



联合国
粮食及
农业组织

Food and Agriculture
Organization of the
United Nations

Organisation des Nations
Unies pour l'alimentation
et l'agriculture

Продовольственная и
сельскохозяйственная организация
Объединенных Наций

Organización de las
Naciones Unidas para la
Alimentación y la Agricultura

منظمة
الغذية والزراعة
للأمم المتحدة

E

FAO REGIONAL CONFERENCE FOR ASIA AND THE PACIFIC

Thirty-fifth Session

Thimphu, Bhutan, 17-20 February 2020

**State of Food and Agriculture in Asia and the Pacific Region, including
Future Prospects and Emerging Issues**

Executive summary

Food systems in Asia and the Pacific region are changing rapidly in both the supply and demand dimensions because of economic growth, structural transformation, emerging technologies and urbanization. The livelihoods of family farm households are becoming more complex and diversified, relying more on non-farm income. Although non-farm income helps alleviate poverty, it can also pose challenges in making family farming more competitive and diversified in order to provide nutritious food at affordable prices. Growing urbanization is leading to fundamental changes in food systems and food environments affecting consumers' food choices and how farmers connect with markets. Asia-Pacific is home to 479 million of the world's undernourished, while overweight and obesity continue to rise among children and adults. Given that progress in alleviating hunger has reversed and stalled after many years of rapid progress, it is crucial to benefit from the potential of structural transformation and urbanization in order to achieve zero hunger in Asia and the Pacific region.

Suggested action by the Regional Conference

The Regional Conference is invited to:

- help identify areas for increased analytical and policy work in order to contribute to achieving the Sustainable Development Goals;
- support and improve data collection;
- increase awareness and understanding of the diverse contributions, challenges and support needed to improve food security and livelihoods of family and smallholder farmers;
- reflect on ways to promote the use of innovations to become more competitive and diversified; and

This document may be printed on demand following an FAO initiative to minimize its environmental impact and promote greener communications. This and other documents can be consulted at www.fao.org

- create an enabling environment conducive to the growth of value-addition and employment in agribusiness, including by integrating family farms in rural-to-urban food system value chains.

Queries on the content of this document may be addressed to:

APRC Secretariat

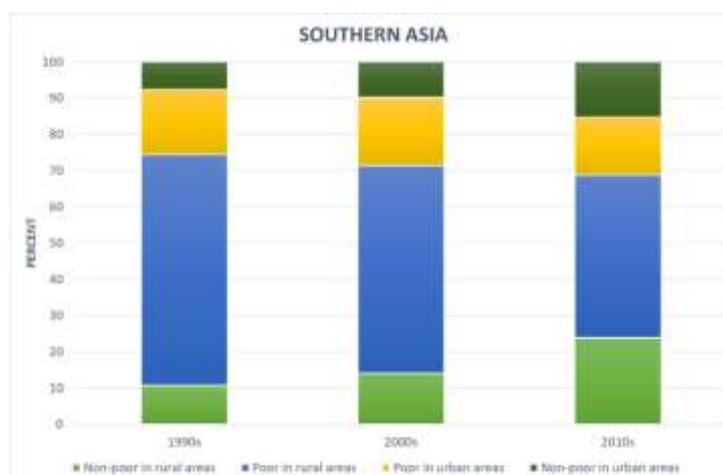
APRC@fao.org

Introduction

1. Asia and the Pacific region¹ has had the most rapid economic growth among major world regions for the past several decades. The incomes of the region's poor have also increased, leading to a massive reduction in extreme poverty, as well as declines in the prevalence of undernourishment and stunting. In East Asia and the Pacific, the prevalence of extreme poverty (defined as people living on less than USD 1.90 [2011 purchasing power parity] per day) declined from 61 percent in 1990 to 2 percent in 2015, while in South Asia it declined from 47 percent in 1990 to 16 percent in 2013.² Note that the declines in extreme poverty have not been driven solely by gains in China and India, there have been substantial declines of more than 40 percentage points since the late 1980s in many other countries as well, including Indonesia, Nepal, Pakistan and Viet Nam.

2. Just as with extreme poverty, moderate poverty (defined as people living on less than USD 3.10 [2011 purchasing power parity] per day) in the region has also declined substantially. This poverty reduction is not solely because of outmigration from rural areas, the proportion of the total population that is non-poor and living in rural areas has increased in both South Asia and East and Southeast Asia (Figure 1), in contrast to recent patterns in the rest of the world.³ For this trend to continue in the future, both rural farm and rural non-farm economies will need to support the livelihoods of farm households.

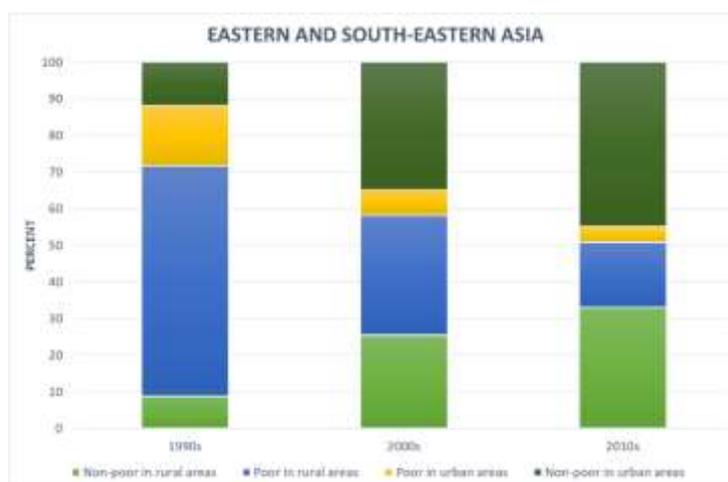
Figure 1. Changes in proportions of rural and urban poor and non-poor, in total population of selected countries by subregions, 1990s–2010s



¹ In this paper, Asia and the Pacific region refers to the developing countries for which operational responsibility rests with FAO's Regional Office for Asia and the Pacific. Countries in Central and Western Asia are not included.

² World Bank. World Development Indicators. 2019. Washington, DC. [Cited 22 November 2019]. <https://databank.worldbank.org/source/world-development-indicators>.

³ FAO. 2017. The State of Food and Agriculture: Leveraging food systems for inclusive rural transformation. Rome, FAO.



Source: FAO. 2017. *The State of Food and Agriculture: leveraging food systems for inclusive rural transformation*. Rome, FAO. See Figure 2 of that publication for data on regions outside of Asia. Data from Pacific Island countries in this regard are not available

3. Despite the aforementioned poverty reduction, income inequality has increased in Asia and the Pacific region over the past 25 years. The Gini coefficient, a widely used measure of income inequality, increased over time during that period in all four subregions.⁴

4. While population growth in the region has been slowing down, the population continues to increase, and along with it, the demand for food. Increased demand for food because of population growth and changes in the types of food demanded because of economic growth are both leading to increased pressure on the natural resource base. Some of the results are land degradation, changes in forest cover, freshwater scarcity and increased greenhouse gas emissions (see document APRC/20/5 on “Building sustainable and resilient food systems in Asia and the Pacific”).

5. The structure of populations is also changing because of a demographic transition (i.e. a shift from high rates of fertility and mortality to low rates of the same) that leads to ageing. Furthermore, urbanization in the region has been rapid, increasing from 30 percent in 1990 to 47 percent in 2016, with further rapid increases projected between now and 2050. Both of these phenomena are leading to shortages of labour in rural areas. International trade in food has expanded substantially (see below) and, along with urbanization, is creating changing patterns of food demand, with important implications for the livelihoods of family farmers.⁵

6. Economic growth and urbanization increase consumer demand for non-food items, consumer electronics (radios, televisions, mobile phones), education, health, entertainment and more convenient modes of transportation (motorcycles, cars), among others. Consumer demand for food is by nature limited to an extent, while demand for other products can be practically boundless, creating more numerous opportunities for employment in the companies that produce those products. In order to satisfy the increased consumer demand for non-food items, sectors other than agriculture will grow more rapidly and become more important to the economy, while agriculture’s share of gross domestic product (GDP) declines.⁶

7. For low- and middle-income countries, the share of agriculture in the labour force is substantially greater than the share of agriculture in GDP for any given subregion at any given point in time.⁷ For example, the share of agriculture in employment in South Asia in 2016 was 44 percent,

⁴ UNESCAP. 2018. *Inequality in Asia and the Pacific in the era of the 2030 Agenda for Sustainable Development*. United Nations ESCAP. [available at <https://www.unescap.org/publications/inequality-asia-and-pacific-era-2030-agenda-sustainable-development>].

⁵ FAO. 2018. *Dynamic development, shifting demographics, changing diets*. Bangkok. 172p.

⁶ Chenery, H., Srinivasan, T.N. 1988. *The Agricultural Transformation*. Handbook of Development Economics, vol. 1. Amsterdam, North-Holland. pp. 275-331.

⁷ Timmer, P. 2018. *State-level structural transformation and poverty reduction in Malaysia: a multi-commodity approach*.

compared with just 18 percent for the share of agriculture in GDP. In essence, there are too many agricultural workers chasing too little agricultural value added. This state of affairs reflects an intersectoral productivity gap for agricultural workers, labour productivity (i.e. value added per worker) is lower in agriculture than in the rest of the economy. This gap results in lower incomes for farm households, which is one key reason why many farm households in the region are so reliant on non-farm income.

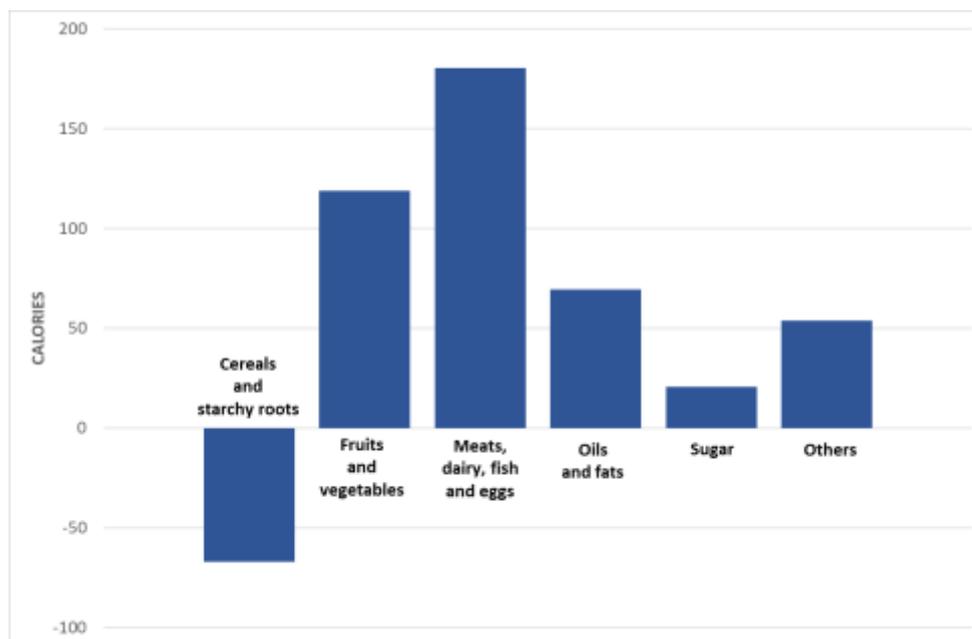
8. While non-farm income can help improve the well-being of family farmers, it is important to increase farm income through various means, such as increasing production of high-value crops, livestock and fish and adopting new technologies. In addition, economic growth and urbanization are creating new opportunities for trading, processing, packaging, distribution and storage. These demands are reflected in a growing share of agribusiness in GDP. Indeed, in several countries in the region (e.g. China, Malaysia, Thailand, Viet Nam), agribusiness now accounts for more value added in the economy than agriculture and is a source of employment for many farm households.⁸ These avenues to greater income for family farm households are discussed later in this paper.

9. Economic growth, especially for the poor, improves access to nutritious food. Given the rapid inclusive economic growth in the region, food consumption patterns have changed substantially over the past few decades (Figure 2). Three particular trends stand out: (1) declining per capita consumption of starchy staples in general and rice in particular; (2) increasing per capita consumption of animal-source foods and fruits and vegetables; and (3) increasing per capita consumption of highly processed foods that tend to be high in salt, sugar and saturated fats.⁹ Dietary diversity beyond staples is important for nutrition because different foods contain different macronutrients and micronutrients. Staple foods are a good source of dietary energy, but usually lack the key nutrients necessary to prevent disease and various micronutrient deficiencies. As a result, a diet overly reliant on staples is more likely to lead to stunted physical and cognitive growth. Animal-source foods and fruits and vegetables, however, are rich in micronutrients, high quality protein and fibre.

⁸ FAO. 2018. (see note 5).

⁹ FAO. 2018. (see note 5).

Figure 2. Change in calories (per capita per day) from various food groups in Asia and the Pacific region, 1990–2013



Source of raw data: FAO. FAOSTAT. 2019. [Cited 22 November 2019]. <http://www.fao.org/faostat/en/#home>

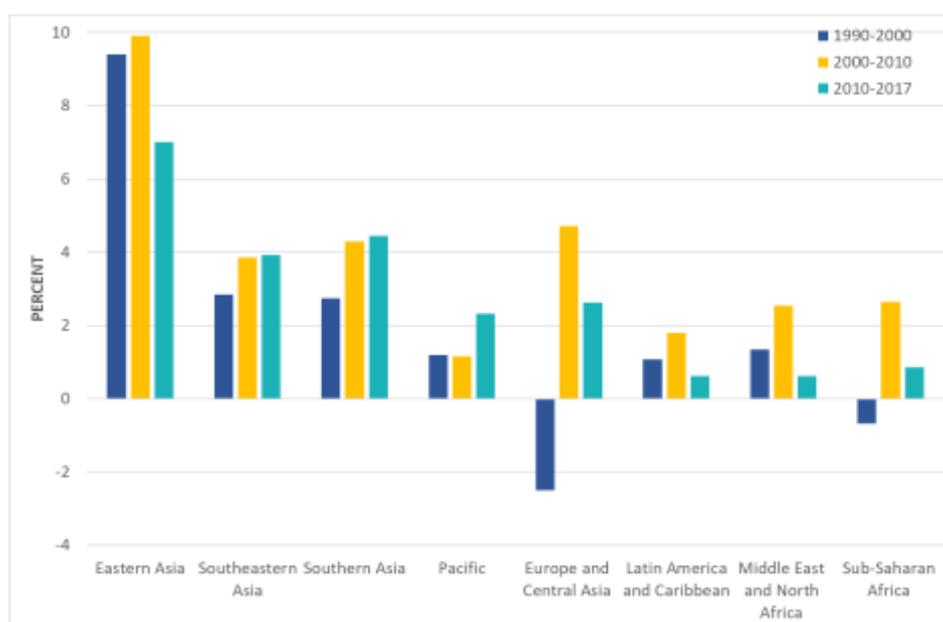
10. Per capita consumption of vegetable oils and sugar has increased in all subregions since 1990. While some amount of fats, sugar and salt are necessary in all diets, excessive consumption can lead to serious health problems, and many people are now consuming more than is optimal for health. Data on sales of highly processed food products, oils and fats suggest that consumption of such foods is high (and rising) in much of the region.¹⁰

Overview of trends in food security and nutrition

11. FAO's measure of the prevalence of undernourishment in Asia and the Pacific region has declined more or less continuously since the turn of the century, but the rate of progress has stalled in recent years. From 2003 to 2015, the prevalence declined from 18.2 percent to 11.8 percent (an average of more than one-half of a percentage point per year), but from 2015 to 2018, the prevalence declined to just 11.3 percent, a small incremental change over the past few years. This lack of recent progress is surprising, especially given that the economic slowdown that much of the world experienced in the aftermath of the 2008 financial crisis was not as disruptive for most of the countries in Asia and the Pacific region (Figure 3). In the past few years, global food prices were not particularly high, and there were no major conflicts big enough to have impacts at regional scale.

¹⁰ Baker, P. & Friel, S. 2016. Food systems transformations, ultra-processed food markets and the nutrition transition in Asia. *Globalization and Health*, 12(80). <https://doi.org/10.1186/s12992-016-0223-3>.

Figure 3. Annual average growth of real GDP per capita by decade by region



Source of raw data: World Bank. World Development Indicators. 2019. Washington, D.C. [Cited 22 November 2019]. <https://databank.worldbank.org/source/world-development-indicators>

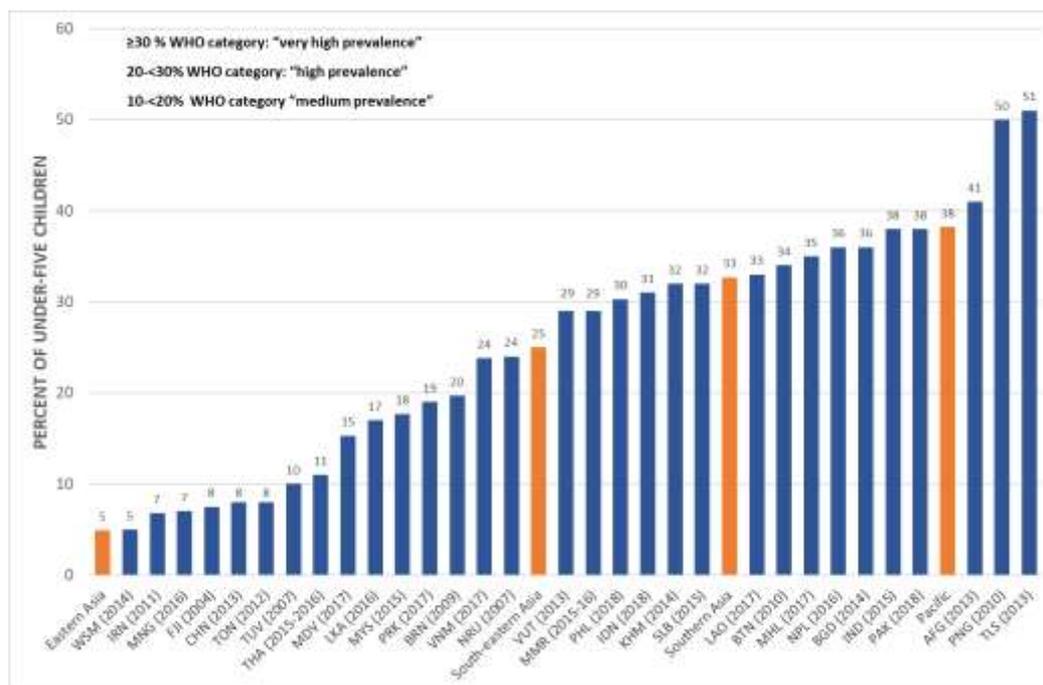
12. But other factors were at work to undermine the fight against hunger. Natural disasters (including droughts caused by El Niño), floods, cyclones and earthquakes have taken their toll on agriculture, livelihoods and food security, particularly on the most vulnerable (see document APRC/20/5 on “Building sustainable and resilient food systems in Asia and the Pacific”). Unequal distribution of income and the cumulative impact of stresses on the region’s natural resource base continue to affect that same group of people. This combination of factors is the most likely explanation for the stalled progress.

13. As with the prevalence of undernourishment, the prevalence of stunting (i.e. the failure for children under the age of five years to meet a universally agreed height-for-age standard) has declined substantially over time in the region, although there has not been progress in the Pacific since 1990.¹¹ Despite the general progress, current prevalence is still very high in many countries of the region (Figure 4), due to any (or most often a combination) of several factors, including inadequate intake of dietary energy, high quality protein or essential micronutrients. It can also be because of substandard water and sanitation infrastructure, as these lead to infections that hinder the efficient utilization of nutrients by the human body.

14. Progress is difficult to monitor in some countries because of a low frequency of data collection. For example, in Pacific Island countries, data on the prevalence of stunting are available from internationally recognized databases, on average, less than once in ten years since the turn of the century. No Pacific Island country has more than two data points since 2000.

¹¹ FAO. 2018. (see note 5).

Figure 4. Prevalence of stunting in children under five years of age, by country and subregion



Source of raw data: United Nations Children’s Fund (UNICEF), World Health Organization (WHO) & World Bank Group. 2019. *Levels and trends in child malnutrition: key findings of the 2019 Edition of the Joint Child Malnutrition Estimates*. Geneva, Switzerland, WHO

Note: Country estimates were updated for Indonesia (Riskesdas Survey 2018), the Lao People’s Democratic Republic (Lao Social Indicator Survey II 2017-18), Maldives (Demographic and Health Survey 2016-17), the Philippines (Expanded National Nutrition Survey 2018) and Viet Nam (National Surveillance Survey 2017)

15. When stunting is widespread in a population, it is symptomatic of suboptimal physical and cognitive growth. Children who are stunted are more likely to suffer from illness and long-term complications that increase health care costs, reduce educational attainment and lower participation in the workforce, ultimately resulting in reduced individual income-generating capacity.¹² As a result, undernutrition imposes a range of ongoing costs to both households and the national economy.

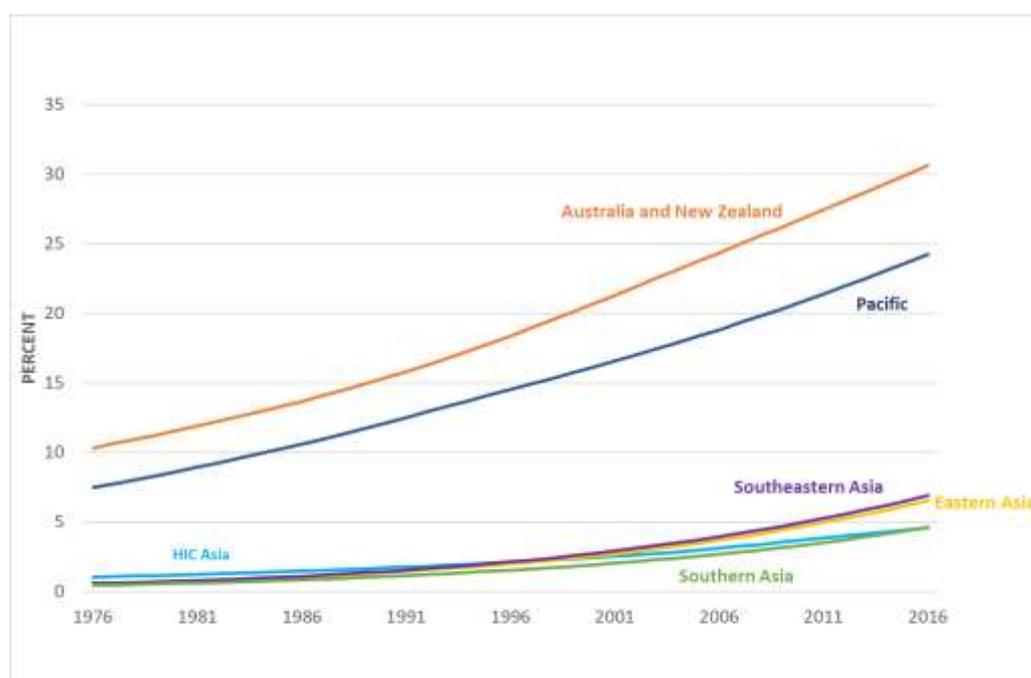
16. In addition to undernutrition, obesity is also a problem in much of the region, especially in the Pacific. Obesity rates in the Pacific, especially in Micronesia and Polynesia, are the highest in the world, indeed, the countries with the ten highest obesity rates in the world are all Pacific Island countries.¹³ In contrast, at present, adult obesity rates in Asia are generally among the lowest in the world, particularly for some of the high-income countries (Japan, the Republic of Korea and Singapore). Yet, they are rising rapidly in all subregions (Figure 5). In addition, there is evidence that the negative health effects of overweight and obesity begin at a lower value of BMI in Asian populations.¹⁴

¹² Hodinott, J., Behrman, J.R., Maluccio, J.A., Melgar, P., Quisumbing, A.R., Ramirez-zea, M., Stein, A.D., et al. 2013. Adult consequences of growth failure in early childhood. *American Journal of Clinical Nutrition*, 98(5): 1170–1178. <https://doi.org/10.3945/ajcn.113.064584>; Hodinott, J.F. 2013. The economic cost of malnutrition. In Eggersdorfer, M., Kraemer, K., Ruel, M., Van Ameringen, M., Biesalski, H.K., Bloem, M., Chen, J., Lateef, A. & Mannar, V., eds. *The road to good nutrition: a global perspective*, pp. 64–73. Basel. (also available at <http://www.ifpri.org/blog/road-good-nutrition>).

¹³ NCD Risk Factor Collaboration (NCD-RisC). 2018. NCD-RisC Data and Publications [online]. <http://ncdrisc.org/>

¹⁴ Ma, R.C.W. & Chan, J.C.N. 2013. Type 2 diabetes in East Asians: Similarities and differences with populations in Europe and the United States. *Annals of the New York Academy of Sciences*, 1281: 64–91. <https://doi.org/10.1111/nyas.12098>; Wen, C.P., Cheng, T.Y.D., Tsai, S.P., Chan, H.T., Hsu, H.L., Hsu, C.C. & Eriksen, M.P. 2009. Are Asians at greater mortality risk for being overweight than Caucasians? Redefining obesity for Asians. *Public Health Nutrition*, 12(4): 497–506. <https://doi.org/10.1017/S1368980008002802>; World Health

Figure 5. Prevalence of obesity in adults by subregion, 1976-2016



Source of raw data: NCD Risk Factor Collaboration (NCD-RisC). 2018. NCD-RisC Data and Publications [online]. <http://ncdrisc.org/>

Note: High-income countries in Asia include Brunei Darussalam, Japan, the Republic of Korea and Singapore

17. Obesity leads to a greater incidence of non-communicable diseases (NCDs) such as diabetes and heart disease. These are now the leading causes of death and morbidity in many developing countries and are causing escalating health care treatment costs that strain the limited financial capacity of their health care systems.¹⁵ In Asia and the Pacific region, direct health care costs and indirect productivity losses from overweight and obesity are estimated at 0.78 percent of GDP.¹⁶ Thus, malnutrition is a problem for both individuals and society.

Overview of trends in agriculture

18. Yields of cereals and root crops per unit of land generally continue to increase (Table 1). However, yield growth of rice and wheat, the main staples in Asia, and sweet potatoes, a main staple in the Pacific, has generally been slower in the current decade than in past decades. On the other hand, yield growth of maize has recently been more rapid than that of rice and wheat, resulting at least in part

Organization (WHO) expert consultation. 2004. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. *The Lancet*, 363(1): 157–163. [https://doi.org/10.1016/S0140-6736\(03\)15268-3](https://doi.org/10.1016/S0140-6736(03)15268-3).

¹⁵ Allotey, P., Davey, T. & Reidpath, D.D. 2014. NCDs in low- and middle-income countries – assessing the capacity of health systems to respond to population needs. *BMC Public Health*, 14(Suppl 2). <https://doi.org/10.1186/1471-2458-14-S2-S1>; IFPRI. 2015. *Global nutrition report 2015: Actions and accountability to advance nutrition and sustainable development*. Washington, DC. (available at <http://www.ifpri.org/publication/global-nutrition-report-2015>); IFPRI. 2016. *Global nutrition report 2016: From promise to impact – Ending malnutrition by 2030*. Washington, DC. (available at <http://www.ifpri.org/publication/global-nutrition-report-2016-promise-impact-ending-malnutrition-2030>); NCD Risk Factor Collaboration (NCD-RisC). 2016. Trends in adult body-mass index in 200 countries from 1975 to 2014: a pooled analysis of 1698 population-based measurement studies with 19.2 million participants. *The Lancet*, 387: 1377–1396. [https://doi.org/10.1016/S0140-6736\(16\)30054-X](https://doi.org/10.1016/S0140-6736(16)30054-X).

¹⁶ Helble, M. & Francisco, K. 2017. *The imminent obesity crisis in Asia and the Pacific: First cost estimates*. ADBI Working Paper Series No. 743. Tokyo. (available at <https://www.adb.org/publications/imminent-obesity-crisis-asia-and-pacific-first-cost-estimates>).

from increased adoption of hybrid varieties to meet increased demand for livestock feed. Unfortunately, yield growth of cereals, roots and tubers has been very slow in the Pacific.

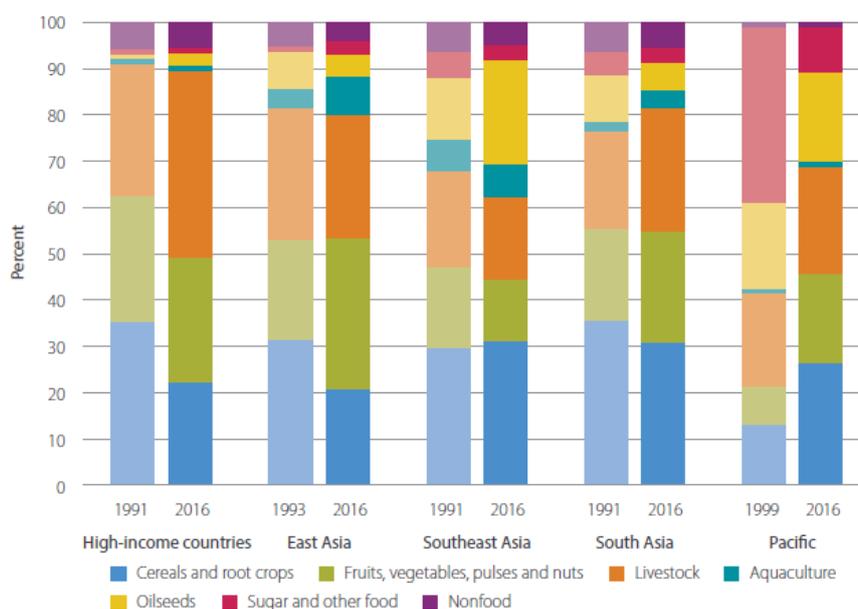
Table 1. Average annual yield growth rate (percent per year) of rice, wheat, maize and sweet potatoes in Eastern Asia, Southeastern Asia, Southern Asia and the Pacific, from 2000–2009 and 2010–2017

2000-2009	Rice	Wheat	Maize	Sweet potatoes
East Asia	0.7	3.2	1.9	0.3
Southeast Asia	1.7	-	4.2	2.4
South Asia	1.8	0.6	3.5	0.0
Pacific	-0.5	-	-0.2	0.2
2010-2017				
East Asia	0.7	2.1	1.2	0.1
Southeast Asia	0.9	-	2.2	4.6
South Asia	1.1	1.4	2.5	3.2
Pacific	0.3	-	5.3	0.0

Note: Average annual yield growth rate calculated from a regression of the logarithm of yield against time. A dash (-) indicates negligible quantities are produced in that particular subregion.

19. While cereals, roots and tubers are still very important to farm incomes and diets, production patterns are changing. In the early 1990s, rice ranked first in East, Southeast and South Asia in terms of farm production value (data for that time in the Pacific are sparse). In recent years, however, rice has been replaced by pork in East Asia and by milk in South Asia, reflecting the shifts in diets towards more animal-source foods. In most of the subregions, the share of cereals, roots and tubers in production value has declined over time (Figure 6) because of more rapid growth in livestock, aquaculture and fruits and vegetables. Furthermore, in all of the subregions, the combined value shares of livestock, aquaculture, fruits and vegetables exceed that for cereals, roots and tubers. Despite the importance of the latter crops, it is clear that the agriculture sector produces much more than cereals, roots and tubers.

Figure 6. Shares of various products in total farm production value, 1990s and 2016



Sources of raw data: FAO. FAOSTAT [online]. www.fao.org/faostat/; FAO. AQUASTAT [online]. <http://www.fao.org/nr/water/aquastat/main/index.stm>

Note: Starting year for each subregion varies depending upon data availability

20. Within the category of cereals, rice production is still dominant, except in the Pacific, where root crops predominate. However, the share of maize in total cereal production value has generally increased (especially in East and South Asia) because maize supplies the energy for most livestock feed, thus, input demand for maize increases along with increased consumer demand for livestock products. Minor cereals such as millet and sorghum remain just that, minor. There has been some small increase in the share of minor cereals in total cereal production value in the high-income countries, nearly all of which has been because of increased barley production in Australia, as well as, to a much lesser extent, increased sorghum production for animal feed. But in the other subregions, the share of minor cereals in total cereal production value has declined during the past 20 years.

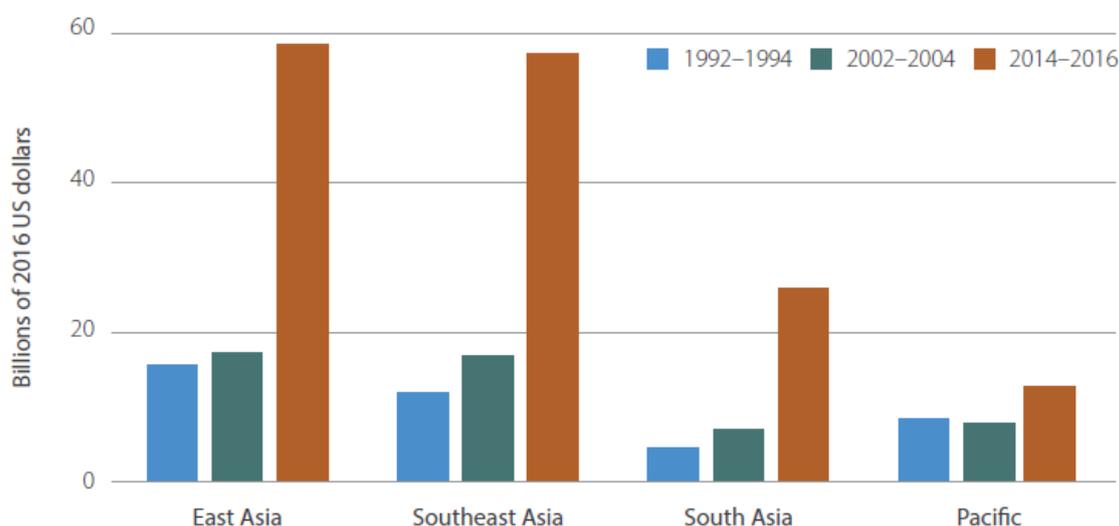
21. Just as the share of cereals, roots and tubers in total production value has generally declined, the shares of fruits and vegetables, livestock and aquaculture have all generally increased. Increased production of these latter foods should be welcome in the sense that such foods are high value (meaning more income for farmers) and nutritious (meaning that they can help to reduce the high rates of stunting in children under five years of age). The shift towards livestock and fruits and vegetables is also evident in changes in area harvested, with China providing the most striking example. In China, the area harvested¹⁷ to fruits and vegetables now exceeds that for any single cereal. The harvested maize area, used primarily for animal feed, now exceeds the area for rice and the area for wheat.

22. Another key trend in agriculture involves increased trade in food. The growth of international food trade was relatively slow in the region in the 1990s, but over the past 12 years the value of international food trade, after adjusting for inflation, more than tripled in all three Asian subregions and grew 67 percent in the Pacific (Figure 7). Free trade agreements, coupled with investments and innovations in infrastructure that allow for more efficient shipping of goods, have facilitated this increase in trade. The increased trade allows for more efficient food production at the global scale and can provide countries with the chance to import food from regions where land or water are more abundant. But trade can also facilitate more rapid exploitation of the environment, especially if exporting

¹⁷ “Area harvested” incorporates cropping intensity (the number of crops grown per year) and physical area. Thus, if a farmer grows two crops of rice in one year on one hectare, that counts as two hectares of rice area harvested.

countries subsidize the exploitation of natural resources (e.g. free or subsidized electricity for groundwater pumping that leads to drawdown of aquifers, subsidized fertilizer that leads to overuse and increasing leaching of nitrogen into waterways). Greater trade also provides export opportunities for farmers and value chains, but simultaneously makes it more important for farmers (and value chains) to enhance their competitiveness in order to compete against imports.

Figure 7. Annual average value of international trade in food, adjusted for inflation



Source of raw data: FAO. 2018. Dynamic development, shifting demographics, changing diets. Bangkok. 172p

Note: Data for the Pacific are in hundreds of millions of United States Dollars

23. Despite the rapid growth in international trade, it is still important to note that domestic trade is typically much more important than international trade. Nearly all low- and middle-income countries in the region source more than 85 percent of their dietary energy supply from domestic production, not imports. The main exceptions are a few small island, peninsular or landlocked nations. For example, domestic production in all of the Pacific countries accounts for less than 65 percent of dietary energy supply.¹⁸

Livelihoods for family farmers in a changing rural environment

The importance of family farmers

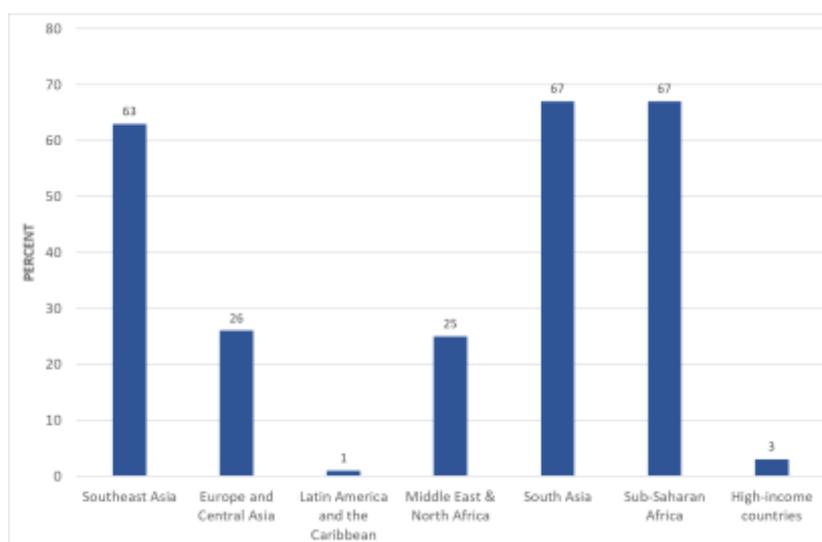
24. Throughout the world, smallholder family farmers are crucial to food production. Nowhere is this truer than in Asia and the Pacific region.¹⁹ About 95 percent of all farms in Asia and the Pacific region are less than five hectares in size, compared with just 50 percent in Latin America and the

¹⁸ FAO. 2018. (see note 5).

¹⁹ The definition of what constitutes a family farmer varies widely. FAO defines family farming as “a means of organizing agricultural, forestry, fisheries, pastoral and aquaculture production which is managed and operated by a family and predominantly reliant on family labour, including both women’s and men’s. The family and the farm are linked, co-evolve and combine economic, environmental, social and cultural functions (FAO, 2013).” [International year of family farming 2014. Master plan. Rome (available at http://www.fao.org/fileadmin/user_upload/iyff/docs/Final_Master_Plan_IYFF_2014_30-05.pdf)]. However, internationally comparable cross-country nationally representative data on type of labour use (hired versus family) by farm do not exist. Thus, in this paper, an operational definition of a family farm uses farm size as a proxy. Families, not large-scale agribusiness, manage the vast majority of small farms, so farm size is a reasonable proxy. This is in line with the assumption made in Mitra and Rao (2016). (FAO and MSSRF. 2016. Family Farming, meeting the Zero Hunger Challenge. Mitra, A. & Rao, N. Chapter 2. Families, farms and changing gender relations in Asia.)

Caribbean.²⁰ In terms of area, farms less than 5 hectares account for 66 percent of total agricultural area in Asia and the Pacific region, compared with less than 1.5 percent in Latin America and the Caribbean (Figure 8).

Figure 8. Percentage of farm area occupied by farms less than 5 hectares



Source of raw data: Lowder, S.K., Scoet, J., Singh, S., 2014. What do we really know about the number and distribution of farms and family farms in the world? ESA Working Paper, 14–2. Available at <http://www.fao.org/family-farming/detail/en/c/281544/>

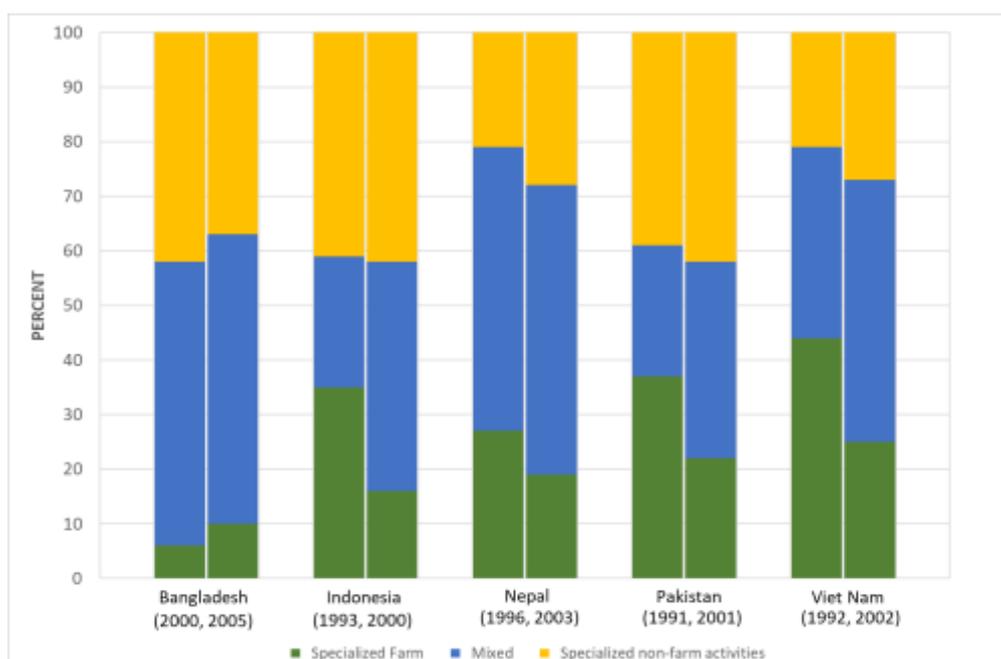
Different types of family farmers

25. It is important to realize that not all smallholder family farmers are alike. Even among smallholders, some have relatively more land than others. Some grow high-value crops like fruits and vegetables, raise livestock or practice aquaculture, although many specialize in staples such as rice, wheat or root crops. Some have a college education, while others may have never entered high school. These differences ultimately impact the structure of their livelihoods.

26. While most rural households earn income from agriculture, the relative importance of farm income to their overall livelihood strategies varies tremendously. As shown in Figure 9, rural households can be grouped into three main types: (1) those who rely predominantly on farm income; (2) those who rely predominantly on non-farm income; and (3) those who have a relatively mixed livelihood strategy. There are substantial numbers of people in all three of these categories. Over time, the trend is shifting to a greater importance of non-farm income.

²⁰ Lowder, S.K., Scoet, J. & Singh, S. 2014. What do we really know about the number and distribution of farms and family farms in the world? ESA Working Paper, 14(2). (available at <http://www.fao.org/family-farming/detail/en/c/281544/>).

Figure 9. Livelihood patterns in rural households over time



Source of raw data: Davis, B., Di Giuseppe, S. & Zezza, A. 2017. Are African households (not) leaving agriculture? Patterns of households' income sources in rural sub-Saharan Africa. *Food Policy*, 67: 153–174. (available at <https://doi.org/10.1016/j.foodpol.2016.09.018>). Note that despite the title of the paper, it includes data on Asian countries

Note: Households are considered specialized in farming or non-farm activities if 75 percent or more of their income comes from that sector

The challenges faced by family farmers in a changing world

27. Given the intersectoral productivity gap between agriculture and non-agriculture and the growing inequality in the region noted earlier, it is clear that a key challenge in the region is increasing the incomes and improving the livelihoods of smallholder family farmers. Meeting this challenge must take into account the mega-trends taking place in the region mentioned above, especially urbanization, increased international trade in food and dietary diversification. It must also take into account the different types of family farmers noted above.

28. The dynamic development taking place in the region is transforming the agriculture and rural sectors and making it more difficult in some ways for smallholder family farmers to earn a living from agriculture. For example, the average farm size is declining over time in most of the region, which makes it more difficult to earn a living strictly from agricultural pursuits.²¹ In South Asia and the Pacific, farm sizes are declining because the rural population is still increasing and there is not much land available for expansion. In Southeast Asia, the rural population has only started to decline slightly. The number of rural households has probably not started to decline, however, as much migration is by individual members of rural households, as opposed to migration of entire households. Thus, the turning point for a decline in the rural population will precede the turning point for a decline in the number of rural households, and it is the latter that determines average farm size. Furthermore, many urban residents still maintain farms as a hedge against large shocks or crises; if they lose their job in urban areas, they can still return to the countryside and have land to provide income. Average farm sizes are increasing in some countries in East Asia, but the increases are small in magnitude.

29. At the same time that average farm sizes are declining, economic growth and rising wages in urban areas have led to rising wages in rural areas. This trend is beneficial for poverty alleviation, as the poorest people in rural areas have no land and rely on labour earnings for their livelihoods. Nevertheless,

²¹ FAO. 2018. (see note 5).

rising wages outside of agriculture lead to labour shortages in agriculture and complicate livelihoods for farmers who hire labourers.

30. The labour shortages induced by rising wages are exacerbated by broader demographic trends that are leading to population ageing. These trends and the fact that rural outmigration is disproportionately undertaken by younger people, combine to lead to increasing average ages for farmers. This trend is most pronounced in the developed countries of East Asia, but it has also taken hold in developing countries. In terms of sex, the agricultural labour force is becoming feminized in South Asia, as males dominate migration to urban areas. But in the rest of the region, the trends point to males accounting for a slightly increased share of the agricultural labour force over time.²²

31. In addition to these upstream production challenges, family farmers also face challenges to their livelihoods further downstream. Economic growth and urbanization are leading to shifts in consumer diets and to increasingly sophisticated value chains that have implications for the quality of farm produce. While these shifts present challenges for smallholders, if they receive support to participate in this transformation, the challenges can turn into opportunities for improving rural incomes.

Opportunities to meet the challenges: pathways to improved livelihoods for family farmers

Mechanization and rental markets

32. Rising rural wages have led to increased mechanization of many farm operations, which increases labour productivity. In India, tractor sales tripled in the decade from 2003/2004 to 2013/2014, and the number of farms using tractors nearly doubled in just five years, from 2006/2007 to 2011/2012.²³ Rice farmers in the Mekong Delta and Zhejiang Province in China have reduced labour use substantially since the turn of the century by mechanization of harvest operations and switching to direct seeding.²⁴ Increased labour productivity in agriculture is essential to closing the intersectoral productivity gap with the industry and service sectors and to creating a more inclusive society where family farmers share in rising living standards.

33. Adoption of machinery and other new technologies by family farmers is essential not only for improving living standards, but also for enhancing agriculture sector competitiveness and for taking advantage of innovations in environmental management. Yet there are a range of constraints for farmers in the region to adopt new technologies. Because the importance of non-farm income to farmer livelihoods is increasing, family farmers in many cases have less time and incentive to learn new knowledge-intensive agricultural technologies (at the same time, though, the additional income from non-farm activities provides more money for farm investment). Because the farm population is ageing, some farmers may be more resistant to change, as they have less time left to benefit from adopting new technologies. Furthermore, since farm sizes are generally declining, family farmers have less land area that can benefit from new technologies, and thus less incentive to adopt them. Rising rural wages mean there is less incentive to adopt labour intensive technologies. In places where agriculture is being feminized, as in South Asia, women may have difficulty getting access to information and inputs, making it difficult for them to adopt new technologies.

34. Rental markets for land and services can help alleviate these problems. China has established a large network of land transfer service centres that provide a range of services to farmers who want to rent out or rent in agricultural land.²⁵ A key advantage of land rental markets is that it will be easier for the farmer who rents in land to achieve economies of scale. Thus, land rental markets can be especially useful for farmers with small farm sizes. One potential disadvantage of land rental markets is that land

²² FAO. 2018. (see note 5).

²³ Gulati, A., Saini, S. & Manchanda, S. 2017. Changing landscape of Indian farms: Holdings, labor, and machinery. Presentation to World Food Policy Conference, 16–17 January 2017, Bangkok, Thailand.

²⁴ Dawe, D. 2015. Agricultural transformation of middle-income Asian economies: Diversification, farm size and mechanization. ESA Working Paper No. 15-04. (also available at <http://www.fao.org/publications/card/en/c/26f0548f-e90c-4650-9e17-9c378f6484dd/>).

²⁵ Huang, J. 2017. Land transaction service centers in China: An institutional innovation to facilitate land consolidation. Beijing.

might become more concentrated in the hands of large absentee landowners, making it politically difficult to implement in some circumstances.

35. An alternative to farm households renting out land is to rent in services. Thus, for example, farmers can rent the services of threshers, water pumps or combine harvesters without owning one themselves. In Bangladesh, while 72 percent of farmers use power tillers, only 2 percent of farmers own them.²⁶ In Indonesia and the Philippines, the private sector provides mango spraying services in a similar manner.²⁷ These service rental markets allow farmers to adopt the latest technologies and make their farms more productive, without having to learn the technology themselves or borrow money to purchase an expensive machine. Such service markets can be particularly helpful for farm households that are earning a large percentage of their income from non-farm activities. The growth of service providers can also create skilled jobs that provide a pathway out of poverty.

36. The key advantage of rental markets is that they allow individual farmers to choose whether they prefer to continue managing their own land, allow others to manage specific operations or allow someone else to manage it entirely on their behalf if they are too old or would prefer to spend more time in non-farm occupations. These land and service rental markets benefit the landowner (who is now earning more income in the non-farm sector, in addition to receiving earnings from rental payments), the rentee (who is farming more land and earning more profits) and the service provider (who is growing their business). In particular, these markets can provide an important pathway for youth to gain access to land or use their knowledge of information and communication technologies.

37. Service provision through rental markets will be more efficient when it is driven by the private sector. Nevertheless, there may be a limited role for the public sector; it can, for example, support the development of prototype machinery suitable to local conditions. But it is always important to partner with the private sector on such initiatives so that there is a viable commercial delivery model for the technology. Governments can also provide some limited tax incentives and enact regulations to smoothen the functioning of credit markets, such as allowing machines to be used as collateral so that private banks are encouraged to lend to farmers or entrepreneurs. But financial subsidies for the purchase of machines work best if the farmer/entrepreneur has a substantial financial stake in promoting and delivering the machine rental service to other farmers. This is preferable to giving the machines away, as experience shows that such machines are often not repaired when they inevitably break down.²⁸

Integrating family farmers into value chains

38. As noted above, economic growth increases demand for non-food items. In addition, a part of the increased income also goes to higher quality food with attributes other than just dietary energy (e.g. taste, convenience, status, nutrition, novelty). These demands for more convenience, improved food safety, higher quality and other characteristics lead to the growth of an agribusiness sector that makes investments in food processing and distribution to deliver a variety of food types in different locations. Because these demands increase as people get wealthier, the ratio of agribusiness value added relative to agricultural value added tends to increase as GDP per capita increases. The growth of agribusiness, such as food and beverage-related manufacturing, provides employment alternatives to agriculture for farm households.²⁹

39. In addition, as urban areas proceed to account for an ever larger share of total food demand, family farmers (and value chains more broadly) will need to take into account the demands of urban consumers. Urban consumers are more likely to have access to refrigeration, both because average incomes are higher and because the electric grid is more accessible. This influences food demand; even

²⁶ Ahmed, A.U. 2017. Patterns of farm mechanisation in Bangladesh. In Mandal, M.A.S., Biggs, S.D. & Justice, S.E., eds. Rural mechanisation: A driver in agricultural change and rural development, pp. 119–134. Dhaka, Bangladesh, Institute for Inclusive Finance and Development (InM).

²⁷ Qanti, S.R., Reardon, T. & Iswariyadi, A. 2017. Indonesian mango farmers participate in modernizing domestic. Bulletin of Indonesian Economic Studies (accepted December 2016).

²⁸ Schmidley, A. 2014. Measures for reducing post-production losses in Rice. In Dawe, D., Jaffee, S. & Santos, N., eds. Rice in the shadow of skyscrapers: Policy choices in a dynamic East and Southeast Asian setting, pp. 67–72. Rome, FAO.

²⁹ FAO. 2018. (see note 5).

after taking account of their higher incomes, urban consumers are more likely to consume perishable foods such as fruits and vegetables and animal source foods.³⁰ For a variety of reasons (e.g. greater distances and traffic congestion between home and work, a wider variety of options for leisure activities, longer working hours in some cases), urban consumers tend to have a great demand for convenience when making food choices. This demand manifests in more purchases of processed food and a greater share of food expenditures on food prepared outside the home. In addition, urban consumers are younger than rural consumers, which also affects food demand (both in terms of quantity and in terms of food choices).

40. As demands increase for safer, higher quality food, a major challenge in emerging value chains will be to make sure they include smallholder farm households through various mechanisms such as contract farming.³¹ One way to make growth more inclusive is to include more farmers in these value chains, although there may be a bias towards including larger farms owned by relatively well-educated farmers, as this reduces transaction costs. Wage employment in large-scale production offers another alternative that can improve rural standards of living, and it should not be overlooked as a way to make rural development more inclusive.³² It can be especially beneficial to the rural landless, who have no opportunity to sell products into value chains because they have no land other than for their houses and a small garden, or to women who may be excluded from participating in product marketing chains.³³

41. Other examples of making value chains more inclusive include legal reforms that can help farmers form marketing cooperatives which will give them greater bargaining power with downstream buyers. Improving rural connectivity (both digital and through improved road networks) can help farmers engage in e-commerce and sell food directly to urban consumers (e.g. Taobao in China). Removing input subsidies can help farmers produce food with less fertilizer and pesticides which will have greater appeal to increasingly environmentally conscious consumers. Also, improving rural educational opportunities and health care facilities can underpin the livelihoods of family farmers and their ability to take advantage of entrepreneurial opportunities.

Production diversification

42. If the experience of the most developed countries in the region is a guide, and assuming economic growth and urbanization continue, then the trends in per capita consumption away from staple foods and towards other foods are likely to continue. These dietary shifts pose both a challenge and an opportunity for agricultural production in the region. If production does not become more diversified in response to changes in consumer demand, then imports of animal source foods and fruits and vegetables, which are essential for eradicating malnutrition and ensuring food security, are likely to increase. At the same time, these foods are high value and can generate more profits for family farmers.

43. There are many obstacles for family farms to diversify into fruits and vegetables.³⁴ First, not all land is suitable for growing new crops, agricultural production choices are heavily conditioned by local climate, water supply, topography and soil, most of which cannot be changed. For example, rice may be the only possible crop that can be grown in the wet season if the land is flooded (although diversification in the dry season is usually possible). Second, growing new crops requires new knowledge that farmers may not have. Third, fruits and other perennials require several years before the trees produce a harvest, and farmers need an alternative source of income during this transition period. Fourth, growing fruits

³⁰ FAO. 2018. (see note 5).

³¹ Miyata, S., Minot, N. & Hu, D. 2009. Impact of contract farming on income: Linking small farmers, packers, and supermarkets in China. *World Development*, 37(11): 1781–1790. <https://doi.org/10.1016/j.worlddev.2008.08.025>.

³² Maertens, M., Colen, L. & Swinnen, J.F.M. 2011. Globalisation and poverty in Senegal: a worst case scenario? *European Review of Agricultural Economics*, 38(1): 31–54. <https://doi.org/10.1093/erae/jbq053>; Maertens, M. & Swinnen, J.F.M. 2009. Trade, standards, and poverty: Evidence from Senegal. *World Development*, 37(1): 161–178. <https://doi.org/10.1016/j.worlddev.2008.04.006>.

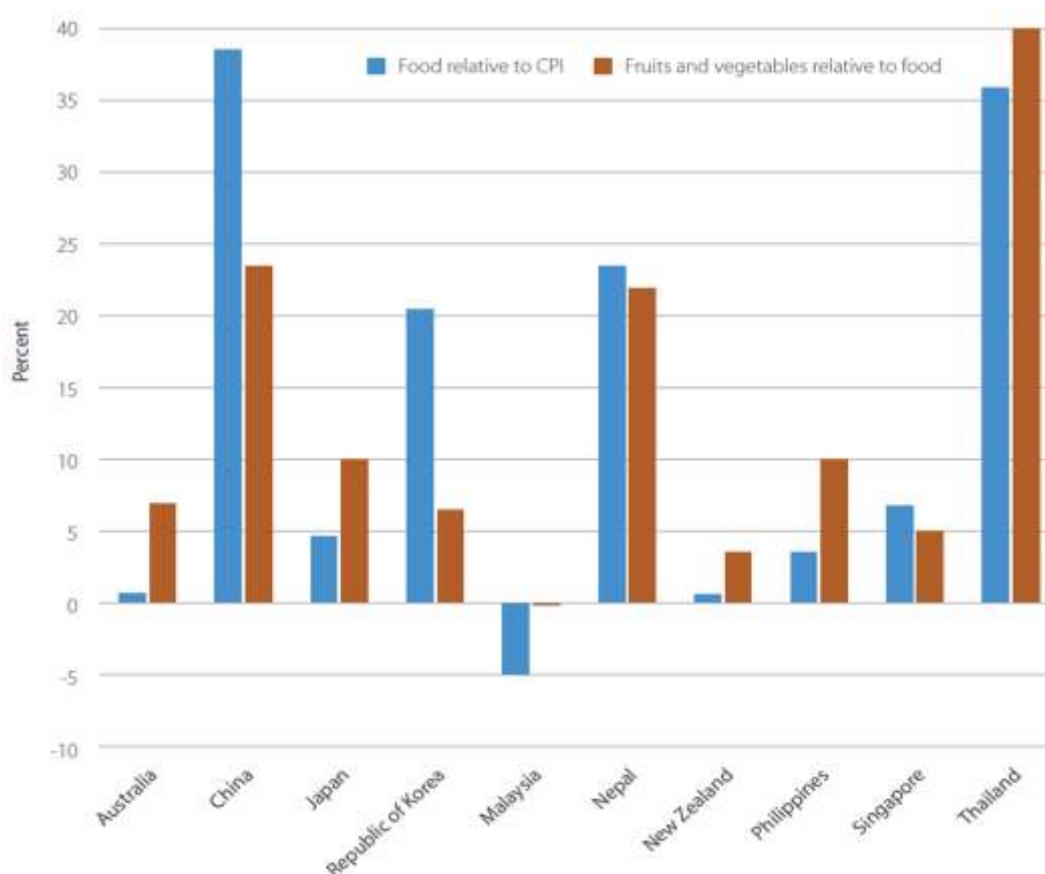
³³ Maertens, M., Minten, B. & Swinnen, J. 2012. Modern food supply chains and development: Evidence from horticulture export sectors in sub-Saharan Africa. *Development Policy Review*, 30(4): 473–497. <https://doi.org/10.1111/j.1467-7679.2012.00585.x>.

³⁴ FAO. 2018. (see note 5).

and vegetables tends to be riskier than growing staple crops, with greater fluctuations in both production and prices. Fifth, it is more labour-intensive to produce fruit and vegetables than rice,³⁵ which means that production costs will increase even more in countries where wages are rising. Finally, many countries provide explicit or implicit subsidies to cultivate rice. For example, rice import restrictions in some countries raise domestic rice prices substantially, thus discouraging farmers from diversifying into other crops.

44. Despite the many obstacles, diversification is indeed occurring. For example, the area in which fruits and vegetables have been harvested has increased substantially, especially in East Asia and South Asia.³⁶ There may be an opportunity to transfer knowledge from those farmers who have successfully transitioned away from staples to those who should be thinking about it. Nevertheless, supply growth for fruits and vegetables appears to be lagging behind demand growth, as evidenced by rising relative prices for fruits and vegetables (relative to prices for goods and services in general and relative to prices for other types of food) in a wide range of countries (Figure 10).

Figure 10. Relative price changes for food and fruits and vegetables, 2000-2016



Source of raw data: FAO. 2018. Dynamic development, shifting demographics, changing diets. Bangkok. 172p

45. In some countries, policies are changing in a way that will help accelerate this shift. For example, the Philippines implemented rice trade liberalization in 2019, allowing the private sector to

³⁵ Alviola, P.A., Cataquiz, G.C. & Francisco, S. 2002. Global competitiveness of rice-vegetable farming systems: Implication to Philippine food security. Paper presented at the International Rice Research Conference, 16–20 September 2002, Beijing, China; Kasem, S. & Thapa, G.B. 2011. Crop diversification in Thailand: Status, determinants, and effects on income and use of inputs. *Land Use Policy*, 28: 618–628. <https://doi.org/10.1016/j.landusepol.2010.12.00>; Maertens, M., Minten, B. & Swinnen, J. 2012. Modern food supply chains and development: Evidence from horticulture export sectors in sub-Saharan Africa. *Development Policy Review*, 30(4): 473–497. <https://doi.org/10.1111/j.1467-7679.2012.00585.x>

³⁶ FAO. 2018. State of Food and Agriculture in Asia and the Pacific Region, including Future Prospects and Emerging Issues. 34th Session FAO Regional Conference for Asia and the Pacific. Plenary session item. Bangkok.

make decisions about the quantity of imports, subject only to a 35 percent tariff on imports from fellow members of The Association of Southeast Asian Nations. This policy is expected to lower domestic rice prices and encourage crop diversification by farmers, possibly into dry season vegetables. The Government of Pakistan announced a USD 2 billion, five-year agricultural plan that focuses on crop diversification. Other countries and governments are experimenting with subsidies to grow alternative crops to rice, especially maize for livestock feed. Viet Nam provided seed subsidies and extension support in certain regions of the country to farmers who switched from rice to maize. Thailand provides credit subsidies to farmers who grow maize and mandates domestic maize procurement requirements for traders who want to import feed wheat. The state of Haryana in India offers free seeds and crop insurance for farmers who diversify from rice into maize. These initiatives are being made in response to growing demand for livestock feed, but also in some cases because of water shortages. While increased livestock production can help reduce the high prevalence of stunting in the region, it is also worth noting that such production often has adverse environmental impacts.

46. Crop diversification is also an issue at the farm level. Here, there are conflicting forces. One key force encouraging specialization at the farm level is knowledge, it is easier to have detailed knowledge of one crop than of many. It is also easier to market one crop than to market a wide variety of crops which requires knowledge of many different value chains. These factors pushing farms to specialize are in line with the employment specialization that most people practice in modern economies. In Thailand, farmers have been increasingly specializing in a smaller number of crops over the past 10 to 15 years, a trend that manifests across all income classes. Farmers who raise livestock and fish have also become more specialized in particular animal species.³⁷

47. On the other hand, some farmers grow many different crops, and some argue that this creates synergies and ultimately more profitable and sustainable farming, as well as more biodiversity. It is an unresolved question as to what is the optimal scale for crop diversification, farms, villages, provinces, nations or the globe. Whatever the answer, it will most likely vary depending upon the crop; it is also likely to be site-specific. But it is clear that diversification needs to take place at some scale in order to respond to changing consumer demand resulting from economic growth and urbanization. It is also clear that diversification at the national level is consistent with specialization at the farm level, and that many farmers will need to specialize if they are to improve their livelihoods.

Conclusion

48. While the prevalence of hunger is still decreasing slightly, the region is far behind the pace needed to eradicate hunger and malnutrition by 2030 as envisioned in SDG2. 1. The region suffers from multiple burdens of malnutrition: there are 479 million undernourished people, micronutrient deficiencies are still widespread, and the incidence of obesity is rising.

49. Improving the livelihoods of family farmers is also part of the Sustainable Development Goals, Target 2.3 is to double the income of small-scale food producers. One important pathway to achieve greater incomes is to increase labour productivity (as noted in Indicator 2.3.1). Improving labour productivity will require outmigration from agriculture into non-farm activities (including employment in agribusiness) and mechanization. Improving farmer incomes will also require family farmers to become better integrated into value chains and that the agricultural sector collectively diversifies away from staple foods in order to meet consumer demands for dietary diversification.

³⁷ Poapongsakorn, N., Pantakua, K. & Wiwatvicha, S. 2016. The structural and rural transformation in selected Asian countries.