473 target institutes from 2012/13 to 2016/17 (Jin 2020, 96). It continues to provide training and consultations directly to large and medium enterprises

as well as training for micro and small enterprises through Technical Vocational Education and Training (TVET). EKI estimated that the benefits of *Kaizen* implementation between 2011 and 2016 reached 2169.5 million birrs, equivalent to US $105 million (Mekonen 2018; Jin 2020, 96). The projects on capacity building for dissemination of *Kaizen* that were implemented in Ethiopia from 2009 to 2014 demonstrated productivity per unit time increased by an average of 37.2% (JICA 2019a, 2). Following the satisfactory results of *Kaizen* promotion, the government incorporated *Kaizen* dissemination into the country's five-year development plan (2015–2020). From 2016, the Technical Cooperation Project on Capacity Development for Kaizen Implementation for Quality and Productivity Improvement and Competitiveness Enhancement started in Ethiopia. Similar projects are ongoing in Egypt, Tunisia, Ghana, Cameroon, Kenya, Tanzania and Zambia.

JICA's assistance in promoting *Kaizen* dates back to 1983, when it commenced a project in Singapore (Chap. 3). Over twenty-nine years (1981–2008), Japan employed a range of different cooperative efforts to introduce *Kaizen* in 46 countries (Ueda 2009). Moreover, JICA has been providing support for *Kaizen* projects specifically aimed at industrial sectors in around 30 countries. As for African countries, *Kaizen*-related technical cooperation projects have been carried out in eight countries since the first project in Tunisia was implemented in 2006. Various lessons have been learned, such as the need to ensure the commitment of high-level government officials, the need to establish and maintain a strong *Kaizen* promotion organization and system, and standardization of an approach to ensure the quality of *Kaizen* promotion personnel (JICA et al. 2018). To further accelerate industrial development through dissemination of *Kaizen* in the African continent, in 2017, JICA launched the Africa Kaizen Initiative (AKI) in collaboration with the New Partnership for Africa's Development (NEPAD) Planning and Coordinating Agency, a technical body of the African Union (AU).

5.4 Concluding Remarks

This chapter has argued that three strategies are relevant for supporting inclusive growth in the agrarian economies of sub-Saharan Africa: increasing the productivity of staple food crops, diversifying agriculture to higher-value crops while building stronger agro-industry value chains, and promoting light-manufacturing industrialization in conjunction with agricultural development. The total process constitutes a structural transformation that could be triggered, sustained, and accelerated by investments in infrastructure, human capital, technology, and inclusive finance. These strategies for promoting jobs and an inclusive growth agenda are mutually reinforcing but must be explicitly articulated. It is clear from past experiences in sub-Saharan Africa that jobs and inclusivity do not necessarily accompany the growth of GDP alone.

The case studies described above show, first of all, that many successful experiences have confirmed the feasibility of rapid, inclusive growth in sub-Saharan Africa. Second, they show that human capacity development, especially of farmers, workers, and SME entrepreneurs, is essential. There is a strong interrelationship between the creation of job opportunities on one hand, and people's capacity to respond to those opportunities on the other. Capacity development is needed for people as well as institutions. Third, in the seven cases studied, different measures were taken to scale up the impact of programs. Pilot projects have been scaled up to cover geographically wider areas, diversify activities, and disseminate proven technologies and practices from the local to the regional and national levels. In some cases, they have been shared with other countries through South-South cooperation. In many of the cases, the roles of government, public institutions, and public–private partnerships have been important.

The cases studied here should not be taken as "best practices" that can be readily supplanted to other countries. Most interventions require careful adaptation to local conditions. Nor are they all of the same level of importance or priority. For

example, of the various strategies, improving the productivity of small farms should be the highest priority. However, strategies to develop jobs, build human capacity, and create inclusive growth opportunities must fully take into account local socioeconomic and natural conditions—especially in agriculture—due to the characteristics of natural capital on which they depend. As the HLP report put it, "there is no single recipe" for developing a jobs and inclusive growth strategy (HLP 2013, 9).

Notes

1. For a discussion on inclusive growth from a "learning perspective," see Chap. 4.
2. This definition is similar to Ali's "three pillars of inclusive growth: (1) Full, productive and decent employment to maximize economic opportunities; (2) social protection to ensure minimum economic well-being; and (3) capability enhancement to ensure equal access to economic opportunities" (2007, 13).
3. Human security refers to the safeguarding of people's freedom from fear and want, ensuring that they can live in safety and dignity.
4. In contrast, hybrid seeds of maize, sorghum, and millet cannot be reproduced by farmers; hence, the private sector supplies seeds, although public support is necessary to develop biological and chemical technologies (World Bank 2012).
5. This is roughly true for nitrogen, potassium and phosphate fertilizers (Hirano 2013).
6. Project for Irrigation Human Resource Development by Strengthening the Capacity of Arusha Technical College: http://www.jica.go.jp/tanzania/office/activities/project/44.html.
7. More information on the capacity development initiatives and Tanrice 1 and Tanrice 2 projects can be found in the following reports: "Technical Cooperation in Supporting Service Delivery Systems of Irrigated Agriculture" (Tanrice 1) http://www.jica.go.jp/tanzania/english/activities/agriculture_04.html and "Project for Supporting Rice Industry Development in Tanzania" (Tanrice 2) http://www.jica.go.jp/tanzania/english/activities/agriculture_07.html.
8. Tanrice is implemented by specialized training institutes, such as KATC (Kilimanjaro Agricultural Training Centre), MATI (Ministry of Agriculture Training Institute)-Ilonga, MATI-Igurusi, MATI-Ukiriguru, KATI (Kizimbani Agricultural Training Institute), and the Rice Research Program in Tanzania and Zanzibar.
9. Participants in CARD include international organizations and donors such as the World Bank and International Fund for Agricultural Development (IFAD), and research institutes such as the International Rice Research Institute (IRRI), the Africa Rice Center (AfricaRice), the Japan International Research Center for Agricultural Science (JIRCAS). It also includes nongovernmental organizations, and South-South cooperation countries (such as Viet Nam).
10. The concept of NAIC was first used by H. Mint (JICA/JBIC 2008). In-depth theoretical and empirical analysis of Thailand was conducted by Suehiro and Yasuda (1987). Thailand's agro-industrial development within the framework of the NAIC strategy and its results are discussed in JICA/JBIC (2008).
11. The survey covered a total of 2,177 individual small-scale farmers belonging to 114 of 122 model farmer groups from which data could be obtained in a manner similar to that used in the baseline survey.
12. For details of the case of agroforestry in semi-arid Kenya, see Chap. 7.
13. In Kenya, farm forestry is considered an essential way of increasing the forest cover and diversifying subsistence products and income while contributing to soil and water conservation (Forest Act of 2005). The Agriculture Act on Farm Forestry Rules of 2009 stipulates 10% forest cover on farms. See KEFRI's web page on the Farm Forestry Research Program: http://www.kefri.org/farmf.aspx.

14. Clearly stipulated by the government's policies, such as its Five-Year Plan for Socio-Economic Development 2001–05 (JICA/JBIC 2008, p. 59).
15. For example, in Bangladesh, the purchasing power of agricultural wages increased dramatically due to the increased productivity of rice, from the monetary equivalent of less than 2.5 kg of rice a day in 1983 to more than 6.0 kg today (World Bank 2012).

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Addressing Challenges of Urbanization for Quality of Growth

6

Urbanization is closely related to the process of industrial structure transformation. New industries, along with the expansion and diversification of existing ones, create employment opportunities, drawing workers and managers to live in areas where such industries are located. Urbanization takes place accordingly, enabling higher productivity of these industries and, in turn, creating new demand for goods and services by industries that will employ more workers, thereby leading to further industrial transformation and urbanization. As such, industrial structure transformation and urbanization are intrinsically self-reinforcing. In this way, urbanization can be considered a part of the transformation process.

From this point of view, ADB's (2013) discussion of the relationship between industrial transformation and urbanization is very illuminating. It highlights five components of structural transformation: "reallocation of factors of production; diversification, upgrading, and deepening of the production and export baskets; use of new production methods and processes and different inputs; urbanization; and social changes" (3). This approach is confirmed by statistical analysis demonstrating that "urbanization and GDP per capita tend to move in sync as countries develop, thus creating a consuming class that drives demand. In all known cases of high and sustained growth, urban manufacturing and services led the process, while increases in agricultural productivity freed up labor to move to the cities" (3). However, the ADB document emphasizes two challenges of urbanization, in that, "Because urbanization is one of the most important enablers of rapid growth, countries that want to grow fast must learn how to make urbanization work well. The first challenge is to foster the growth of high productivity activities that benefit from agglomeration and scale economies in developing-country cities. The second involves managing the likely side effects of the economic success of cities, i.e., urban poverty, pollution, congestion, and high prices of land and housing, as well as regional inequality. Meeting this second challenge is essential for mitigating the divisive impacts of successful economic growth and spreading the benefits of higher economic productivity widely" (25).

Related to these challenges of urbanization is Goal 11 of The Sustainable Development Goals (SDGs). It calls on member states to "[M]ake cities and human settlements inclusive, safe, resilient and sustainable." A specific target of this Goal is to, "by 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries." The Goal addresses the serious context of urbanization in developing countries. In many developing countries, urban conditions continue to be diffuse and disorganized. The lack of proper planning generates unsafe and dangerous conditions for everyday life and blocks access to jobs as well as educational, and cultural

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opportunities (de Souza et al. 2018). Moreover, according to the UN High-Level Panel for the post-2015 Agenda (henceforth, HLP), by 2030, there will be over one billion more urban residents in the world and, for the first time, the number of rural residents will start to shrink (HLP 2013).

Manuh and Yemeru (2019) sketch out the process of urban transition, which is currently taking place in Africa on a scale unprecedented in history. The number of urban dwellers is expected to increase by almost 900 million in the next 35 years. By 2050 Africa is projected to have an urban population of 1.48 billion, with a further 1 billion rural dwellers (380). They argue that "the manner in which urbanization is planned and managed today will play a critical role in the quality of growth in Africa over the coming decades, and in particular the achievement of structural transformation through industrialization." They further emphasize that, "in this respect, although Africa's urbanization offers possibilities to advance key economic, social, and environmental policy priorities, its current trajectory poses significant risks for the quality of growth" (376).

The *World Development Report 2016: Digital Dividend* argues that rapid urbanization in the developing world "creates urgency to get our cities 'right' because global response to our most pressing challenges – from climate change to rising inequality – will likely succeed or fail in cities" (World Bank 2016, 240). We could consider this concept of getting cities "right" as realizing "quality urbanization."

From a quality of growth perspective, one of the most effective approaches that can be used to address these urban challenges is "re-urbanization with land readjustment." This chapter aims to provide insights into the main features of the land readjustment approach, focusing on its effectiveness, advantages, and challenges. First, in Sect. 6.1, this chapter will discuss the main characteristics of land readjustment and its relevance for urbanization, drawing from experiences in Japan. In Sect. 6.2, it will analyze how land readjustment can enhance the inclusiveness, sustainability, and resilience of urban development. Section 6.3 will discuss experiences of land readjustment in developing countries, focusing on the remarkable case of Medellin, Colombia. It will review international cooperation in introducing land readjustment in Sect. 6.4. Finally, some concluding remarks will be offered.

6.1 Land Readjustment and Re-urbanization as an Approach to Making Cities Inclusive, Safe, Resilient, and Sustainable: Key Issues

As cited above, Goal 11 of SDGs calls on member states to "Make cities and human settlements inclusive, safe, resilient and sustainable." We therefore need to find effective ways and means to realize Goal 11. One method or practice that could provide an effective approach to this goal is "land readjustment." This approach could help to address the challenges of improving urban conditions in order to achieve urbanization while promoting more desirable attributes. Based on experiences in Japan and other countries, this section explores how these experiences have been applied and further improved in a range of developing countries through Japan's international cooperation programs, as well as those of other organizations.

There are two main known tools that can be used to address the demand to reorganize urban structures and land patterns. The first of these is eminent domain, or expropriation, by which private property is compulsorily purchased for public usage or reallocated to third parties who will assign it to public or civic uses. The other is land readjustment. This has been promoted as an innovative land assembly method to overcome reorganization problems faced—especially by developing countries (Sorensen 2009; de Souza 2018, 17).

Japan is one of several countries that have managed over the past decades to implement solutions to urban problems faced by all developing countries: migration from rural areas to urban centers, urban expansion and uncontrolled

growth, and countless environmental problems. Throughout this entire process—which took place over more than a century—methods for territorial planning were developed and institutionalized. This included negotiation processes to control urban growth, and implementation of infrastructure and land pattern changes—especially through land readjustment practices—without the widespread use of expropriation (de Souza 2018, 22). Therefore, Japan might be considered a pioneering country in mainstreaming the land readjustment approach in urban development policy.

The usage of land readjustment in Japan is broad in scope and purpose. It can be divided into five categories: control of urban sprawl, development of new towns, urban rehabilitation, development of complex urban infrastructure, and disaster reconstruction (de Souza 2018, 23–24). Indeed, the scale of its application in Japan is outstanding: "Widely applied throughout the country, land readjustment is known as the 'mother of urban planning' in Japan. Several project modalities have been introduced and improved over the past century, transforming 10,909 areas, or 329,249 ha (as of March 2013), which represents approximately 1/3 of the whole country's urban area" (de Souza and Ochi 2018, 36). Furthermore, land readjustment has been a driving force behind post-disaster reconstruction, in particular (Yanase 2018, 42).

Definitions of land readjustment are diverse and differ according to country contexts. However, the essential concepts can be found in the general provisions of the Japanese "Land Readjustment Law" enacted in 1954. According to this law, land readjustment means to alter the shape and land conditions of lots and install or improve public facilities in a city planning area in order to provide better public facilities and increase the usage of each lot.

The following explanation describes land readjustment in terms of its goals and process: "through land readjustment projects, the main contribution is in the form of land that will improve the public realm—roads, parks, sidewalks, sites for public schools and hospitals—and, consequently, increase private land values. As purchasing land for public facilities can be prohibitively expensive, through the win–win potential of land readjustment, it can be possible to finance and promote projects that would not be possible by any other means. Landowners' property rights, in this sense, still prevail, with smaller size and possible higher total asset value, aiming at the fair distribution of costs and benefits for urban development" (de Souza 2018, 25).

6.2 Land Readjustment: Characteristics and Relevance for Urbanization in Developing Countries' Quality Growth

Based on the above-mentioned characteristics, we might ask how land readjustment can facilitate the attainment of the desired attributes of urban development: inclusiveness, safety, resilience, and sustainability. The following sections will discuss some general aspects of land adjustment first, and then consider its contribution to developing countries' urban development, by drawing from one concrete case.

6.2.1 Land Readjustment and Inclusiveness

As discussed in Chap. 3, the Framework of Inclusive Growth Indicators (FIGI) asserts that the outcomes of inclusive growth are achieved through three policy pillars. These are sustained economic growth and development of productive jobs and economic opportunities, social inclusion to ensure equal access to economic opportunities by expanding human capacities, and social safety nets to protect the chronically poor and to address the risks and vulnerabilities of the population (ADB 2013).

Land readjustment may bring two significant social benefits in comparison to eminent domain, or expropriation. The first benefit is the preservation of social, cultural and economic networks that are closely tied to a physical location, routines and interactions of everyday life in that

place, through original community maintenance (de Souza 2018, 17). This is because, in the case of land readjustment, all dwellers (landowners and tenants) remain after project implementation. Community cohesion, or social capital, is maintained or fostered in this approach. The second benefit is the realization of the equitable distribution of costs and benefits in urbanization processes. All property owners (the original residents) contribute by providing a portion of their property to establish public spaces, or by providing land to sell to pay for improved infrastructure. Thus land readjustment can provide a means of working towards a more equitable distribution of both costs and benefits of urbanization (Sorensen 2009, xi; de Souza 2018, 17).

From the perspective of inclusive development, the inclusiveness of land readjustment is clear in indicators such as FIGI, as mentioned above. On the one hand, land readjustment could potentially facilitate opportunities for residents to participate more actively in the economic and social development process through better access to opportunities. For example, new infrastructure constructed in a land readjustment area can enhance connectivity to public transport (new bus stops and so on) and to urban centers, access to higher education or specialized health care, as well as diversified job opportunities. Moreover, land readjustment can secure the public space necessary for basic education and primary healthcare through the landowners' land contribution mechanism.

Furthermore, land readjustment contributes to addressing increasing inequalities that may occur during the process of urbanization. It ensures a fair distribution of the costs and benefits of urban development and avoids the problem of increases in land values (capital gain, or *plus valía*) being monopolized by large landowners, developers or governments. With the costs of land readjustment mostly borne by beneficiaries, the need to use public funds for urban development can be minimized. Finally, social safety nets to protect the chronically poor and address the risks and vulnerabilities of the population can be enhanced directly or indirectly by land readjustments (as discussed below). In short, land readjustment may help to make urban development inclusive and equitable.

6.2.2 Land Readjustment and Safety, Resilience, and Sustainability

One driving force behind post-disaster reconstruction in Japan is land readjustment. After a disaster occurs, people aim to build back more resiliently and stronger than before, or build back better (see Chap. 8), rather than simply trying to rehabilitate the disaster-stricken communities (Yanase 2018, 42). In post-disaster reconstruction, both preservation/cohesion and stronger resilience of communities are essential and, as such, land readjustment has been a powerful driving force.

The improvement of sewage, waste treatment and drainage systems, construction of green belts and parks, and other facilities necessary for the environmental sustainability of the community requires public space for which a land readjustment approach may be effective. Without this approach, the cost of securing land for these investments in public expenditure could be enormous. Cities without facilities for environmental sustainability are likely to suffer from serious air and water pollution and its consequences. Public space and better connectivity, as well as community coherence, are important for the safety of residents and the city as a whole. Furthermore, as discussed below, there have been cases of re-urbanization through land readjustment that have contributed remarkably to improving public safety.

In summary, land readjustment is an approach that can contribute to making cities more inclusive, safe, resilient, and sustainable, as established by the SDGs—especially Goal 11. However, land readjustment alone cannot assure inclusive development. In order to address urban poverty in slums, several policy measures need to be introduced, together with land readjustment, in slum areas. As such, a comprehensive scheme with a whole range of policies and tools is

essential. On the other hand, traditional pro-poor approaches may be more effective when they are implemented with land readjustment.

6.3 Land Readjustment in Developing Countries: Case of Medellin, Colombia

Urbanization is accelerating in developing countries, where urban sprawl, slums, inadequate urban infrastructure, human insecurity, air and water pollution, and vulnerability to disasters are common. Urban slums continue to expand in high-risk areas. In this context, participation by the urban poor in the development process is constrained by inadequate access to jobs and economic opportunities and by limited access to education and healthcare, undermining the capacity to take advantage of such opportunities. After urban slums are settled and subdivided, whether legally or illegally, it is extremely difficult to rearrange property patterns, and it is both difficult and expensive to ensure land for proper public purposes and facilities. In these circumstances, land readjustment or reurbanization programs that include land readjustment could provide an effective approach to addressing the above-mentioned urban poverty and slums and making cities of developing countries inclusive, safe, resilient, and sustainable.

Additional insights into these aspects can be drawn from an examination of one concrete case from a developing country. In Colombia, Law No 9 was enacted in 1989 in order to introduce urban reform instruments for management and land use planning, conferring on the State the primary role as city builder. During the law's development process, the involvement of the Japan International Cooperation Agency (JICA) was reflected in the incorporation of instruments such as land readjustment and urban redevelopment in particular (Rojas Everhard 2018, 116).

Later, in 1997, a new law (Law No. 388) was enacted, which prompted all Colombian city councils to prepare an urban planning master plan. Japan's ten-year history of cooperation contributed greatly to efforts to establish this new urban planning framework. Former trainees from the JICA country-specific training courses provided a driving force in Colombia's urban planning. In 2003, the Colombian government proposed new urban development projects and asked for the participation of the former trainees. This meant that JICA's support for capacity building in the areas of urban planning and land readjustment was relevant to the Colombian government and its development policies, and the high level of capacity building was recognized (Ochi 2018, 134).

The former JICA trainees worked in administrative institutions of important Colombian cities, including Medellin, Cartagena and Chia, and applied the urban planning and the land readjustment methods they learned. By 2013, land readjustment projects that included urban redevelopment projects had been conducted in five districts, including Medellin, and there were about 50 projects using methods similar to land readjustment that had been undertaken all over the country (Ochi 2018, 134).

Integral improvement of communities (Mejoramiento Integral de Barrios, MIB) in the *Juan Bobo* area of Comuna no. 2 in the Northeastern zone of Medellín was designed, coordinated, and implemented by the Company of Urban Development (Empresa de Dessarollo Urbano, EDU) between 2004 and 2008. The project targeted dwellings that had been constructed along the banks of the Juan Bobo Stream, with a population of 1,353 (300 families) and a land area of 1.75 ha. MIB is a part of the Integral Slum Improvement Program, a city program that attempted integral slum redevelopment between 2004 and 2007. The project goals were: (i) applying an efficient and flexible planning procedure based on technical criteria adjusted for each micro-territory, (ii) fostering community consensus and participation in generating secure co-living conditions, (iii) improving the whole neighborhood by securing proper financial resources, (iv) improving and legalizing

residences on the basis of an analysis of demographic dynamics, and (v) improving degenerated land and the environment to help on-site resettlement (Alcaldía de Medellín 2011; Sato 2013, 5).[1]

In 2002, a public gondola-lift transport system called Metro Cable K Line was inaugurated in areas called Comuna no. 1 and Comuna no. 2, providing a 7-min service connecting the hillside neighborhoods of Northeastern Medellín with the Medellín metro system, benefitting approximately 170,000 residents. This provided services to Comuna no. 1 and no. 2, areas where living conditions were the lowest in the city, and constituted a much-needed public intervention. Thus, the blueprint for MIB came to be included in the draft of the city development plan.

Through this project, the following infrastructure works were completed in the public space secured by land readjustment in the Juan Bobo area: sewage pipes (2.7 km), cleaning of the stream basin (200 m), stream-edge improvement for pedestrians (1,500 m^2), public space and pedestrian mobility improvement and construction (4,500 m^2), restoration of the environment (2,000 m^2), construction of a bridge to connect parts of the community, and construction of a library and two community salons. At the same time, eight new apartment blocks were constructed and property rights were registered for 118 families. Along with this, 115 houses were improved (Sato 2013, 34).

This re-urbanization project utilizing a land readjustment approach was inclusive: coherence of the community was maintained and fostered through the whole project process and by the construction of two community salons. The conversion of property rights was made not only from land to land (i.e. moving to a new smaller property of approximately the same value) as practiced in Japan, but also from land to building floor in this case (i.e. moving to an apartment of similar value to the land). In addition, all apartment floors were legally registered. With the improvement of roads in the district, together with the construction of the Metro Cable, access to jobs and other economic opportunities substantially improved.

Through the construction of the sewage pipes, cleaning of the Juan Bobo stream basin, and restoration of the environment, the project contributed to the environmental sustainability of the district. The resilience of the community was enhanced, because the high-risk areas where houses were located (for example, where there was a possibility of landslides occurring) were converted into green areas. Furthermore, new apartments were constructed in areas where there was a low risk at a safe distance from the valley through which the Juan Bobo stream runs. Regarding public safety, the only available statistics are for the whole of Medellin city. While considered one of the most dangerous cities in the world at the beginning of the 1990s, the number of homicides per 100,000 persons decreased from 381 in 1991 to 184 in 2002, and just 26 in 2007. Although this decrease cannot be attributed exclusively to urban redevelopment programs, the completion of Metro Cable K and the implementation of these programs in the 2000s coincided with the rapid decrease in the homicide rate. In 2007, the homicide rate in Medellin was lower than the average for Colombia, yet it still remains higher than the capital, Bogota.[2]

The improvement in inclusiveness (better housing, better access to jobs, and education and health facilities), safety, resilience, and sustainability through urban redevelopment with the land readjustment approach may have contributed at least partly to the improvement of the Human Development Index of Comuna no. 1 from 73 in 2004 and 2006 to 79 in 2009. At the same time, the status of Medellin also improved from 79 in 2004 to 80 in 2006, and 85 in 2009.[3]

In short, experiences in Colombia and many other developing countries confirm that the land readjustment approach may provide a fundamental tool for improving poor areas, and in securing land for the poor, together with public spaces for inclusive development. Experiences in Afghanistan, Angola, Bhutan, Brazil, Colombia, India, Indonesia, Mongolia, Nepal, Thailand, Turkey, and Vietnam are analyzed in Chap. 3 of the book, *Land Readjustment: Solving Urban Problems through Innovative Approach* edited by de Souza

et al. (2018). In Japan, land adjustment is not usually regarded as a means of addressing issues of poverty (see Ochi 2018, 137). As such, the above finding regarding the relevance of land readjustment for improvement of poor areas is a result of mutual learning toward innovative approaches achieved through international cooperation. In Colombia, the establishment of a land readjustment framework contributed to the country's efforts in urban planning, in which the need to address issues related to urban poverty remains a major concern.

6.4 International Cooperation for Land Readjustment

Japanese cooperation for land readjustment has been provided mainly through three schemes or programs: (1) active participation in international conferences and seminars, (2) structured training courses for developing countries' practitioners held continuously in Japan over the past three decades, and (3) technical cooperation with some developing countries carried out together with above-mentioned international seminars or training courses.

Land readjustment became internationally known in the late 1970s. The first International Conference on Land Consolidation was held in 1979, where the term 'land readjustment' was used for the first time. The conference decided to switch away from the term 'land consolidation' to 'land readjustment' after considering the variety of land readjustment projects presented at the conference (see Ochi 2018, 126). The second international conference was held in 1982 in Japan as a commemorative event to celebrate the completion of the post-war reconstruction land readjustment projects in Nagoya City. This conference highlighted the active implementation of land readjustment projects in Japan. After the conference, several international seminars were held in the ASEAN region and other countries, resulting in significant impacts on urban development in Southeast Asian countries. These international seminars came to an end in the year 2000 (see Ochi 2018, 126).

Japan started to provide technical cooperation related to land readjustment during the 1980s, in which the former Ministry of Construction and JICA played a central role. There have been two types of technical cooperation programs in this regard: (1) a full set-type technical cooperation program which includes dispatch of experts and feasibility studies on land readjustment; and (2) training courses and follow-up type support for developing countries to establish their own land readjustment frameworks.

JICA and the former Ministry of Construction (Japan) began to provide training courses on land readjustment in 1983, aiming to disseminate Japan's urban development techniques to developing countries. JICA has continued to provide these training courses until today, with a total of 363 participants from 68 countries attending these courses from 1986 to 2014 (see Ochi 2018, 127).

Based on the experiences of international cooperation over the past three decades, JICA has introduced changes in the training courses, taking a more specific approach, such as the establishment of an institutional land readjustment framework and problem-solving, thus going well beyond a general introductory program of land readjustment. To this end, JICA decided to accept trainees from countries where land readjustment projects are being conducted, and from countries where a government organization is trying to introduce the land readjustment method at home. The training program contents do not focus solely on Japanese experiences of land readjustment but are based on mutual learning with countries that have successfully applied their own land readjustment policies (see Ochi 2018, 138). Triangular cooperation approaches—in which pivotal countries, beneficiary countries and Japan all participate—appear to be a promising area (Hosono 2013). Colombia is now acting as the leader (or pivotal country) in land readjustment experiences for Latin American countries, while Thailand is expected to be a leader in Asia.

Recently, some international organizations have become increasingly engaged in international cooperation in land readjustment. For

example, UN-Habitat incorporates this approach into its cooperation program by paying attention to the participatory and inclusive attributes of land readjustment. This organization also considers land readjustment as a viable tool to enable public and private partnerships for land development. In 2016, the World Bank started to offer online courses in land readjustment (see Ochi 2018, 139).

In these ways, land readjustment has increased its relevance in international cooperation for urbanization, urban redevelopment, and in particular, for the achievement of the SDGs—especially of Goal 11.

6.5 Concluding Remarks: Land Readjustment and Quality Urbanization

Land readjustment could provide an effective approach toward realizing "quality urbanization" and attaining Goal 11 of the SDGs. However, land readjustment alone is unlikely to achieve the expected outcomes. It needs to be applied comprehensively and strategically in addressing the issues that face developing countries. This includes not only infrastructure development, slum upgrading and the guarantee of property rights but also urban management, urban governance, climate change mitigation/adaptation, and so forth.

In this regard, it is critical to envisage comprehensive ways of achieving "quality urbanization." that can be adapted to the many diverse realities of developing countries. Further in-depth study is needed, drawing from theoretical and empirical analyses of past experiences. This chapter has provided some substantial insights into recent initiatives and their outcomes. For example, land readjustment in Medellin, Colombia, applied to urban slums, together with several measures implemented in the same period, has achieved substantial improvements within informal settlements in high-risk areas. In general, pro-poor policies, infrastructure for better access to jobs, education and health, and land readjustment could produce synergies and effectively address the challenges faced by urban slums.

Since the mid-2000s, several "smart city" initiatives have been carried out to make cities more sustainable. It is important to note that smart city development projects have recently emphasized both sustainability and inclusion. The *World Development Report 2016: Digital Dividend* identifies three exemplary practices for smart cities: using data to address the most vulnerable populations (e.g. São Paulo), opening up data to promote accountability (e.g. Nairobi), and using mobile connectivity to enhance civic participation (e.g. Philippines) (World Bank 2016, 241). The alignment of land readjustment projects to these and other initiatives of smart cities appears to constitute a very promising approach.

In summary, land readjustment could provide an important instrument for development and redevelopment of urban areas, and potentially for "quality urbanization," which is essential for quality growth in the contemporary developing world. It is hoped that the discussion provided in this chapter has offered meaningful insights into inclusive, sustainable, and resilient urbanization by identifying the advantages and challenges of land readjustment, and hence, will help with the identification of useful steps toward the attainment of quality growth and poverty reduction realized through such growth.

Notes

1. This and next four paragraphs are based on Sato (2013) and the author's field survey in Juan Bobo area in 2010.
2. These figures are from Sato (2013, 7), based on the data from Empresa de Desarrollo Urbano (EDU).
3. These figures are from Sato (2013, 7), based on Rivas (2011, 45).

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Quality Growth Focusing on Environmental Sustainability

7

Transformation and sustainability is one of the central themes of the quality growth agenda. Generally, emphasis is put on the necessity of transforming the actual economic structure into a more sustainable one. The outcome document of the United Nations Summit for the adoption of the post-2015 development agenda, "Transforming Our World: the 2030 Agenda for Sustainable Development," states in its preamble: "We are determined to protect the planet from degradation, including through *sustainable consumption and production, sustainably managing its natural resources and taking urgent action on climate change*, so that it can support the needs of the present and future generations" (italics added) (United Nations 2015). Concrete goals and targets have been established for, among other things, the three priority areas: sustainable consumption and production (Goal 12 of Sustainable Development Goals (SDGs) adopted at the UN summit), sustainable management of natural resources (Goals 14 and 15), and urgent action on climate change (Goal 13). This chapter discusses effective approaches toward quality growth, focusing particularly on environmental sustainability related to Goals 12, 13, 14, and 15 of the SDGs. Section 7.1 of this chapter focuses mainly on the idea of a circular economy, Sect. 7.2 discusses the green economy, and Sect. 7.3 examines natural capital, transformation and sustainable growth, with some concluding remarks at the end.

7.1 Sustainable Consumption and Production: Mainstreaming of the Circular Economy

As a target of Goal 12 (Target 12.1), the UN 2030 Agenda states the importance of implementation of the 10-Year Framework of Programs on Sustainable Consumption and Production Patterns (10YFP). It was adopted at the United Nations Conference on Sustainable Development (Rio + 20 Conference) in its Outcome Document *The Future We Want* (United Nations Conference on Sustainable Development 2012). The 10YFP will develop, replicate and scale up Sustainable Consumption and Production (SCP) and resource efficiency initiatives at national and regional levels, decoupling environmental degradation and resource use from economic growth, and thus increase the net contribution of economic activities to poverty eradication and social development. An effective approach to SCP is to "substantially reduce waste generation through prevention, reduction, recycling and reuse" (Target 12.5). From this viewpoint, the concept of a circular economy deserves special attention, as it entails markets that give incentives to reusing products, rather than scraping them, and then extracting new resources[1]: In such an economy, all forms of waste, including clothes, scrap metal and obsolete electronics, are returned to the economy or used more efficiently. This can provide a way to not only protect the environment

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but also use natural resources more wisely, develop new sectors, create new jobs and develop new capabilities (UNCTAD 2017, 1). As such, transformation of industrial structures to strengthen the circular economy could be an effective path to attain quality growth in terms of environmental sustainability and inclusive development. This will result in fundamental changes in the way that our societies produce and consume goods and services.

One of the industrial sectors that has high potential for strengthening the circular economy is the automobile industry. In many countries, there are many places where old vehicles are abandoned as garbage around cities. Diverse resources could be recovered and recycled from these vehicles, reducing the risk of environmental deterioration and creating jobs, and thus decoupling growth from environmental degradation. Case 7.1 below elaborates on the process of a circular economy of automobiles. Another sector with high potential for the circular economy is the electronics industry. As the World Bank (2020) states, "Global Value Chains (GVCs) have the potential to turn [electronic]-waste (e-waste) into valuable resources … E-waste flows should be viewed as sources of inputs for next-generation products. The World Economic Forum's call for a *circular electronics value chain* represents a model of sustainability that is difficult to envisage without GVCs" (123, italics are added). The report points out that Japan has e-waste management laws that make manufacturers and retailers responsible for taking back used home appliances, recycling them, and publishing the cost of recycling.

7.1.1 Case 7.1: Enhancing the Circular Economy of the Automobile Industry

Today, efficient car recycling has become a major challenge in developing countries. Used automobiles must be dismantled properly, or otherwise, this can be a major cause of environmental pollution. One Japanese company, Kaiho Industry, has been a pioneer in reusing and recycling used cars in many countries—including Japan and some developing countries. If the production of cars through global value chains can be perceived as an arterial industry, the recirculation of used cars could be considered to be a venous industry. In order to achieve Goal 8.3, enhancement of venous industries are essential. This company addresses the challenge with its experience and technology. It developed the "KRA system," an automobile recycling total management networking system, to manage every process from vehicle purchase to overseas sales while maintaining traceability of vehicle quality. The worldwide network covers about 90 countries. The "KRA system" enables all automobile recycling companies to participate in the fair trade of used cars. It is a system that is indispensable for overseas expansion of venous industries. Currently, the company is running projects in countries such as Brazil, India, Indonesia, and Kenya, where it has established recycling centers with public or private partnerships. The company established a pilot plant and an international recycling education center (IREC) in Brazil to disseminate "correct car recycling methods" and to conduct an automobile recycling business.

In 2010, the company created its own standard, named "JRS (Japan Reuse Standard)," to evaluate the quality of used engines of automobiles. In 2013, based on the JRS, the used engine evaluation standard, referred to as "PAS 777," was officially issued by the British Standards Institute as a publicly available specification. Since the quality of used engines evaluated by this standard is clear, customers around the world can purchase them without worry. Indeed, these activities are a critical part of automobile value chains in terms of the improvement of resource efficiency in consumption and production and decoupling economic growth from environmental degradation, as indicated in Goal 8 of the SDGs (Target 8.3). UNDP has approved Kaiho Industry's accession to the Business Call to Action (BCtA) as the first SME (small or

medium-sized enterprise) in a venous industry in Japan.[2]

Improvements in the efficient use of energy and materials in the process of production are a cross-cutting approach to strengthening sustainable production of goods and services. In this regard, a management system known as Kaizen, along with related approaches including Total Quality Management (TQM), could be an effective vehicle for this approach. This approach seeks to achieve higher quality and productivity through continuous improvement, while eliminating among other things, *Muda* (waste). Case 7.2 considers the Kaizen approach from a sustainable production perspective.

7.1.2 Case 7.2: Kaizen, TQM and Sustainable Growth

A core method of Kaizen is to eliminate *Muri* (overloading), *Muda* (waste), and *Mura* (inconsistency) from the worksite through efficient utilization of labor, energy, materials, and equipment. As such, the concept of environmental sustainability has been intrinsically incorporated into Kaizen, TQM and related approaches in Japan from the inception phase of the introduction of these approaches (see Chap. 4). It should also be highlighted that the widespread dissemination of Kaizen, QCC (Quality Control Circle), TQC (Total Quality Control), TQM, and related approaches have contributed significantly to the sustainable growth of Japan since the 1970s. As the Development Bank of Japan and Japan Economic Research Institute (2003) emphasize, "One of the significant impacts of Japanese TQC/TQM is often explained through descriptions of the development of the car industry after the oil crises in the 1970s. During this period, TQC was extended to activities for energy conservation and measures for resource maintenance. It greatly impacted on various industries and became more securely established as a valuable quality framework for Japanese industrial development" (46) (see Chap. 4).

7.2 Strengthening the Green Economy: Sustainable Use of Terrestrial Ecosystem, Sustainable Management of Forests, and Reversal of Land Degradation

The UN outcome document on the SDGs establishes that Goal 15 aims to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation, and cease biodiversity loss. For Goal 15, the concept of a green economy deserves special attention. The Rio + 20 Conference in 2012 focused on the development of a green economy. Its outcome document stated that, "we express our determination to address the themes of the conference, namely a green economy in the context of sustainable development and poverty reduction, and the institutional framework for sustainable development" (United Nations Conference on Sustainable Development 2012, 2). A 'green economy' is a pathway to sustainable development and poverty reduction, as highlighted by the United Nations Environment Program's (UNEP) report prepared for the Rio + 20 Conference (UNEP 2011). UNEP defines a green economy as one that results in "improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities" (UNEP 2011, 9). A concept similar to the green economy is 'green growth'. OECD provides the following definition of green growth: "Green growth means fostering economic growth and development, while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies" (OECD 2011, 4).

As such, from the quality growth perspective, there is a close relationship between the transition to a green economy and the eradication of poverty, as well as inclusive development. Productive sectors like agriculture, forestry, fishery and water management are sectors with high potential for poverty reduction as well as possible areas for a green economy. Nevertheless, the

transition to a green economy will not automatically address all poverty issues. On the other hand, the transition to a green economy will not be realized without people's support and cooperation; hence, it needs to contain a poverty-reduction orientation if it is to succeed. Thus, as UNEP correctly points out, "a pro-poor orientation must be superimposed on any green economy initiative" and, furthermore, "a green economy must not only be consistent with [the] objective [of Millennium Development Goals (MDGs)], but must also ensure that policies and investments geared towards reducing environmental risks and scarcities are compatible and ameliorating global poverty and social inequality" (UNEP 2011, 20). Therefore, this chapter often utilizes the term 'inclusive green economy' in order to make explicit the inherent needs for a green economy to have a pro-poor and inclusive orientation.

From this viewpoint, this chapter examines three cases that can be broadly categorized as 'sustainable and inclusive development' and are related to the areas of agriculture, forestry and water management. The case studies provide insights into how to achieve the dual objectives of reducing environmental risks and poverty and inequality, and realizing, according to the definition given above, an inclusive green economy. In particular, we will discuss how innovative solutions were created during the process toward the attainment of both these goals. All selected cases are related to forests in tropical regions, while they have different climatic and topographic conditions. Two cases—the Amazon rainforest and Panama Canal watershed—are in a humid tropical zone, while the third case, in Kenya, is mainly located in an arid or semi-arid zone. Topographically, the Panama Canal watershed is in mountainous areas while the Amazon rainforest is located on low, flat land. In contrast to the other two cases, Kenya contains both low and high lands. Hence, all these regions face different risks of environmental deterioration. However, they face common challenges in simultaneously achieving the conservation of the environment and improvement of livelihoods of those who live in these regions.

A remarkable experience of consolidating a green economy in the Amazon Rainforest is examined in Case 7.3 below.

7.2.1 Case 7.3: Strengthening the Green Economy with Innovative Practices: Agroforestry in the Amazon Rainforest

As natural capital, tropical rainforests are extremely important for a green economy. They are rich in biodiversity and function as huge reservoirs of carbon dioxide, but they are increasingly becoming endangered. Indeed, significant losses have already occurred worldwide. Shifting agriculture was thought to account for about one-third of the deforestation in Amazonia, while cattle ranching was responsible for at least half of the forest retreat (Smith et al. 1998). It was common practice for illegally deforested land to be used for a number of years as pasture for cattle ranching and other purposes and for the land then to be abandoned when its fertility was almost lost. Therefore, the challenge in the Amazon rainforest lies not only in the establishment of sustainable and inclusive agroforestry for small farmers but also for the regeneration of abandoned land.

In this context, in the state of Pará in the Brazilian Amazon region, crop diversification and critical production experience in Tomé-Açu, led to the development of an innovative agroforestry model (hereafter referred to as the Tomé-Açu model) that is well suited to the Amazonian environment according to, among others, a study by Piekielek (2010). This study highlights the model's main characteristics: "The basis of this model is that production is most successful when it mimics some of the important natural processes of the tropical forest. Crops are interplanted, grown with associated crops that complement each other by providing shade and that allow farmers to focus intensively on smaller plots of land. Crops are planted to establish a series of successive harvests … Crops are intensely fertilized with a variety of organic compounds,

including organic wastes, natural fertilizer compounds, charcoal, and bokashi, a type of fermented compost developed in Japan, to ensure that associated crops do not compete for nutrients" (Piekielek 2010, 20).

As such, in the Tomé-Açu model, key factors include a combination of crops and trees and the sequence for planting them. For example, cacao plants need 40% shade, so bananas are the ideal neighbor, because they grow faster than cacao and provide protection from direct sun, heavy rain and strong winds. Between the rows of banana and cacao, at 24-m intervals, *tabereba* (*Spondias mombin*) fruit trees, açai palm trees, and/or mahogany can be planted. Among these tree species, corn and rice can also be planted. When planting diversified species, it is necessary to take particular care that the spacing between the different species should be appropriate. Perennial and arboreal species tend to compete against each other for space in which to grow. Some consume a lot of water while others need more fertilizer. Michinori Konagano, one of the leaders of Tomé-Açu Multipurpose Agricultural Cooperative (CAMTA), who made a substantial contribution to the development of the Tomé-Açu model, has devised a long-term cultivation plan, featuring crop species that are all economically reliable.[3]

For example, the following is a model case for the overall long-term development process of an 'agroforest'. The tropical climate encourages the rapid growth of plants. Rice is harvested in the first year, so farmers are sure of some income. In the second year, the banana and black pepper produce their fruits. From the third year, as the plants continue to grow, the farmland turns increasingly bushy. Banana plants bear fruit for several years. Cacao grows in the shade of the banana leaves. Black pepper plants increase production each year throughout their life spans of about eight years. Tabereba, açai palm and mahogany grow quickly in their early years. Cacao starts to bear fruit from the third year. By the sixth year, cacao will have grown to a height of three meters, açai palms to five meters and tabereba and mahogany to more than eight meters. The farm becomes dense like a forest. Açai palm and tabereba are now ready for harvest. Cacao production begins to overtake that of pepper, giving farmers another source of revenue. Banana and black pepper plants die off after seven years. Cacao carries on producing in the shade of tall tabereba and mahogany trees. At this point, the farm turns into a forest garden. In this way, the agroforestry in Tomé-Açu allows a succession of productive plants, providing farmers with a steady annual income. Which species and when they are planted depends on the discretion of the farm and the farmer. Factors affecting the decision include location, soil condition, water availability, management efficiency and the optimum harvesting period. In this process, what matters is the farmers' learning and enhancing the capacity of learning to learn.

The model is inclusive and sustainable. Using this model, 25 ha of agroforestry produce the same level of income as 1000 ha of cattle ranching. Therefore, the income from 25 ha of agroforestry is forty times that of the cattle ranching from the same amount of land. Moreover, the agroforestry creates jobs for ten to twenty workers in 25 ha, whereas the ranching needs 50–75 ha to create a single job (Yamada 2003). In their study Smith et al. (1998, 5) emphasize the commercial feasibility of the Tomé-Açu model: "Agroforestry is an ancient practice in Amazonia. Many indigenous peoples plant a mixture of tree and annual crops in their fields, and traditional, small-scale farmers usually maintain a rich assortment of tree, bush, and herbaceous plants in their home gardens." However, the authors emphasize that commercial agroforestry in plots away from home gardens is the main focus of their study, because it can play an especially important role in slowing deforestation and improving rural livelihoods (Smith et al. 1998, 7). As the study finds, "Tomé-Açu in Para, settled by Japanese immigrants in the late 1920s and early 1930s, became an innovative pole for agroforestry systems geared to markets starting in the 1970s" (Smith et al. 1998, 8).

In one of its recent research projects, the Brazilian Agricultural Research Corporation (Embrapa) Eastern Amazon Center found striking similarities between the characteristics of agroforest soils of this model and those of the natural forest soil of the Amazon rainforest. This may imply the resilience of the agroforest ecosystem in terms of not only flora but also fauna. In fact, as agroforests have grown over the years, the number of observed bird species has increased, showing how agroforestry supports both ecosystem recovery in the Amazon and farmers' livelihoods. In acknowledgment of the establishment of the successful model, on December 1, 2010, the Tomé-Açu Multipurpose Agricultural Cooperative (CAMTA) was awarded the first Brazil Regional Development Contribution Prize by the Federal Government of Brazil (Hosono 2013).

Several Japanese companies, including Meiji and FRUTAFRUTA, commercialize products of Tomé-Açu for the Japanese market. Agroforestry Chocolate produced by Meiji received the Eco-Products Award as well as the Award of the Environment Minister of Japan. Recently CAMTA and Meiji started to work together through an agreement for cooperation in the development of technology of fermentation and for the sustainable trade of cacao. As the web page of FRUTAFRUTA explains, "Charmed by the passion and diligence of Japanese immigrants engaged in agroforestry through trial and error with numerous crops amid difficult conditions, FRUTAFRUTA directly imports the fruit ingredients and other types of ingredients produced through agroforestry from CAMTA in order to support the development of their agroforestry."

The case of the Panama Canal watershed conservation area is also relevant for the aforementioned challenges in attaining both conservation of the environment and inclusive development. In Panama, there had been concerns about water, a key natural capital, for the Panama Canal. The problem of how to conserve the watershed in the area while at the same time reducing poverty became a critical issue for the country. Case 7.4 explores a process of consolidating the inclusive green economy in Panama.

7.2.2 Case 7.4: From Slash-and-Burn Farming to Sustainable Agriculture: Panama Canal Watershed Conservation

Land reclamation in the Panama Canal watershed has been progressing because of recent increases in population in the area. Consequently, there are fears that forest degradation and a decline in the replenishment of water-source functions in the watershed will have an impact on the operation of the Panama Canal. Since the 1950s, the Panama Canal watershed has been experiencing deforestation resulting from a number of factors, including expanding farmland and pasture, burning and subsequent extensive pasturage, clearing associated with slash-and-burn farming, and overexploitation. Forest degradation, as exemplified by deforestation, soil degradation, soil erosion, and the loss of biodiversity, is a major environmental concern to the development agenda for Panama. There are concerns that a fall in the capacity for water-source conservation/recharging as a result of forest degradation is affecting navigation along the Panama Canal.

Concerns about environmental conservation and navigation of the Panama Canal during the dry season increased markedly after the El Niño climate event in 1997. These circumstances prompted the Panamanian government in 1997 to establish a law concerning land use planning in the Panama Canal watershed. Among other targets, this law called for reducing the proportion of pasture and increasing that of afforested land for the purpose of forest conservation and appropriate land use. Attempts to achieve these targets led the National Environment Authority (ANAM), which was reorganized from the National Natural Resources Institute (INRENARE) in 1998, to formulate administrative guidelines on the relevant policy issues. The guidelines included a plan to promote participatory forest management, whereby farmers in the watershed would understand the importance of forest conservation and practice appropriate land use. In this context, Panama–Japan technical cooperation on the Panama Canal Watershed

Conservation Project (PROCCAPA) began in 2000.

According to a report on this project, the conversion from slash-and-burn farming to sustainable farming could be facilitated through the following three approaches (JICA 2004, 33): (1) converting to a more effective alternative farming method to produce staple foods; (2) increasing cash earnings to a level sufficient to purchase staple foods; and (3) abandoning agriculture completely. Of these alternatives, the project considered the first one to be the most realistic one. In this regard, paddy rice production (wet-rice culture) was one of the most effective alternatives for farmers to turn from their slash-and-burn farming to more sustainable agriculture to grow staple crops. At the same time, it was crucial to improve and maintain soil fertility in order to generate considerable increases in the productivity of the land through the introduction of compost and a number of other improvement methods. Forestation and reforestation were also promoted. This involved the planting of three types of trees: trees for timber, fruit trees and trees for medicinal use. The planting of trees for timber had a number of environmental benefits: the improvement of soil, conservation of the watershed through small dams constructed by farmers, production of charcoal, and the avoidance of landslides (JICA 2005, 26). Organic agriculture was also encouraged, including the experimental introduction of several different materials: *bokashi* fertilizer, *mimizu* compost, natural insecticides and so forth. Environmentally friendly cultivation methods were also introduced, including contour line cultivation, alley cropping (different crops planted in parallel alleys), the combination of coffee with laurel trees, and so on. Charcoal kilns and ponds for tilapia culture were also introduced.

The adaptation of these technologies was carried out jointly by farmers and other stakeholders in the Panama–Japan project. However, the leading role was played by farmers. In this process, the empowerment and enhancement of consciousness of individual farmers and their organizations were remarkable, a point highlighted in the project's evaluation report (JICA 2005, 60): "the most significant impact is that the Farmers' Association of the Upper Panama Canal Watershed (APRODECA) was created spontaneously by farmers." In the words of the report: "Group organization strategy works as the mechanism for expansion of the techniques that is a part of farmers' empowerment. For example, the magnitude of training was multiplied considerably by the group activities." The report emphasized that group organization strategies contributed to the "creation of social capital." There was an increase in farmers' consciousness of their situation. The report notes that: "they became aware of the importance of reforestation and are implementing small-scale tree planting in water source areas and for the production of firewood, charcoal and wood vinegar to improve the quality of their life. In addition, farmers become aware that practicing the new techniques instead of slash and burn contributes to the protection of their environment and watershed conservation" (JICA 2005, 63). There were increases in the level of women's participation and their empowerment was attained throughout this project. This process is explained eloquently in an interview given in 2003 by a woman who participated in the project: "When slash and burn was practiced, farms were so far and steep that it was difficult for us, women, to participate in farming. Therefore, we depended on men for food production. In contrast, in paddy rice and other crop farming, which are promoted by the project, farms are located near our houses and the work is not so hard, so we women can participate. We would like to engage more in production work and improve our livelihood" (JICA 2005, 30).

In the bulletin of the Panama Canal Authority (ACP), the administrator of ACP and other government officials all agreed that the experience gained from the project could be put to good use in other parts of the Canal watershed. The ACP administrator was quoted as saying that he was considering applying this model to other regions. The Panamanian government is considering granting land certificates to small farmers involved in the project through the Inter-

institutional Commission of the Canal Watershed (CICH). On a broader scale, National Geographic, has written about the project (JICA 2005, 60). As one of the post-PROCCAPA projects, the Project for the Participatory Community Development and Integrated Management of the Alhajuela Lake Subwatershed (Alhajuela Project) was implemented by ANAM and JICA between 2006 and 2011. Based on experiences of this project—as well as PROCCAPA—Panama and Japan implemented the International Course on Participatory Integrated Watershed Management during 2014–2017, and started the International Course on Ecosystem Based Participatory Watershed Management from 2018 for 16 countries in Latin America.

As stated in Chap. 5, one of the most serious challenges faced by Kenya is to cope with desertification of arid and semi-arid land (ASAL) that is vulnerable to global warming and climate change and is characterized by a very high incidence of poverty. Several innovative solutions to address these issues have been developed and brought into the mainstream. One of the most important of these is 'social forestry', which is defined as a "form of forestry which aims at both the improvement of the economy and the preservation of forest resources, by entrusting local people with the management and ownership of the forest resources" (JICA 2003). It is a very similar concept to the inclusive green economy as a pathway to sustainable development and poverty reduction. An effective instrument developed and disseminated to promote social forestry has been the 'farm forest', as is explained below.

7.2.3 Case 7.5: Fight Against Desertification: Social Forestry in Semi-Arid Kenya

A period of more than twenty years has seen the introduction of three consecutive projects to strengthen social forestry in semi-arid areas of Kenya—with remarkable results. The first of these, the Social Forestry Training Project (SFTP), was carried out from 1987 to 1997, and aimed to develop practical techniques for planting and tending trees for the establishment of a farm forest. In particular, the project focused on developing tree nursery and tree planting technologies in semi-arid areas as well as to provide social forestry training for farmers and government staff. The second project, the Social Forestry Extension Model Development Project (SOFEM, 1997–2002), saw the introduction of forestation nurturing technologies applicable to farmers and suitable for the local environment. "The Project developed systems such as a cost-sharing system, a seed/seedling plan information system, a farmer to farmer extension method, and a core farmer selecting method. Their effectiveness was proved through actual farm forestry preparation practice" (JICA 2003, 3). Therefore, the project effectively developed a social forestry extension model, which is based on the establishment of farm forests by local residents (JICA 2009, 9).

The third project, the Intensified Social Forestry Project (ISFP 2004–9), consolidated the main lessons learned and key technologies acquired in the previous two projects. Although the previous two projects achieved their goals, neither of them was able to reach a substantial number of farmers (FAO et al. 2011, 12). Therefore, ISFP established, among others, a "Farmer Field School" (FFS) as a means to extend social forestry. A total of 94 FFSs conducted by the Kenyan Forest Service (KFS) cultivated the abilities of a considerable number of farmer facilitators. Farmer-run FFSs utilizing farmer facilitators had the same effect as a FFS by KFS. The Evaluation Study Team on ISFP confirmed "high evaluation and acknowledgements of FFSs by those who not only introduced FFSs in the initial time of the Project but also by those who implemented, managed and operated FFSs including target groups" (JICA 2009, 14–15).

As such, building on the country's past experiences, ISFP brought a new dimension to forestry extension, creating a systematic extension management system. The FFS methodology mentioned above was introduced with assistance

from the United Nations' Food and Agriculture Organization (FAO). Previously, the FFS methodology had been principally applied to agricultural extension service delivery in the country. The ISFP customized the FFSs to farm forestry, leading to the implementation of the Farm Forestry Field School (FFFS) approach. Currently this approach is the standard method for farm forestry extension in KFS and is widely used in other districts and projects in Kenya. With help from the FAO, KFS has further developed the Livelihood Farmer Field School, which was based on the FFFS (FAO et al. 2011, 13).

In short, throughout social forestry projects in Kenya, with the Kenya Forestry Research Institute (KEFRI) as an implementing agency, basic tree nursery and tree planting technology in arid and semi-arid regions was developed and core farmers were supported to provide a base for the extension of the model developed under the Kenya–Japan technical cooperation projects. For the extension of this model, the FFS approach, an existing proven extension approach in the agricultural sector, was applied to the forestry sector through innovative adjustments to the methodology. Through the FFS, techniques such as seedling production, fruit tree planting (mango, grevillea, and others), poultry raising, vegetable cultivation, utilization of compost, and creation of woodlots were disseminated (JICA 2013). As a result of all these measures, KFS, Kenya Forestry Research Institute, farmer facilitators and farmers, as well as JICA, have developed appropriate solutions incrementally to address the challenges mentioned above. They are based on a series of technological and institutional innovations and they have produced synergies to take full advantage of social forestry.

From their inception, the three projects entrusted local people with the management and ownership of forest resources. This approach is the essence of social forestry. The FFS has developed ownership, strengthened communities, and increased farmers' capacities in terms of knowledge about forestry practices (JICA 2009, 15). Through FFS, individual farmers, farmers' groups, and the surrounding farmers are continuing to raise and produce seedlings and plant trees. They have started to sell social forestry products such as mangoes, seedlings, lumber, and firewood. Through these activities, farmers are increasing their awareness of methods to improve their livelihoods. Wider extension activities related to social forestry are expected, as graduate farmers from FFS give advice about agriculture and social forestry to neighboring and surrounding area farmers, which indicates the creation of a network (JICA 2009, 15–16). The most important achievement is that the growth of trees contributes to the improvement of the livelihoods of farmers, attaining the overall goal of ensuring that social forestry projects contribute toward the development of a green economy. It appears that social capital has been strengthened and there is a greater sense of empowerment among the people. The final evaluation of IFSP emphasized dynamic group activities, including songs and dances celebrating FFS. While emphasizing the joy of solidified farmer groups working and studying together, the group plays a core role in assuming the continuation of activities and keeps farmers interested in FFS. The Green Zone project of the African Development Bank adopted the FFS approach in its forestry preservation activities in areas of high potential.

7.3 Natural Capital, Transformation, and Sustainable Growth

The afore-cited documents (Sect. 7.1) examine a general framework of the relationship between transformation and quality growth and, in particular, sustainable growth in terms of environment and eco-diversity. However, special attention to these aspects is needed in cases of transformation in which 'natural capital' is the essential endowment that enables the transformation. While natural capital assets are not created by human activity, their quality and capacity to yield goods and services, and therefore their value as productive inputs, are affected by it (OECD 2008, 30). Understanding the synergies

between different attributes of quality growth is normally the most difficult in cases where natural capital plays the crucial part of transformation. Two of the notable cases that were discussed in Chap. 3, Cerrado agriculture and Chile's salmon aquaculture, are cases in which human activity, particularly technological innovation or adaptation increased the value of natural capital: Cerrado land and southern Chile's seashore. A remarkable transformation of a vast region of Cerrado and southern Chile took place by utilizing natural capital, which was not necessarily used before as an input for the production of goods and services. However, special attention has been needed to address the risk of sustainability due to the possible degradation of or other consequences to the natural capital.

Analysis of Cases 7.6 and 7.7 could provide clues toward developing an effective approach to quality growth with sustainability and inclusiveness, in cases in which 'natural capital' is the crucial endowment that enables the transformation. As discussed above, the quality of growth extends to green growth concepts. UN-ESCAP (2013, 27) argues that "Policies and investments that promote green growth seek to improve the "eco-efficiency" of growth, which involves minimizing resources use and negative environment impacts per unit of benefit generated by the economy … *Green growth is a pre-requisite for building a green economy* characterized by substantially increased investments in economic *activities that build on and enhance the earth's natural capital* or reduce ecological scarcities and environmental risks …" (italics added). Cases 7.6 and 7.7 are examples of efforts to promote this "broadly defined green growth," as cited above.

7.3.1 Case 7.6: Natural Capital, Transformation, and Sustainable Growth: The Case of Cerrado Agriculture

The Cerrado has become known as the savanna zone with the world's richest biodiversity. Plants in the Cerrado cope with the unique stresses of extreme nutrient shortages, high soil acidity, and high aluminum saturation, and are believed to have evolved to protect themselves against damage from ants and wildfires, making them a valuable genetic resource.[4]

In the case of the Cerrado agriculture, active environmental conservation measures were implemented from the outset. As well as adhering strictly to the 20% legal reserve (50% in Tocantins and other states) in individual farms, to prevent the legal reserve areas from becoming a haphazard patchwork of points, efforts were advanced to create joint strengths of reserve land through a 'condominium' model, as well as the formation of micro-corridors of reserve land made up of individual reserves. Moreover, measures to preserve agricultural environments have been actively promoted, such as the introduction of contour cropping, crop rotation, and no-till farming (direct planting).

The government of Brazil conducted a series of broad and varied initiatives aimed at environmental conservation. In the Cerrado region, the government especially pursued a balance between Cerrado agricultural development policies and environmental conservation policies. This could be considered as a pioneering initiative for the sustainable transformation of unused land into fertile agricultural land. In 1998, Brazil enacted the Environmental Crimes Law, and in 2000 the Forest Code was amended to impose stricter legal reserve percentages on landowners and to enable the trading of reserve land with the land of other forested landowners. Also in 2000, the National System of Nature Conservation Units (SNUC) was established. This system was designed to organize categories for native reserves to both protect and restore the biodiversity found in their ecosystems.

The Environmental Conservation Expansion Program, which is meant to efficiently manage expansive areas of privately owned land using satellite imaging technology, was launched through Presidential Directive 7029 at the end of 2009, and the government also decided to introduce the Rural Environmental Registry (CAR, Cadastro Ambiental Rural, in

Portuguese).[5] In October 2012, the Ministry of Environment issued a decree that established the obligation to register all agricultural land in Brazil in accordance with CAR within a year (or in two years if authorized by the President). The National System of CAR (SiCAR; Sistema National de Cadastro Ambiental Rural, in Portuguese) was established by Presidential Directive in October 2012. Moreover, Brazil's environmental conservation policy was further strengthened by Law 12651 and Law 12727 (amendment to Law 12651), enforced in 2012.

The Ministry of the Environment purchased the RapidEye satellite pictures for the entire country to support the CAR. RapidEye acquires images of the Earth's surface from a constellation of five satellites in the same orbit (Sano 2019, 155). More than 90% of the country is covered by RapidEye images each year. Images from 2011, 2012, 2013, and 2014 are available on the geocatálogo Internet system.[6] A set of approximately 14,500 images per year, each with less than 20% cloud cover is available on this system.

In spite of the impressive increase in agricultural production in Cerrado in the last 3–4 decades, land used by "Cerrado agriculture" has not increased as fast as the rate of production growth. This is due to the remarkable improvement of yield per hectare. According to the Brazilian Institute of Geography and Statistics (IBGE) farm census, 61.36% of the growth of agricultural production (soybeans, rice, edible beans, corn, cotton and coffee) in the Cerrado between 1970 and 2006 occurred as a result of yield growth, while the rest, 38.64%, was due to expansion of the planted area (Hosono 2015).

According to an analysis of land use expansion based on two latest mappings of land use in the Brazilian Cerrado produced by interpreting Landsat satellite images in 2002 and 2013, land use in the entire Cerrado biome increased 3% points from 40% in 2002 to 43% in 2013. "This leads to an average increase of 0.27% per year, which matches up with the work conducted by the Project of Deforestation Monitoring of the Brazilian Biomes by Satellite (PMDBBS) by IBAMA (2016)" (Sano 2019, 144). In this project, the average annual deforestation found in the years 2008/09–2010/2011 was 0.34%, a rate much lower than the previous rates of deforestation. In 2013, approximately 43% of the Cerrado biome was used primarily for food and energy production. In other words, 55% of the Cerrado biome retained its natural vegetation. The remaining 2% consisted of water bodies, burned areas, and clouds/shadows present during the satellite overpasses. Of the 43% of the Cerrado biome used for food and energy production, cropland corresponded to 11.7% (8.5% occupied by annual cropland and 3.2% by perennial cropland) and improved pasture to 29.5% (Sano 2019, 144).

Currently, due to the commitments on compliance with COP-15, the goals for the Brazilian Amazon and Cerrado are to reduce deforestation by 80 and 40% of the average deforestation found in 1996–2005 by 2020, respectively.[7] For the agricultural sector, the National Plan for Low Carbon Emissions in Agriculture (ABC Plan initials in Portuguese) was established. Sano (2019) enlarges on the ABC Plan as follows:

> [The] ABC plan includes the following actions: (1) Adoption of 5 million ha of the crop-livestock-forest integration (ILPFS) system; (2) Reclamation of 15 million ha of degraded pastures through the fertilizer inputs and better management practices; (3) Reaching 8 million ha of no-till agriculture, a method of farming in which crop residues are left on the soil surface to reduce soil erosion by wind and rainfall and to increase the soil organic matter; (4) Encouraging the use of nitrogen biological fixation in 5.5 million ha; and (5) Expansion of reforestation by 3 million ha. As regards to no-till farming, this system has been widely adopted by farmers located in the Cerrado. In the same way, soybean producers are taking advantage of biological nitrogen fixation into the soils by a bacterium named Rhizobium. It is now helping the country to save billions of dollars in nitrogen chemical fertilizers. The goal of 3 million ha of reforestation was already reached in 2013. As for the integrated crop-livestock-forest (ILPFS) system, a type of mixed system or producing grains, meat, and timber simultaneously, it is advantageous for cattle ranchers facing pasture degradation, since it is one of the best choices for recovering the capacity of biomass productivity of degraded pastures. ILPFS is agronomically efficient, economically viable, socially fair (creating good jobs), and environmentally correct, and it presents similar characteristics to the no-till

farming in the Cerrado. As such, it is expected that most cattle ranchers will adopt ILPFS within 10–30 years. On the other hand, the use of Precision Agriculture (PA), which enables farmers to apply correct amounts of fertilizers, pesticides, and irrigation water, reducing environmental contamination of soils, surface water and groundwater, is still incipient in the Cerrado. However, geo-referenced soil sampling, and further production of prescription maps are the most relevant activities to PA in the Cerrado.

The UN document on the SDGs establishes in Goal 14 the importance of conservation and sustainable use of the oceans, seas and marine resources for sustainable development. More specifically, the SDGs aim to sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience and take action for their restoration, to achieve healthy and productive oceans (Target 14.2). In this context, in order to avoid overfishing and to conserve marine ecosystems, aquaculture of fish (i.e. fish farming) and shellfish has crucial implications for food security. Today, farmed fish correspond to half to the total harvest of fish in the world. As Chile has been a pioneer in salmon aquaculture, its experience of addressing challenges of sustainable development appears to be full of insights—in particular, in terms of managing marine resources by identifying sustainable levels of their use (carrying capacity) while supporting dynamic growth of the productive sector (Iizuka et al. 2016, 3). Case 7.7 elaborates on this experience in Chile.

7.3.2 Case 7.7: Natural Capital, Transformation, and Sustainable Growth: The Case of Chile's Salmon Industry

In the case of Chilean salmon farming, it was crucial to establish a regulatory framework for many aspects of the salmon industry, especially environmental and quality standards for the aquaculture industry. In other words, what was needed was so-called 'institutional infrastructure', including laws, regulations, and environment and quality standards. Mitsuo Sakai, who participated in the Japan Chile Technical Cooperation (PTTC) for salmon farming in 1980s noted that, "by starting technology transfer activities concerning feed development and fish disease control early, the PTTC project forestalled the problems the farming industry faced later, including concerns about the spread of salmonid bacterial kidney disease (BKD), and the paucity of feed for the feeding culture business that had traditionally used living feed rather than fish meal." He concluded by saying, "These technology transfer activities anticipated technical problems that would arise in the early stages of the development of the Chilean salmon industry, and thus devised precautionary measures, including the development of necessary technologies" (Sakai and Ishida 2002, 1554).

Two decades later, when the Chilean salmon industry achieved full-fledged development, it experienced a sanitary crisis caused by infectious salmon anemia (ISA) in 2007. This experience demonstrated how natural resource-based activities such as salmon sea farming need to be supported not only by advanced production technology but also by scientific knowledge of the local environment so that appropriate local regulatory institutions to manage the use of common resources can be established. This case also demonstrates that progress in production capabilities may not be sufficient to ensure long-term sustainability in natural resource-based industries in which natural capital plays an important role.

As a reaction to the sanitary crisis in 2007, institutional change took place in Chile: the Aquaculture Law to modify the existing General Law of Fishery and Aquaculture (LGPA) enacted in 2010 was an important milestone. This modification granted more authority to the government to ensure sustainable management of aquaculture. Concretely, it strengthened the role of the Undersecretariat of Fisheries and the National Fisheries Service (SERNAP) by regulating firms' activities concerning sanitary

management of aquaculture and by creating a mechanism of concession rights and new institutions—barrios and macrozones—to manage sanitary conditions in production centers. In order to reduce the systemic risk of new diseases in the future, the National Fisheries Service also required salmon farming firms to group their cultivation centers into barrios, or production zones, according to geographical location. They also obliged firms operating in cultivation centers within the same barrio to synchronize their production calendars, providing for a three-month resting period to facilitate sanitary controls aimed at minimizing navigation time, often instrumental in transmitting pathogens (Iizuka and Zanlungo 2016).

The modification of LGPA was partly the outcome of a gradual and profound co-evolutional change among stakeholders over the years (Iizuka 2016, 169). One of the insights that can be drawn from the case of the salmon industry in Chile is "a general lesson in creating a non-traditional export industry based on natural resources in developing countries. This process often suffers from a lack of traditional institutions and local knowledge due to lack of prior history. If the industry successfully takes off and increases its scale, local environmental sustainability may collapse without a sound management system. The provision of institutions at an earlier stage to monitor sustainable environmental conditions would be critical for the sustainability of such economic activity" (Iizuka 2016, 171). As Lebdioni (2019), summarizes: "The Chilean case thus demonstrates how natural resource-based activities need to be supported not only by advanced production technology, but also by scientific knowledge of the local environment in order to establish appropriate local regulatory institutions to manage the use of common resources (Iizuka and Zanlungo 2016; Katz 2006). Such a local regulatory role can be seen as an input that has public goods characteristics and thus will be under-provided by the market" (14).

In recent years, large-scale red tides in Chilean coastal waters have caused serious damage to fisheries, including aquaculture. In this context, the recent Chile-Japan Cooperation Project for Development of Harmful Algal Bloom Monitoring Methods and Forecast System for Sustainable Aquaculture and Coastal Fisheries in Chile appears to be a highly relevant initiative. This project is being carried out under the framework of Science and Technology Research Partnership for Sustainable Development (SATREPS), with the participation of Chilean and Japanese universities, the Fisheries Development Institute of Chile (IFOP), and Japan Fisheries Research and Education Agency (FRA). It aims to identify microorganisms that propagate prior to red tide formation and termination, which are expected to serve as bloom dynamic indicators. The cooperative project aims to elucidate the mechanisms of red tide occurrence and termination, and to develop a red tide dynamics forecast system. The system will provide forecasts to fishery operators, and the information will be utilized to mitigate damage by red tides. The project will also devise red tide countermeasure proposals based on scientific evidence through industry, government, and academic collaboration.[8]

Furthermore, for SDG Goal 15, the UN 2030 Agenda establishes as one of its targets "to promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally" (15.2). In this regard, monitoring data on deforestation and forest changes in the tropical regions is an effective approach to Goal 15. Case 7.8 discusses the JICA-JAXA Forest Early Warning System in the Tropics (JJ-FAST).

7.3.3 Case 7.8: JICA-JAXA Forest Early Warning System in the Tropics (JJ-FAST)[9]

Brazil has maintained a coherent surveillance system to protect its tropical forests for decades. Since 1988, the Brazilian National Institute for Space Research (INPE) has published statistics showing the area of forestland destroyed each year based on satellite images, and has continued to issue warnings regarding excessive

deforestation. In 2004, the Plan of Action for the Prevention and Control of Deforestation in the Amazon (PPCDAM) and the Near Real-Time Deforestation Detection System (DETER) were initiated, making it possible to monitor logging activity on a fortnightly basis. The federal police and the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA), part of the Ministry of the Environment (MMA), began using satellite images provided by INPE to clamp down on illegal logging. There was, however, one major shortcoming in this surveillance system: the dense clouds that cover the Amazon during the rainy season were preventing the satellite's optical sensor from monitoring conditions on the ground. The breakthrough needed to resolve this issue came in the form of Japanese satellite technology.

In August 2006, JICA sent Manabu Kawaguchi, an expert in satellite image analysis, to Brazil for a period of six months to collaborate with IBAMA and the federal police to improve their environmental crime geographic information system. Kawaguchi concluded that the issue could be resolved by using data from DAICHI, the Advanced Land Observing Satellite (ALOS) operated by the Japan Aerospace Exploration Agency (JAXA), and he started to put his theory into practice. Launched by JAXA in 2006, ALOS uses a PULSAR microwave sensor instead of an optical sensor. This enables it to get a clear picture of the ground even in cloudy or rainy conditions, or at night. Whereas illegal loggers had previously been cutting down trees for half the year, hiding under cover during the rainy season, their activities are now exposed year-round, day and night. There may have been a degree of skepticism about Japanese technology in Brazil at the outset, but ALOS images have proved to be hugely effective in combating illegal logging. JAXA began providing ALOS data to IBAMA and the federal police in 2007, and in 2009 JICA launched the ALOS Satellite Image Utilization Project, together with IBAMA and the federal police, in order to improve ALOS imagery analysis capabilities. By using the results of this project, Brazil has greatly improved its satellite observation capabilities and its ability to crack down on illegal logging activities.

The utilization of ALOS images supported the Brazil-JICA project to identify deforestation and illegal logging in Brazil implemented between 2009 and 2012. The project contributed to the detection of more than 1000 deforestation and 150 illegal logging cases, respectively, from 2010 to 2011. The extent of forest decline in 2014 was 500,000 ha, which was about 80% less than the 2004 level.[10] According to a study carried out by the Climate Policy Initiative (CPI),[11] the control of illegal logging by satellite monitoring in the Amazon (DETER)[12] impeded deforestation of more than 59,500 km^2 during the period of 2007–2011. Deforestation in the period was 41,500 km^2, which is 59% less than the estimated level without the control based on the satellite information (*Valor Económico*, May 5th, 2013). JAXA's ALOS system is the only such system in the world capable of providing satellite imagery around the clock. The use of ALOS to help prevent illegal logging marks a significant achievement in Japan-Brazil cooperation efforts.

Taking into account the experiences in Brazil, Japan International Cooperation Agency (JICA) and Japan Aerospace Exploration Agency (JAXA) launched a new Forest Governance Initiative in June 2016. For this initiative, JICA and JAXA have developed an early warning system for reducing deforestation of tropical forests: JICA-JAXA Forest Early Warning System in the Tropics by using JAXA's Advanced Land Observing Satellite (ALOS-2). The outstanding features of this system are: (1) ALOS-2 is able to capture images through the cloud; (2) The system monitors tropical forests every 1.5 months in 77 countries with a 50 m resolution; (3) The system allows free access from PCs and mobile devices from anywhere in the world.[13] In order to improve forest resources management skills and promote environmental improvement for afforestation in Africa, JJ-FAST released monitoring data on deforestation and forest changes in the tropical regions in 43 countries during the 2016–2018 (TICAD VI period) (JICA 2019, 10).

7.4 Concluding Remarks

Critical efforts to transform consumption and production patterns into those of, for example, circular economies and green economies, are necessary in order to achieve the improvement of human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. The cases discussed in this chapter, especially Cases 7.1, 7.2, and 7.3, demonstrate that inclusive approaches, in which consumers and/or producers, as well as other stakeholders actively participate, is crucial. At the same time, innovative technologies and the accumulation of capabilities are both key. In this regard, several aspects related to learning and capacity development discussed in Chap. 4 could be observed in the above cases. For example, easy entry points can be identified in circular economies (such as 3R initiatives for both producers and consumers), in Kaizen activities, and green economies. Mutual learning and co-creation of innovative solutions are also relevant in these cases. The stakeholders who participated in efforts to transform consumption and/or production patterns incrementally developed appropriate solutions to address local and/or specific challenges. The costs and risks are relatively low when innovative activities are introduced incrementally.

Cases 7.3, 7.4, and 7.5 demonstrate that, in developing an inclusive green economy, environmental sustainability and adaptation to climate change can be strengthened through innovative and inclusive approaches. In these cases, innovative solutions, including technological and institutional innovations, facilitate opportunities for people to address the challenges of a green economy. In the case of the Tomé-Açu agroforestry model, innovative combinations of crops and trees, and the sequence in which they have been planted, are essential. In the Panama Canal watershed, innovative solutions were identified to promote the transition from slash-and-burn farming to sustainable farming to produce staple foods and improve soil fertility. Throughout social forestry projects in Kenya, basic tree nursery and tree planting technologies in arid and semi-arid regions were developed, and core farmers were identified and their skills fostered. While these innovative solutions in terms of technology and institutions are important factors for achieving a green economy, they need to be practiced effectively by farmers, foresters and community members. These groups need to draw on their capacities, ownership and social capital if the goal is to achieve a transformational impact at the regional or country level or a full-fledged scale-up. Therefore, for a green economy, an inclusive and participatory approach is crucial.

In cases where natural capital is the essential endowment that enables the transformation, one of the key challenges for sustainable growth is to create institutions that are capable of monitoring and managing resources while supporting inclusive growth and poverty reduction through such growth, as demonstrated by Cases 7.6, 7.7, and 7.8. The activities of these institutions need to be supported by scientific research on the environmental, ecological and social impacts of the transformation, as well as developing effective monitoring systems.

Notes

1. The concept of 3Rs (Reduce, Reuse and Recycle) was incorporated in the Basic Law for Promotion of Development of a Circular Society enacted in 2000 in Japan. The country proposed the "3R Initiative" at the G7 Summit in 2004 and an international ministerial meeting on 3R Initiative was held in 2005.
2. This paragraph draws on Kaiho Industry's web page: https://kaihosangyo.jp/english/.
3. This and the following paragraphs are based on information provided by JICA-Net. http://jica-net.jica.go.jp/lib2/07PRDM008, 2008.
4. This and the following three paragraphs draw on Hosono (2015) and Hosono and Hongo (2016).
5. A registry that uses a GIS to determine the borders of each farm, as well as the legal

reserve and preservation districts in each part of owned land. Upon the request of a farm, expert contractors prepare digitized drawings of the land usage status inside each farm area. These electronic data are incorporated into Integrated Environmental Monitoring and Licensing databases operated by state government environmental agencies.

6. http://geocatalogo.mma.gov.br/.
7. This and the next paragraph draw from Sano (2019) and Hosono et al. (2019).
8. This paragraph is based on the project's web page: https://www.jst.go.jp/global/english/kadai/h2905_chile.html.
9. The first four paragraphs of this section are based on Hosono and Hongo (2016).
10. Based on JJ-FAST webpage. https://www.eorc.jaxa.jp/jjfast/docs/JJ-FAST_EN.pdf.
11. CPI is an NGO financed by Open Society Foundations, supported by George Solos. In Brazil, the Foundations' partner is the Catholic University of Rio de Janeiro (PUC).
12. Deteccao de Desmatamentos em Tempo Real.
13. Based on JJ-FAST webpage. https://www.eorc.jaxa.jp/jjfast/docs/JJ-FAST_EN.pdf.

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8 Quality Growth Focusing on Resilience to Disaster Risks

Enhancing resilience against disasters is a fundamental attribute of quality growth. Disasters can be classified into four major categories (Sawada 2007). As set out by Aldrich et al. (2015), the first category is comprised of natural disasters including geophysical disasters (earthquakes, tsunamis and volcanic eruptions), meteorological disasters (storms or typhoons), hydrological disasters (floods), climatological disasters (droughts), and biological disasters (epidemics and insect infestations). The second category of disasters is comprised of technological disasters, such as transport accidents (including air, rail, road and water transport) and industrial accidents (chemical and oil spills, nuclear power plant meltdowns, industrial infrastructure collapse). The remaining two disaster types are manmade disasters, including economic crises (currency crises, hyperinflation, and banking crises) and disasters involving the use of violence (such as terrorism, civil strife, riots, and civil and external wars) (2).

This chapter mainly discusses those from the first category: hydrological, meteorological, climatological, and geophysical disasters with particular regard to the concept of resilience. The United Nations Office for Disaster Risk Reduction (UNISDR) (2009) defines "resilience" in regard to these types of disasters as "The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions" (UNISDR 2009, 24).

Quality growth is expected to enable people and society to strengthen resilience and transform their economy, making it more resilient. The outcome document of the United Nations summit for the adoption of the post-2015 development agenda, "Transforming Our World: the 2030 Agenda for Sustainable Development," includes Goal 9 as the need to "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation," while Goal 11 sets out the need to "Make cities and human settlements inclusive, safe, resilient and sustainable." More specifically, one of the targets of Goal 11 is to, "By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015–2030, holistic disaster risk management at all levels."

Disaster risk reduction (DRR) enables both quality growth and human security. During the world conference that adopted the Sendai Framework for DRR, states reiterated their commitment to addressing disaster risk reduction and the building of resilience to disasters with a renewed sense of urgency within the context of sustainable development and poverty eradication. They also pledged to integrate, as appropriate,

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both disaster risk reduction and the building of resilience into policies, plans, programs and budgets at all levels and to consider both within relevant frameworks (United Nations Office for Disaster Risk Reduction 2015, 1). Indeed the Sendai Framework for DRR added a policy of simultaneously reducing poverty while addressing disaster risks by engaging in disaster risk reduction with a focus on economic development.

Towards Reconstruction: Hope Beyond the Disaster, a report by the Reconstruction Design Council in Response to the Great East Japan Earthquake and Tsunami 2011 highlights seven principles for the reconstruction framework. They are fundamental concepts for resilience enhancing quality growth. The first principle is: "For us, the survivors, there is no other starting point for the path to recovery than to remember and honor the many lives that have been lost. Accordingly, we shall record the disaster for eternity, including through the creation of memorial forests and monuments, and we shall have the disaster scientifically analyzed by a broad range of scholars to draw lessons that will be shared with the world and passed down to posterity." Further, among others, the report highlights the importance of "community-focused reconstruction" (Principle 2); "forms of recovery and reconstruction that tap into the region's latent strengths and lead to technological innovation" (Principle 3); and the need to "simultaneously pursue reconstruction of the afflicted areas and revitalization of the nation" (Principle 5).

Disaster risk reduction and enhancement of the resilience of people and society are critical for quality growth, especially for sustainable growth and inclusive growth, as well as poverty reduction through such growth. Working on disaster risk reduction in advance reduces the level of damage caused by a disaster. Such approaches are "more cost-effective when compared with the cost required for post-disaster recovery and reconstruction. As a result, it also leads to sustainable economic growth" (JICA 2017, 2). Ishiwatari (2016) cites studies that confirm high cost-effectiveness of investment in disaster risk reduction: the benefit–cost ratio of 4 was the average of 4,000 disaster risk reduction programs in the United States; the ratio was 1–17 in cases of flood control investments in 7 countries; the ratio was 3.3 in cases of investments for comprehensive flood control in Tokyo, Osaka, and Nagoya (13). Furthermore, it should be emphasized that much of the suffering caused by disaster damage affects low-income and vulnerable people and communities. Disaster takes away their means of livelihood and prevents them from breaking out of the poverty trap (JICA 2017). Therefore, disaster risk reduction is crucial for poverty reduction and for growth to be inclusive so as not to leave anyone behind.

Regarding concrete actions for disaster risk reduction, the Sendai Framework for DRR focuses on four priority areas for action, as follows.[1] Priority 1: Understanding disaster risks; Priority 2: Strengthening disaster risk governance to manage disaster risk; Priority 3: Investing in disaster risk reduction for resilience; and Priority 4: Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction (United Nations Office for Disaster Risk Reduction 2015, 14). This chapter discusses experiences related to these priority areas in the Central American region, one of the most vulnerable regions in the world, as well as Chile, Peru, and Japan (Sects. 8.1, 8.2, 8.3 and 8.4). Following this, concluding remarks will be provided.

8.1 Understanding Disaster Risks

In order to improve the understanding of disaster risks, the Sendai Framework for DRR emphasizes that "Policies and practices for disaster risk management should be based on an understanding of disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment. Such knowledge can be leveraged for the purpose of pre-disaster risk assessment, for prevention and mitigation and for the development and implementation of appropriate preparedness and effective response to disasters" (United Nations Office for

Disaster Risk Reduction 2015, 14). In this regard, one of the most important lessons that Japan learned from the Great East Japan Earthquake and Tsunami was the realization of the big gap between the required capacity of the country, society and people to cope with the disaster, and the actual capacity. The magnitude of this gap determines the damage caused by disasters.

Based on case studies, Ejima (2012) assumes that there are three kinds of required capacities to be considered depending on the severity of the disasters we face.[2] The first one is the capacity for a scenario disaster. A "scenario disaster" refers to a disaster that is of a predicted magnitude and for which preventive measures have been taken in advance. However, the capacity that a society actually has can sometimes be smaller than what is required to cope with these kinds of predicted "scenario disasters." This gap is called a Type 1 gap. The second gap, known as a Type 2 gap, is the gap between the actual capacity a society has and the required capacity to cope with a disaster of which the magnitude happens to exceed the foreseen "scenario disasters." The last of these, the Type 3 gap is the gap between the actual capacity a society has and the capacity level that has to be enhanced over time to deal with the long-term changes that happen due to factors such as climate change, urbanization, population growth, etc.

A basic approach to enhance the capacity to address the three types of gap is learning and learning to learn. Indeed resilience is "about learning to live with the spectrum of risks that exist at the interface between people, the economy, and the environment" (Global Facility for Disaster Reduction and Recovery (GFDRR) and World Bank 2015, 12). The United Nations Office for Disaster Risk Reduction (UNISDR) defines capacity development as "the process by which people, organizations and society systematically stimulate and develop their capacities over time to achieve social and economic goals, including through improvement of knowledge, skills, systems, and institutions." It notes that "capacity development is a concept that extends the term of capacity building to encompass all aspects of creating and sustaining capacity growth over time. It involves learning and various types of training, but also continuous efforts to develop institutions, political awareness, financial resources, technology systems, and the wider social and cultural enabling environment" (UNISDR 2009, 6). In this section, I will discuss capacity development (CD) to address the three types of gap, with reference to the above definition of CD.

Against the Type 1 gap, which is concerned with the difference between recognition and reality, strengthening "risk literacy" could be an effective approach. In many cases, people make judgments on their own and do not make the effort to evacuate. It is important to establish adequate communication at various levels in order to minimize this type of gap. For instance, it is necessary to understand the limitations of structural and non-structural measures. While one of the important roles of the public administration is to make residents feel safe, it is also important to make them aware of the limitations of such measures so that they can properly anticipate the risk of disaster. Communication is essential to ensure this awareness. There are cases seen frequently around the world where people's sense of crisis suddenly disappears, especially after the construction of large-sized structures such as embankments. However, there are limitations to any kind of measure. It is essential to improve people's disaster-reaction capacity by spreading this kind of information throughout the community.

The Type 2 gap is caused because anticipating risk always involves uncertainty. This shows the importance of "redundancy," such as building a multi-layered or combined capability for reacting to disasters. In various regions throughout the world, including Japan, people may develop a very strong sense of security with the introduction of a system based on leading-edge technology. However, we must also be aware of the limitations of such systems. When the Great East Japan Earthquake occurred, there were situations where information could not be transmitted because of a blackout. It is important to remember that there are many kinds of potential risks, and sometimes "apparently redundant" preventive measures may become necessary.

They may appear redundant, but in fact they are necessary. Another method that can also be effective is to establish multi-purpose measures by adding disaster prevention to projects in different areas that are not originally aimed at disaster prevention. We should therefore not ignore redundant measures and operations for future disaster risk management due to the Type 2 gap. In learning from the East Japan Earthquake and other experiences, we should be better prepared with as many alternatives as possible by designing and operating preventative measures. To do so, we had better consider the importance of multi-functional and multi-sector disaster risk management. We could call this approach "redundancy."

Lastly, regarding the Type 3 gap, we need to recognize that even if we institute measures based upon an expected situation, such measures may not provide a permanent solution, as circumstances can change daily. For example, with the recent discussions in the international community regarding climate change and its impacts, we need to continue reviewing various countermeasures, taking into account changing factors such as the rate and extent that the climate is changing, urbanization, and social factors. In order to address this type of gap, an effective measure could include efforts toward continuous improvement or a kind of "Kaizen" approach.

Various kinds of disaster prevention measures have been implemented in many countries. However, disasters such as the Great East Japan Earthquake demonstrate the fact that various countermeasures may not necessarily work as expected and may not result in the reduction of risk. In order to fill the various gaps explained so far, to plan effective disaster countermeasures and implement better disaster risk management, reliable risk assessment based on scientific analysis is needed.

8.2 Strengthening Disaster Risk Governance to Manage Disaster Risk

The Sendai Framework states that strengthening DRR for prevention, mitigation, preparedness, response, recovery and rehabilitation is necessary and fosters collaboration and partnership across mechanisms and institutions for the implementation of instruments relevant to disaster risk reduction and sustainable development. In order to mainstream and integrate risk reduction, the Sendai Framework emphasizes the importance of (1) addressing disaster risk in publicly owned, managed or regulated services and infrastructures, (2) promoting and providing incentives, (3) enhancing relevant mechanisms and initiatives for disaster risk transparency, and (4) putting in place coordination and organizational structures (United Nations Office for Disaster Risk Reduction 2015, 17). The "Disaster Countermeasures Basic Act" in Japan states that disaster risks should be managed and reduced comprehensively through the vertical roles of the national and local governments, the horizontal role of society across the whole area, and collaboration with other stakeholders such as the private sector, NGOs and local communities (JICA 2017, 9).

Regarding the first and second priorities of Sendai Framework for DRR, understanding disaster risks and strengthening disaster risk governance, experiences of international cooperation for disaster risk management in Central America could be highly relevant, as shown in Case 8.1. The Central American region is very prone to natural disasters due to frequent hurricanes, earthquakes, and volcanic activities. For example, 88.7% of the territory of El Salvador is considered to be a high-risk area for disasters, and 95.4% of the population are living in high-risk areas (World Bank 2005).

8.2.1 Case 8.1: Capacity Development for Disaster Risk Management in Central America: BOSAI Initiatives[3]

8.2.1.1 Central American Policy of Integrated Risk Management (PCGIR) and BOSAI Project

Central America is a disaster-prone region and the countries of the region have been making

concerted efforts to reduce disaster risks through a regional cooperation mechanism of the Center of Coordination for the Prevention of Natural Disasters in Central America (CEPREDENAC). One of the projects based on the above-mentioned approaches discussed in Sect. 8.1 is the Project on Capacity Development for Disaster Risk Management in Central America, or the "BOSAI Project." In this project, JICA supports capacity development (CD) to promote community-based disaster risk management in six countries in Central America through a region-wide cooperation framework under CEPREDENAC, which itself is one of the specialized regional cooperation mechanisms under the auspices of the Integration System of Central America (SICA).

The overall framework for this region-wide cooperation initiative was established in the Tokyo Declaration of Japan-SICA Summit in 2005. It included a region-wide cooperative effort for the fight against Chagas disease,[4] better mathematics education, natural-disaster prevention, improved reproductive health, quality and productivity improvements, and other initiatives. The governments of Costa Rica, Honduras, Guatemala, El Salvador and Panama submitted official requests to Japan for technical cooperation with regard to local disaster risk management in 2006. Based on this initiative, management authorities of the above five countries, CEPREDENAC and JICA launched the "BOSAI Project" in 2007. Nicaragua later joined the project in 2008.

The heads of states of member countries of SICA adopted, on October 30, 2010, the Central American Policy of Integrated Disaster Risk Management (PCGIR), in order to respond to the need to update the regional commitments designed to reduce the risk and enhance prevention of disasters and thereby contribute to an integrated vision of development and security in Central America. The PCGIR highlights the importance of developing local capacity to reduce risk and to respond to disasters by strengthening the autonomy and resilience of communities. BOSAI has constituted an important pillar in the implementation of the PCGIR.

8.2.1.2 Understanding Disaster Risks and Capacity Development (CD) to Reduce Vulnerability

The regional progress report of the Hyogo Framework of Action (HFA) on Central America, updated April 2011, referenced two indicators for HFA priorities in relation to local disaster risk management: "Sub/regional early warning systems exist" and a "Sub/regional information and knowledge sharing mechanism is available." One of the aspects which should be highlighted among the achievements of BOSAI is its contribution to the progress towards achieving these regional indicators of HFA (BOSAI Terminal Evaluation Team 2012, 9).

In this regard, BOSAI's approach to these indicators could be reviewed from the three perspectives discussed in Sect. 8.1. In terms of "Risk Literacy," BOSAI focused on helping the residents fully understand the risks for their own community and taking actions on their own by maintaining reliable communication between the communities, municipalities and national agencies. At the same time, it empowered the communities themselves to implement risk mapping through repeated discussions and site inspections.

From the perspective of "redundancy," BOSAI approached other sectors through activities to promote the awareness of disaster prevention by means of school education, and by incorporating methods of collaboration with the development committees of the communities.

In terms of the Kaizen approach, BOSAI implemented capacity development (CD) programs aiming to let the community prepare risk maps and disaster management plans, and improve them on its own. Capacity development (CD), both at the community and local government levels, strengthened their ability to effectively respond to various disasters including earthquakes, flooding and landslides and to take concrete action such as the development of hazard maps, early warning systems, disaster prevention plans, and innovative practices to prevent landslides, flooding, etc.

According to the Terminal Evaluation Report of BOSAI, reduction of vulnerability to disasters in target communities (the first target) and reduction of vulnerability to disasters in target municipalities (the second target) were 68% and 90% achieved, respectively. As regards improvement of knowledge and ownership of local disaster risk management of national institutions (the third target), the target was achieved fully in three national institutions and significant advances were attained in three other national institutions (BOSAI Terminal Evaluation Team 2012, 10–11).

The first target of BOSAI was related directly to the communities' capacity development (CD). There have been many important cases of successful capacity development in which effective mutual learning and co-creation of innovative solutions have taken place. One of the most outstanding cases could be that of used-tire dikes. Major achievements at the community level included the development of organizations, risk maps, evacuation routes, early warning systems and emergency response plans. Some communities in Panama, Costa Rica, Honduras and El Salvador constructed small mitigation works such as used-tire dikes and retaining walls, as well as demonstrating remarkable involvement and commitment through voluntary labor. As the experience of constructing of new dikes with used tires was almost completely new and innovative, a very careful approach was adopted. It was decided to first carry out a pilot project in order to establish the proper methods of design and construction. Community members participated in the construction work in shifts. These decisions were made by community members. In the BOSAI Project, there were several other cases of the co-creation of innovative low-cost solutions to reduce the vulnerability to disasters in the target communities and to strengthen their disaster preparedness. Installation of rainfall equipment (rain gauges, fluviometers) with alarm units for community-operated flood warnings and water glasses (water level monitors) with automatic warning systems are some examples of this.

According to the evaluation of the strengthening of the mechanisms for disaster risk management, based on interviews conducted in 50 communities out of the target 62 communities of the BOSAI project, 96% established a disaster risk management organization, 88% prepared a risk map, 66% set-up communication systems, and 88% developed a disaster response plan. Regarding the promotion of knowledge or awareness on disaster risk management in target communities, 66% held workshops or events in communities and 60% conducted evacuation drills.

Based on the experiences of the targeted communities, national scale-up processes have taken place in each country. The installation of rain gauges for early flood warning extended beyond the targeted communities in El Salvador. A plan to set up warning sirens in more than 150 communities is being implemented in Tegucigalpa, Honduras. The Frog Caravan is one successful activity of the BOSAI Project in that the practice extends well beyond the target communities.[5] The Frog Caravan was also conducted by other donors. A plan to extend the Frog Caravan nationwide has been implemented in Guatemala and Panama.

8.2.1.3 The Impact of the BOSAI Project in Reducing Vulnerability of Communities and Municipalities

The impact of the BOSAI project has been recognized in some natural disaster events. When Hurricane Ida slammed into El Salvador in November 2009, it triggered massive flooding and landslides and more than 300 people were killed or went missing. However, in the coastal village of Las Hojas, there were no deaths and an investigation attributed this at least partly to the fact that a disaster early warning system had been installed there by the BOSAI project.

In the very early morning of November 8, the disaster committee of San Pedro Mashuat received the information of extraordinary rainfall with water levels beginning to rise dangerously from the upstream communities of the Jiboa River. This information was transmitted to the village disaster prevention committee of Las Hojas via a JICA-donated wireless system. Nine alarm sirens were

sounded throughout the village two hours before the flood allowing local residents to flee quickly before floodwater could engulf them. The establishment of disaster prevention committees and the installation of wireless transmission systems and nine alarm sirens were part of the BOSAI project. A survey conducted in 2010 discovered that 50% of 94 families of the community evacuated when they heard the siren and that 37% knew about the BOSAI Project. During tropical depression 12E in October 2011, there were no casualties in the BOSAI Project target areas in El Salvador. When another survey was conducted in December 2011 in San Pedro Mashuat, where significant damage occurred during storm 12E, inhabitants expressed their gratitude to the BOSAI Project that there were no casualties thanks to the early evacuation practice (BOSAI Terminal Evaluation Team 2012, 13).

In February 2011, one of the pioneer municipalities of the BOSAI Project in El Salvador, Santa Tecla participated as the sole local government representative community of Central America in the Thematic Debate of the United Nations General Assembly on Disaster Risk Reduction. The discussion aimed to strengthen the understanding of how to reduce risk and exposure to disasters through effective investment policies and practices and sustainable urban management. Santa Tecla received recognition as the "Role Model for Participatory and Sustained Risk Reduction Policy" of the "Making Cities Resilient Campaign" in the Third Session of the Global Platform for Disaster Risk Reduction, organized by the United Nations in Geneva in May 2011.

According to the Mayor of Santa Tecla, Oscar Ortiz, the keen awareness and motivation of this municipality toward disaster prevention is due to the tragic consequences of a landslide caused by the big earthquakes of 2001. The landslide took the life of 700 inhabitants. It was difficult to reconstruct communities severely affected by the earthquakes. The municipality has placed the highest priority on disaster risk management since this tragedy occurred. The mayor considers the key to the successful process, recognized by the United Nations, was the trust of the inhabitants through a participatory approach, education and local government leadership with a medium and long-term vision. Santa Tecla's experiences and know-how have been shared with other Central American countries. The BOSAI Project has been effective and the municipality learned a lot from the Hyogo Phoenix Plan.[6]

8.2.1.4 Strengthening Disaster Risk Governance to Manage Disaster Risk

Several national scale-up initiatives to strengthen disaster risk governance based on the BOSAI project have been carried out. In El Salvador, the Civil Protection Authority has assigned 178 municipal delegates and 19 department delegates in accordance with the Law of Civil Protection, Prevention and Mitigation of Disasters enacted in 2005. These delegates facilitated the establishment of the Municipal Commission of Civil Protection (CMPC). The National System of Civil Protection (SINAPROC) in Panama has increased the number of staff at a provincial level with the assignment of a national agent and provincial agent, who are engaged in the coordination with municipalities/communities to promote integrated local disaster risk management. The Permanent Commission of Contingencies (COPECO) of Honduras, through its seven regional offices, is promoting the establishment of Emergency Committees at different levels (departments, municipalities, communities, schools and working centers). The BOSAI Project has been contributing to the institutional strengthening of these organizations through activities specifically targeting municipalities and communities. National legal and/or regulatory frameworks related to disaster risk reduction have been established and strengthened (for details, see Hosono 2012).

Exchanges of experiences, knowledge and know-how related to disaster risk management among member countries have been actively promoted through CEPREDENAC. The capacity of CEPREDENAC itself has been strengthened during the BOSAI Project. In the BOSAI Project, methodologies and tools commonly applicable in Central America were developed based on the different experiences of member countries, producing a series of practical materials including a

manual of hazard-map based trainings, manuals on the production and use of a rain gauge and water glass, construction guides for used-tire or soil–cement dikes, prevention kits for disasters caused by volcanic eruptions, Frog Caravan manuals, a disaster simulation game, SAT (*Sistema de Alerta Temprana*, or early warning system) guidebooks and so on, which have been made publicly available in member countries.

8.3 Investing in Resilience: "Build Back Better" in Recovery, Rehabilitation and Reconstruction

Regarding the characteristics of investment in disaster risk reduction, the Sendai Framework for DRR highlights that "Public and private investment in disaster risk prevention and reduction through structural and non-structural measures are essential to enhance the economic, social, health and cultural resilience of persons, communities, countries and their assets, as well as the environment. These can be drivers of innovation, growth and job creation. Such measures are cost-effective and instrumental to save lives, prevent and reduce losses and ensure effective recovery and rehabilitation" (United Nations Office for Disaster Risk Reduction 2015, 18). For disaster preparedness and build back better, the Sendai Framework states that "Disasters have demonstrated that the recovery, rehabilitation and reconstruction phase, which needs to be prepared ahead of a disaster, is a critical opportunity to 'Build Back Better', including through integrating disaster risk reduction into development measures, making nations and communities resilient to disasters" (United Nations Office for Disaster Risk Reduction 2015, 21).

Cases 8.2 and 8.3 contain multiple insights from the afore-mentioned concepts of the Sendai Framework. Case 8.4 provides an effective approach to build back better, summarizing reconstruction experiences after major earthquakes and the tsunami in Japan with the use of "land readjustment."[7]

8.3.1 Investing in Low-Cost Earthquake-Resistant Housing to Enhance the Resilience of Low-Income Families and Communities

El Salvador was devastated by two successive earthquakes on January 13th (magnitude 7.6) and February 13th (magnitude 6.6), 2001, which resulted in the deaths of over 1,000 people, along with extensive damage to buildings—especially the houses of low-income communities. According to one study of these two large earthquakes (Saito 2012), 60% of destroyed houses were those of poor people whose income was less than twice the country's minimum wage. Total damage amounted to 16 billion dollars, or 12% of GDP of the country. Half of all hospitals, one-third of schools and even the Office of the President were affected.

In all countries, it is necessary to invest in disaster risk reduction for resilience to enhance disaster preparedness for an effective response and to build back better in recovery, rehabilitation and reconstruction. However, in developing countries particularly, both the fiscal and other constraints of government and the low incomes of the most vulnerable inhabitants of the country need to be fully taken into account. Therefore, it should be emphasized that technologically and financially feasible options are essential for developing countries. From this point of view, the low-cost earthquake-resistant housing (Taishin) initiatives in El Salvador are a way to address this issue. Case 8.2 elaborates on these initiatives.

8.3.1.1 Case 8.2: Technological Innovation and Capacity Development for Low-Cost Earthquake-Resistant Housing: Taishin Initiatives

Taishin initiatives were aimed at furthering earthquake-resistant housing in El Salvador from 2003 to 2012. JICA started a cooperation project for earthquake disaster prevention in

Mexico with the National Center for Disaster Prevention (CENAPRED) after the big earthquake in the central part of Mexico in 1985, which killed about 10,000 people. The technology and innovative methods developed by the project have since been used in the Taishin Project.

The launch of the Taishin Project in 2003, two years after the two great earthquakes in El Salvador, was timely because in the following year the government of El Salvador introduced the "Safe Country: Plan of Government of El Salvador 2004–2009," which advocated for the adequate provision of housing with clear government roles in tackling the challenge. This included the formulation of a new housing policy, strengthening of housing standards and regulations, a new loan scheme for the informal sector, and a land entitlement, especially for the poor. The launch of the five-year "Safe Country" plan, which emphasized housing issues, further enhanced the policy-relevance of the Taishin initiative (Saito 2012).

In El Salvador and other Central American countries, adobe (sun-dried brick) houses are popular among low- and middle-income earners. These houses are vulnerable to earthquakes and many of them were completely or partially destroyed by two major earthquakes in 2001 in El Salvador. Houses made of improved adobe, soil–cement, block panels, and concrete blocks were tested with their respective appropriate structures in large structure laboratories at the National University of El Salvador and the Jose Simeon Cañas University of Central America (UCA). Among other goals, the Taishin Project aimed to establish official technological standards for earthquake-resistant houses and achieve institution-building for the governmental urban and housing development agency in charge of housing policies and construction permits. As a result, according to a JICA (2017) report, "a legally backed architectural technology standard was enacted in 2014. In El Salvador, structural calculations have been used to confirm safety for low- or middle-income earners in most cases. The new technological standard does not require structural calculations, it regulates only the specification code. It is expected to be used to design and build small houses. The project has also provided opportunities to raise the awareness of highly quakeproof houses. The 'Build Back Better' project, based on the experience of the earthquake in 2001, is steadily being implemented" (13). Subsequently, the experiences and innovation from the joint Taishin Project CENAPRED/JICA/Japan Institute of Construction/El Salvador were shared throughout Central America. The following lists the major accomplishments of the Taishin project, as highlighted by Saito (2012, 181–182):

> First of all, the initiative has undertaken all the planned activities for the transfer and adaption of Taishin assessment techniques to major national institutions, including the National University of El Salvador and the UCA. Now, these two universities are capable of undertaking the scientific seismic capacity assessments using the equipment and facilities provided by Japan. Through the Taishin experiment, the laboratories of two universities in collaboration with El Salvador Foundation for Development and Dissemination of Housing (FUNDASAL) has already finished testing four low-cost housing construction methods. It is also noteworthy that in 2012, both of these universities newly established a Master's Program for Earthquake Engineering, which takes advantage of the capacity and expertise the universities have built up through this Taishin initiative.
>
> Secondly and closely related to the first achievement, the project succeeded in refining four low-cost housing construction techniques to make them more earthquake resistant. In collaboration with FUNDASAL, the project undertook the experimental housing construction pilot, based on the refined quake-resistance methods. With regard to the soil-cement method, one of the four appropriate technologies for low-cost housing, the project improved the soil-cement by adding the locally available volcanic ash to soils. Furthermore, in collaboration with El Salvador's "Chagas' disease[8] project" with JICA assistance, the Taishin project also introduced cement plaster for adobes, which is effective in preventing the vector insect of Chagas' disease (kissing bugs) from encroaching into the walls and floors of the adobe houses. The introduction of such an improved technique for low-cost adobe methods, which is more quake-resistant and repellent to insects, would be particularly beneficial for low-income groups. Following the satisfactory results of the pilots, manuals and training materials on the quake-resistant construction methods were developed and distributed widely.

Thirdly, thanks to the successes in the capacity development of partner institutions, El Salvador has now started to play the role of a sub-regional pivotal country in the field of the Taishin technique, assisting Nicaragua, Dominican Republic, Haiti, among others.

8.3.2 Investing in Resilient Infrastructure for Resilient Cities and Human Settlements

According to the JICA document, *Disaster Resilient Society for All*, build back better is the concept of turning disasters into an advantage by creating a stronger country and society (JICA 2017, 14). This concept is based on many decades of Japanese experience. The same document explains that every time Japan is struck by a major disaster, it revises its existing related laws, regulations, and standards. This approach "enables various stakeholders to build a more disaster-resilient country based on more stringent standards. This attitude—seeing major disasters as opportunities to build more disaster-resilient communities—was referred to in the Sendai Framework as the concept of 'Build Back Better'" (JICA 2017, 2).

Cases 8.3 and 8.4 appear to be relevant as cases of investing in disaster risk reduction for resilience (Sendai Framework Priority for Action 3) and build back better (Priority for Action 4).

8.3.2.1 Case 8.3: Project for Capacity Development of the Department of Climate Change Adaptation and Strategic Risk Management for Strengthening of Public Infrastructure: GENSAI Initiatives

In an effort to support the risk-reduction efforts of El Salvador, a cooperation project called GENSAI (Phase 1) started in 2012. The tropical cyclone 12E seriously affected El Salvador in 2011, leading to historically high continuous rainfall, and causing severe damage to social and economic infrastructure in the country. Not only did 12 bridges collapse, but 37 bridges were damaged seriously, and landslides and road slope failures were observed at many sections along roads including major highways. Disasters caused by rain in El Salvador have become more frequent and serious recently. Hurricanes Mitch, Stan, Ida and Tropical Cyclone 12E all brought heavier continuous rainfall.

In these circumstances, the Department of Climate Change Adaptation and Strategic Risk Management (DACGER) was newly organized by the Ministry of Public Works, Transport, Housing and Urban Development (MOP) of El Salvador under the Minister's direct control in 2008. With this initiative, the government of El Salvador made the promptest response to climate change among Central American countries. With these provisions, government efforts proved highly capable during the restoration works following 12E. Heavy equipment consisting of 142 heavy machines for reconstruction was granted by the Japanese government in 2010 and was effectively utilized during the restoration work. With this experience and in response to a request from the MOP, the Japanese government decided to implement the Economic Infrastructure Rehabilitation Project in 2012. Almost concurrently, in order to strengthen the capacity of disaster reduction through pre-disaster investments and seismic reinforcement construction, the GENSAI Project commenced with the cooperation of JICA.

The aims of the GENSAI Project carried out between 2012 and 2015 in El Salvador were: (1) to establish a structure in the MOP which promotes the implementation projects of improvement of public infrastructure in accordance with the priority recommended by DACGER; (2) to establish a system which rapidly and adequately prepares an inventory of damage and implements reconstruction work when natural disasters occur; and (3) to establish a national training system for national engineers in charge of public infrastructure.

The GENSAI Project includes grant provisions for equipment and technical cooperation

for the reinforcement of public infrastructure for climate change adaptation as well as education for disaster prevention.

The GENSAI Project Phase II has been implemented from 2016 to 2021. It aims to (1) improve risk diagnosis ability against earthquakes for road infrastructure (bridges, road slopes); (2) formulate standard specifications, design guides, and cost estimation standards for road disaster risk reduction projects; (3) enhance DACGER's project management capacity on road disaster risk reduction projects; and (4) share with other countries project outcomes from disaster risk diagnoses and road disaster risk reduction projects (JICA and MOP 2019).

In this way, a more comprehensive approach to disaster risk management has been adopted in El Salvador. The goal of the GENSAI Project is to strengthen the infrastructure to protect the lives and livelihoods of inhabitants. BOSAI, TAISHIN, and GENSAI Projects are expected to produce synergistic effects enhancing the capacity and resiliency of people and society to address the risk of natural disasters, in ways that are much more integrated and effective.

8.3.3 Post-disaster Reconstruction to Enhance Resilience of Communities, Cities, and Society: Building Back Better Through Land Readjustment

After a disaster occurs, people aim to build back more resiliently and stronger than before ("building back better"), rather than simply trying to rehabilitate the disaster-stricken communities (see Yanase 2018). In post-disaster reconstruction, both preservation/cohesion and stronger resilience of communities are essential. In these regards, "a driving force behind the post-disaster reconstruction is land adjustment" (Yanase 2018, 63). As explained in Chap. 6, the usage of land readjustment in Japan is broad in scope and purpose. Post-disaster reconstruction is one of the five categories that delineate the purposes of land readjustment, together with control of urban sprawl, development of new towns, urban rehabilitation, and development of complex urban infrastructure (de Souza 2018, 23–24). As discussed in Chap. 6, land readjustment is an approach that can contribute to making cities more inclusive, safe, resilient, and sustainable. Moreover, it should be emphasized that, in addition to the standard scheme of land readjustment applicable to the five categories, innovative measures have been introduced to enhance the effectiveness and flexibility of land readjustment for post-disaster reconstruction. We can acknowledge the effectiveness of these approaches during the reconstruction process after the two great disasters in the last few decades in Japan: the Great Hanshin-Awaji Earthquake and the Great East Japan Earthquake and Tsunami.

8.3.3.1 Case 8.4: Reconstruction After the Great Hanshin-Awaji Earthquake and Great East Japan Earthquake and Tsunami Through Land Readjustment and Its Further Innovation

Yanase (2018) summarizes the damage resulting from these two disasters and the subsequent innovative measures introduced in the form of a standard land readjustment scheme during the reconstruction process.[9] On January 15, 1995, the Great Hanshin-Awaji Earthquake occurred with a magnitude of 7.3. The earthquake occurred directly beneath Kobe, causing widespread destruction across the Kinki area (Hyogo Prefecture in particular, along with Osaka and Kyoto). The urban area of Kobe, one of the major cities of Japan, suffered significant damage. The earthquake left 6,437 people dead or missing, and 43,792 injured. A total of 460,000 households suffered damage; 104,906 houses were completely destroyed. Kobe, the most severely damaged city, conducted post-disaster

reconstruction projects, including public housing development for the sufferers and land readjustment.

The government responded swiftly to these reconstruction plans. The primary mechanism for land readjustment is known as "replotting." Replotting refers to the change of location, format and area of several plots of land to achieve a project's final scenario. On February 26, a little more than a month after the earthquake, the Act on Special Measures Concerning Disaster-Stricken Urban District Reconstruction was passed. This act enabled a special framework for land readjustment. For example, a joint-construction public apartment site can be designated in a project area in which landowners can get their replotted land and participate in the joint construction of the apartment if they so choose. In addition, the act provided a framework to offer a flat in an apartment instead of replotted land to the disaster-affected people who lost their houses and were left with the land as their only asset. Legally, when the replotted land is not offered, equity is paid. The new framework helped the disaster-affected people to restore their livelihoods by providing them with houses built by an implementation agency instead of money. It is expected that the framework will enable the disaster-affected people to move from temporary housing into their own houses relatively soon after a disaster, without increasing their financial burdens.

On March 11, 2011, a big earthquake off the Pacific Coast of Japan hit the eastern part of the country. The damage from the 9.0 magnitude earthquake and subsequent tsunami, said to be of a kind that hits about once every 1,000 years, was far more devastating than that caused by the Great Hanshin-Awaji Earthquake. According to the National Police Agency, official records confirmed that the Great East Japan Earthquake and Tsunami left 18,456 people dead or missing and 400,438 houses/buildings either completely or partially destroyed as of August 8, 2014. The number of evacuees totaled more than 400,000 immediately after the disaster, and 247,233 people as of July 10, 2014. Note, however, that these figures include evacuees from around the damaged Fukushima Daiichi Nuclear Plant due to the fear of radiation contamination. The direct damage of the earthquake is estimated to be around 16–25 trillion yen. According to an estimation by the World Bank, this was the worst economic damage from a natural disaster in the world's history.

The scale of the disaster was unprecedented. A plan that included measures to improve disaster prevention functions was prepared. Several post-disaster reconstruction projects concerning urban planning are being conducted, including large-scale site preparations to move the communities from lower ground close to the sea to higher ground, and most of these projects require the use of land readjustment. In the tsunami-affected areas, the majority of the buildings were swept away and many places looked like wastelands. Based on its experience in new town developments, the Urban Renaissance Agency (former Housing and Urban Development Corporation) employed a method that was not often used for existing urban areas. The method involved leasing all of the land necessary for construction work from the property owners at an early stage, instead of using provisional replotting to implement the project. It therefore tried to complete the project within the shortest possible time.

8.4 Sharing Knowledge and Innovative Solutions and Nurturing Human Resources for Disaster Risk Reduction

Knowledge, good practices, and innovative solutions to reduce disaster risks are valuable assets for each country and for the entire world. Sharing them and nurturing human resources in the field of disaster risk reduction while taking advantage of these assets is an effective approach to enhancing the resilience of people and society. For example, an affordable emergency warning system based on advanced information and communication technology (ICT), as well as other cutting-edge technologies, enables people

to take actions to minimize disaster risks. Case 8.5 highlights the initiatives of establishing an Emergency Warning Broadcast System (EWBS), based on Integrated Services Digital Broadcasting-Terrestrial (ISDB-T). Enhancing disaster prevention awareness, which is crucial for stronger resilience, can be facilitated by innovative equipment. Case 8.6 refers to the introduction of earthquake simulation vehicles to Peru. Finally, Case 8.7 discusses the Kizuna project as a pioneering initiative to nurture human resources for disaster risk reduction.

8.4.1 Case 8.5: Integrated Services Digital Broadcasting-Terrestrial (ISDB-T) and Emergency Warning Broadcast System (EWBS)[10]

ISDB-T is a terrestrial digital broadcasting system developed in Japan. Its functions—such as emergency alert broadcasting, TV reception on mobile terminals, and data broadcasting—provide advantages in disaster responses and the provision of diverse services. Japan has made proactive efforts to provide comprehensive support for the overseas promotion of ISDB-T. As of December 2018, ISDB-T is being spread in Latin American and the Caribbean, Asia and Africa, and has been adopted in a total of 18 countries. In 2009, Peru became the first Spanish-speaking country to decide to adopt the Japanese system of terrestrial digital broadcasting. Currently, this system is being introduced and installed in to the country's major metropolitan areas. EWBS, one of the Japanese system's features, is a method for broadcasting urgent information via the television, using a special signal, in order to promptly convey information on disasters such as earthquakes and tsunamis. EWBS TV sets and mobile receivers automatically activate when earthquakes and tsunamis happen, and this raises the alarm among the people. In the case of Japan, once a disaster occurs, the Japan Meteorological Agency releases disaster information, then broadcasters transmit the information via a special signal to TV sets and mobile receivers. Peru became the first country in Central and South America to make practical use of the EWBS. Peru is expected to serve as a leader in the spread of digital terrestrial broadcasting and the EWBS, and engage in independent efforts, such as sharing its experience with other countries adopting the terrestrial digital system in the region (MOFA 2019, 20–22).

8.4.2 Case 8.6: Disaster-Prevention Training with Earthquake Simulation Vehicles[11]

Japan has been supporting Peru in reducing its disaster risk for nearly 40 years. JICA comprehensively supports Peru in its disaster management cycle of evaluation, prevention, mitigation, preparation, response, rehabilitation, and reconstruction. JICA also works with organizations that scientifically analyze earthquakes and provide data to the government. A public awareness campaign is also carried out to explain the risks of earthquakes to junior high schools and elementary schools in comprehensible terminology (JICA 2016).

In principle, the Centro de Sensibilización y Aprendizaje sobre Terremotos y Tsunamis (Center for Sensitization and Learning on Earthquakes and Tsunamis, CESATT) of the Japan-Peru Center for Earthquake Engineering and Disaster Mitigation (CISMID) at the University of Engineering (UNI) carries out activities such as creating teaching materials and developing programs for disaster-prevention education and providing enlightenment workshops and training. Various Japanese know-how is being applied in these activities. CISMID began implementing disaster-prevention trainings of earthquake experiences, using earthquake simulation vehicles from 2018. Most of the participants in these trainings said that the experience of riding in the earthquake simulation vehicle was extremely beneficial, and that it made them realize the importance of earthquake countermeasures. The earthquake simulation vehicles, which can easily make small turns, are

now visiting regions all over Peru so that the local people can experience the shaking of an earthquake. Earthquake simulation vehicles allow trainers to experience simulated earthquakes up to magnitude 7 for two minutes at a time and can be customized according to local needs. Starting with the introduction of these vehicles, it is hoped that disaster-prevention awareness will further grow among the people of Peru, and that preparations for large-scale disasters will be undertaken in every household (MOFA 2019, 64).

8.4.3 Case 8.7: *Kizuna*: Disaster Risk Reduction Training Program for Latin America and the Caribbean

Chile and Japan have a long history of cooperation in disaster risk reduction with successful results, including the improvement of a tsunami warning system, the development of a rapid building inspection sheet, and the update of a manual on bridge seismic criteria.

On Sept. 16, 2015 at 7:54 p.m., central Chile was struck by an earthquake with an 8.3 magnitude. Immediately when the earthquake struck, there was a tsunami warning issued that urged residents to evacuate to higher ground. Consequently, considering the size of the earthquake, human casualties were kept to a relative minimum. This was due to a "prompt response by the Chilean government, related organizations and local residents," and was highly praised by the United Nations. "One of the factors that made such a response possible was the disaster risk reduction support JICA has been providing for a number of years. Chile's experience demonstrated the effectiveness of JICA's diverse range of support for developing infrastructure and human resources, including revisions to earthquake resistance standards for buildings, improvements to the tsunami warning system and the implementation of evacuation training programs" (JICA 2015, 1). In Chile, an Integrated System of Prediction and Warning of Tsunami (SIPAT) was developed and started to operate from 2016.

Kizuna, Disaster Risk Reduction Training Program for Latin America and the Caribbean was launched in March 2015 at the Third UN World Conference on Disaster Risk Reduction (DRR) in Sendai, Japan. Its overall goal is to strengthen the capacity of human resources and networks in DRR and improve measures for DRR in countries of the region. It aims to train more than 4000 professionals in the region. *Kizuna* is implemented by the Agency of International Cooperation and Development (AGCID), JICA, and the National Emergency Office (ONEMI) of the Ministry of the Interior and Public Security of Chile (the Technical Manager of *Kizuna*).

8.5 Concluding Remarks

The determinants of learning discussed in Chap. 2 can also be observed in the cases of disaster risk management. Easy entry points and low-cost solutions were identified in the BOSAI Projects. First, risk literacy was enhanced, with the focus on making the residents fully understand the risks of their own community and take actions on their own. From the perspective of continuous improvement or Kaizen in the context of BOSAI to cope with ever-changing risks, capacity development (CD) aims to let the community members prepare risk maps and disaster management plans—as well as improve them—on their own. CD processes at the levels of both the community and local government strengthened their capacity to respond effectively to various disasters and to take various concrete actions. From these experiences, we could confirm that resilience is indeed about learning to live with risks. Effective learning by communities and their members has taken place in the BOSAI Projects. BOSAI at the community level is effective only when the process is inclusive, whereby all members contribute to and receive benefits from the BOSAI activities.

Learning by doing, mutual learning, and co-creation of innovative solutions were also a

feature of BOSAI and related activities. As discussed, major achievements at the community level include the development of organizations, risk maps, evacuation routes, early warning systems, and emergency response plans. Greater levels of involvement and commitment of voluntary labor were also observed. We can recognize clearly that, through this process, there was mutual learning among stakeholders and successful co-creation of innovative solutions. In Taishin Projects, low-cost earthquake-resistant housing technology—established through cutting-edge laboratory experiments—was provided for free as a public good. This technology opened up the possibility of a new type of inclusive business for low-income people with the participation of other stakeholders in El Salvador, such as NGOs. The technology has now been shared with some other Central American countries. In BOSAI, TAISHIN, and GENSAI Projects, capacity development to strengthen resilience through organizational learning and institution-building took place. As such, learning, including learning to learn, effectively contributed to innovative and inclusive development, enhancing resilience in El Salvador and other Central American countries that belong to the Center of Coordination for the Prevention of Natural Disasters in Central America (CEPREDENAC).

Furthermore, the use of emergency warning broadcast systems, earthquake simulation vehicles, and so on, based on cutting edge technologies, can enhance the awareness and resilience of people to cope with disaster risks. The recruitment and training of professionals for institutions in charge of DRR through programs such as *Kizuna* may further enhance the resilience of society to natural disasters. We can confirm that learning, resilient infrastructure, and institutions, are among other things, crucial in the process of transforming societies into more resilient ones.

Notes

1. According to JICA (2017), these priority areas and strategies are based on lessons learnt through JICA's activities in the disaster risk reduction sector, which originally were gained through long efforts and experience within Japan. 'The Sendai Disaster Risk Reduction Framework' explicitly demonstrates the global recognition of these important strategies (3).
2. This and the following three paragraphs related to the three types of gaps draw on the presentation made by Shinya Ejima, Director General of the Global Environment Department of JICA, on the occasion of an ASEAN meeting in April 2012. Errors and omissions are those of the author.
3. According to JICA (2017), BOSAI, Disaster Risk Reduction, is a series of efforts to reduce economic and physical loss in case of disasters to ensure the overall development process is not disturbed.
4. For Chagas disease, see Case 8.2.
5. Frog Caravan (Caravana de Rana) is an innovative training system to learn about natural disaster prevention developed by Plus Arts (+Arts), a Japanese NPO, in 2005. In Japan the frog is considered a friendly symbol promoting good feelings and Frog Caravans tour schools, involving local officials, teachers and schoolchildren, and introduce for example games for teaching children how to extinguish fires or rescue people trapped under rubble in the wake of an earthquake.
6. This part of the experiences of Santa Tecla is based on the author's interview with its Mayor, Mr. Oscar Ortiz on August 28, 2012.
7. See Chap. 6 for a full discussion of land readjustment.
8. The assassin bug transmitting Chagas disease resides in the walls and floors of adobe houses. For further information on Chagas disease, see https://www.jica.go.jp/usa/english/office/others/newsletter/2014/1405_06_05.html.
9. This and the following three paragraphs are based on Yanase (2018). Errors and omissions are of the author.
10. This case mainly draws from MOFA (2019).
11. This case draws from MOFA (2019).

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