FOSTERING PRODUCTIVITY IN THE RURAL AND AGRICULTURAL SECTOR FOR INCLUSIVE GROWTH IN ASIA AND THE PACIFIC

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In recent years, income poverty has been declining steadily in the Asia-Pacific region, but rural poverty remains widespread and deep, and continues to pose a serious challenge for policymakers. Improving agricultural productivity has been a core strategy for economic development and poverty alleviation for several decades, as this type of productivity was thought to facilitate structural transformation, which enables "surplus agricultural labour" to find employment in non-agricultural sectors. However, it has now been realized that the share of agriculture in national output declines more rapidly than the share of agricultural employment in total employment, trapping millions in "unproductive" agriculture and making them relatively poorer. Understanding this process and identifying appropriate responses is critical for poverty alleviation and inclusive growth. Based on data analysis and policy reviews, in the present paper, it has been found that structural transformation processes are incomplete in many developing countries. Reducing rural poverty and promoting inclusive growth cannot be realized by confining to agriculture, but instead they can be achieved by seeking a broader policy framework that facilitates enhanced intersectoral linkages.

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I. INTRODUCTION

Income poverty has been declining steadily in the Asia-Pacific region in recent years. However, rural poverty remains widespread and deep, and continues to pose a serious challenge for policymakers, partly because of the large number of people affected by it and partly because of its chronic nature, which is rooted in structural, institutional and sociological aspects. For a large majority of the rural poor, agriculture remains an important source of livelihood, although by no means it is the only, or the most important, livelihood (Haggblade, Hazell and Reardon, 2007; IFAD, 2016). Theoretical models and empirical studies have well documented that agricultural productivity growth is a critical condition for reducing rural poverty and promoting inclusive growth prospects. Agricultural productivity growth is considered to play a central role in the industrialization process. In the Clark-Kuznets-Chenery-Syrquin framework, it was suggested that a rise in per capita income is directly linked to the structural transformation process in which the share of agriculture in total output and the share of agricultural employment in total employment decline almost simultaneously, allowing "surplus agricultural labour" to find employment in the industrial and services sectors. However, that fairly "typical" process of transformation has not occurred in many developing countries. While the share of agriculture in output has declined, the share of agriculture employment in total employment has been found to change at a much slower rate, thus trapping millions in the agricultural sector with lower marginal productivity. In the process, agricultural workers have become relatively poorer compared to their counterparts in the industrial and services sectors.

Lack of progress in agricultural development and limited opportunities available for the rural poor in non-farm activities have forced the rural poor to migrate to urban centres in search of productive employment. Only a limited number of them find productive employment opportunities outside agriculture, and even when they secure jobs, incomes generated in urban areas tend to be highly volatile (de Haan and Rogaly, 2002). This has led to an appreciation of the importance of promoting economic activities rooted in rural areas and strengthening linkages with non-agricultural sectors. The need to strengthen rural economies and ensure that the rural poor can benefit from growth processes is fundamental to inclusive growth. The rural poor need to overcome many obstacles in order to reap the benefits associated with national growth, which include: high transaction cost differentials between rural and urban areas and their buying and selling prices; barriers to accessing technology, finance and public services; and widely differing capacities to participate in non-farm income generating activities.

In the present paper, the historical evolution of agricultural productivity and some key variables that determine inclusive growth in selected countries in Asia and the Pacific are reviewed and some policies that contributed to agricultural productivity growth and inclusive growth are identified. The rest of the paper is organized as follows. The next section contains a review of the literature, followed by a review of salient features of agricultural productivity growth in Asia and the Pacific. Section IV incudes a review of agricultural policies pursued by four countries in the region. In section V, a review of economic transformation and its links to inclusive growth are provided, and section VI concludes.

II. LITERATURE REVIEW

In development economics literature, which largely emerged to explain the process of economic transformation in industrialized countries, agricultural productivity has been identified as being essential for economic growth. Growth in agricultural productivity had resulted in increased demand for manufacturing goods, which in turn had led to a process of structural transformation in which the share of agriculture in national incomes and employment fell with a parallel rise in employment in the manufacturing and services sectors. The same process of transformation had occurred much later in Japan and the Republic of Korea. This transformation process is viewed as robust, and is associated with declining shares of agriculture in total output and agricultural employment in total employment and increasing per worker agricultural value added; simultaneously the shares of manufacturing and services in total output had increased (Clark, 1940; Kuznets, 1957; Chenery and Syrquin, 1975; Timmer, 1988). If economic and social conditions are conducive for the process of transformation to be spontaneous and without many internal or external barriers, higher agricultural productivity enables sectoral differences to decline, thus providing a foundation for economic growth that benefits agricultural workers.

The literature recognized two channels through which agricultural productivity could spur industrial growth: demand channel and supply channel. The demand channel proposes that agricultural productivity generates sufficient demand for manufactured goods and other services if consumers facing different incomes but the same prices do not demand goods in the same proportions. The growth in demand for manufactured commodities in turn is thought to induce a reallocation of labour away from agriculture, allowing surplus agricultural labour to find employment in non-agricultural sectors and thus completing the transformation (Murphy, Shleifer and Vishny, 1989). The supply channel is based on the hypothesis that at initial stages, agricultural productivity increases more rapidly than productivity growth in the industrial sector and that goods produced in the two sectors complement each other,

but demand for agricultural goods does not grow as rapidly as for manufactured goods, thus inducing labour to be reallocated to manufacturing activities (Baumol, 1967).

The view that growth in agricultural productivity can lead to industrial growth and transformation has been challenged on the ground that the process could take place only in closed market economies. In subsequent literature, under an open market assumption, the possibility for growth in agricultural productivity to slow industrial growth because of the possibility for reallocating labour from agriculture to a sector with more comparative advantage has become apparent (Wright, 1979; Matsuyama, 1992).

More recent empirical evidence has shown that technical change in agricultural production can lead to industrial growth if the technical change is labour-saving (Bustos, Caprettini and Ponticelli, 2016). Advanced knowledge of genetic structures and mechanisms, especially in agricultural biotechnology, has been shown to push the agricultural productivity frontier dramatically, which is likely to contribute to a rise in the productivity of secondary crops, such as millets, cassava and root crops, that provide sustenance to millions (Naylor and Manning, 2005).

Recent research has enhanced the understanding of additional conditions required for growth in agricultural productivity to induce economic transformation. It has been found that the process works better under a relatively better distribution of income and resources among people (Ravallion and Datt, 1996; Timmer, 2007; World Bank, 2008). Furthermore, growth processes that occur in rural areas help the poor to move out of poverty faster and are conducive for more rapid economic growth and transformation (Ravallion, Chen and Sangraula, 2007). Vertical integration of agricultural production within larger production and processing systems along with the "supermarket revolution" has also been found to help transform food retail markets and supply chains (Reardon and others, 2003; Reardon and Timmer, 2007).

Structural transformation is associated with two additional transformations that help the rural sector: spatial reorganization and institutional transformation (Brooks, 2012). Need for spatial reorganization is thought to have emerged from higher agricultural productivity, which induces farm enterprises to consolidate land and establish relatively large farming operations, and growth of satellite cities and the development of larger urban centres. In the process, agricultural workers who manage to acquire technical skills find employment in the modern sector. This has an additional advantage: a reduction in the unit costs of providing services, including electricity, telephone connectivity, sanitation, education and health care. As unit costs decline, greater demand makes it possible for a large number of suppliers to enter markets, making prices more competitive. This involves the replacement of old

production processes and institutions with new economic structures and institutions, marked by the shift of labour, capital and other resources to more productive sectors. The second aspect is related to institutional transformation in which more formal contractual arrangements replace traditional systems in the management of land, labour, credit and marketing arrangements; this is found to be conducive for the emergence of specialized skills and markets, which consequently reduce transaction costs and lead to overall economic transformation (Wickramasinghe and Weinberger, 2013).

III. AGRICULTURAL PRODUCTIVITY GROWTH

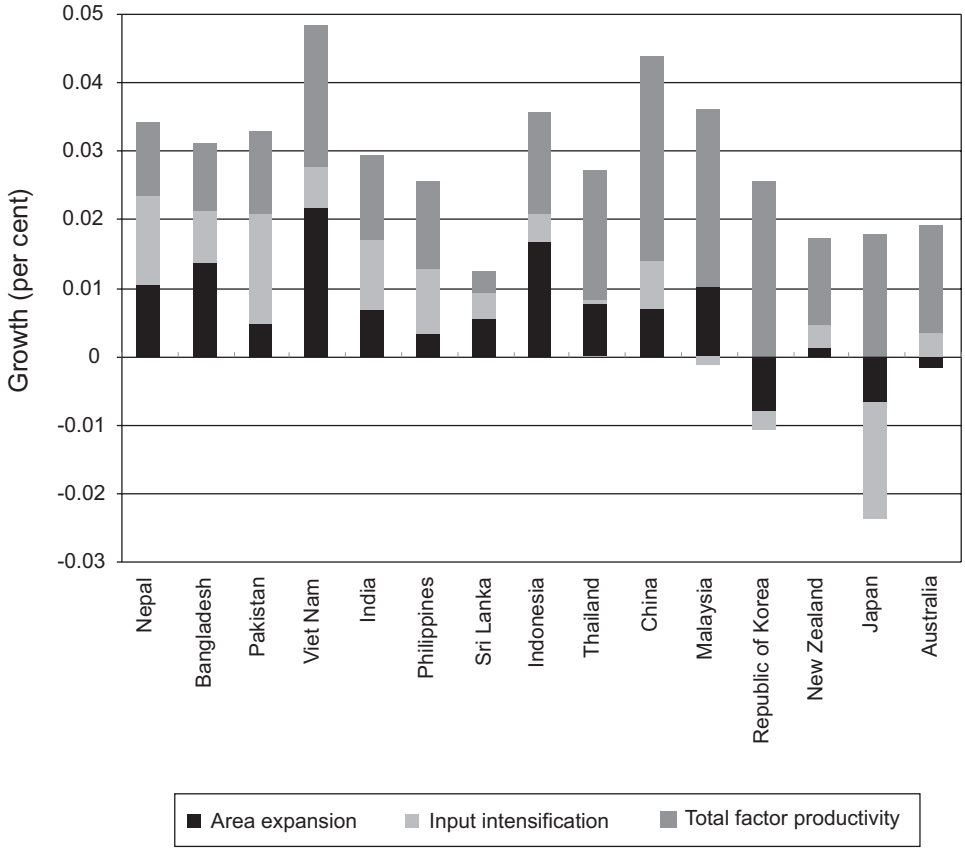
The growth theory discussed above gives pre-eminence to agricultural productivity growth as a key factor that triggers economic growth and transformation. In this section, an overview of agricultural productivity growth in selected countries in Asia and the Pacific is presented, and policy reforms that have supported agricultural productivity growth[1] for four countries are reviewed.

Figure 1 presents data on average annual growth rates of agricultural output, decomposed by area expansion, input intensification and total factor productivity (TFP) growth. Countries are organized by per capita gross domestic product (GDP) (constant 2010). It was found that the higher the per capita GDP, the higher the proportion of agricultural output generated from growth of TFP. China and Viet Nam are two exceptions, where higher TFP growth rates have been realized at relatively

[1] Growth in agricultural output originates from three sources: expansion of input use (extension), and increased application of inputs (intensification); and efficiency improvements resulting from the adoption of efficient technologies and farming practices without the augmenting resources, which is termed as total factor productivity (TFP). Productivity growth comes from technical progress, which consists of two key components: technical change; and technical progress. The first component arises from improvements in production practices and the latter comes from a movement of production practices close to the existing good practices. For a comprehensive review of methodology, refer to Headey, Alauddin and Rao (2010), and for a description of estimation procedure with a guide to data, see United States Department of Agriculture (2017). Total factor productivity (TFP) is measured either by its level or its growth. The level of TFP is measured by dividing an index of agricultural outputs (index of gross crop and livestock output) by an index of inputs comprising of land, fertilizer, machinery, livestock and feed. TFP growth, on the other hand, is measured by taking the difference between growth rates of the index of agricultural outputs and the index of inputs. Growth in TFP can come from various sources: improvements in using existing resources more efficiently; the use of high-yielding, disease-resistant and drought tolerant varieties; the implementation of efficient and timely cultivation and harvesting practices; and the application of agricultural practices that control the use of water, fertilizer and other inputs more precisely (precision agriculture); providing better rural education that enhances community understanding of modern agricultural practices; institutional innovation; or improved quality of resources. TFP growth can be positive when output growth is higher than input growth, which indicates an improvement in the sources mentioned above. It can be negative when input growth surpasses that of output growth.

low per capita GDP. In Japan and the Republic of Korea, almost all of agricultural output expansion comes from TFP growth, and land and other resources are being reallocated to other sectors. Similarly, a higher percentage of agricultural output has also come from TFP growth in China, Malaysia and the Republic of Korea. Developing countries with relatively low per capita incomes, such as Bangladesh, Nepal and Pakistan, continue to rely more on area expansion and input intensification.

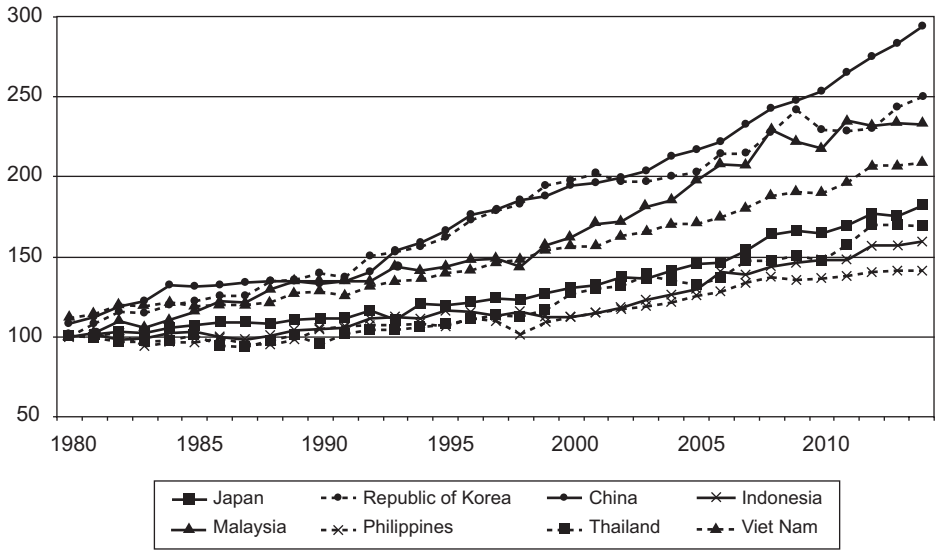
Figure 1. Sources of agricultural output growth (1980-2014)



Source: Author, based on United States Department of Agriculture (2017).

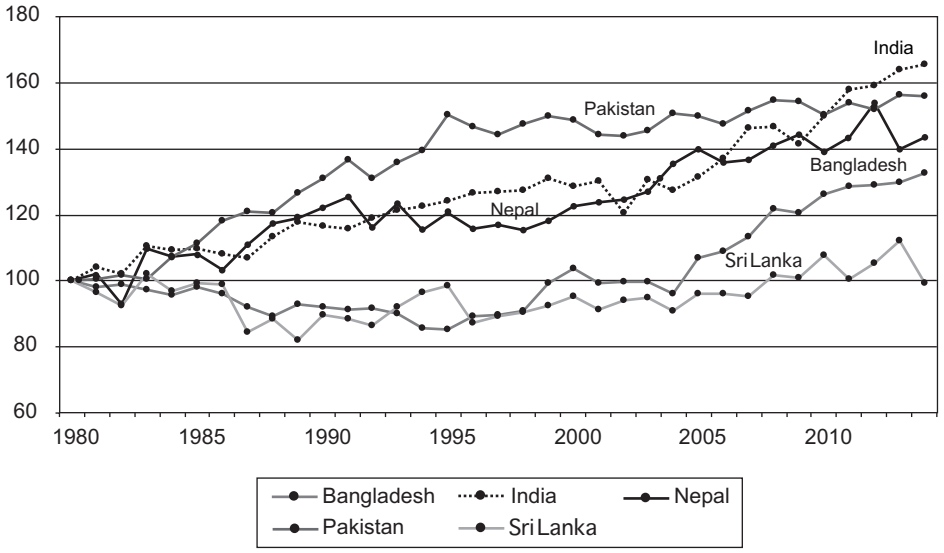
While the above figure is useful in gaining an overall view of agricultural productivity growth, it does not indicate how the change actually happened over time. Figure 2 presents annual TFP indices for East and South-East Asia for the period 1980-2014. It shows that some countries, such as China, Malaysia and the Republic of Korea, have been able to experience a transition to higher levels of output generated through TFP. Other countries in East Asia, including among them, Japan, have maintained a consistently high TFP, but not at the high levels experienced by the countries mentioned above. In South Asia, TFP growth rates have hardly reached the levels realized by East Asian countries, except for India, in the last few years (figure 3). Within the subregional group, three countries, namely India, Nepal and Pakistan, have realized higher TFP growth, whereas Bangladesh and Sri Lanka have fallen below the other countries. Sri Lanka is an exception, as TFP growth has fallen way below the other countries with significant fluctuations, perhaps indicating erratic changes of policies related to agricultural development.

Figure 2. Total factor productivity in agriculture in East Asia Index (1980 = 100)



Source: Author, based on United States Department of Agriculture (2017).

Figure 3. Total factor productivity in South Asia Index (1980 = 100)



Source: Author, based on United States Department of Agriculture (2017).

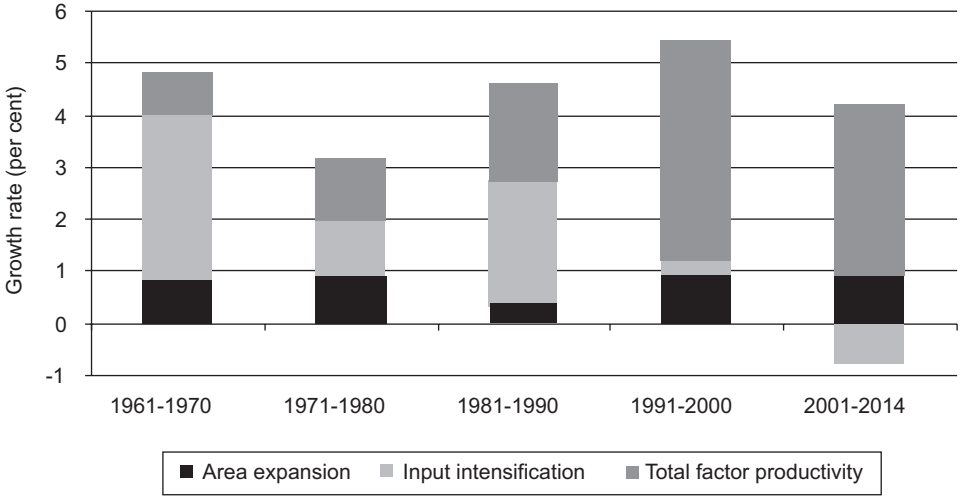
IV. AGRICULTURAL POLICY REFORMS IN SELECTED COUNTRIES

Agricultural policy reforms implemented by four countries, namely China, India, Indonesia and Thailand, with the objective to spur agricultural productivity growth are discussed below. It aims to identify policies that may have specifically targeted to stimulate agricultural productivity.

China

In China, agricultural output expansion originating from TFP has been rising consistently over time, driven largely by investment in agricultural technology, the construction of rural infrastructure and the introduction of innovative institutional arrangements. In the late 1980s, role of agricultural intensification in output expansion had virtually come to an end. In subsequent periods, the use of inputs per area has been dominant, and in more recent years TFP growth has begun to play a dominant role in agricultural development.

Figure 4. Agricultural output growth and its decomposition in China



Source: Author, based on United States Department of Agriculture (2017).

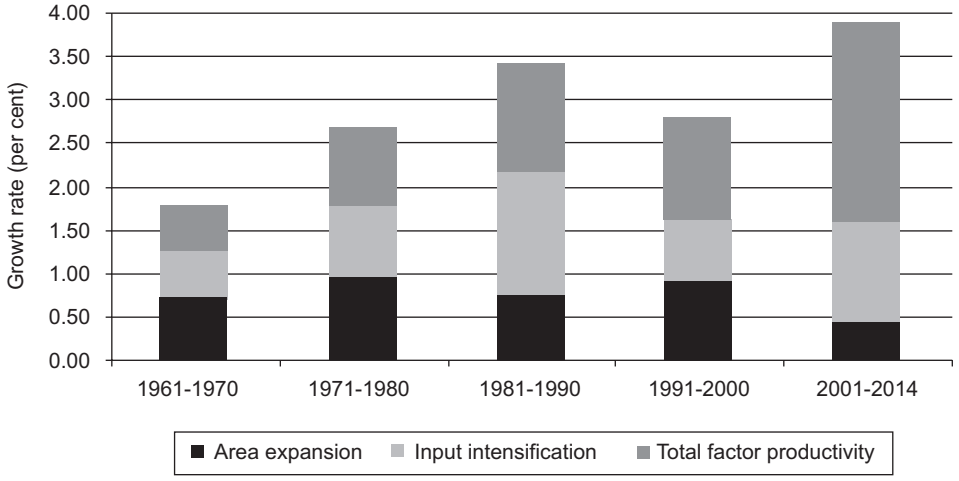
Production decentralization introduced in 1978 was a key part of the reform package to revive agricultural development. Liberalization of the agricultural pricing system and reforming agricultural procurement (Fan, Zhang and Zhang, 2002) have contributed to growth in agricultural output in subsequent periods. However, it appears that those reforms exposed farmers to market vagaries, prompting policymakers to address market adjustment issues in the 1990s. A critical step in the transition was the way China began to manage excess supply and the rising gap between urban and rural areas, for which it launched several measures in early 2000. With a focus on raising farmers' incomes, the Government (a) began to provide input subsidies to purchase improved seeds, (b) made direct payments to farmers who engaged in grain production, and (c) reduced and later abolished agricultural taxes (Zhang and Brummer, 2011).

India

India's agricultural output has been rising since the Green Revolution, spurred by the use of intensive agricultural practices (Chand, Kumar and Kumar, 2011; Joshi and others, 2000), infrastructure and irrigation development, area expansion and technical progress. In the process, some sector such as dairy have grown much more rapidly, partly supported rising demand from the growing urban population. In India during the period 2001-2014, TFP became the dominant factor in agricultural output

growth although area expansion and input intensification has continued to play significant roles (figure 5).

Figure 5. Agricultural output growth and its decomposition in India



Source: Author, based on United States Department of Agriculture (2017).

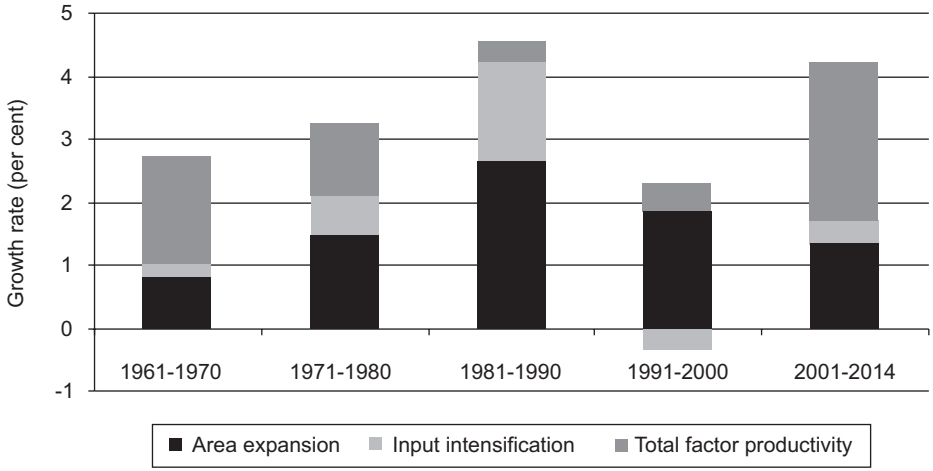
Policies implemented to support agricultural development in India include: input subsidies; incentives to encourage crop diversification with a target on encouraging farmers to move from grains and pulses to high-value food commodities, such as vegetables, fruits, spices and livestock (Gulati, 2009; Chand, Kumar and Kumar, 2011); establishing agricultural research institutes and agricultural universities to generate and disseminate new technologies; and food price stabilization schemes (Chand, Kumar and Kumar, 2011). Notwithstanding, agricultural development and improving farmers' incomes have been impeded by several factors, namely scarcity and fragmentation of land (India, Ministry of Agriculture, 2014); small farm size that is largely efficient but lacking economies of scale; weak market access; soil degradation (Indian Council for Agricultural Research, 2010); inefficiencies in water use; and vulnerability to climate change.

Indonesia

In Indonesia, agricultural output grew consistently over the past five decades (figure 6). The contribution of land expansion to output growth was a significant factor throughout the entire period covered by the study. Agricultural intensification contributed to growth through the 1990s, but, since then, it has not been a consistent

source of growth. Growth in TFP had been limited in earlier years, but became more significant in the 1990s, with its contribution rising to 60 per cent of agricultural output growth in the period 2001-2014. The gradual shift from food staples to higher-value perennial, horticultural and livestock commodities such as palm oil, and away from food staples in the main factor supporting this growth in TFP (Fuglie, 2012).

Figure 6. Agricultural output growth and its decomposition in Indonesia



Source: Author, based on United States Department of Agriculture (2017).

In Indonesia, efforts towards realizing food self-sufficiency and price stability stand out as government priorities. The rice sector has been regulated using food production and a marketing system, supplemented by export and import controls and high tariffs. The Government has been providing subsidies to agricultural inputs to incentivize the production of five specifically identified food commodities, namely rice, soybean, maize, sugar and beef. A fertilizer subsidy scheme, which accounts for nearly 10 per cent of the national development budget, was reintroduced in 2009, pushing the share of fertilizer subsidy to 30 per cent of the agriculture budget (Cervantes-Gody and Dewbre, 2010). The Government also promoted the adoption of high-yielding varieties in rice and other crops; invested in irrigation schemes; agricultural research and development and the dissemination of their findings; and provided credit at subsidized rates to stimulate agricultural output growth. In recent years a shift in policy focus to food diversification has taken place with a target to promote the consumption of food derived from secondary crops, such as cassava, banana and maize. In addition, the Government has pursued a policy to promote the

expansion of palm oil cultivation to reduce reliance on traditional crops such as rubber, coffee and cocoa. Indonesia also used border control measures (export bans, export tariffs and variable levies) to manage its agricultural markets for encouraging domestic value addition.

Thailand

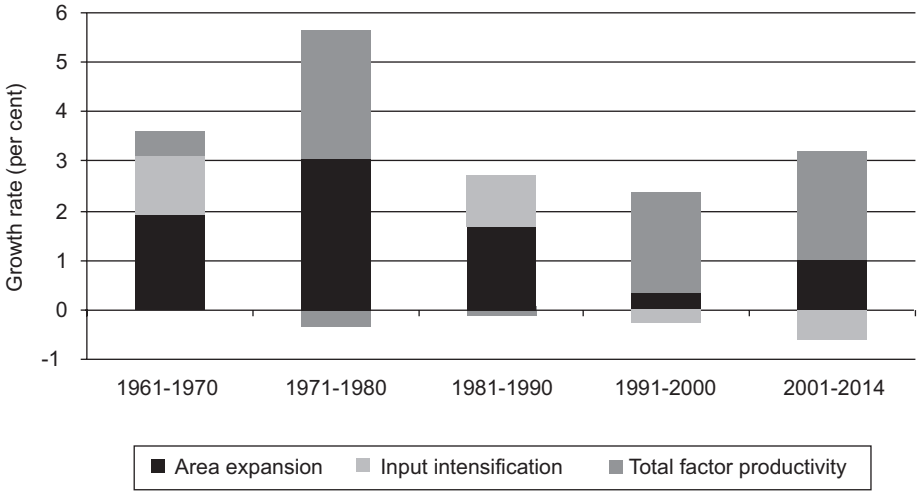
Agricultural output has been rising in Thailand for several decades. For almost three decades since the 1960s, area expansion was the dominant source of agricultural output growth while input intensification was not used consistently. Since about the beginning of the 1990s, agricultural output growth has been largely driven by factor productivity.

Agricultural development in Thailand has gone through three phases: (a) area expansion-led strategy in the 1960s and 1970s; (b) private investment-led strategy in the 1980s to contain an exodus of young workers from agriculture (Poapongsakorn, 2006); and (c) efficiency-driven growth with a decline in the use of external inputs. The first phase began when the Government established a land tenure system under which farmers were allowed to clear forests and gain secure property rights by paying taxes. Once farmers cleared land, the Government invested in roads and large irrigation systems, later complemented by spending on rural education, electrification and telecommunication (Poapongsakorn and others, 1995). The Government also strengthened the agricultural education system by investing in agricultural research, and established and expanded agricultural universities and research centres throughout the country, supplemented by extension services that promoted new high-yielding varieties. The Government of Thailand ensured continuity of funding agricultural research and development, and developed improved plant varieties in cereal, food crops and secondary and commercial crops, such as corn, sorghum, rubber and cotton (Poapongsakorn and others, 1995), but the measures were not sufficient enough to compensate for the generally weak private investment in research and development (Suphannachart and Warr, 2011).

The role of the Government in this process was largely limited to establishing an enabling environment, investing in infrastructure, such as roads, irrigation, telecommunication and energy and research, expanding agricultural credit, and investing in education. In addition, the Government focused on facilitating the adoption of improved seed varieties and provided incentives for farmers to invest in agriculture, initially by instructing commercial banks to provide farmer credits, and later by establishing agricultural banks. The novelty of the new system was the implementation of a modality of extending credit to farm households through cooperatives without collateral.

Over time, the Government of Thailand has shifted its focus on strengthening agricultural markets through the promotion of food certification schemes, opening up foreign markets for Thai products through trade agreements, strengthening value chains and supporting through international marketing. In recent years, taxes have been reduced.

Figure 7. Agricultural output growth and decomposition in Thailand



Source: Author, based on United States Department of Agriculture (2017).

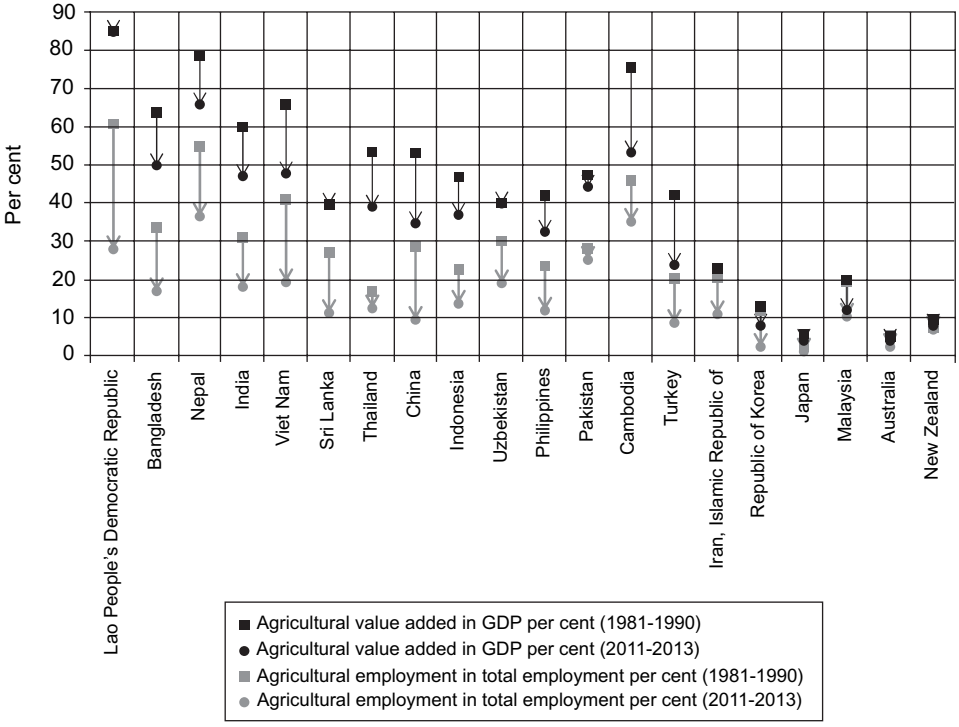
V. ECONOMIC TRANSFORMATION AND INCLUSIVE GROWTH

Following classical development theories, three variables can describe agricultural transformation: the share of agricultural value added in GDP (AVA), the share of agricultural employment in total employment (AET) and agricultural value added per worker (AVW). Figure 8 contains a summary of the movements of the first two variables for the periods 1981-1990 and 2011-2013. In all but four countries out of the 20 surveyed, the AVA share was already less than 40 per cent in the 1960s, but by 2013, it dropped to less than 20 per cent in 10 countries and to below 10 per cent in six countries. The AVA share was consistently high only in four countries – Cambodia, the Lao People's Democratic Republic, Nepal and Pakistan.

As per the classical development theory, growth in agricultural productivity releases some members of the labour force from the agricultural sector, and the growing manufacturing sector should be able to absorb them. This, while true for

industrialized and newly industrialized countries, did not happen as expected, shown in figure 8, in Asia and the Pacific. The process has been too slow for many countries.

Figure 8. Agricultural value added and agricultural employment

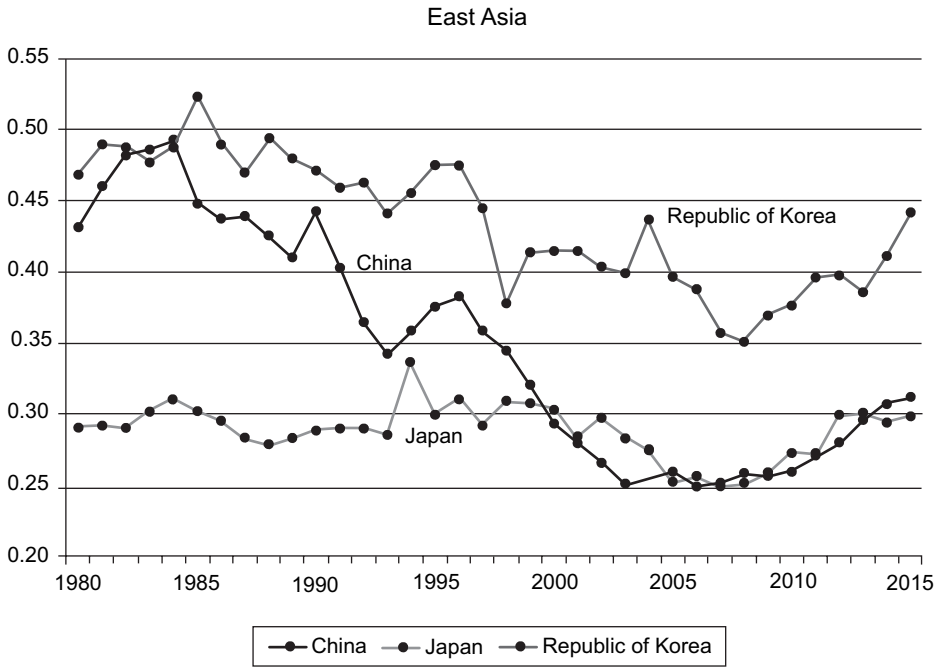


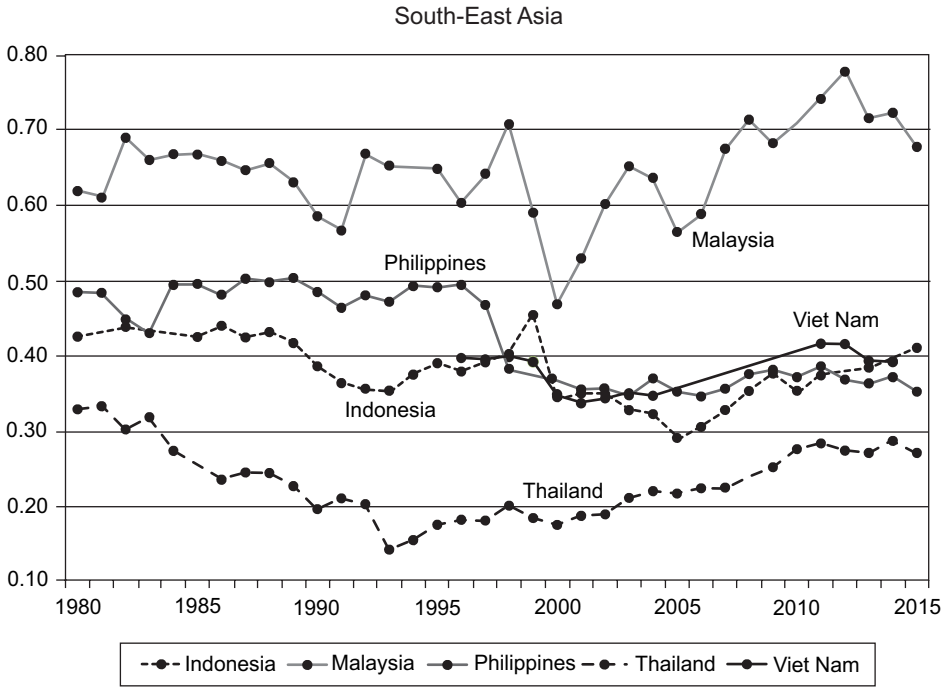
Source: Author, based on World Bank (2017).

In four high-income countries in the sample, namely Australia, Japan, New Zealand and the Republic of Korea, the AVA and the AET shares declined as the classical growth model would predict. Although not declining at the same rate, total labour force in China declined by 131 million between 1990 and 2013. In India, however, the total labour force increased by 62 million during the same period. In almost all other countries, the AVA share continued to decline without a parallel decline in the AET share, effectively trapping millions in the agriculture sector and resulting in a decline in the share of agricultural GDP potentially accrued to each agricultural worker, effectively increasing their relative poverty.

To see this clearly, the AVA share is divided by the AET share, which provides an approximation to whether agricultural workers become worse off over time. Figure 9 shows the results for selected countries. The ratio has been generally high for Australia, Malaysia and New Zealand, a reflection of generally favourable economic conditions for farmers. In China, the ratio has been declining for nearly 20 years from 1986 to 2006, but in recent years the ratio has been rising, indicating improvements in farmers' relative incomes. In South Asia, farmers continue to be marginalized compared to workers in the industrial and services sectors. In India, it was observed that relative farmers' incomes have been declining since the 1980s, while some signs of recovery can be observed in recent years.

Figure 9. Ratio of the share of agricultural value added in gross domestic product and the share of agricultural employment in total employment




South-East Asia
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
1980
1985
1990
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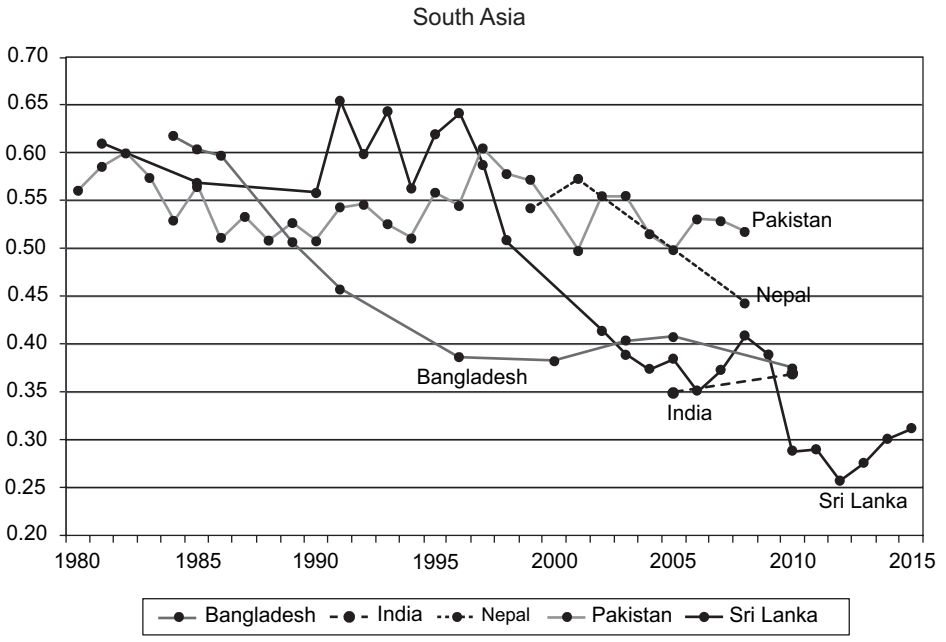
South Asia
0.70
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0.50
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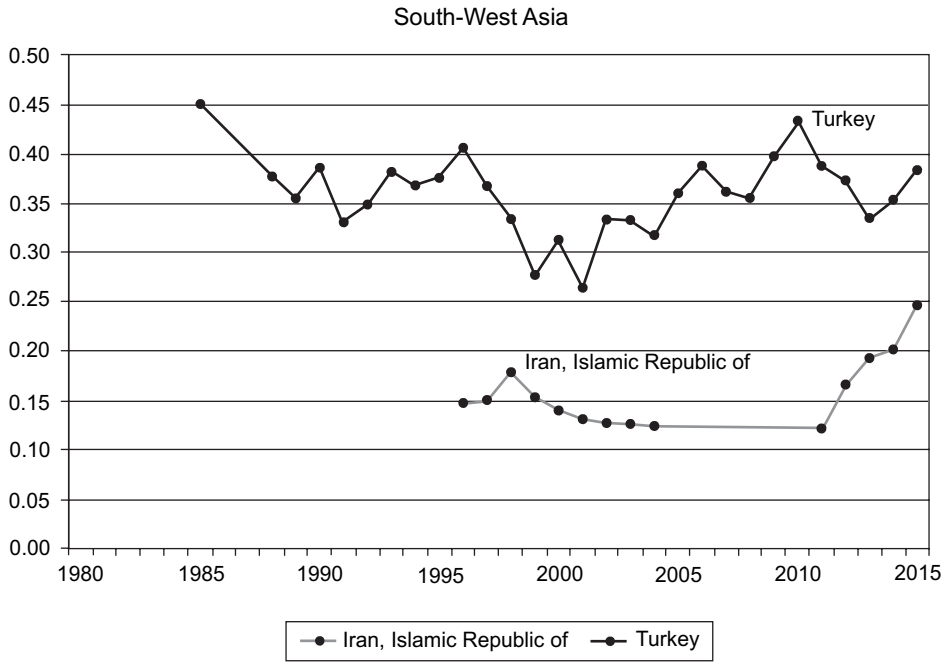
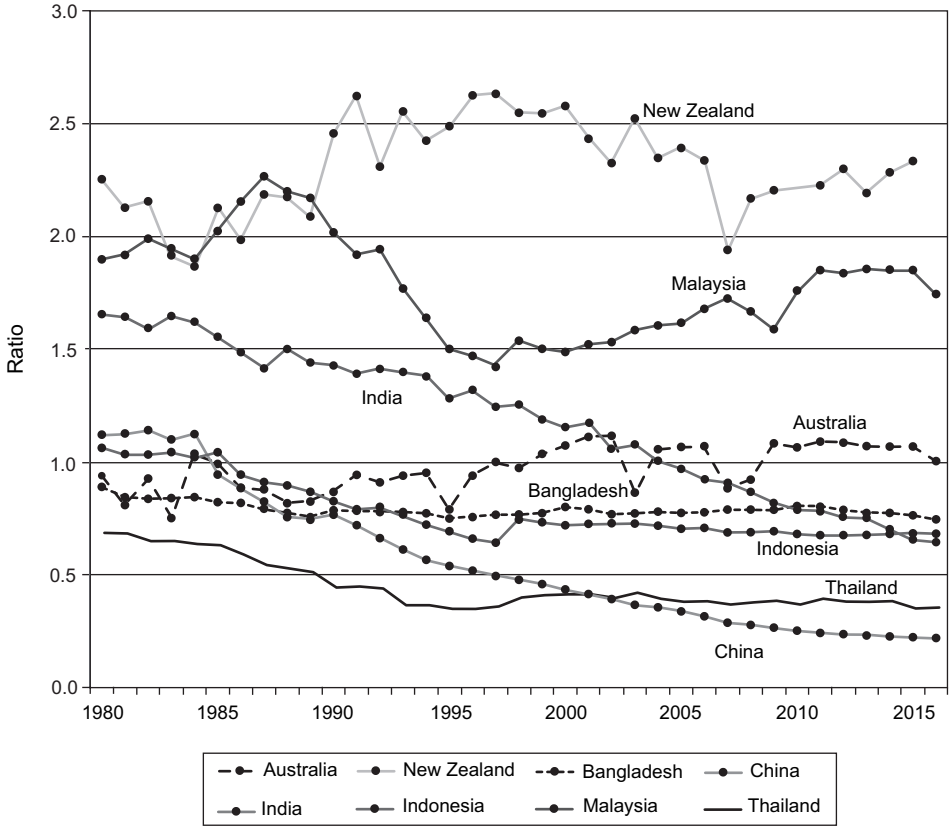


Source: Author, based on World Bank (2017).

Agricultural value added per worker (AVW) is the third important variable that explains changes to relative farmers' income over time. To put it in the perspective of national income, AVW is divided by per capita GDP (figure 10). The ratio that is closer to 1 indicates that agricultural workers could expect to receive just about the value of per capita GDP. In other words, agricultural workers are neither worse off nor better off than an average citizen. Figure 10 presents the results. In New Zealand and Malaysia, a farm worker could expect to have higher income than the per capita GDP in respective countries; and in Australia, the average income of an agricultural worker is equivalent to per capita GDP. In several other countries, including in China, India and Indonesia, farmers' relative incomes have been declining. Those results largely confirm previous findings that farmers' relative incomes have been deteriorating across many countries in Asia and the Pacific.

Figure 10. Ratio between agricultural value added per worker and per capita gross domestic product



Source: Author, based on World Bank (2017).

VI. CONCLUSIONS

Income poverty has declined steadily in Asia and the Pacific in recent years. However, poverty rates in rural areas continue to be high and widespread. Agriculture remains an important source of livelihood of a large proportion of people in the region, although by no means it is the only or the most important livelihood in rural areas. Classical economic development theories and recent empirical evidence suggest that agricultural productivity growth is a key condition for rural economic transformation and poverty alleviation. In the present paper, agricultural productivity developments were reviewed, the evolution of some key variables that would explain the nature of

structural transformation were analysed and policies implemented by selected countries to foster agricultural development were studied.

In summary, agricultural outputs across many of the countries surveyed have been rising, with agricultural productivity being a factor behind much of the agricultural expansion. However, the transformation process predicted by the classical development model in which the modern sector absorbs the labour leaving the agriculture sector has not occurred in much of Asia. Although economic growth associated with policy reforms launched in many countries in the 1980s, including in China and in India, have increased average farm incomes, the most vulnerable segments have not been able to benefit from those transformations. This confirms an earlier finding that economic growth processes in Asia have become progressively less successful in integrating low-productive agricultural labour into the rest of the economy. In some Asian countries, policy regimes have dampened the movement of labour out of agriculture deliberately and, in the process, halted economic transformation midstream. This has been done with the belief that a large movement of labour out of agriculture is politically untenable because of its potential impact on food production and unsustainable urbanization.

The experience of China in recent years is highly relevant for the discussion, where strong intersectoral linkages and higher productivity growth in the manufacturing sector enabled it to absorb a significant number of agricultural workers from agriculture into non-agriculture sectors. Whether other countries are able to emulate this experience depends on their capacity to foster stronger growth in non-agricultural sectors or movement towards agriculture-based processing industries, if such an effort can be sustained with the use of current agricultural produce. Given that the structural transformation is unlikely to happen spontaneously, efforts are needed to boost jobs outside of agriculture in parallel with agricultural productivity growth in order for agricultural productivity to have a meaningful impact on the alleviation of poverty.

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