

Working Paper Series

Macroeconomic Policy and Financing for Development Division

FOSTERING PRODUCTIVITY IN THE RURAL AND AGRICULTURAL SECTOR FOR INCLUSIVE GROWTH AND SUSTAINABLE DEVELOPMENT IN ASIA AND THE Pacific

WP/16/07

June 2016

Upali Wickramasinghe



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

Upali Wickramasinghe

Senior International Consultant, FAO-Regional
Office for Asia and the Pacific



For more information, contact:

Macroeconomic Policy and Financing for Development Division (MPFD)

Economic and Social Commission for Asia and the Pacific

United Nations Building, Rajadamnern Nok Avenue, Bangkok 10200, Thailand

Email: escap-mpdd@un.org

Series Editor

Dr. Aynul Hasan,

Director

Macroeconomic Policy and Financing for Development Division

Please cite this working paper as:

Wickramasinghe, Upali (2016). Fostering productivity in the rural and agricultural sector for inclusive growth and sustainable development in Asia and the Pacific. MPFD Working Paper WP/16/07. Bangkok: ESCAP. Available from www.unescap.org/publications.

Contents

I.	Introduction	1
II.	Trends and Patterns of Rural Areas and Agriculture	1
	A. Rural population	1
	B. Importance of agriculture in the national economy	2
III.	Increasing Productivity in the Rural and Agriculture Sector	10
	A. Productivity, rural industrialization and agricultural growth	10
	B. Agricultural Productivity: approach, estimates and observations	15
	C. Productivity growth and policy frameworks	17
	D. Country profiles of agricultural productivity and policies	18
IV.	Conclusions and Recommendations	26
	A. Conclusions	26
	B. Recommendations	29
	References	32

WP/16/07

MPFD Working Papers

Macroeconomic Policy and Financing for Development Division

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

by

Upali Wickramasinghe

June 2016

The views expressed in this Working Paper are those of the author(s) and should not necessarily be considered as reflecting the views or carrying the endorsement of the United Nations. Working Papers describe research in progress by the author(s) and are published to elicit comments and to further debate. This publication has been issued without formal editing.

* This paper was prepared as a background paper for the *Economic and Social Survey of Asia and the Pacific 2016*.

I. Introduction

The declining contribution of agricultural value-added in GDP (AVAgdp) has been a major concern among policy makers in recent years. In the Asia - Pacific (A-P) region, from the 1990s to 2012, AVAgdp has declined from 19.2 per cent in the 1990s to 9.8 per cent, while the share of agriculture in total employment (SAE) declined by about 30 per cent. At the same time, the contribution of services to value-added now exceeds 52 per cent in developing ESCAP economies as a whole, compared to 42 per cent in 1990 (ESCAP, 2015). Understanding the causes and consequences of this change from the lens of an inclusive development perspective is an urgent imperative, particularly within the new Sustainable Development Goals (SDG) framework, which among other things expects to end hunger, achieve food security and improved nutrition and promote sustainable development by 2030.

The world is shifting towards a phase of implementing the SDGs adopted by the United Nations in September 2015. Major international and national level efforts are underway to identify appropriate policies to realize the SDGs. The 17 goals in the SDG framework, as the UN resolution itself recognized, “are integrated and indivisible.” Given that targets are defined as “inspirational and global, with each Government setting its own national targets guided by the global level of ambition but taking into account its own national circumstances.” (para. 55), Governments need to undertake their own review of circumstances and identify best approaches to realizing the SDGs.

This paper is motivated by the need to identify potential links between productivity in the rural and agriculture sector in The A-P with a view to proposing policies and strategies on how strengthening productivity in the rural and agriculture sector will contribute to the realization of SDGs. In order to identify broad regional trends, the paper analyses the circumstances of 23 countries of the ESCAP region¹, but policy discussions are limited to a selected few from among the 23 countries.

II. Trends and Patterns of Rural Areas and Agriculture

This section describes the main trends of the rural and agricultural sector that underpin agricultural productivity, emphasizing their importance in developing the rural and agriculture sector. It also describes main issues that are constraining the agricultural and rural sector.

A. Rural population

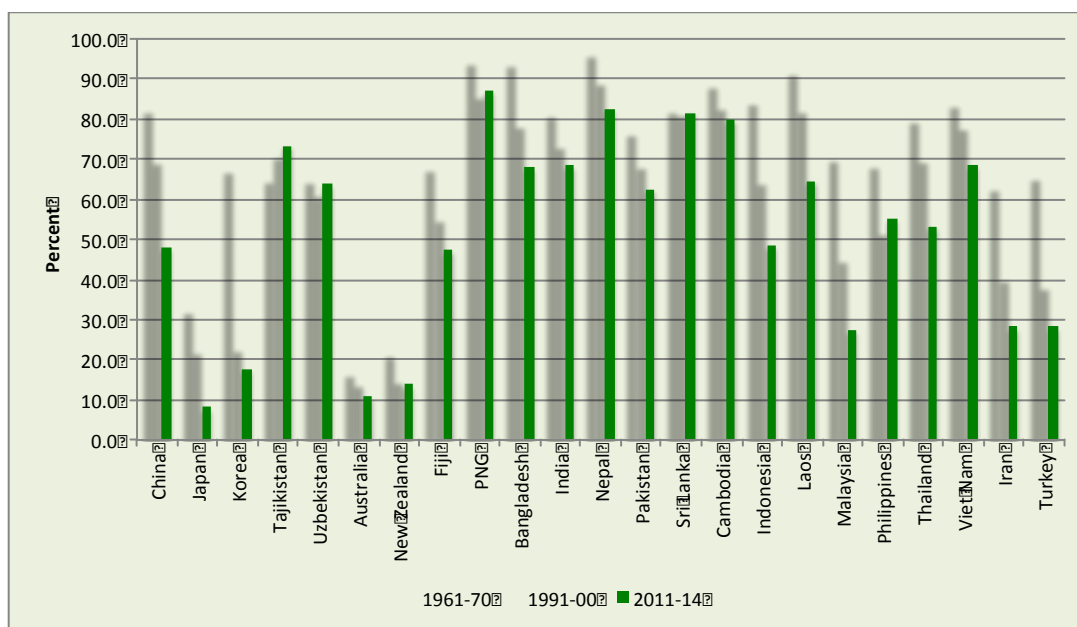
In 2014, 53 per cent of people in the region lived in rural areas. This is equivalent to a staggering 2.1 billion people, which accounts for 29 per cent of the global population and 63 per cent of all people living in rural areas in the world. In other words, two-thirds of people considered “rural” in the world live in The A-P. This is after an unprecedented decline in the

¹ Countries selected for the analysis within each sub-region are: East and North-east Asia (China, Japan, and Republic of Korea); North and Central Asia (Tajikistan and Uzbekistan); Pacific – developed (Australia and New Zealand); Pacific – developing (Fiji and Papua New Guinea); South Asia (Bangladesh, India, Nepal, Pakistan and Sri Lanka); and South-west Asia (Iran and Turkey). All 23 countries could not be used throughout the paper because of data limitations. Averages and percentages referred to in this paper are averages or percentage values for those countries only, unless otherwise stated. Sample countries cover a significant proportion of the total ESCAP population, geographic area and national income, and hence, the results may be applicable for the whole region, but caution should be exercise in interpreting the results.

share of rural population in this region. In the 1960s, over 60 per cent of people lived in rural areas, and a much greater proportion depended on agriculture and was relatively poor.

In the sample countries, the share of rural population as a percentage of the total population has declined from 78 per cent in 1961 to 53 per cent in 2014 (**Figure 1**). The progress has been quite uneven across sub-regions and countries. The rural-urban transformation in East and North-east Asia, South-east Asia and South-west Asia has been quite impressive, whereas in the Pacific developing countries and South-Asia, the progress has been quite slow. In the 1960s, over 60 per cent of the populations lived in rural areas in 20 out of the 23 countries analysed. By 2011-14, only 11 countries had populations of over 60 per cent living in rural areas.

Figure 1. Share of people living in rural areas in selected economies in Asia and the Pacific



Source: Author based on WDI (2015).

B. Importance of agriculture in the national economy

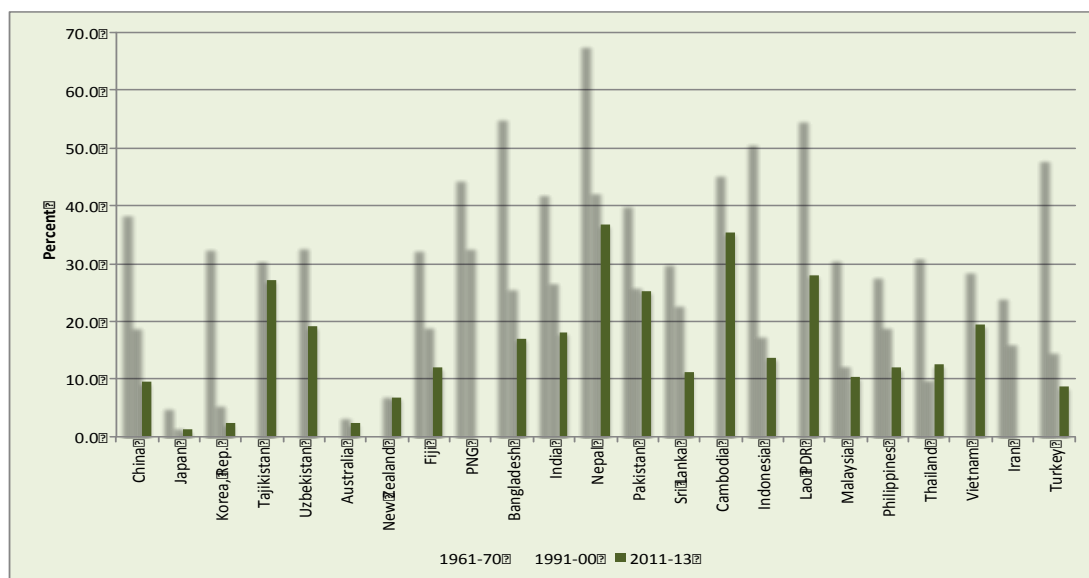
1. Agriculture in national incomes

Figure 2 shows the average agricultural contribution to national economies measured by AVAgdp for the 23 countries analysed for three time periods. Except for six countries, agriculture's contribution to GDP was less than 40 per cent even in the 1960s, but by the period 2011-13 it was less than 20 per cent in 14 countries, and less than 10 per cent in seven countries. Major differences between sub-regions in terms of the contribution of agriculture has almost disappeared, and only in five countries out of the 23 analysed had AVAgdp over 20 per cent, namely Tajikistan, Nepal, Pakistan, Cambodia and Lao PDR.

Shares of agriculture in total employment (SAE) have declined, albeit at a much slower rate than that of the decline in AVA in GDP across all the countries analysed (except Malaysia)

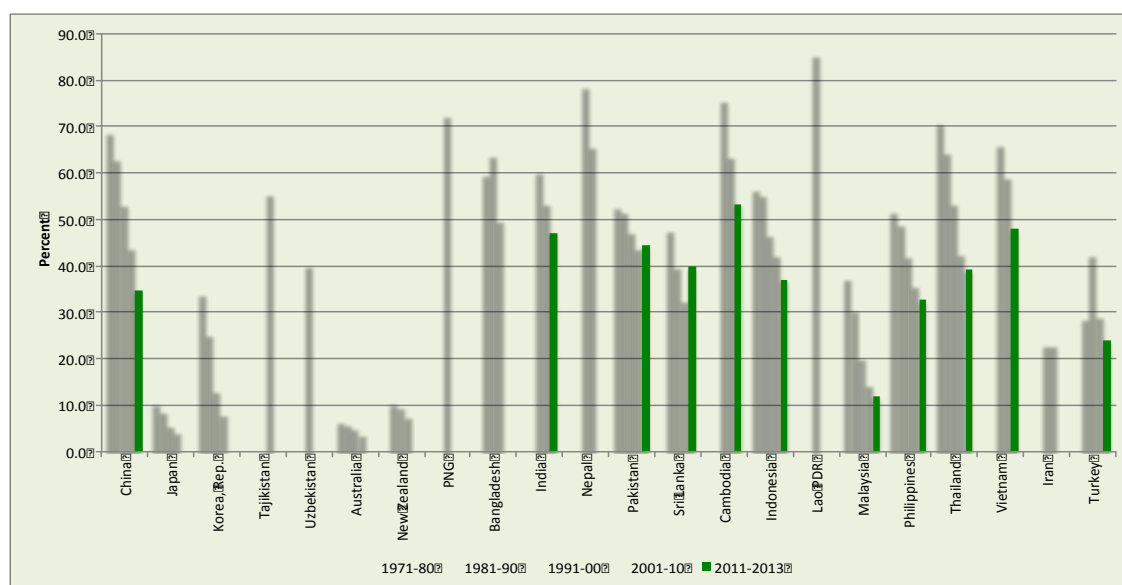
and the Pacific developing countries (**Figure 3**).² China's reduction of the share of agriculture in employment is 34 percentage points from the levels of the 1970s. The shares of agricultural employment further declined in West Asian countries from their historically low levels. In the 1970s.

Figure 2. Agricultural value added in GDP of selected economies in Asia and the Pacific



Source: Author based on WDI (2015).

Figure 3. Share of agriculture in total employment (per cent)

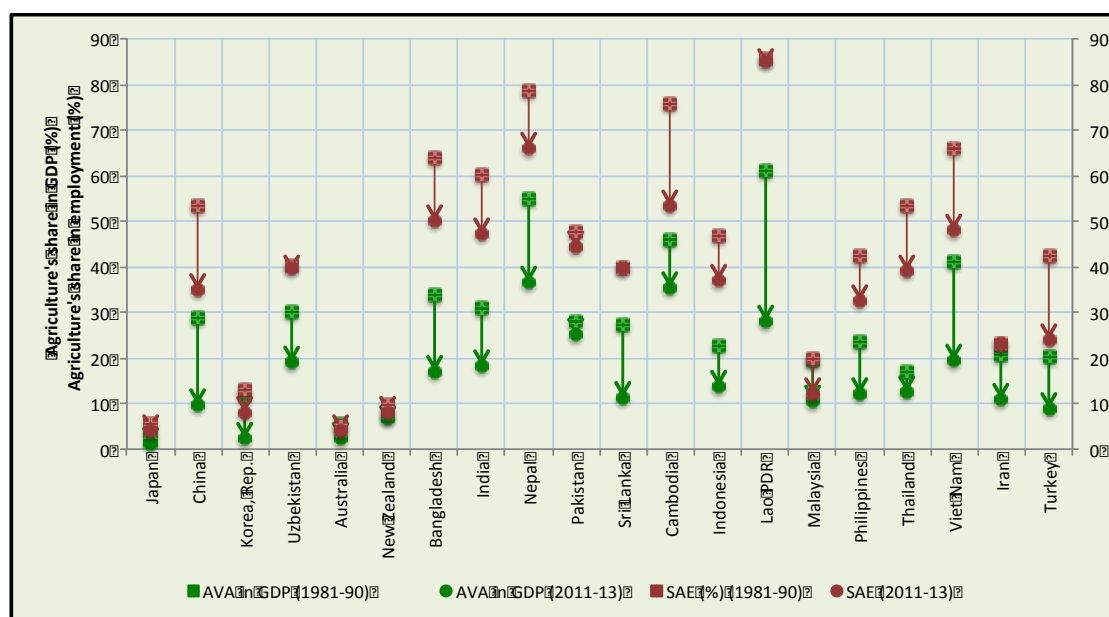


Source: Author, based on WDI (2015).

² Figures are not available for Fiji, and employment figure is available only for one year for PNG. Anecdotal evidence suggests both the countries still have fairly high agricultural employment shares.

A comparison of Figure 2 and Figure 3 shows that agriculture's share in GDP has declined much faster than the corresponding decline of agriculture in total employment. To compare the relative decline of the two variables over time and across countries, AVAgdp and SAE for 1981-90 and 2011-13 were marked with arrows pointing in the direction and magnitude of change Figure 4.³ Large gaps between the two would be an indication of a relatively faster growth of the industrial and services sectors faster than that of the agriculture sector combined with an extremely slow movement of labour out of agriculture. An examination of labour force changes in agriculture over time provides a rough guide to the overall economic progress of a country. This paper compared the overall labour force in agriculture in 2013 compared to the level in 1990. Data show that from 1990 to 2013 agricultural labour force has decreased in six countries (China, Japan, Rep. of Korea, Malaysia, Thailand and Turkey) by 143 million and increased in all the other 16 countries in the A-P region considered for the analysis by 103 million. Between the two years, agricultural labour force reduced in China by 131 million in absolute terms and in India it increased by 62 million. Therefore, it can be concluded that agriculture remains the largest employment and continues to absorb more labour despite its relative decline both in terms of agricultural value added and in total employment.

Figure 4. Share of agriculture in GDP and in employment



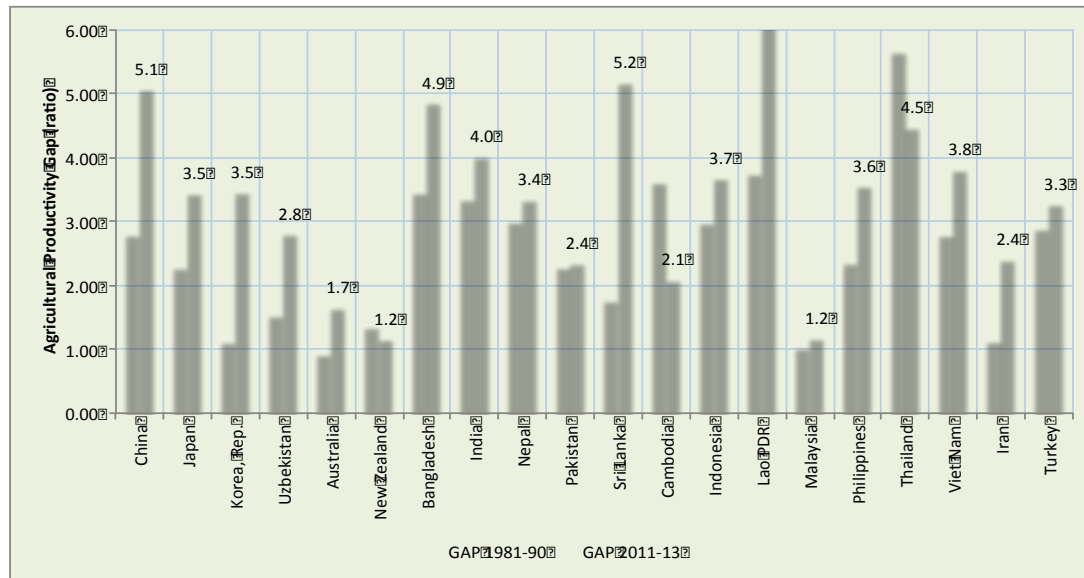
Source: Author based on WDI (2015).

To see this in a better light, the measure known as the Agricultural Productivity Gap (APG) (Gollin and others, 2013), defined as the ratio between the share of value added and

³ The figure could be constructed using any two years, but decadal averages were used to minimize a potential bias that may arise due to the selection of an inappropriate year for a particular year. Even this may have introduced some biases. For example, Uzbekistan has limited number of observations for the earlier years, and Tajikistan was dropped because of the unavailability of data on earlier years. Arrow indicates the direction and size of the change.

employment in non-agriculture and agriculture,⁴ is calculated and shown in Figure 5. The ratio is close to one only in Australia, New Zealand and Malaysia, and that labour misallocation appears to be particularly large in Lao PDR, Sri Lanka, China, Bangladesh and India. This further confirms an observation made by Timmer (2007) that a large number of countries in Asia and the Pacific have been unsuccessful in integrating ‘surplus labour’ into the rest of the economy. In this sense, this can be considered a systemic issue that needs to be urgently addressed.

Figure 5. Agricultural productivity gap



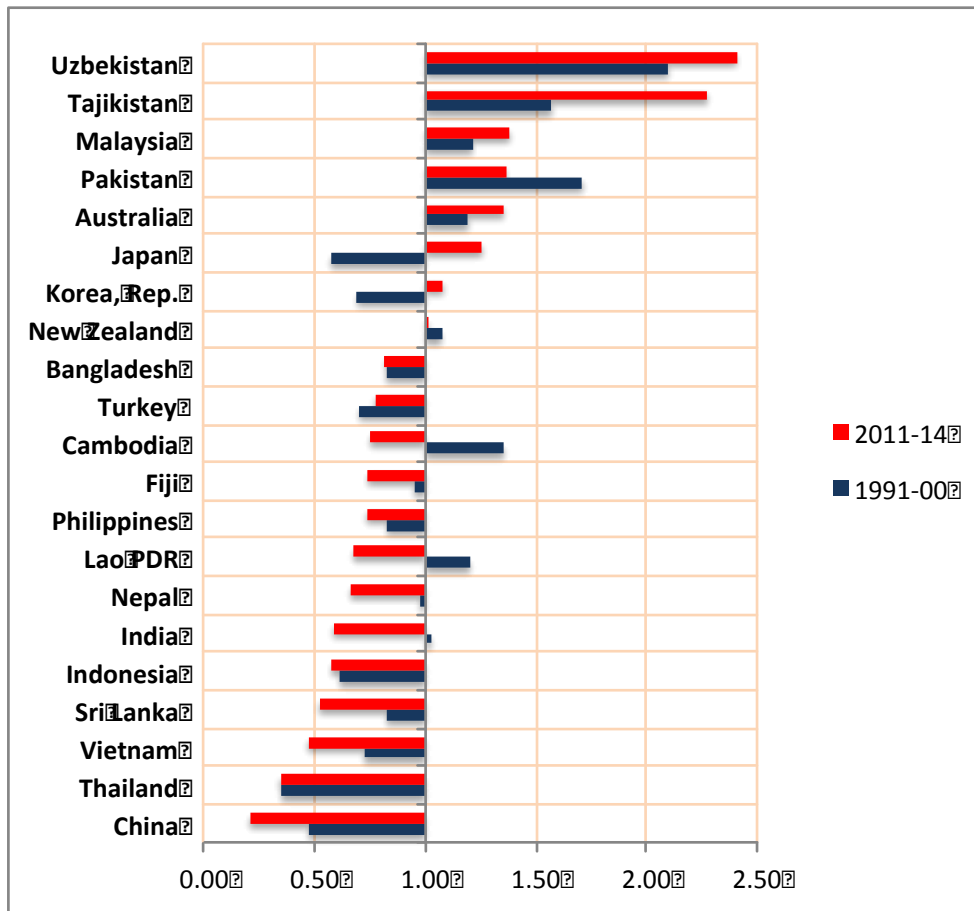
Source: Author, based on WDI (2015).

The relative position of agricultural incomes, measured by agricultural value added per worker (AVApw), in comparison to GDP per capita also shows that agricultural value added per worker is below that of GDP per capita across a large number of countries, and that ratio has declined significantly in a large number of countries over the years. Figure 6 shows the ratio between the real values of agricultural value added per worker and per capita GDP for 19901-2000 and 2011-2014. The value must be equivalent to one when values for AVApw are equal to per capita GDP and values below one indicate situations where AVApw is lower than per capita GDP. It can be observed that values for agricultural value added per worker are below that of per capita GDP. Out of the 23 countries surveyed, China has the highest ratio between the two followed by Thailand, Viet Nam, Sri Lanka and Indonesia. In a number of countries including in China the gap has widened making agricultural workers relatively poorer. For example, in case of China, agricultural value added per worker in 1991-2000 was US\$ 382 when per capita GDP was US \$ 813 (ratio of 0.47), but in 2011-2014 the values respectively were US \$ 721 and US \$ 3,503 (ratio of 0.21).⁵

⁴ Agricultural productivity gap is defined as $\frac{(1-y_a)/(1-l_a)}{y_a/l_a}$, where y_a is the share of agriculture in GDP and l_a is the share of agriculture in total employment. The ratio must be equal to one under the assumption of competitive labour market, which implies workers are paid the value of their marginal product, and that firms hire up to the point where the marginal value product of labour equals the wage. This measure has some serious biases coming from various sources and data noise. For a comprehensive review, see Gollin et al. (2013).

⁵ When vertical axis crosses at 1, values below one is represented as one minus the actual value.

Figure 6. Ratio between agricultural value added per worker and per capita GDP



Source: Author, based on WDI (2015).

2. Agriculture in exports, imports and manufacturing

Agriculture contributes to national economies through exports, and the impact of exports is generally higher in low-income countries. To examine agriculture's role in national economies, this study considered five variables: agricultural raw material exports and imports in merchandise trade; food exports and imports in merchandise trade; and food, beverages and tobacco in value added in manufacturing.

The A-P region is no longer as dependent on agricultural raw materials exports as it was in the 1960s. Indonesia and Malaysia perhaps illustrate the case well. In the two countries, respectively, raw materials constituted 33 per cent and 52 per cent of exports in the 1960s, but the share declined to 6.4 per cent and 2.6 per cent in 2011-13 (**Table 1**). Agricultural raw materials imports have never been a large part of the region except in Japan and Korea in the 1960s. In 2011-13, food exports constitute over 10 per cent of merchandise exports in 14, and food imports in 9, out of 21 countries analysed. However, agriculture's contribution to value added in manufacturing is relatively high across all countries analysed. What this means is that although agriculture is generally viewed as having little impact on industrialization and the larger economy, it provides the basis for many other activities including manufacturing.

In summary, the A-P region has moved away from an era where agricultural raw material exports dominated national exports to one where agriculture contributes to a declining but significant and stable share of food exports, imports and in manufacturing. Improvements in agricultural productivity can boost the share of food and agriculture in manufacturing and exports, provided countries provide the other enabling environment as is discussed later.

Table 1. Agriculture in international trade and in manufacturing

Region	Country	Agricultural raw materials exports (% of merchandise exports)		Agricultural raw materials imports (% of merchandise imports)		Food exports (% of merchandise exports)		Food imports (% of merchandise imports)		Food, beverages and tobacco value added in manufacturing	
		1991-00	2011-2013	1991-00	2011-2013	1991-00	2011-2013	1991-00	2011-2013	1991-00	2011-10
East & North-East Asia	Japan	0.52	0.81	5.0	1.5	0.53	0.60	15.9	8.9	10.5	11.9
	China	1.72	0.48	4.7	3.9	8.61	2.77	4.9	5.2	14.6	12.7
	Korea, Rep.	1.17	1.10	5.1	1.6	2.36	1.13	5.8	4.9	9.2	6.9
North & Central Asia	Tajikistan	12.59		0.7		4.37		10.2			
Pacific Developed	Australia	8.06	2.90	1.6	0.6	23.13	12.47	5.0	5.4	20.2	20.0
	New Zealand	16.36	11.44	1.0	0.6	46.60	57.11	7.8	10.6	30.7	27.2
Pacific Developing	Fiji	2.43	5.26	0.4	0.3	56.00	64.82	16.2	19.3	49.1	48.5
	Papua New Guinea	9.87	5.58	0.7	0.4	20.32	27.98	18.6	11.3		
South Asia	Bangladesh	2.88	1.75	4.7	7.3	10.31	3.86	16.8	19.5	25.8	14.8
	India	1.69	1.95	3.6	1.8	16.47	10.24	5.1	3.9	12.2	10.1
	Nepal	0.82	3.18	5.4	1.9	11.56	21.05	11.8	17.3	31.2	39.1
	Pakistan	4.64	2.19	4.3	4.4	10.85	18.85	16.1	11.1	22.4	21.6
	Sri Lanka	3.26	3.33	1.8	1.4	22.84	26.24	15.4	12.3	39.3	32.5
South-east Asia	Cambodia	2.89	2.95	3.4	1.0	0.96	3.24	9.7	6.7	26.6	
	Indonesia	4.79	6.42	5.9	2.8	11.13	17.30	9.1	8.8	21.0	23.5
	Malaysia	6.17	2.57	1.3	2.4	9.09	12.52	5.6	8.4	9.6	9.6
	Philippines	1.09	1.00	2.0	0.7	11.38	10.07	8.1	10.4	31.5	24.8
	Thailand	4.20	5.59	3.8	1.8	20.34	13.64	4.8	5.3	18.2	16.4
	Vietnam	2.13	2.90	2.7	3.5	28.67	16.70	5.29	8.41	30.2	22.4
South-west Asia	Iran, Islamic Rep.	0.72	0.20	2.6	2.4	4.29	3.67	19.2	14.1	13.4	9.2
	Turkey	1.58	0.48	4.5	2.6	19.75	10.87	5.5	4.6	16.1	14.4

Source: WDI (2015).

3. Agricultural Production

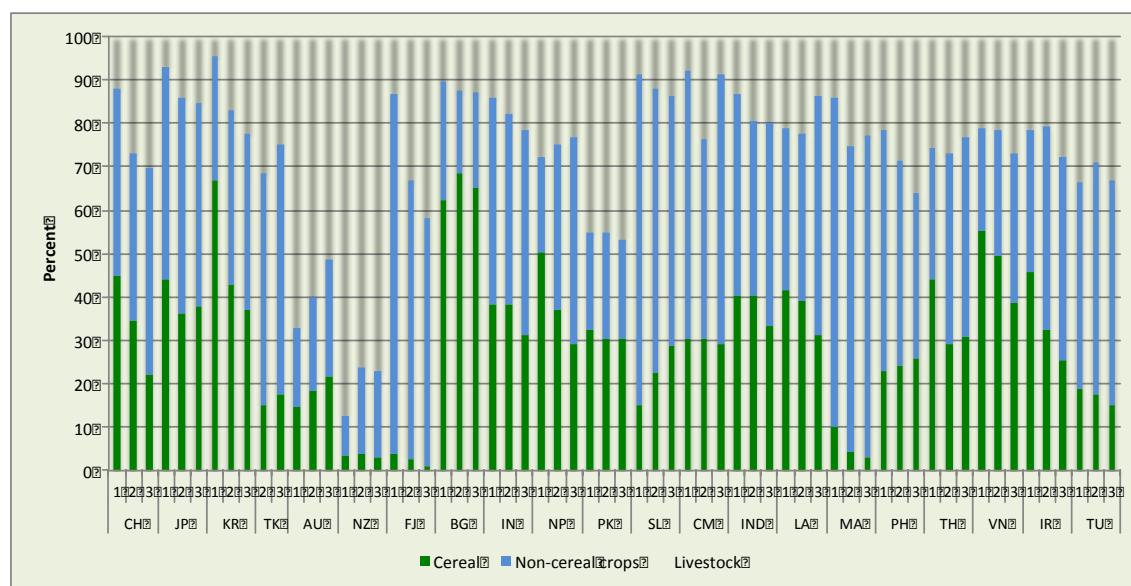
In aggregate terms in a sample of countries, agricultural production increased from US\$ 276 billion to US\$ 1,185 billion, in constant 2004-2006 values, over the period between 1961-2013. The region is producing four times more food than it did at the beginning of the 1960s. The structure of agricultural production has changed as well. In the 1960s, cereals, non-cereal crops and livestock contributed 41 per cent, 43 per cent and 16 per cent, respectively. By 2011-13, they respectively contributed 26 per cent, 46 per cent and 28 per cent. So, in five decades, the relative share of cereal in total production declined by 15 percentage points; non-cereals crops and livestock sectors gained three and 12 percentage points. The share of livestock in total production increased from 17 per cent in 1961 to 38 per cent in 2013. In other words, the share of livestock in total production is rising faster, but the share of non-cereal crops remains high across the region.

Figure 7 shows the changing structure of agriculture in selected countries of The A-P⁶. Numbers 1 to 3 refer to periods 1961-70, 1991-00 and 2011-13, and for each period, the

⁶ Numbers 1 to 3 respectively refer to 1961-70, 1991-00 and 2011-13, and country names are shortened to avoid clutter.

value given is the average for that period, and country names are shortened to avoid visual clutter. The figure identifies the general structure of agriculture in sub-regions and countries, and their changes over time. For example, it is quite visible from the figure that Australia and New Zealand are highly dependent on livestock, whereas in other countries the general crops sector including cereals dominates agriculture. The structure of agriculture has changed in two opposite directions with respect to the two sets of countries. The agricultural structure in Australia and New Zealand has shifted towards producing more crops and reducing the dependency on livestock; in other countries the livestock share has increased in overall terms. Although this change may seem trivial, it can have far-reaching implications on the demand for resources throughout the food value chain, dietary patterns, health, and the environmental footprint of agriculture.

Figure 7. Structure of agriculture in Asia and the Pacific



Source: FAOSTAT (2015).

4. Changing Use of Agricultural Inputs

The A-P region has a variety of agricultural production systems, ranging from highly specialized rice farming systems to rain-fed agriculture and commercial crops, and they all tend to have their own unique characteristics that determine the quantity and quality of input use. Data on four key agricultural inputs over two time periods are shown in Table 2. Several key features are observed.

The distribution of resources across countries has the potential to alter growth dynamics within and across countries, through spillovers of economic growth or slowdowns, environmental externalities, international trade and possibilities for knowledge and technology transfer on the one hand, and internally through a country's capacity to generate its own demand within the country. Indeed, growth performances and dynamics have been very different across countries. Over the two periods 1991-00 and 2003-12, China and India each added close to 20 million hectares of land to agriculture and doubled the use of agricultural machinery but differed significantly in agricultural labour utilization. The key difference lies in the agricultural labour force change. In China, the average agricultural

labour force decreased from 364 million in 1991-2000 to 306 million in 2003-2012, registering a decline of 58 million agricultural workers. In India, agricultural labour force during the same period increased from 225 million to 259 million, effectively adding 33 million more to the agricultural sector. This change needs to be viewed in relation to population dynamics of the two countries. In China, population increased from 1.15 billion in 1990 to 1.36 billion in 2013, and increase of 208 million people; and in India, during the same period, population increased from 0.87 billion in to 1.3 billion, an increase of over 400 million. Similarly, agricultural labour force has declined in Japan, Republic of Korea, Malaysia, Thailand, Turkey and Uzbekistan. Agricultural labour force has increased by about 24 million in all the other countries that were analysed

South Asian countries added more land, labour, machinery and livestock⁷ to agriculture. Bangladesh has expanded the use of machinery, perhaps to counter their limited capacity to expand agricultural land. In Nepal, the agricultural labour force increased significantly without a parallel increase of complementary inputs (land and machinery). In Turkey, agriculture is becoming more mechanized along with a reduction of labour and land.

In South East Asia, both Malaysia and Thailand shed workers from agriculture, but compensated for it by deepening mechanization. Indonesia on the other hand added land and labour above and beyond the amount of new agricultural machinery. Cambodia and Viet Nam have sharply increased the use of agricultural machinery, with subdued growth in both land and labour. In Tajikistan and Uzbekistan, reforms that began after the independence from the Soviet Union is continuing with adjustments to use agricultural inputs agriculture is still undergoing a transformation that began after independence, which resulted in internal reforms that led to sharp declines in the use of agricultural inputs.

In the Pacific, Australia reduced its land under agriculture by 1.1 million hectares in the two periods, and kept other resources intact. In Fiji and PNG, agricultural sectors were yet to pick up from their underperformance.

⁷ The only exception is Sri Lanka that experienced a decline in livestock capital.

Table 2. Key agricultural inputs

Region	Country	Agricultural land (1000 ha of irrigated cropland equivalents)		Agricultural labour (1000 persons economically active in agriculture)		Agricultural machinery (Number of 40 CV Tractor-Equivalents)		Livestock (Head of cattle equivalents)	
		1991-2000	2003-2012	1991-2000	2003-2012	1991-2000	2003-2012	1991-2000	2003-2012
East & North-East Asia	Japan	118,184	117,532	115,549	117,713	1,093,610	1,404,314	1,701	1,358
	China	74,462	94,768	64,283	06,259	659,300	816,422	10,078	86,895
	Korea, Rep.	13,040	12,728	12,776	11,491	11,151	39,408	15,673	16,899
North & Central Asia	Tajikistan	1,098	1,110	1,033	1,437	1,217	9,305	1,860	1,526
	Uzbekistan	1,829	1,602	1,465	1,063	1,76,171	69,100	1,603	1,844
Pacific developed	Australia	6,158	4,983	51	53	48,380	46,607	4,543	1,253
	New Zealand	1,095	1,155	1,174	1,185	7,790	7,885	5,940	5,752
Pacific developing	Fiji	1,274	1,170	1,21	1,25	1,693	1,795	1,491	1,500
	Papua New Guinea	1,85	1,30	1,571	1,003	1,384	1,391	1,476	1,618
South Asia	Bangladesh	6,139	8,707	1,938	2,890	5,858	38,488	10,534	4,507
	India	78,671	100,825	25,260	58,860	1,644,934	1,586,037	51,004	71,720
	Nepal	1,640	1,963	1,320	1,192	1,688	1,230	2,206	4,602
	Pakistan	6,660	1,107	6,757	3,052	106,068	94,795	1,803	8,260
	Sri Lanka	1,035	1,238	1,528	1,935	2,878	2,178	1,586	1,907
South-east Asia	Cambodia	1,408	1,780	1,445	1,799	1,063	4,996	1,387	1,101
	Indonesia	1,802	3,029	4,480	9,136	8,479	10,460	1,045	7,240
	Lao PDR	1,316	1,041	1,722	1,277	1,017	1,170	1,099	1,802
	Malaysia	1,458	1,786	1,879	1,637	9,264	9,709	1,292	1,647
	Philippines	2,808	3,374	1,891	3,246	53,555	81,622	10,334	12,660
	Thailand	9,919	12,116	10,036	9,126	14,226	1,073,696	4,724	3,224
	Vietnam	3,434	8,608	5,505	9,257	1,71,702	1,85,034	3,557	9,477
South-west Asia	Iran, Islamic Rep.	2,488	3,463	3,379	4,453	61,102	19,110	3,475	9,703
	Turkey	9,397	17,761	11,775	18,305	25,726	1,043,247	2,590	9,900

Source: USDA (2015).

III. Increasing Productivity in the Rural and Agriculture Sector

This section reviews the economic literature on the relationship between productivity, rural industrialization and the growth of the agriculture sector, with a specific focus on the proposed policies in selected economies that target raising productivity in the agriculture sector. It provides an analysis of agricultural productivity.

A. Productivity, rural industrialization and agricultural growth

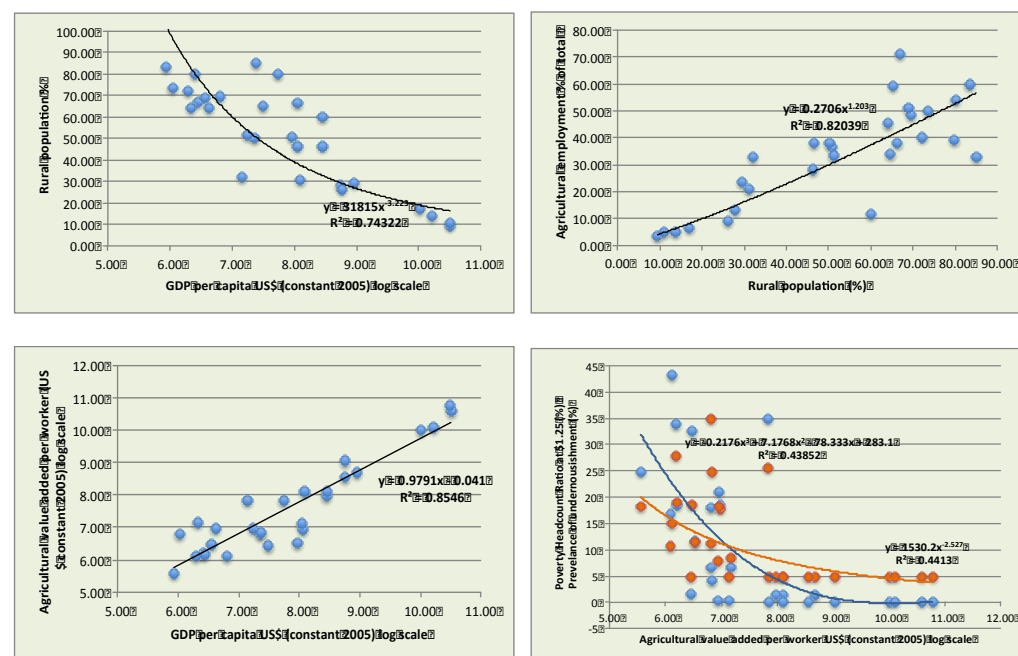
The need to spur agricultural productivity in order to increase rural development and poverty alleviation was the key message of the seminal contribution of Johnston and Mellor (1961). This, and the idea of the agriculture sector having a surplus labour were largely misinterpreted in later years to push for import-substitution industrialization, and taxed agriculture to finance industrialization while subsidizing the manufacturing sector (Schiff and Valdés, 2002; Kruger, 1996). It was not realized at the time that faster growth in the agricultural sector facilitates an even higher rate of growth in the non-agricultural sector because of strong sectoral interconnections.

Recent economic growth experiences in the world, particularly in Asia, have shown that poverty alleviation requires a more strategic approach in which active development of the agricultural sector and the rural economy are essential for stimulating economic growth, realizing equity and economic and political stability; the “development trilogy” to borrow Timmer’s (2015) words. Agricultural and rural development is at the centre of the strategy and connected to all three dimensions – stability, equity and economic growth. The underlying argument is that agricultural households derive a significant proportion of their

income from agriculture than from other sources, and therefore growth in that sector enhances incomes of rural, agricultural households. In addition, agricultural productivity growth reduces food insecurity, through enhancing the food accessibility of poor households because household incomes are likely to be positively correlated with AVA per worker.

Cross-country data on GDP per capita, share of agricultural employment in total employment, AVA per worker, share of rural population, Poverty Headcount Ratio (PHR) and Prevalence of Undernourishment (PoU) from the A-P countries confirm this relationship. Figure 8 shows several possible links among the five variables. It is possible to see that agriculture and rural sectors share many common elements, and largely confirm the general perception that being rural is synonymous with having a small amount of cash income, being poor and food insecure. AVA per worker seems to be the key variable that runs through all the graphs. The figure in the upper left corner shows that the share of rural population is negatively correlated with GDP per capita and that a rise in GDP per capita implies a reduction in the share of rural population by a significant margin, especially at lower levels of income. The figure in the upper right corner shows that people living in rural areas are highly likely to be working in the agricultural sector. The figure in the lower left corner shows that GDP per capita is positively correlated with AVA per worker, meaning that people in low-income countries also earn relatively little from agriculture. The figure in the lower right corner shows that agricultural value added per worker is strongly negatively correlated with the indicators of poverty and food insecurity. It also shows that a rise in AVA per worker will induce a greater reduction in poverty and food insecurity, at lower levels of income than at higher levels.

Figure 8. Agricultural productivity, ruralness, poverty and food insecurity



Source: Author based on WDI (2015).

Empirical studies have shown that agricultural income growth is more effective at reducing poverty than growth in other sectors and that the welfare effects of non-agricultural growth

are smaller among the poorer households (Ligon and Sadoulet, 2011; FAO, 2012). Agricultural growth reduces poverty many times more than an identical growth in the non-agricultural sector (excluding sub-Saharan Africa) (FAO, 2012). The same result has been found in India during the Green Revolution (Binswanger-Mkhize, 2013); in Indonesia (Cervantes-Godoy and Dewbre, 2010) and in China (Liu and Yang, 2015).

China's recent growth is characterized by its strong inter-sectoral linkages, which also enabled China to shift a significant number of agricultural workers from agriculture to non-agriculture sector. Lie and Yang (2014) observed that between 1978 and 2004 labour productivity of India in relation to China, measured by output per worker, had fallen from 147 per cent to 58 per cent. Using a three-sector model, they show that higher productivity growth in China's manufacturing and agriculture explains most of the aggregate productivity gap.

These and similar findings elsewhere point to the need for countries to increase jobs outside of agriculture in parallel with agricultural productivity growth in order for agricultural productivity to have a meaningful impact on poverty (Timmer, 2015). Similarly, Warr (2006) shows that in Indonesia and Thailand, virtually all factor productivity growth at the sectoral level derives from agriculture, but the reallocation of resources away from agriculture was a much larger source of aggregate national productivity. In the period leading to the financial crisis of 1998, agricultural GDP per worker grew faster than per worker gains in other sectors, and it was in that same period that Indonesia made the most rapid progress in reducing poverty (OECD, 2010).

This is not unique to The A-P. The voluminous literature across the world over many decades points out that economic development is associated with a fairly uniform pattern of structural transformation in which the share of agriculture declines in total output and labour force and agricultural output per worker increases are accompanied by the rising share of manufacturing and services in output.⁸

Economic transformation does not end there. It forces the replacement of old production processes and institutions with new economic structures and institutions; capital and labour to shift from less to more productive sectors; old agricultural production structures including the way farms are organized to be replaced by new and more resilient structures and institutions (Brooks, 2012), supported by growing income and productivity changes that induce rural people to use their resources more efficiently. The issue is not whether or not farms or firms are large or small, but whether they are efficient (Roumasset, 2010). Rural-urban migration is part of this process, and it eventually leads to an agglomeration of economic activities, which effectively reduces the unit cost of the provision of electricity, telephone connectivity, sanitation, education and health care because more people can be served with the same amount of funding for public services.

Sectoral productivity gaps appear to have widened in recent years because of slow growth, and in some cases stagnation, of agricultural productivity, and trapped a large proportion of workers in agriculture without ever finding opportunities in the industrial and services sectors. So what Timmer (2007) observed, that Asia has become less successful in integrating low-productive agricultural labour into the rest of the economy" appears to remain valid. Policy frameworks in the A-P region have largely dampened labour movements out of agriculture on the premise that growth in Asia was too rapid to allow for such a rapid

⁸See Timmer (1988) for a comprehensive review of this literature.

movement and that it would have politically untenable because of its potential contribution to unsustainable urbanization.

However, the current environment is propitious for a second wave of agricultural development and transformation. Agricultural science, technology and innovations such as agricultural biotechnology have made significant advances. A broad understanding is emerging on the need to use a rather broad spectrum of food available in the world for ensuring food security including secondary crops such as millets, cassava and root crops that are rich in vitamins and minerals and the danger of depending on few selected commodities for sustenance (Giovannucci and others, 2012). Advancement of new agricultural processing and marketing systems that are capable of supporting small-scale farm households have emerged (Reardon and others, 2003; Reardon and Timmer, 2007).

Transforming these advantages to spur agricultural productivity growth in the A-P region is the key challenge. Historical experience from successful agricultural transformations across the world offers a few lessons: creating an enabling environment for both farmers and others to effectively participate in agricultural value chains; establishing or strengthening institutions for innovation, identifying and applying agricultural technologies; providing policy stability with sufficient flexibility to change over time when circumstances change; strengthening rural extension services along with inclusive financial systems and risk insurance; and income support to ensure farmers' stability of income in times of crisis (Wickramasinghe and others, 2012).

Farm households operate at the interface between macro-policy environment and micro-economic factors that incentivize farmers to put extra efforts required to produce, process and market food and agricultural commodities. Transaction costs are fundamental to this process (Coase, 1937; North, 1981).⁹ Public policies that contribute to reducing transaction costs, including rural infrastructure and the provision of information and communication technologies, electricity and other public utilities, encourage farmers to put extra effort into producing for markets, usually within their own resource limits, which contributes to a rise in agricultural productivity. As the transformation progresses, agricultural productivity growth leads to the emergence of new forms of agricultural production including in some cases, crop specialization (Kurosaki, 2003) and in others, crop diversification. This allows for the emergence of more diversified, higher quality and distinctive agricultural products, supported by the availability of a strong supplier base and services.

Further impetus for raising productivity growth comes from scale effects, more specifically, increasing returns to scale (Young, 1928). Although the original concept was applied to industrial development, the process remains the same in that increasing returns to scale in agriculture incentivize farm households to pursue knowledge, acquire skills, learn new techniques and marketing methods; become more efficient in production, processing and marketing; and the use of machinery and agricultural inputs. These, in turn, enable farmers to use labour more productively; and interact with markets vigorously to explore trading opportunities. Accordingly, it is the capacity of an economy to utilize increasing returns to scale, not larger operations per se, which determines agricultural productivity growth. In this sense, debates on small vs. large farms, small vs. large corporations etc. largely miss the fundamental forces that govern agricultural productivity growth and transformation in developing countries.

⁹ For a review of this literature see Wickramasinghe and Weinberger, 2013).

Stigler's (1951) suggestion that it is the capacity for functional operation of firms, especially purchasing and storing material, transforming it first into semi-finished and then into finished products, storing and selling the output and extending credit to buyers, played a significant role in the emergence of specialized firms and business operations is equally valid to rural, agricultural industrialization.

Institutions play a critical role in many of these processes, and hence accurately identifying institutional issues from others is as important as devising strategies to remove bottlenecks. Gulati and others, (2005) provide a convincing case. In a case study of two water scarce states of India, Gulati and others (2005) conclude that the issues that persist (e.g., increasing costs of new irrigation schemes; the backlog of incomplete schemes; and the increasing neglect of existing systems; lack of maintenance, inadequate operations, poor water distribution system; and the poor timing of water delivery) are all not technical but institutional. Another closely related issue is the evolution of coordination. Reardon and Gulati (2008) show how agriculture and food systems in The A-P are evolving from systems with limited coordination to better-organized systems of governance, guided by economies of scale (Reardon and Gulati, 2008). The food retailing sector is expanding fast linking agro processors, wholesale and logistic suppliers and farmers through emerging rural business and service hubs.

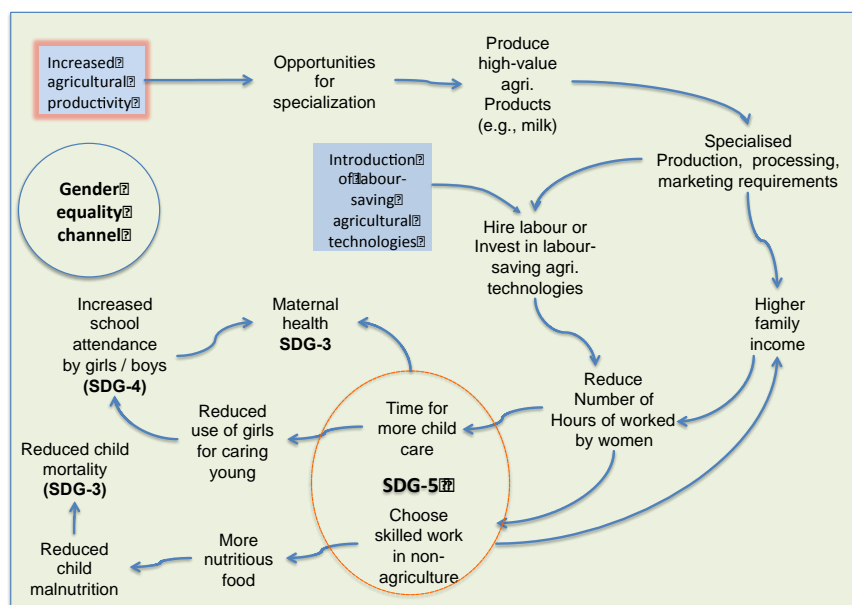
Recent literature identified the importance of the decline in fixed costs of supplying new, intermediate products as well as fixed transaction costs for farms and firms in their efforts to identify new products (Yang, 2003) and markets (Key and others, 2000).

Agricultural productivity growth is both a cause and effect of supply and demand forces. Agricultural productivity growth contributes to a general rise in per capita incomes, which, in turn, increases demand for a whole range of commodities, including agricultural, industrial goods, intermediate goods and services. This leads to the emergence of agro-industrialization, a process that has become the key that drives agricultural growth in some countries, but is missing in many others. Spurring such dynamic systems will be a key to transforming agriculture and enhancing farmers' incomes, which will lead to poverty alleviation and food security.

Klasen and others (2013), who examined the impact of households' diversification to nonfarm income activities, productivity improvements of coffee and cocoa cultivation, and crop switching on rural income dynamics, found that non-agricultural sources of income have increased constantly over time, but agriculture still constitutes the financial backbone of rural households across the entire income distribution model. The study also found significant entry barriers for poorer households to engage in non-agricultural economic activities, especially capital constraints. For this to make a bigger impact on poverty, new and innovative mechanisms need to be identified to increase investment in infrastructure that benefit the poor.

Literature identifies several impact pathways of agricultural productivity to poverty reduction: income and employment, education, gender equality; reduced exposure to risk, vulnerability and diseases; and the environment. The importance of identifying and working along those impact pathways for realizing sustainable development is illustrated in

Figure 9 for gender dimension.

Figure 9. Agricultural productivity and gender equality: impact pathways

Source: Author.

B. Agricultural productivity: approach, estimates and observations

Real agricultural output growth can come from two sources: area expansion, yield growth, or a combination of the two. Yield growth is the most widely used estimate to describe productivity growth (e.g., kilograms per hectare, kilograms per animal, or litres of milk per cow), and relatively easy to obtain information on. The paper briefly explores yield growth in crops, and livestock.

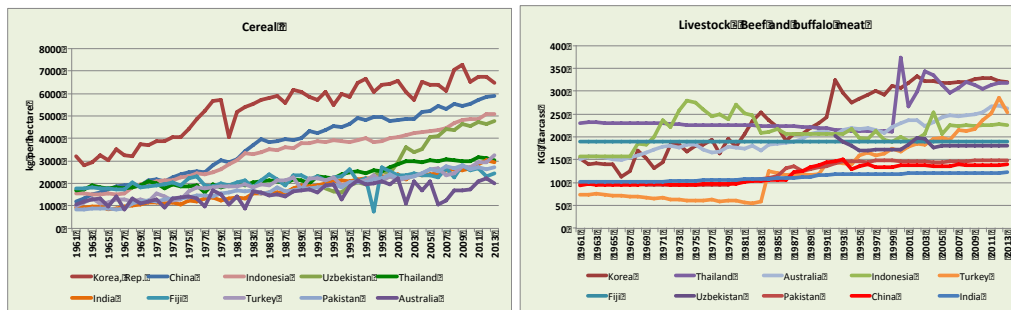
The Asia-Pacific region managed to improve yields significantly during the Green revolution, reaching almost 4 per cent rate of yield growth.

Figure 10 shows that yield growth continued to grow and reached over or close to 5000 kilograms per hectare in Korea, China, Indonesia and Uzbekistan, whereas in the rest of the countries yield converged to about 2000 kilograms per hectare (India, Fiji, Pakistan and Turkey). Much of yield growth in this region is attributed to the introduction and adoption of hybrid rice, wheat and maize varieties. It must be noted that progress on crop production has largely come from the introduction and large scale adoption of hybrid varieties in rice, wheat and maize, along with the use of chemical fertilizer, irrigation and mechanized farm equipment.

Intensive agriculture has led to several issues, however. First, intensive agriculture has largely been driven by three cereal crops –rice, wheat and maize. It has come at the expense of the neglect of an estimated 50,000 edible plants in the world (Giovannucci and others, 2012). Second, the high use of inputs has contributed to significant negative impact on the environment in the form of land and soil degradation, nutrient loss, loss of bio-diversity, contamination of water, and pest resistance. Third, minimum crop diversification under the

intensive agriculture model has contributed to loss of bio-diversity, faster spread of diseases, and loss of soil nutrients.

Figure 10. Yield growth in cereals and livestock in selected countries



Source: Author based on FAOSTAT (2015).

Livestock and fisheries (marine and freshwater) contribute to a significant proportion of food diet, especially protein. Consumption of livestock and fisheries remains low in general in Asia, although it has risen in the recent past. As

Figure 10 shows, livestock yield has increased only in four out of 10 countries – Korea, Thailand, Australia and Indonesia. While several others have recorded small yield growth until the 1990s, yield growth has come to a virtual standstill since then. There is scope for enhancing current yield levels, but that needs to be evaluated against the heavy use of maize and other cereal as animal feed and its ethical considerations. Unlike in cereals, the private sector-led breeding and intensive feeding methods were largely restricted to the chicken and pig subsectors.

Although yield per acre provides an estimate that allows for cross- or within-country comparisons of agricultural productivity, it does not inform the sources of growth of output. Total Factor Productivity provides such a measure¹⁰. Agricultural output growth occurs due to: (i) an expansion of input use such as sown area or livestock inventories (extension); (ii) increased application of inputs such as fertilizer, machinery or feed on a given unit of input (intensification); and (iii) efficiency improvements through the adoption of better technologies, or from farming practices that result in more outputs from existing resources (Total factor Productivity)¹¹ (Figure 11).

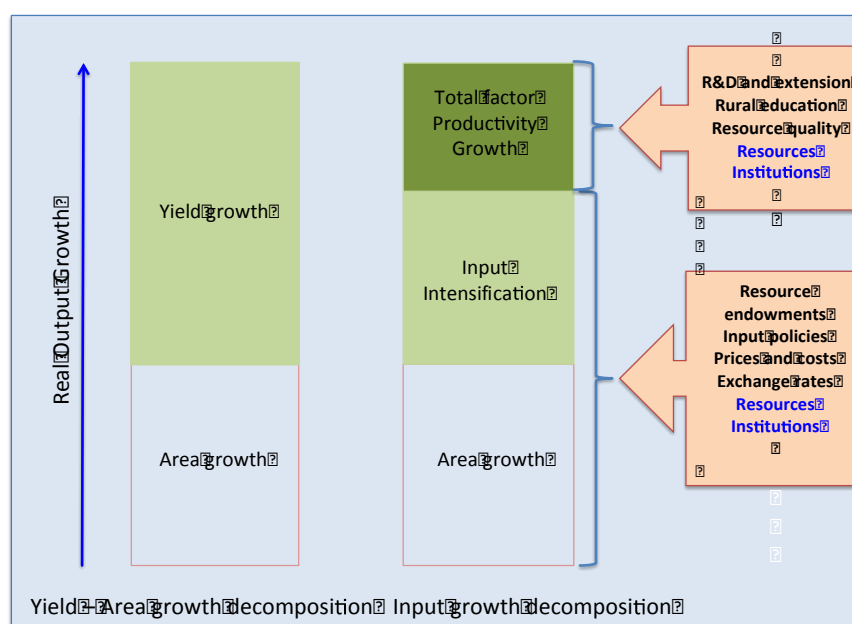
The efficiency improvements that result in better use of existing resources are measured by total factor productivity (TFP). TFP is measured either by its level or its growth. The level of TFP is measured by dividing an index of agricultural outputs (index of gross crop and livestock output) by an index 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. TFP growth results

¹⁰ For a comprehensive review of methodology, refer to Headey et al., (2010), and for a description of estimation procedure with a guide to data, see USDA (2015).

¹¹ Productivity growth comes from technical progress, which consists of two key components: technical change and technical progress. While the first arises from improvements in production practices the latter comes from a movement of production practices close to the existing good practices. This paper does not provide further decomposition of TFP.

from growth in the efficiency of using existing resources and crop and livestock varieties arising from 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 input 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 could be positive when output growth is higher than input growth, which indicates an improvement of the sources mentioned above. It could be negative when input growth surpasses that of output growth.

Figure 11. Output growth, yield, and total factor productivity



Source: USDA (2015).

C. Productivity growth and policy frameworks

1. Key trends

Annex Table 1 provides estimates of output growth due to: area expansion (extensification), intensive use of inputs (inputs/area) (intensification), and TFP. For selected countries, the estimates are shown in Figure 12. Several salient features emerge from the estimates. First, several countries have begun to take land away from agriculture including Japan, Korea, Australia, Turkey and Uzbekistan. In several others, while land area under agriculture is still expanding, it is occurring at much slower rates than in earlier periods. So the contribution of area expansion to output growth has declined across several countries. Second, the contribution of intensive use of land in output growth is largely continuing, but in several countries the contribution of intensification to output growth is also declining. Third, the contribution of TFP growth to output growth has become larger over time in several countries, indicating that a large proportion of output growth comes from the adoption of good agricultural practices and scientific methods of cultivation.

Area expansion has been a key strategy to increase agricultural production throughout Asia and the Pacific and it continues to date, but in recent years the rate of area expansion has

declined. For example, in the 1960s, only Japan and Rep. of Korea reported reductions of land under agriculture, but in the 1990s, 10 out of 23 countries analysed reported some reduction of land. Of these 10, five countries continued to have negative growth rates continuously in subsequent periods (Australia, Rep. of Korea, Japan, Fiji and Uzbekistan).

Agricultural intensification is another common practice utilized by the region as part of the Green Revolution. Estimates show that the number of countries that derived more output growth from intensive agriculture increased up to a point and began to decline. For example, 19 out of the 23 countries analysed reported having positive contributions from intensification in the 1980s, but the number declined to 13 during the period 2003-12.

The contribution of TFP growth to output growth has been rising in several countries, but for others, its contribution has not been consistently positive or rising over time. Thus, it is necessary to review TFP growth along with policy frameworks that support TFP growth to better understand how and why TFP growth has been so divergent across countries. A common pattern that can nevertheless be observed is that those countries that successfully managed a transition from land expansion to agricultural intensification consistently also appear to have managed to increase contribution of TFP growth over time.

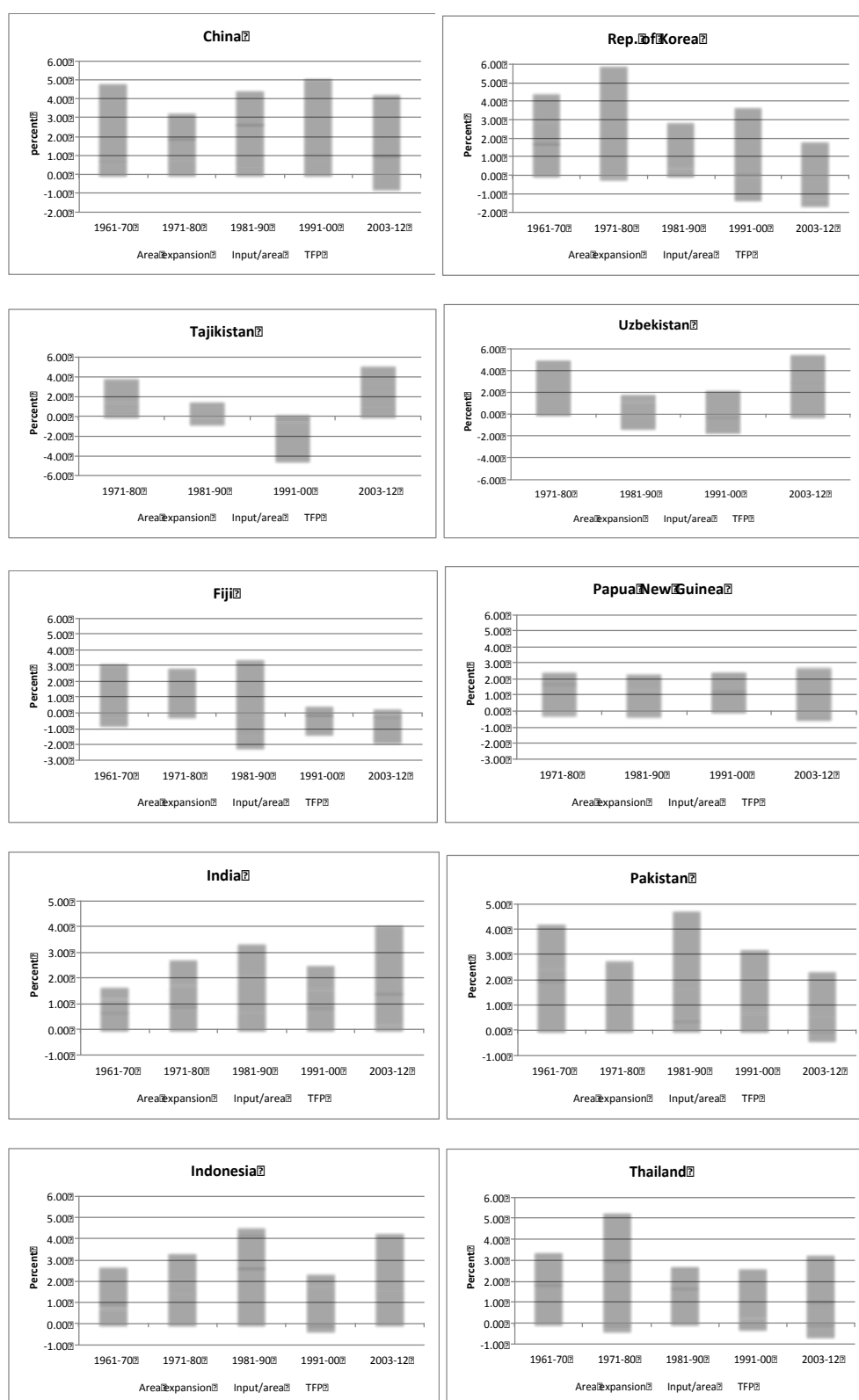
D. Country profiles of agricultural productivity and policies

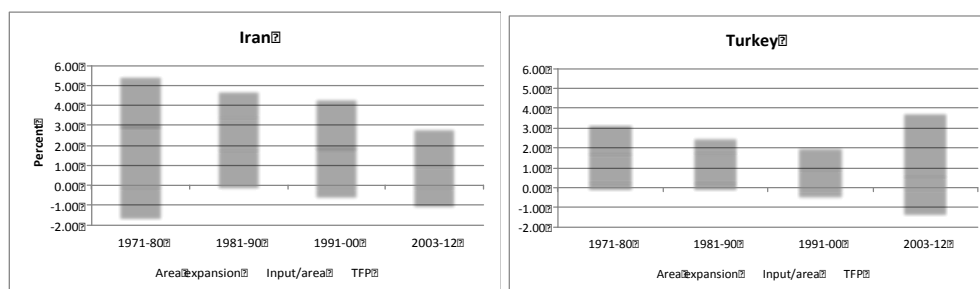
1. Tajikistan and Uzbekistan

In Tajikistan, following agricultural reforms after independence, agricultural output growth plummeted in the 1980s and the 1990s. In the last decade, agriculture has recovered with output growing annually by 5.18 per cent and TFP by 2.17 per cent, along with growth coming from intensification (2.16 per cent) and land intensification (0.85 per cent). Tajikistan has managed to transform its economy fast allowing TFP growth and intensification to drive its agricultural output growth. Uzbekistan did not experience as dramatic a drop in agricultural output growth after economic reforms as Tajikistan did; it managed the transition with a slump in agricultural output growth.

Using the standard Solow growth accounting framework, Lerman and Sedik (2009) showed that 45 per cent of growth in crop production came from productivity growth and the remaining 55 per cent from area expansion in Tajikistan; and in Uzbekistan, because land area declined while crop production grew, the whole increase in crop production is attributed to productivity improvement. They further noted that there are significant differences of productivity across farm types, with apparently higher productivity among smaller farms.

Tajikistan and Uzbekistan went through a rapid reform process after the two countries became independent on the promise that higher levels of agricultural productivity and efficiency can be gained from family farms organized in smaller units (Lerman and Sedik, 2009). Thus, land reforms were the main instrument used for enhancing agricultural productivity. Land reforms began in 1991-92 but real implementation started only in the late 1990s. The reforms resulted in a decline of land parcel sizes; land under large collective “farm enterprises” also declined; but land under household cultivation as well as peasant farms expanded.

Figure 12. Sources of agricultural output growth



Source: Author based on USDA (2015).

The Soviet agricultural system was organized to supply agricultural inputs to corporate farms and purchasing of output at fixed prices. In the aftermath of implementing policy reforms, the system that supplied inputs through a planned process was no longer available. That resulted in a sharp decline of agricultural production immediately after the reforms, but production began to show signs of recovery towards the end of the 1990s.

2. China

In China, growth of agricultural output coming from TFP productivity has been consistently positive throughout the last five decades. Starting from a moderate growth rate of 0.90 per cent in the 1960s, it reached 3.99 per cent in the 1990s, and 3.2 per cent in the last decade. In contrast to TFP growth, growth that came from intensification fluctuated. In the 1960s, agricultural intensification was the main driver of agricultural output growth, but its impact had largely been exhausted in the 1970s and revived again during the period 1981-90 due to policy reforms in the 1970s. Growth coming from intensification is no longer the main source of agricultural growth.

In a study covering the period 1979-2000 where TFP was further broken down into technical change, technical efficiency and a scale effect found high levels of technical efficiency in 1979-84 but a decline in 1985-89, which authors attribute to exhaustion of the impact of economic reforms carried out in the earlier periods (Zhang and Brummer, 2011). In contrast, technical change has increased dramatically over the whole period, which authors attribute to long-term investment in agricultural technology and rural infrastructure. The contribution of scale effect was limited. Overall TFP growth that combines all three effects shows a net increase over the whole period, confirming the results noted above.

Agricultural productivity growth in China began with economic reforms launched in 1978. Decentralization of agricultural production by giving households responsibility to decide what and how much to grow, followed by liberalization of the system of pricing and marketing agricultural goods were the keys to agricultural transformation (Braun and others, 2005). The first period, 1979 to 1984, focused on the decentralization of the production system and reforming agricultural procurement (Fan, et al. 2002). Successive reforms and adjustments during the 1980s led to dismantling of price and quantity controls imposed by the central government, and by 1993 more than 90 per cent of all agricultural production was sold at market-determined prices (Fan et al., 2002). Some price and quantity controls remained in sub-sectors (cotton, oil crops, livestock and vegetables). The segmentation of regional markets continued along with the isolation of domestic markets from international markets (Brummer et al., 2006, as cited in Zhang, Y. and Brummer, B, 2011)

A new phase of reforms began in the early 2000s to address some market adjustment issues. Two key issues were excess supply and the rising gap between urban and rural areas. And thus, the government began introducing reforms to raising farmers' income (OECD, 2005) which included: providing input subsidies for farmers to purchase improved seed; direct payments to farmers engaged in grain production; and reducing, and later on abolishing, agricultural taxes (Zhang, Y. and Brummer, 2011).

3. India

In India, TFP growth contributes to an increasingly larger share of agricultural output growth. Intensification growth played a key role in output growth in the Green Revolution era, but lost steam in subsequent periods. Extensification played a key role in the earlier periods, but its contribution to output growth has declined sharply in recent years, suggesting that land expansion is continuing but not at the rates that it did in earlier periods. TFP growth has become a key source of output growth, but both extensification and intensification continue to play a role.

Studies have confirmed several sources of TFP growth: public and private research and extension that led to crop genetic improvements (Evenson, 2003; Chand et al. 2011; Joshi et al. 2003); infrastructure and irrigation development (Evenson et al. *ibid*); rapid adoption of high-yielding varieties and new technology (Evenson and others, 1999; Fan and others, 1999; Kumar, 2001); years of schooling of labour force and dietary energy (Avila and Evenson, 2004).

In a crop level study, Chand et al. (Op. cit.) found that TFP growth in 11 out of 15 crops benefitted from agricultural research, but public investment in extension and technology transfer contributed positively toward TFP in only two crops, and that both the investment levels and quality of extension and technology dissemination matter. In the livestock sector, the structural shift in consumption towards milk, meat, and poultry has contributed to sector's growth. The contribution of technical progress to livestock sector growth has accelerated especially after the 1980s (Birthal et al. 1999).

India, since its independence in 1947, has implemented several initiatives to increase food production. The Green Revolution period was characterised by building institutional capacity (setting up of agricultural research institutes, and a system of agricultural universities), dissemination of new technologies, and food price stabilization and farmer incentives (Chand and others, 2011). Farmers were often provided subsidies to buy agricultural inputs, especially targeting high-yielding varieties. In the post-Green Revolution era, the government of India emphasized diversification from grains and pulses to high-value food and agricultural commodities (vegetables, fruits, spices and livestock), particularly targeting the Southern and Western parts of the country (Gulati, 2009; Chand, 2011).

The Twelfth Five-Year Plan (2012-2017) of the Government identified three priorities for the agricultural sector: (i) better weather forecasting, (ii) effective water management and development, and (iii) dissemination of agricultural technologies that can help farmers increase yields, without depleting natural resources.

The government and researchers have identified several challenges facing India for raising agricultural productivity: scarcity and fragmentation of land (India, 2014); small farm size that is largely efficient but lacking economies of scale; soil degradation (ICAR, 2010); inefficiencies in water use ranging from 35 per cent in flooding method and canals to 65-75

per cent in pumping water; and the vulnerability to climate change of some areas.

4. Pakistan

In Pakistan too, TFP growth was high during the early period of the Green Revolution, but it could not be sustained for long. Agricultural development efforts in the 1970s enabled Pakistan to revive the agricultural sector, but TFP growth began dissipating again, and ended up in being negative in recent years. As a result, agricultural output growth is increasingly coming area expansion or intensification.

Pasha et al. (2002) found TFP growth to vary over time ranging from 2.7 per cent from 1977-78 to 1982-83 and 4.2 per cent in the period 1992-93 to 1997-98. Avila and Evenson (2004), as cited by Kumar (et al. 2009), found slower TFP growth rates for the whole period, and a slight deceleration in the 1990s. They attribute this sober TFP growth to the reduction of public expenditure on R&D (Kumar and others, 2009); inadequate human resources (Pasha and others, 2002); and inadequate infrastructure (transport, energy, communication-and non-factor inputs fertilizer and water) (Kumar et al., 2009).

Policy instruments that Pakistan used to enhance agricultural productivity included: the use of high-yielding varieties, supported by irrigation, and subsidized inputs; public investment in R&D and extension; and improved innovations such as improved fodder supply, substitution of milk animals for drought animas, and the one-time slaughter of drought animals in the livestock sector.

Agricultural pricing policy, especially price fixing, has been a key policy instrument targeted to achieve multiple objectives including production, marketing and consumer price stability. The introduction of a fixed commodity price scheme along with a mandatory procurement by government agencies and commodity export bans characterized the agricultural policy regime up to 1980s. In subsequent periods, the government dismantled trade restrictive practices such as the export ban on cereals and the mandatory grain procurement, and replaced them with import controls using tariff.

5. Thailand

In Thailand, the contribution of area expansion to agricultural output growth was high in the 1960s; it became the most prominent contributor in the 1970s, but its importance has waned since then. Growth due to intensification of agriculture fluctuated significantly in earlier periods, but became negative in the 1990s. Instead, TFP growth has become the key source of output growth since the beginning of the 1990s; in 2003-2012, agricultural sector grew by 2.7 per cent in spite of a decline of intensification growth (-0.63 per cent) because of high contributions of extensification (1.1 per cent) and TFP growth (2.2 per cent).

Suphannachart and Warr (2011) found that between 1970-2006, growth of the capital stock (mechanisation) accounted for 60 per cent of output growth, growth of quality-adjusted labour and land account for another 10 per cent and growth of TFP for a further 20 per cent.

Thailand had three distinct phases of agricultural development: a period of high land expansion in the 1960s and 1970s, a period of surge in private investment in response to an exodus of young workers from agriculture (Poapngsakorn, 2006); and efficiency-driven agricultural development along with a decline in the use of external inputs. The establishment of a land tenure system where farmers were allowed to clear new land and gain secure

property rights by paying taxes paved the way for expanding the land frontier in the earlier periods. Once farmers cleared land, the government invested in roads and large irrigation systems, later complemented by spending on rural education, electrification and telecommunication (Poapongsakorn et al., 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. GOT ensured continuity of funding to R&D in agriculture, and went beyond many other countries by developing better varieties not just in cereal and food crops, but also secondary crops such as corn and sorghum and commercial crops such as rubber and cotton (Poapongsakorn et al. *ibid*), but was inadequate to compensate for generally weak private investment in R&D ((Suphannachart and Warr, 2011).

The role of government policy in Thailand is a story of successful transition from a stage that relied on the use of underused factors of production to work, with only limited improvements in productivity, to a later stage where land and labour became increasingly scarce and growth could only come from increased returns to scarce factors (OECD, 2012).

In this process, the role of government has been largely limited to establishing an enabling environment for private initiatives to take place, investing in infrastructure (roads, irrigation, telecommunication and energy) and research, expanding agricultural credit, and investing in education. In addition, the government focused on facilitating funding for farmers to adopt new seed varieties and spur farmers' investment in agriculture initially by instructing commercial banks to allocate a minimum of 5 per cent of their commercial credit portfolio to rural credit, and later by establishing its own bank (The Bank for Agriculture and Agricultural Cooperatives). The novelty of the new system was the implementation of a modality of extending credit to farm households through cooperatives without the usual collateral requirement.

With the passage of time, the government has shifted its focus more to strengthening agricultural markets through the promotion of food certification schemes; bilateral and regional trade negotiations for opening up export markets; strengthening value chains; and support for global campaign such as 'kitchen to the world'. In recent years, GOT has reduced heavy taxes imposed on the agriculture in earlier periods.

6. Indonesia

In Indonesia, agricultural output grew consistently over the last five decades, ranging from 2.7 per cent in 1961-70 to 4.6 per cent in 2001-10. The contribution of land expansion to output growth increased during 1961-90, and continued in the next two decades at slower rate; agricultural intensification contributed to growth through the 1990s but since then it has not been a source of growth consistently. TFP growth on the other hand shrank in the first three decades, but picked up again in the 1990s, contributing to 60 per cent of agricultural output growth in 2003-12. The gradual shift from food staples to higher-value perennial, horticultural and livestock commodities such as palm oil and away from food staples largely explain this TFP growth (Fuglie, 2012).

In Indonesia, two key policy goals stand out: food self-sufficiency and price stability. The rice policy constituted a highly regulated food production and marketing system, supplemented by export / import controls and high tariffs. The government used subsidies for agricultural inputs to incentivize production of identified products, namely rice, soybean,

maize, sugar and beef. Fertilizer accounted for nine per cent of the total development budget in 1984 to 1990. After a period of lapse, the government reintroduced fertilizer subsidy in 2009, and in that year alone fertilizer subsidy was 30 per cent of the agriculture budget (OECD, 2010).

The government also promoted the adoption of high-yielding varieties in rice and other crops and invested in irrigation schemes, agricultural R&D, and dissemination; provided credit at subsidized rates. In recent years, the policy focus has shifted from the promotion of rice to encourage greater crop diversification targeting secondary crops (cassava, banana, maize), and commercial crops (rubber, coffee, cocoa, tea, and palm oil).

Border controls including export bans, export tariffs and variable levies have also been used extensively including in export crops such as palm oil, cocoa and rubber. In recent years, the government has encouraged biofuel production through the conversion of six million hectares of land into biofuel production (OECD, 2010). A number of additional measures are being contemplated including export bans on palm oil, sugarcane molasses, and convert them for producing biofuel or bioethanol.

7. Fiji

In Fiji, the agriculture sector contributes to about 10 per cent of the national GDP and employs approximately two-third of labour force (Fiji, 2014). In recent years, the agricultural sector has experienced negative growth, and that currently, agriculture (Annex Table 1). The agriculture sector grew at 2.45 and 2.74 per cent per annum respectively in the 1960s and the 1970s, which declined to roughly half that rate in the 1980s and became negative since then. In the period from 2003 to 2012, the sector recorded a negative growth rate of 1.47 per annum. The TFP growth has been negative in the last five decades, making Fiji the only country among those analysed where the TFP growth was consistently negative for five decades. Area expansion has been the main contributor for agricultural output to grow at positive rates before 1990. Agricultural intensification has made a positive but very small contribution to agricultural output growth in some years. The Fiji 2020 Agriculture Development Policy Agenda attributed the poor performance of the agricultural sector to: the decline in the performance of the sugar industry, the inability to cope with trade liberalization, the occurrence of natural disasters and pest and disease outbreaks, export trade restrictions, political instability, and inconsistent public sector support (Fiji, 2014). In addition, the poor performance of the agricultural sector development in the last several decades is attributed to issues related to land ownership that constrain access to credit, poor quality and small volume of agricultural commodities, weaknesses in agricultural policies pursued by successive governments and weak institutional organization to implement even well-formulated policies.

Agricultural policies pursued by the government changed over time. In the 1970s, the government pursued a policy of import substitution aimed at replacing import dependence of food and agricultural commodities. In the 1980s and 90s, the government introduced policy reforms aimed at liberalizing the market including the agricultural sector along with more emphasis on the role of private sector in economic activities. Towards the end of the 1990s and early 2000s, the government again introduced some protective measures to safeguard the agricultural sector through various schemes including through the Farm Assistance Programme and the Commodity Development Framework. The first decade of the century

dominated policies targeting livelihoods development, efforts to develop marketing of agricultural produce and the rehabilitation of some critical agro industries such as sugar.

In a review of agricultural policy environment in Fiji, Duncan and Sing (2009) concluded that agricultural policies and schemes have ‘failed’ due to the unnecessary government interventions and that they had particularly detrimental impact on research and extension services and have reinforced a ‘dependent mind set’ in the farming community.

The most recent effort towards revitalizing the agricultural sector is the development of the Fiji 2020 agriculture sector development agenda (Fiji, *ibid*). It aims to develop a modern organized agricultural sector, build integrated support infrastructure, strengthen agriculture support services, improve capability in planning and policy formulation, and an enhance capability in investment and international cooperation.

8. Papua New Guinea

In PNG, in the 1970s and 1980s, both area expansion and more inputs use have contributed to output growth but in the period 2003-12 output growth was driven primarily by area expansion. Both TFP growth and intensification growth were negative during 2003-2012. PNG’s agriculture remains underutilized, despite having abundant land supply, fairly stable water resources and climatic conditions suitable for agriculture (Wickramasinghe and others, 2013).

However, agriculture is the biggest contributor to rural village households (Bourke et al., 2009); over 85 per cent of the population lives in rural areas and depends on subsistence agriculture, forests and rivers for their basic food needs. Fresh food crops sold in informal open markets provide 21.7 per cent of income and involve 94 per cent of the total rural population (Bourke et al., *ibid*). In overall terms, agriculture contributes to about 40 per cent of GDP in recent years.

Agriculture in PNG is constrained by many factors that are pervasive at early stages of development. Apart from a standard set of constraints such as a weak or lack of infrastructure, limited or no capacity of human resources and limited access to markets for output and inputs, and financial resources, PNG has an unresolved land tenure system that appears to hinder progress towards a commercially viable agricultural system, although it supports a highly stable subsistence agricultural system (Wickramasinghe and others, 2013).

The Papua New Guinea Vision 2050 recognized that agriculture needs to be developed along with manufacturing, services and ecotourism to shift from an economy that is heavily dependent on the mining and energy sectors to one that is well balanced where all sectors contribute to economic growth and development. Land reforms are an essential part of the process of restructuring the economy (GoP, 2011). The midterm development plan has a target of converting 70 per cent of subsistence farmers into small- and medium-scale agricultural enterprises, using five strategic priorities: (i) develop an efficient land administration, allowing land owners to profit from their land; (ii) develop roads and supply chains to link producers and markets; (iii) provide extension services to improve productivity; (iv) utilize economic corridors, enabling to utilize niche markets; and (v) enforce CODEX marketing standards to improve agricultural exports.

9. Turkey

The Turkish agricultural reform program, which gained momentum in 2001, had two target areas: to reduce the fiscal burden of support to agriculture and to move towards a more efficient production structure (Cakmak and Eruygur, 2008). The first target aimed at phasing out government interventions in the output, fertilizer and credit markets and the introduction of direct income support to farmers through per hectare payment independent from the choice of crop. The second theme included commercialization and privatization of state owned enterprises in agriculture and restructuring of quasi-government institutes. The third theme covered grants to farmers who required assistance in switching out of surplus crops (hazelnuts, tobacco and sugar) to net imported crops (oilseeds, feed crops and corn). Agricultural policies are becoming market friendlier, although the transition is slow (Cakmak and Eruygur, *ibid*).

Investing in R&D has been a major part of Turkish agricultural development efforts. In recent years, the government has established gene banks; supported the development of new product varieties through biotechnology, nanotechnology and techno-parks and the use of renewable energy in agriculture.

The 10th Development Plan 2014-2018 identified important ‘problem areas’: the small and fragmented structure of agricultural businesses, insufficiencies in market access, organization of farmers and their training and extension needs. Key policy areas covered by Turkey include: strengthening effective private sector institutions; strengthening law and order; increasing efficiency of operations; strengthening of food quality and competition; and the promotion of new ICT in agriculture. Several rural development programmes have also been implemented over the years with the objective of raising rural income and living standards through the diversification of economic activities, irrigation rehabilitation and construction of rural roads.

IV. Conclusions and Recommendations

This section provides a brief summary and recommendations for enhancing the productivity of the rural and agriculture sector.

A. Conclusions

The declining contribution of agriculture to national incomes and the high dependency of a disproportionately large number of people on agriculture for livelihoods on the one hand and an apparent mismatch between economic growth and capacity for absorbing ‘surplus’ labour from agriculture to the non-agricultural sector on the other have received considerable attention by policy makers in recent years for their implications for poverty, food insecurity, unsustainable urbanization and sustainable development. This paper is motivated by the need to identify potential links between productivity in the rural and agriculture sector in The A-P with a view to proposing policies and strategies on how strengthening productivity in the rural and agriculture sector will contribute to the realization of SDGs.

The paper reviewed key trends and patterns of rural and agricultural development; offers a review of literature on the connection between ruralness, agricultural productivity growth and poverty and food insecurity; analyses agricultural productivity trends using both yield and total factor productivity; reviews broad policy and intuitional frameworks that countries have pursued.

The A-P region has undergone tremendous transformation in the last five to six decades. Economies are urbanizing fast, but 53 per cent of the people continue to live in rural areas, equivalent to 2.1 billion people. The rural sector relies heavily on agriculture although non-farm incomes are becoming increasingly important parts of household income. The share of agriculture in national income has declined everywhere, and currently agriculture on average contributes to less than 10 per cent in the A-P region. The A-P region is no longer dependent on raw material exports or imports as in the past, but the share of food, beverage and tobacco in manufacturing has generally increased. The share of agricultural employment in total employment also declined almost everywhere but at very different rates across countries. Growth in the non-agricultural sector without the creation of adequate jobs to absorb ‘surplus labour’ in the agriculture sector has enlarged the sectoral misallocation of labour in recent years.

Agricultural production measured in constant 2004-2006 valued has increased from US\$276 billion in 1961 to US\$1,185 billion in 2013, a growth of a factor of 4.3 times, in 23 countries analysed in the A-P region. This is equivalent to a compound rate of growth of 2.8 per annum for 53 years. During this period not only did the structure of agriculture change from one dominated by cereals to non-cereal crops and livestock, but the way agricultural inputs are used in production processes has also changed. Area expansion largely contributed to agricultural output growth in earlier periods, followed by a general tendency to generate much of output growth through the use of external inputs such as chemical fertilizer and pesticides with the use of machinery, and in recent years through agricultural productivity growth. Indeed, country experiences vary significantly, which is to be expected in a region as vast as the A-P, consisting of countries in their early stages of development to highly developed high-income economies.

A challenge for the A-P region is to simultaneously realize economic growth and convergence of labour productivity across agriculture, industrial and services sectors, and to make growth more inclusive by providing growth dividends to rural areas and thus, contributing to the elimination of poverty and hunger. Raising agricultural productivity must be at the centre of this effort because the great bulk of the remaining poor and food insecure people live on agriculture, inhabit rural areas, and it is now known that growth in agriculture stimulates economic growth, and contributes to equity and political stability.

Theoretical and empirical studies in recent years have advanced our understanding of the mechanics of agricultural productivity growth and rural development. They show that agriculture is again at a propitious time in history to enter into an era of fast, sustainable growth because of the developments in agricultural science, technology and innovations; a greater realization of the inability of countries keep on exploiting planetary resources as they had been in the past; and the advancement of new agricultural processing and marketing systems that are also capable of supporting small-scale producers. Transforming these advantages to spur agricultural productivity growth in the A-P region will require the implementation of an evidence-based policy framework that give emphasis to: creating an enabling environment for both farmers and the others to effectively participate in agricultural value chains; establishing or strengthening institutions for innovation, identifying and applying agricultural technologies; providing stable policies with sufficient flexibility to change over time when circumstances change; strengthening rural extension services along with inclusive financial systems and risk insurance; and income support to ensure farmers’ stability of income in times of crisis.

Policies will need to be evaluated from the lens of efficiency, economies of scale and capacity for functional operation of farm operations and businesses. In such an approach, debates such as small vs. large farms or firms will disappear and give rise to a broader understanding of best possible approaches suitable for specific environments.

Agricultural output growth generally comes from three sources: area expansion, agricultural intensification and productivity growth. Expansion of agricultural land has been continuing albeit at slower rates in recent years. Only a handful of countries have been able to actually reduce land under agriculture. Notwithstanding very different agricultural growth experiences across countries, countries do appear to have shifted over time from being highly dependent on land expansion to raise agricultural output, especially in the 1970s and the 1980s, to using agricultural inputs more intensively in their second stage of agricultural development, followed by a transition towards raising agricultural productivity supported by agricultural R&D, adoption of good agricultural practices and technology improvements in the last stages.

In spite of very different country circumstances and resource endowments, policies that helped countries to raise agricultural productivity have several common elements. First, economic reforms in more successful countries started with reforms that supported the poorest segments of the society, and it usually happened to be those in the rural, agricultural sector. The cases of China in recent times and the Republic of Korea in the 1950s are examples. Second, these policy reforms were not merely targeted to gain political expediency but all attempts were made to improve the economic efficiency of using resources, especially land. Third, in all successful transformations, public policy facilitated the process by establishing an enabling environment for farms and agro-firms to operate smoothly; investing in rural infrastructure such as roads, irrigation and ICT; easing access to credit through mechanisms to reduce or eliminate collateral requirements; investing in R&D; and providing extension services. The countries that attempted to coerce farmers and agro-firms to deliver results by a combination of policy instruments and controls such as price fixing, subsidies, and mandatory procurement requirements have largely failed to raise agricultural productivity beyond a certain level sustainably.

In the past, progress in crop yield increases have been realized through the introduction of high-yielding crop varieties and the intensive use of inputs such as fertilizer and pesticides along with irrigated water. Although this mode of agricultural production allowed the A-P region to increase agricultural production manifold and alleviate hunger and food insecurity, it led to negatively affected the resource base, contributing to land degradation, soil nutrient loss, over-exploitation of ground water and erosion of bio- and genetic diversity. This model cannot be continued in the future. A formidable challenge for the region is to arrive at a broad consensus on a long-term vision for the planet, countries and societies, and guide the economies to a sustainable growth trajectory. The A-P region is facing several challenges to realize sustainable productivity growth and to translate that into socially desirable outcomes in the area of poverty reduction, food security and sustainable agricultural development. They can be broadly classified under four headings: technical, policy, institutional, and implementation.

Technically, studies show three sets of challenges: reaching economically exploitable yields based on current technology and resources, identifying new varieties to meet certain quality and traits required to meet current and future food demand, and exploiting all edible plant varieties for enhancing agricultural productivity and food security. All three technical

problems are hampered by weaknesses in policy, institutional and implementation arrangements. Addressing one without paying to attention to others will eventually fail to yield results.

In the area of policy, despite the wide availability of knowledge on agricultural policies that are successful in raising agricultural productivity and promoting inclusive growth and development, governments tend to make bad policy choices as well as inaccurate sequencing of policy implementation. Much greater effort will be needed to identify why governments continue to make bad policy choices time and again and ways to assist governments to avoid common pitfall.

Institutional constraints are so pervasive in the A-P region, ranging from poor coordination among farmers, CSOs, the private sector, R&D and extension services, and government ministries; poor services delivery due to wrong or misplaced incentives and poor organizational structures; lack or inadequate technical skills in many areas required for developing new varieties, adopting existing varieties, using good agricultural practices, and collecting data and undertaking policy-relevant analysis; inadequate funding for R&D; and lack of direction for organizing research and development.

A review of studies finds that almost all the countries have reasonably well-designed policies, strategies and action plans targeting long-time horizons; mid-term plans and in some instances even annual plans. However, very rarely do they get implemented for a variety of reasons. Often, long-term objectives are shelved in the presence of ‘urgent’ requirements, limiting the potential of a country to realize its development objectives.

B. Recommendations

Enhancing agricultural productivity and realizing inclusive development is very much of an art rather than a science. There are many paths that governments in the A-P region could traverse. Making policy recommendations for a region as vast as the A-P can be so meaningless given its enormous diversity in terms of history, culture, economic strengths and political institutions. This section therefore focuses on areas that the A-P region could adopt to get the basic fundamentals right so that the region could move onto, and traverse along, a sustainable growth trajectory.

Recommendation 1: Recognize the indestructible inter-connections between the agriculture, industry and services sectors rather than defining sectors narrowly. The review and analysis recognized that the three sectors are interwoven in many different directions. This recognition will immediately lead to a related recognition that the issue of large and unsustainable ‘surplus labour’ in agriculture cannot be solved within the boundaries of agriculture alone. Within this broad framework, the target should be to introduce policies, strategies and action plans to realize a convergence of labour productivity across the three sectors over time. That alone will lead to inclusive development and poverty reduction. This means that government policy should target the removal of rules and regulations that limit the movement of labour and capital across sectors; facilitate such movements by retraining workers to carry out different functions (e.g., training some farmers in operating machines, and training industrial workers to better technical services in rural areas); and offer productivity-based financial incentives for encouraging such movements.

Recommendation 2: Recognize food and agriculture as systems operating within well-defined geographical spaces and landscapes (e.g., river basin systems) with unique

characteristics (climate, soil conditions, topography, humans and animals, flora and fauna). Value chain development should also follow the same principle so as to prevent overexploitation of resources within a given landscape. The past overuse of key agricultural resources –land, soil, water, forests that preserve bio- and genetic diversity- is primarily a result of our inability to understand that resources interact in numerous ways to produce a particular outcome, which in turn, determine human wellbeing. This recognition will enable us to design better agricultural value chains that are sustainable over time as such systems will have to conform to environmental, economic and social boundaries in a given setting.

Recommendation 3: Policy focus should be to get efficiency of resource allocations right. For example, the fundamental policy focus should be to enhance the efficiency of organizing land within a given environment rather than whether or not small farms are efficient. The above review revealed that small farms are efficient in some environments but large farms are efficient in others, under different conditions. The same principle applies to technology choice. The issue is not whether more mechanisation is the right way, but rather which technology and machinery will be more efficient for producing a given commodity. Similarly, enhancing quality and efficiency of extension services should be the main criterion for choosing and recommending extension services, not whether if the private or public sector should deliver them.

In order to create policies with the maximum ability to enhance agricultural productivity and its impacts on rural poverty reduction and sustainable development, policy makers need to identify and target the most effective impact pathways. More research needs to be carried out to empirically validate impact pathways.

Recommendation 4: Strengthen institutional foundations required for undertaking technology related R&D activities as well as policy formation and analysis including data collection. While the A-P region as a whole has a large number of R&D institutions, small countries generally have inadequate capacity for R&D activities. Even when R&D institutes are available, many of them are not geared towards undertaking fundamental research, but focus mainly on applied or translational research. The A-P region also has a large number of policy research institutes but institutes targeted to undertake focus policy research affecting agriculture and its links to industrial and services sectors are rare. In parallel with the advancements this region has made, it is high time for the region to invest more in fundamental R&D and policy research. The target should be quality rather than quantity. The paper recommends developing strong networking arrangements to link public R&D institutions, academic institutions, CSOs, the private sector and farmers.

As a part of strengthening institutions for R&D and innovations, focus should also be to address some fundamental issues facing agriculture from a technical point of view. Three technical issues need to be addressed: minimizing exploitable yield gaps; identifying good farming practices to raise yield where possible; and developing new crop varieties with certain qualities required. Responsibility for the first two may largely lie within national economies with some assistance from CGIAR centres and international organizations, but for the third, a greater international effort involving south-south-north cooperation will be required. Regional economic organizations can play a decisive role here.

Strengthening institutional organization required to deliver better extension services is another strong requirement of the region. New forms have emerged to deliver extension services more efficiently including innovative ways of using ICT and public and private

partnerships. Extension services could be converted into an effective mechanism for collecting agricultural statistics, processing and dissemination.

Recommendation 5: Strengthen agricultural skills development and training. Agriculture is changing fast and becoming more sophisticated than merely ploughing, sowing seed and collecting harvest. The region needs more agricultural scientists, policy and programme analysts, statisticians, technology experts, logistic managers, etc. An overwhelming number of researchers point out that R&D expenditures are declining across many countries, and that when R&D is reasonably large there are large quality issues. An effort towards building a truly modern sector with versatile farmers, agricultural scientists and many other numerous professionals will be required.

In the new environment where resources are scarce, new and innovative technologies and agricultural practices such as precision agriculture, laser-guided land preparation, automated agricultural systems are becoming the norm because they conserve resources. Future agricultural competition and productivity will depend on how the region is able to innovate, identify, adapt or adopt new technologies. All of them require better human skills, and countries in the A-P region will have to lay the foundation for this transition by attracting and training the youth to be part of the new agriculture.

Human capital also helps build the capacity for establishing business ventures and running them efficiently and effectively; by learning ways to reduce costs and waste throughout the food system; exploring the capacity for using new marketing techniques, ICT communication, negotiate and entering into sophisticated contractual arrangements for production, marketing as well as financial instruments; managing futures markets; and by evaluating a range of potential risks and uncertainties affecting agriculture and agricultural trade. Human capital formation in agriculture will have far-reaching positive impacts on social and political institutions, including in addressing gender imbalances.

References

- Alston, J.M., J.M. Beddow, and P.G. Beddow (2010). Food commodity prices in the long run: the crucial role of agricultural research and productivity. *EuroChoices*. The Agricultural Economics Society and the European Association of Agricultural Economists.
- Birthal, P.S., and others (1999). Sources of growth in livestock sector. Policy Paper, No. 9. New Delhi: National Centre for Agricultural Economics and Policy Research.
- Binswanger-Mkhize (2013). The stunted structural transformation of the Indian economy: agriculture, manufacturing and the rural non-farm sector. In *Economic and Political Weekly Supplement*, 29 June, vol. XLVVIII, Nos. 26 & 27, pp. 5-13.
- Blum, E.H. (2005). Functions of soil for society and the environment reviews. *Environmental Science and Bio/technology*, vol. 3, No. 2005, pp. 75-79.
- Brooks, J., ed. (2012). *Agricultural Policies for Poverty Reduction*. Paris: OECD Publishing.
- Cakmak, E.H., O.H. Eruygur (2008). Food, rural, agricultural and fisheries policies in Turkey. In *Les Agricultures Méditerranéennes: Analyses par Pays*, M. Allaya, ed. Montpellier: CIHEAM. (Options Méditerranéennes: Série B. Etudes et Recherches, No. 61).
- Cervantes-Gody, D., and J. Dewbre (2010). Economic importance of agriculture for sustainable development and poverty reduction: findings from a case study of Indonesia. OECD.
- Chand, R., and S. Parappurathu (2012). Temporal and spatial variations in agricultural growth and its determinants. *Review of Rural Affairs, Economic & Political Weekly Supplement*, vol. XLVIII, Nos. 26 & 27, p. 55.
- Chand, R., K. Praduman, and S. Kumar (2011). Total factor productivity and contribution of research investment to agricultural growth in India. Policy Paper, No. 25. New Delhi: National Centre for Agricultural Economics and Policy Research.
- _____ (2012). Total factor productivity and contribution of research investment to agricultural growth in India. Policy Paper, No. 25. New Delhi: National Centre for Agricultural Economics and Policy Research.
- Coase, R.H. (1937). The nature of the firm. *Economica*, New Series, vol. 4, No. 16, pp. 386-405.
- Codron J.M., and others (2004). Supermarkets in low-income Mediterranean countries: impacts on horticulture systems. *Development Policy Review*, vol. 22, No. 5, pp. 587-602.
- Denny, M., M. Fuss, and L. Waverman (1981). The measurement and interpretation of total factor productivity in regulated industries, with application to Canadian telecommunications. In *Productivity Measurement in Regulated Industries*. New York: Academic Press.
- Dewi, S., B. Belchor, and A. Puntodewo (2005). Village economic opportunities, forest dependence and rural livelihoods in East Kalimantan, Indonesia. *World Development*, vol. 33, No. 9, pp. 1419-1434.
- Duncan, R., and Y.W. Sing (2009). The failure of agricultural policy making in Fiji. *Pacific Economic Bulletin*, vol. 24, No. 2, pp. 167-184.

- Eberhardt, M. and F. Teal (2010). Mangos in the Tundra? Spatial heterogeneity in agricultural productivity analysis. *Agriculture and Its External Linkages*, vol. 2, *Part A of Handbook of Agricultural Economics*, Centre for the Study of African Economies, Department of Economics, University of Oxford, eds. Elsevier, 2002.
- Evenson, R.E., C. Pray, and M.W. Rosergrant (1999). Agricultural research and productivity growth in India. Research Report, No. 109. Washington, D.C.: International Food Policy Research Institute.
- Fan, S., P.B.R. Hazel, and S. Thorat (1999). Linkages between government spending, growth, and poverty in rural India. Research Report, No. 110. Washington, D.C.: International Food Policy Research Institute,
- Fan, S., B. Yu, and S. Jitsuchon (2008). Does allocation of public spending matter in poverty reduction? Evidence from Thailand. *Asian Economic Journal*, vol. 22, No. 4, pp. 411-430.
- Fan, S., L. Zhang, and X. Zhang (2002). Growth, inequality, and poverty in rural China: the role of public investments. IFPRI Research Report.
- Fiji (2014). *2020 Agriculture Sector Policy Agenda: Modernizing Agriculture*. Suva: Ministry of Agriculture, Fisheries and Forests, Rural and Maritime Development, and National Disaster Management.
- Food and Agriculture Organization (FAO) (2012). *State of Agriculture in the World 2012*. Rome.
- Fuglie, K. (2010). Sources of growth in Indonesian agriculture. *Journal of Productivity Analysis*, vol. 33, pp. 225-240.
- Fukase, E., and W. Marin (2015). Who will feed China in the 21st century? Income growth and food demand and supply in China. *Journal of Agricultural Economics*, Early view. Available from <http://onlinelibrary.wiley.com/doi/10.1111/1477-9552.12117>.
- Gibson, J., and S. Olivia (2010). The effect of infrastructure access and quality on non-farm enterprises in rural Indonesia. *World Development*, vol. 38, No. 5, pp. 717-726
- Giovannucci, D.S., and others (2012). Food and agriculture: the future of sustainability. A strategic input to the sustainable development in the 21st century (SD21) project. New York: United Nations Department of Economic and Social Affairs, Division for Sustainable Development.
- Global Harvest Initiative (GHI) (2014). *2014 GAP Report: Global Agriculture Productivity Report*. Washington, D.C.: Global Harvest Initiative.
- Gollin, D., D. Lagakos, and M.E. Waugh (2013). The agricultural productivity gap. Working Paper, No. 19628. Cambridge: National Bureau of Economic Research.
- Gulati, A. (2009). Indian agriculture: changing landscape. Paper prepared for the IAAE Conference. Beijing, 17 August.
- Gulati, A., R. Meinzen-Dick, and K.V. Raju (2005). Institutional reforms in Indian irrigation. Food Policy Statement, No. 2 (February). IFPRI.
- Headey, D., M. Alauddin., and D.S.P. Rao (2010). Explaining agricultural productivity growth: an international perspective. *Agricultural Economics*, vol. 41, pp. 1-14.
- India (2014). *Agriculture Census 2010-11 (Phase-I)*. New Delhi: Ministry of Agriculture, Department of Agriculture & Co-Operation, Agriculture Census Division.

- Indian Council for Agricultural Research (ICAR) (2010). *Degraded and Wastelands of India: Status and Spatial Distribution*. New Delhi: Indian Council for Agricultural Research.
- Johnston, B.F., and J.W. Mellor (1961). The role of agriculture in economic development. *American Economic Review*, vol. 51, pp. 566-593.
- Joshi, P.K., and others (2000). Socioeconomic constraints to legumes production in rice-wheat cropping systems of India. In *Rice-Wheat production System Sustainability in IGP*, C. Johansen and others, eds. ICRISAT and Cornell University.
- Kabeer, N. (1994). *Reversed Realities: Gender Hierarchies in Development Thought*. London: Verso.
- Kaur, M., and M.L. Sharma (1991). Role of women in rural development. *Journal of Rural Studies*, vol. 7, pp. 11-16.
- Key, N., S. Sadoulet, and A. de Janvry (2000). Transaction costs and agricultural household supply response. *American Journal of Agricultural Economics*, vol. 82, No. 2, pp. 245-259.
- Klasen, S.K., J. Priebe, and R. Rudolf (2013). Cash crop choice and income dynamics in rural areas: evidence for post-crisis Indonesia. *Agricultural Economics*, vol. 44, pp. 349-364.
- Krueger, Anne O. (1996). Political Economy of Agricultural Policy, Public Choice. vol. 87, No. 1/2, pp. 163-175.
- Kumar, P., S. Mittal, and M. Hossain (2008). Agricultural growth accounting and total factor productivity in South Asia: a review and policy implications. *Agricultural Economics Research Review*, vol. 21 (July-December), pp. 145-172.
- Lerman, Z., and D.J. Sedik (2009). Sources of agricultural productivity growth in central Asia: the case of Tajikistan and Uzbekistan. Policy Studies on Rural Transformation, No. 2009-05. FAO Regional Office for Europe and Central Asia.
- Ligon, Ethan A., and Elisabeth Sadoulet (2011). Estimating the effects of aggregate agricultural growth on the distribution of expenditures. CUDARE Working Paper Series, 1115. University of California at Berkeley, Department of Agricultural and Resource Economics and Policy.
- Liu, H., and T. Yang (2015). Explaining the productivity growth gap between China and India: the role of structural transformation. *The Developing Economies*, vol. 53, No. 2 (June), pp. 100-121.
- National Academy of Agricultural Sciences (NAAS) (1999). Reorienting land grant system of agricultural education in India. Policy Paper, No. 6. National Academy of Agricultural Sciences.
- North, D. (1981). *Structure and Change in Economic History*. New York: W.M. Norton.
- OECD (2010). Economic importance of agriculture for sustainable development and poverty reduction: findings from a case study of Indonesia. Global Forum on Agriculture. Paris, 29-30 November.
- _____ (2012). *Agricultural Policies for Poverty Reduction*. Paris: OECD Publishing.
- Pasha, H.A., A.G. Pasha, and K. Hyder (2002). The slowing down of the growth of total factor productivity in Pakistan. Karachi: Social Policy and Development Centre.
- Poapongsakorn, N. (2006). The decline and recovery of Thai agriculture: causes, responses, prospects and challenges. In *Rapid Growth of Selected Asian Economies: Lessons and*

- Implications for Agriculture and Food Security*. FAO Regional Office for Asia and the Pacific. Policy Assistance Series 1/3 (2006/06).
- Poapongsakorn, N., and others (1995). Agricultural diversification/restructuring of agricultural production systems in Thailand. Paper prepared for the Food and Agriculture Organization of the United Nations, Bangkok.
- Rada, N.E. (2013). Agricultural growth in India: examining the post-green revolution transition. Selected paper prepared for presentation at the Agricultural and Applied Economics Association's 2013 AAEA and CAES Joint Meeting. Washington, D.C., 4-6 August.
- Rada, N.E., and K.O. Fuglie (2012). Shifting sources of agricultural growth in Indonesia: a regional analysis. In *Productivity Growth in Agriculture: An International Perspective*, Fuglie and others, eds. CAB International.
- Randhawa, M.S. (1979). *A History of the Indian Council of Agricultural Research*. Available from <https://ia601602.us.archive.org/0/items/IcarHistory/IcarHistory.pdf>.
- Reardon, T., and C.P. Timmer (2007). Transformation of markets for agricultural output in developing countries since 1950s: How has thinking changed? In *Handbook of Agricultural Economics*, R. Evenson and P. Pingali, eds., vol. 3.
- Reardon, T., and others (2003). The rise of supermarkets in Africa, Asia and Latin America. *American Journal of Agricultural Economics*, vol. 85, No. 5, pp. 1140-1146.
- Rosegrant, M.W., and P.B.R. Hazell (1992). Agricultural productivity and sources of growth in South Asia. *American Journal of Agricultural Economics*, vol. 67, No. 3, pp. 757-761.
- Roumasset, J. Wither (2010). The economics of agricultural development? Working Paper, No. 10-3 (March). University of Hawaii at Manoa, Department of Economics.
- Schiff, Maurice, and Alberto Valdes (2002). Agriculture and the macroeconomy, with emphasis on developing countries. In *Handbook of Agricultural Economics*, edition 1, vol. 2, B.L. Gardner and G.C. Rausser, eds. Elsevier.
- Stigler, G.J. (1951). The division of labor is limited by the extent of the market. *Journal of Political Economy*, vol. 59, No. 3, pp. 185-193.
- Suphannachart, W., and P. Warr (2011). Research and productivity in Thai agriculture. *The Australian Journal of Agricultural and Resource Economics*, vol. 55, pp. 35-52.
- Suryahadi, A., D. Suryadarma, and S. Sumarto (2009). The effects of location and sectoral components of economic growth on poverty: evidence from Indonesia. *Journal of Development Economics*, vol. 89, pp. 109-117.
- Timmer, P.C. (2007). The structural transformation and the changing role of agriculture in economic development: empirics and implications. Wendt Lecture. American Enterprise Institute, Washington, D.C., 30 October.
- _____ (2015). Food security and scarcity: why ending hunger is so hard. Philadelphia: University of Pennsylvania Press.
- Unnevehr, L.J., and M.L. Stanford (1985). Technology and the demand for women's labour in Asian rice farming. In *Women in Rice Farming. Proceedings of a Conference on Women in Rice Farming Systems*. Aldershot: Gower Publishing.
- United States Department of Agriculture (USDA) (2010). Total factor productivity calculations. Available from www.ers.usda.gov/data-products/international-agriculturalproductivity/documentation-and-methods.aspx.

- Von Braun, J., A. Gulati, and S. Fan (2005). Agricultural and economic development strategies and the transformation of China and India. IFPRI Annual Report: Essays.
- Warr, P. (2006). Productivity growth in Thailand and Indonesia: how agriculture contributes to economic growth. , Working paper in Economics and Development Studies. Pajajaran University, Center for Economics and Development Studies, Department of Economics .
- World Development Indicators (WDI) (2015). WDI Database for 2015.
- Wickramasinghe, U., S. Saifullah, and H. Siregar (2013). The role of policies in agricultural transformation: lessons from Brazil, Indonesia and South Korea. Working Paper, No. 105. Bogor: Centre for the Alleviation of Poverty through Sustainable Agriculture.
- Wickramasinghe, U., and K. Weinberger (2013). Smallholder market participation and production specialization. Working Paper, No. 107. Bogor: Centre for Alleviation of Poverty through Sustainable Agriculture.
- World Bank (1991). *Gender and Poverty in India*. Washington, D.C.
- _____ (2006). *Indonesia: Revitalizing the Rural Economy*. Washington, D.C.
- Yang, X. (2003). *Economic Development and the Division of Labour*. New York: Blackwell.
- Zaman, H. (1995). Patterns of activity and use of time in rural Bangladesh: class, gender, and seasonal variations. *Journal of Developing Areas*, vol. 29, pp. 371-388.
- Zhang, Y., and B. Brummer (2011). Productivity change and the effects of policy reforms in China's agriculture since 1979. *Asian-Pacific Economic Literature*, vol. 25, No. 2 (November), pp. 131-150.

Subregion	Country	Output growth due to area expansion					Output growth due to intensive use of inputs (inputs / area)					Output growth due to growth in total factor productivity					Total agricultural output growth				
		1961 - 70	1971 - 80	1981 - 90	1991 - 00	2003 - 12	1961 - 70	1971 - 80	1981 - 90	1991 - 00	2003 - 12	1961 - 70	1971 - 80	1981 - 90	1991 - 00	2003 - 12	1961 - 70	1971 - 80	1981 - 90	1991 - 00	2003 - 12
East & North-East Asia	China	0.80	0.83	0.35	0.90	1.07	3.18	1.13	2.35	0.27	-0.72	0.90	1.34	1.78	3.99	3.20	4.87	3.31	4.49	5.16	3.55
	Japan	0.54	-0.76	-0.52	-0.81	-0.48	1.09	0.78	0.19	-1.80	-2.77	1.37	1.38	0.84	1.55	2.87	2.99	1.40	0.51	-1.06	-0.39
	Korea	1.79	-0.16	0.10	-1.28	-1.16	1.17	2.24	0.39	0.14	-0.41	1.51	3.73	2.42	3.60	1.89	4.48	5.81	2.91	2.46	0.31
North & Central Asia	Tajikistan		0.67	0.84	-0.48	0.85		0.95	0.74	-3.96	2.16		2.28	-0.71	0.34	2.17	0.00	3.90	0.87	-4.09	5.18
	Uzbekistan		1.73	1.30	-0.09	-0.17		0.42	0.60	-1.50	2.99		2.93	-1.23	2.31	2.59	0.00	5.07	0.68	0.72	5.42
Pacific - developed	Australia	1.94	0.30	0.28	-0.26	-0.81	0.07	-0.21	0.23	0.71	0.11	0.95	1.76	1.17	3.12	1.64	2.96	1.85	1.68	3.57	0.94
	New Zealand	1.23	1.27	0.17	-0.18	1.30	0.47	-0.92	-0.58	0.66	-0.56	1.06	0.94	1.42	1.78	0.39	2.76	1.29	1.01	2.26	1.14
Pacific - developing	Fiji	-0.74	2.02	3.44	-0.01	-0.14	3.14	0.92	-1.11	0.54	0.34	0.06	-0.20	-1.07	-1.27	-1.66	2.45	2.74	1.25	-0.74	-1.47
	PNG	3.09	1.79	1.43	1.32	2.73	0.18	-0.20	0.97	1.14	-0.47	-0.31	0.74	-0.27	0.01	0.08	2.97	2.33	2.12	2.46	2.34
South Asia	Bangladesh	2.15	0.97	2.45	1.21	0.55	0.27	0.76	0.74	0.71	0.68	-0.28	0.24	-1.10	1.03	3.04	2.15	1.97	2.09	2.95	4.27
	India	0.71	0.94	0.74	0.91	0.24	0.53	0.85	1.40	0.70	1.22	0.43	0.97	1.22	0.94	2.64	1.68	2.75	3.36	2.55	4.10
	Nepal	0.96	4.48	1.67	1.59	0.44	0.66	-1.44	0.90	1.41	1.49	-0.16	-1.18	2.12	-0.19	1.68	1.46	1.87	4.70	2.81	3.61
	Pakistan	2.01	1.04	0.42	0.77	0.65	0.50	1.73	1.28	1.32	1.73	1.76	0.01	3.08	1.14	-0.37	4.26	2.78	4.78	3.24	2.00
	Sri Lanka	2.29	0.24	0.27	0.29	1.27	-0.42	0.85	0.83	0.62	-0.09	0.79	2.17	-1.69	0.17	1.96	2.67	3.26	-0.59	1.08	3.15
South-east Asia	Cambodia	0.06	1.38	8.06	0.22	1.22	3.59	-4.01	-5.24	2.21	1.85	-0.98	-4.41	3.32	2.29	5.08	2.67	-7.04	6.14	4.73	8.16
	Indonesia	0.78	1.46	2.68	1.83	1.16	0.22	0.61	1.55	-0.30	0.57	1.71	1.27	0.35	0.56	2.58	2.71	3.34	4.57	2.08	4.32
	Lao PDR	0.53	3.66	0.80	3.18	2.85	4.50	-1.57	1.16	-0.12	0.94	0.66	-0.90	1.05	2.22	1.54	5.69	1.20	3.00	5.29	5.32
	Malaysia	2.54	2.28	3.56	0.26	0.94	-0.16	0.02	-1.99	0.39	-0.85	3.03	2.10	3.04	1.81	2.91	5.41	4.40	4.61	2.46	3.01
	Philippines	1.05	3.18	0.73	-0.43	1.39	1.83	-1.33	0.95	2.04	-0.69	-0.23	3.23	0.15	0.46	1.80	2.64	5.08	1.82	2.06	2.50
	Thailand	1.89	3.04	1.73	0.33	1.10	1.19	-0.34	0.98	-0.27	-0.63	0.35	2.27	0.04	2.34	2.22	3.43	4.97	2.74	2.39	2.70
	Vietnam	0.64	1.65	1.87	2.44	1.31	0.44	-0.05	1.04	0.92	0.03	-0.62	1.34	1.11	2.34	2.71	0.46	2.94	4.02	5.69	4.05
South-west Asia	Iran	0.39	-1.56	1.83	-0.48	1.06	1.30	3.03	1.66	1.94	-0.95	2.24	2.48	1.24	2.41	1.79	3.93	3.95	4.74	3.86	1.90
	Turkey	0.97	0.36	0.34	-0.36	-1.24	1.15	1.41	1.50	1.03	0.64	0.70	1.46	0.70	1.02	3.13	2.82	3.22	2.54	1.69	2.52

Source: USDA (2015).

Recent MPDD Working Papers

WP/09/01	Towards a New Model of PPPs: Can Public Private Partnerships Deliver Basic Services to the Poor? by Miguel Pérez-Ludeña
WP/09/02	Filling Gaps in Human Development Index: Findings for Asia and the Pacific by David A. Hastings
WP/09/03	From Human Development to Human Security: A Prototype Human Security Index by David A. Hastings
WP/09/04	Cross-Border Investment and the Global Financial Crisis in the Asia-Pacific Region by Sayuri Shirai
WP/09/05	South-South and Triangular Cooperation in Asia-Pacific: Towards a New Paradigm in Development Cooperation by Nagesh Kumar
WP/09/06	Crises, Private Capital Flows and Financial Instability in Emerging Asia by Ramkishen S. Rajan
WP/10/07	Towards Inclusive Financial Development for Achieving the MDGs in Asia and the Pacific by Kunal Sen
WP/10/08	G-20 Agenda and Reform of the International Financial Architecture: an Asia-Pacific Perspective by Y. Venugopal Reddy
WP/10/09	The Real Exchange Rate, Sectoral Allocation and Development in China and East Asia: A Simple Exposition by Ramkishen S. Rajan and Javier Beverinotti
WP/10/10	Approaches to Combat Hunger in Asia and the Pacific by Shiladitya Chatterjee, Amitava Mukherjee, and Raghendra Jha
WP/10/11	Capital Flows and Development: Lessons from South Asian Experiences by Nagesh Kumar
WP/10/12	Global Partnership for Strong, Sustainable and Balanced Growth: An Agenda for the G20 Summit by Nagesh Kumar, Shuvojit Banerjee, Alberto Isgut and Daniel Lee
WP/10/13	Economic Cooperation and Connectivity in the Asia-Pacific Region by Haruhiko Kuroda
WP/11/14	Inflationary pressures in South Asia by Ashima Goyal
WP/11/15	Social and Economic Impact of Disasters: Estimating the Threshold between Low and High Levels of Risk by Clovis Freire
WP/11/16	Financial Crisis and Regional Economic Cooperation in Asia-Pacific: Relevance, Trends and Potential by Nagesh Kumar
WP/11/17	Productive Capacities in Asia and the Pacific by Clovis Freire
WP/11/18	High Food and Oil Prices and Their Impact on the Achievement of MDG 1 in Asia and the Pacific by Clovis Freire and Alberto Isgut
WP/11/19	Impact of Health Expenditure on Achieving the Health-related MDGs by Clovis Freire and Nobuko Kajiura
WP/12/01	High Food Prices in Asia-Pacific: Policy Initiatives in view of Supply Uncertainty and Price Volatility by Clovis Freire, Aynul Hasan and M. Hussain Malik
WP/12/02	Building Productive Capacities: Challenges and Opportunities for Least Developed Countries by Clovis Freire
WP/12/03	Euro zone debt crisis: Scenario analysis and implications for developing Asia-Pacific by Sudip Ranjan Basu, Clovis Freire, Pisit Puapan, Vatcharin Sirimaneetham, and Yusuke Tateno
WP/12/04	Strategies for Structural Transformation in Countries in South and South-West Asia by Clovis Freire
WP/12/05	In which industries to invest? Aligning market and development incentives in Myanmar by Steven Ayres and Clovis Freire
WP/13/01	Policies for structural transformation: An analysis of the Asia-Pacific experience by C.P. Chandrasekhar and Jayati Ghosh
WP/14/01	G20 agenda for the World Economy: Asia-Pacific perspectives By Sudip Ranjan Basu, Alberto Isgut and Daniel Jeongdae Lee
WP/15/01	Infrastructure Financing, Public-Private Partnerships, and Development in the Asia-Pacific Region by Gilberto Llanto, Adoracion Navarro, Ma. Kristina Ortiz
WP/15/02	Financing for Development: Infrastructure Development in the Pacific Islands by ESCAP Pacific Office
WP15/03	Capital Market Development and Emergence of Institutional Investors in the Asia-Pacific Region by Hans Genberg
WP/15/04	Trade Finance for Sustainable Development in Asia and the Pacific by Sailendra Narain
WP/15/05	Financing Small and Medium Sized Enterprises for Sustainable Development: A View from the Asia-Pacific Region by Nick Freeman

WP/15/06	Financing the Social Sector: Regional Challenges and Opportunities by Social Development Division, ESCAP
WP/15/07	Inclusive Finance in the Asia- Pacific Region: Trends and Approaches by Md. Ezazul Islam
WP/15/08	Climate finance in the Asia-Pacific: Trends and Innovative Approaches by Ilaria Carrozza
WP/15/09	Financing Disaster Risk Reduction for sustainable development in Asia and the Pacific by Disaster Risk Reduction Section, ICT and Disaster Risk Reduction Division, ESCAP
WP/15/10	Financing Statistics Development in Asia and the Pacific by Statistics Division, ESCAP
WP/15/11	Financing Sustainable Development – What Can We Learn from The Australian Experience of Reform? by Wayne Swan
WP/15/12	Financing Development Gaps in the Countries with Special Needs in the Asia-Pacific Region by Mustafa K. Mujeri
WP/15/13	Polarizing world: GDP, development and beyond by Michael Shashoua and Sudip Ranjan Basu
WP/16/01	Strengthening the capacities of Asia and the Pacific to protect workers against unemployment By John Carter
WP/16/02	Asia-Pacific's experience with national systems of TVET By Jenny Grainger, Liz Bowen-Clewley and Sarah Maclean
WP/16/03	An analytical framework for identifying optimal pathways towards sustainable development By Jaebeum Cho, Alberto Isgut, and Yusuke Tateno
WP/16/04	Pathways for adapting the Sustainable Development Goals to the national context: the case of Pakistan By Jaebeum Cho, Alberto Isgut, and Yusuke Tateno
WP/16/05	Obstacles to productivity in Asia and Pacific region: finance reigns By Filipe Lage de Sousa
WP/16/06	China's productivity: past success and future challenges By Yanqun Zhang
WP/16/07	Fostering productivity in the rural and agricultural sector for inclusive growth and sustainable development in Asia and the Pacific By Upali Wickramasinghe

READERSHIP SURVEY

The Macroeconomic Policy and Financing for Development Division of ESCAP is undertaking an evaluation of “Fostering productivity in the rural and agricultural sector for inclusive growth and sustainable development in Asia and the Pacific”, with a view to making future issues more useful for our readers. We would appreciate it if you could complete this questionnaire and return it, at your earliest convenience, to:

Director
Macroeconomic Policy and Financing for Development Division
ESCAP, United Nations Building Rajadamnern Nok Avenue
Bangkok 10200, THAILAND

QUESTIONNAIRE

	Excellent	Very good	Average	Poor
--	-----------	-----------	---------	------

1. Please indicate your assessment of the *quality* of the publication on:

• Presentation/format	4	3	2	1
• Readability	4	3	2	1
• Timeliness of information	4	3	2	1
• Coverage of subject matter	4	3	2	1
• Analytical rigour	4	3	2	1
• Overall quality	4	3	2	1

2. How *useful* is the publication for your work?

• Provision of information	4	3	2	1
• Clarification of issues	4	3	2	1
• Its findings	4	3	2	1
• Policy suggestions	4	3	2	1
• Overall usefulness	4	3	2	1

3. Please give examples of how this publication has contributed to your work:

.....

.....

.....

.....

.....

4. Suggestions for improving the publication:

.....

.....

.....

.....

.....

About Economic and Social Commission for Asia and the Pacific (ESCAP)

ESCAP is the regional development arm of the United Nations and serves as the main economic and social development centre for the United Nations in Asia and the Pacific. Its mandate is to foster cooperation between its 53 members and 9 associate members. ESCAP provides the strategic link between global and country-level programmes and issues. It supports Government of countries in the region in consolidation regional positions and advocates regional approaches to meeting the region's unique socio-economic challenges in a globalizing world. The ESCAP office is located in Bangkok, Thailand.

WWW.UNESCAP.ORG

[TWITTER.COM/UNESCAP](https://twitter.com/UNESCAP)

[FACEBOOK.COM/UNESCAP](https://facebook.com/UNESCAP)

[YOUTUBE.COM/UNESCAP](https://youtube.com/UNESCAP)