



Food and Agriculture
Organization of the
United Nations

2017

Asia and
the Pacific

REGIONAL OVERVIEW OF FOOD SECURITY AND NUTRITION



**INVESTING IN FOOD
SYSTEMS FOR BETTER
NUTRITION**

2017

Asia and
the Pacific


**REGIONAL
OVERVIEW OF
FOOD SECURITY
AND NUTRITION**

REGIONAL OFFICE FOR ASIA AND THE PACIFIC
FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Bangkok, 2017



FAO. 2017. Regional Overview of Food Security and Nutrition: Asia and the Pacific, Bangkok, 64 pp.

ISBN: 978-92-5-109965-0



The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations (FAO) concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by FAO in preference to others of a similar nature that are not mentioned.

ISBN 978-92-5-109965-0

© FAO, 2017

FAO encourages the use, reproduction and dissemination of material in this information product. Except where otherwise indicated, material may be copied, downloaded and printed for private study, research and teaching purposes, or for use in non-commercial products or services, provided that appropriate acknowledgement of FAO as the source and copyright holder is given and that FAO's endorsement of users' views, products or services is not implied in any way.

All requests for translation and adaptation rights, and for resale and other commercial use rights should be made via www.fao.org/contact-us/licence-request or addressed to copyright@fao.org.

FAO information products are available on the FAO website (www.fao.org/publications) and can be purchased through publications-sales@fao.org.

COVER PHOTOGRAPH

Ciawi, Bogor, Indonesia

"Results of Hard Work"- The cucumber harvest

©FAO/Rully Kustiwa

Photo taken on 7 November 2013.

CONTENTS

Foreword	v
Acknowledgements	vii
Key messages	viii
Abbreviations	ix
<hr/>	
The 2030 Sustainable Development Agenda for Food Security and Nutrition in Asia and the Pacific	1
<hr/>	
Regional Overview of the Food Security and Nutrition Situation	5
The prevalence of undernourishment	6
Food insecurity as experienced by people – the Food Insecurity Experience Scale	7
Malnutrition among children – insufficient progress to meet the 2030 targets	9
<hr/>	
Promoting Healthy Diets through Nutrition-Sensitive Food Systems	17
What is a healthy diet?	18
Dietary trends in Asia and the Pacific	20
Government initiatives to encourage healthy diets	23
<hr/>	
Linking Smallholders to Remunerative Markets	27
The building blocks for successfully linking smallholders to markets	28
Policies, legislation and projects facilitating smallholder linkage with markets	28
<hr/>	
Prices, Policy and Food Security	33
International food prices	34
Domestic food price inflation	35
An overview of recent policy responses	36
<hr/>	
Reducing Food Loss and Waste – Towards a More Efficient Food System in Asia and the Pacific Region	39
Defining and measuring food loss and waste	40
A review of food loss estimates in the region	41
Initiatives in the region on reducing food loss and waste	44
The next steps	46
References	49

BOXES, FIGURES AND TABLES

Boxes

Box 1	WHO guidelines on healthy diet for adults	19
Box 2	Conceptual definitions of food loss and waste	41
Box 3	India – food loss estimates for 2013-2014	43
Box 4	An illustration of identified problems and their solutions	46

Figures

Figure 1	Undernourishment in Asia and the Pacific Region	6
Figure 2	The Food Insecurity Experience Scale	8
Figure 3	Prevalence of stunting in children under five years of age	10
Figure 4	Stunting rates by wealth quintiles	11
Figure 5	Ratio of stunting rates between poorest and richest wealth quintiles	12
Figure 6	Wasting prevalence 2016	13
Figure 7	Overweight prevalence among children under five around 2000 and 2016	13
Figure 8	Change in food category intake by Asia-Pacific subregion 2000 compared to 2013 (weighted by population)	20
Figure 9	Fruits and vegetables, intake	21
Figure 10	FAO food price indices, 2011-2016	34
Figure 11	Domestic prices of selected cereals in selected markets, 2011 to 2016	35
Figure 12	Relative price increases of various food subgroups in the region as a ratio of prices for cereals, 2014-2016	36
Figure 13	Food loss and waste in various regions	41
Figure 14	Food loss across sub-regions	42

Tables

Table 1	Number of undernourished (million) and prevalence of undernourishment in Asia and the Pacific Region in 2016	6
Table 2	Percentage of people affected by severe food insecurity in the region measured using the FIES, 2014-2016	8
Table 3	Country level prevalence rates for stunting among children under five years of age	10
Table 4	Progress towards achieving the target on reducing overweight in children under five years of age	14
Table 5	Six broad mechanisms and instruments for enhancing smallholder linkage to markets	28
Table 6	Main features of selected targeted interventions linking smallholders to markets	31

FOREWORD

When the international community came together in 2015 to announce its ambitious 17 Sustainable Development Goals (SDGs) the mood was one of optimism. Agenda 2030, as it is now known, would, among other things, lead us to a world without hunger and poverty. Two years later, in 2017, we still believe that we can become the “zero hunger generation.” But the clock is ticking, and while good progress has been made towards eliminating hunger and poverty in the Asia-Pacific region, recent signs suggest that we must redouble our efforts in pursuit of these goals.

Last year, we reported that momentum in the reduction of hunger was slowing. This year, there are growing indications that in some areas not only is the rate slowing but it has actually stopped and in some cases reversed. In other words, in some areas of this region, hunger could be on the rise once again.

The numbers remain frustratingly high – some 490 million people are hungry in Asia and the Pacific, with large disparities across subregions, countries and demographic groups within countries. If these trends continue, many countries in the region will fall short of the 2030 target of ending food insecurity. This reality points to an urgent need to step up investment in agriculture while taking action in other areas to tackle malnutrition, such as improvements to sanitation, access to safe drinking water, improving diets during the first 1000 days of life, and increasing consumption of diverse nutrient-rich foods.

Promoting healthy food systems was the fundamental recommendation of the Second International Conference on Nutrition held in Rome in 2014. The review in this report shows that while there has been good growth in consumption of food items considered as healthy, progress remains inadequate and special efforts are required in this area through supportive policies, project interventions, and awareness campaigns. At the same time, however, the trend towards increased consumption of food items considered as unhealthy has been gaining strength. Taken together, the diet challenge facing most countries is to further improve the consumption of healthier food items while curbing the growth in consumption of unhealthy ones.

Tackling the food security and nutrition challenges will also require enhanced investment in building pro-poor, stable and sustainable food systems, including investment in smallholder agriculture. While access to markets has been one of the main pathways through which millions of smallholders in this region moved out of poverty during the past few decades, there is a need to accelerate this process if those remaining behind are to double their incomes by 2030. While the region has had good experience with programmes and projects that have been relatively effective in raising farm productivity and incomes, scaling up such interventions remains a challenge. This report also points out that, while there are a few exceptions, food prices worldwide have been declining in recent years and this provides a good window of opportunity to put in place policy measures aimed at long-term food and nutrition security.

The special theme of this year's report is *Reducing Food Loss and Waste*. Considerable analytical work has been undertaken on this issue during the past 4-5 years, reaffirming the initial claims that reducing food loss and waste offers a triple win – for food security, higher income for farmers and supply chain actors, and the environment. The special section reviews existing knowledge on the extent of food loss and waste in the region, examines their definitions and measurement challenges, and considers existing policy/programme initiatives. One conclusion is that the data and available estimates are inadequate for establishing a baseline for the purpose of monitoring progress. FAO is finalizing some approaches that would help national statistics offices collect essential data and establish a baseline, which is essential for monitoring progress.

This generation has a real chance to make hunger and malnutrition history. Building on our past successes and the growing awareness about these issues, we also have good reasons to be optimistic that we can become the Zero Hunger Generation. But going forward we must avoid complacency and stay fully committed to the objectives we have set out for ourselves through the SDGs. It is my hope that this report will contribute to a more informed dialogue and more concerted action by all partners and will enable accelerating collective progress towards the goal of a healthy and hunger-free Asia and the Pacific.



Kundhavi Kadiresan
Assistant Director General and Regional
Representative for Asia and the Pacific

ACKNOWLEDGEMENTS

This Asia and the Pacific Regional Overview of Food Security and Nutrition was prepared by a team comprising Ramesh Sharma (Senior Consultant), Vinod Ahuja (Policy Officer) and David Dawe (Senior Economist), under the guidance of Kundhavi Kadiresan, FAO Assistant Director-General and Regional Representative for Asia and the Pacific.

Contributions were received from many FAO staff members. These included, in alphabetical order: Aziz Arya, Anthony Bennett, Sunniva Bloem, Sumiter Broca, Jaesik Lee, Clara Park, Mukesh Srivastava, Yukitsugu Yanoma and Yurdi Yasmi at the Regional Office in Bangkok; Tim Martyn, FIRST Policy Officer in Fiji; and Felix Baquedano, Carlo Cafiero, Filippo Gheri, Cindy Holleman, Areej Jafari, Anne Kepple, Ekaterina Krivonos, Isabel Parras Pancorbo, Luca Renzi, Rosa Rolle, JungEun Sohn and Ramani WijesinhaBettoni at FAO Headquarters in Rome.

At the Regional Office, Melina Lamkowsky provided data analysis assistance, Allan Dow helped develop the key messages and Kanokporn Chansomritkul, Surawishaya Paralokanon, and Poranee Ngarmtab coordinated the publishing process, with the valuable support of colleagues at headquarters.

Copy editing, proofreading and layout were provided by QUO Global in Bangkok.

For more information about this publication, please contact Vinod Ahuja (vinod.ahuja@fao.org) or David Dawe (david.dawe@fao.org).

KEY MESSAGES

The fight against hunger is slowing and as we reassess progress we are concerned that the number of hungry people in Asia and the Pacific region may have already begun to rise. This means that many countries in this region risk not meeting the 2030 target of ending food insecurity.

Malnutrition and stunting among children below the age of five remains high in many countries in the region, with large disparities among population groups. Recent initiatives – such as multisectoral approaches, amended policies and interventions that are more nutrition-sensitive – are helping, but these efforts need to be considerably scaled up.

More people in Asia and the Pacific region are moving towards healthier diets, although the availability of nutritious foods is still inadequate in many countries. **However, on average, the consumption of food items considered unhealthy is also on the rise.** A key challenge is to reorient food systems in a way that will help promote healthier diets through supportive food and trade policies, education and awareness campaigns.

Smallholder farmers need better access to more profitable markets if they are to escape poverty and food insecurity. While some technical assistance projects have been effective in improving rural livelihoods, it is essential to address systemic weaknesses at the national level by promoting farmer organizations, investing in improved rural infrastructure and improving the functioning of rural financial markets.

In view of the overall trend in declining food prices in recent years, and a relative abundance of food, there is less public concern over the state of food security; nevertheless, it is important that governments and other stakeholders not become complacent. Given the fundamental importance of food in both production and consumption for the poorest of the poor, stepped up investments in the food economy will be essential if we are to achieve the SDG goal to “leave no one behind.”

Reducing food loss and waste offers a triple win – for food security, higher farm income and the environment. While current knowledge on the extent and incidence of food loss along the supply chain, or hotspots in the chain, is inadequate, recent government initiatives addressing this challenge are encouraging.

ABBREVIATIONS

AARR	Average Annual Rate of Reduction	IFAD	International Fund for Agricultural Development
ADF	Agricultural Development Fund	IFPRI	International Food Policy Research Institute
CADP	Commercial Agriculture Development Project (Nepal)	Kcal	Kilocalories
CIPHET	Central Institute of Post-Harvest Engineering & Technology	MDG	Millennium Development Goal
DES	Dietary Energy Supply	NCD	Non-communicable diseases
DF	Direct Farm (programme, China)	OECD	Organisation for Economic Co-operation and Development
FAO	Food and Agriculture Organization of the United Nations	PACT	Project for Agriculture Commercialization and Trade (Nepal)
FBS	Food Balance Sheet (FAO)	PB	Production Base (programme, China)
FIES	Food Insecurity Experience Scale	PHL	Post-harvest loss
FIRST	Food and Nutrition Security Impact, Resilience, Sustainability and Transformation	PoU	Prevalence of Undernourishment
FL	Food loss	SDG	Sustainable Development Goal
FLW	Food loss and waste	SHML	Smallholder market linkages
FW	Food waste	UNICEF	United Nations Children's Fund
g	Gram	UNSCN	United Nations Standing Committee on Nutrition
GDP	Gross Domestic Product	US\$	United States dollar
GNR	Global Nutrition Report	USDA	United States Department of Agriculture
HLPE	High-level Panel of Experts on Food Security and Nutrition	WFP	World Food Programme
ICAR	Indian Council for Agricultural Research	WHA	World Health Assembly
ICN2	Second International Conference on Nutrition	WHO	World Health Organization
		WTO	World Trade Organization

THE 2030 SUSTAINABLE DEVELOPMENT AGENDA FOR FOOD SECURITY AND NUTRITION IN ASIA AND THE PACIFIC



In September 2015, 193 countries adopted the 2030 Agenda for Sustainable Development, which commits world leaders to ending poverty and hunger in all its dimensions and shifting to a sustainable development path integrating economic, social and environmental dimensions. The Agenda contains 17 Sustainable Development Goals (SDGs) and 169 associated targets.

The 2030 Agenda has a strong focus on food security and nutrition, with a specific goal defined as follows: *End hunger, achieve food security and improved nutrition, and promote sustainable agriculture* (SDG 2). This goal is comprehensive and is articulated around outcomes, covering in large part all four dimensions of food security (food

availability, access, utilization and stability) and nutrition. Regular and systematic monitoring of the SDG 2 indicators therefore has a prominent role in providing valuable and regular evidence to member states, regional bodies and international organizations.

The Food and Agriculture Organization of the United Nations (FAO) has committed to support the monitoring of trends in food security and nutrition within the framework of the new 2030 Agenda. This is to be achieved through two annual corporate publications, *The State of Food Security and Nutrition in the World* and *the Regional Overview of Food Security and Nutrition* reports. The global report will provide a situation analysis of SDG 2 at the global



level, monitor food and nutrition developments, and provide analytical interpretation of the existing and emerging global trends. The regional reports will complement the global report, providing more in-depth situation analyses for each region with regard to progress towards achieving SDG 2 targets, combined with an updated review of policy interventions and analysis of key drivers of food security and nutrition outcomes.

With that background, this report presents the trends and levels of the food security and nutrition situation in Asia and the Pacific region and highlights relevant policy developments to facilitate more informed dialogue around those trends. The purpose is to inform global and regional audiences (comprising development practitioners, policy-makers, researchers, advocates and citizens at large) with the food security and nutrition situation in the region and to facilitate more coordinated action in support of SDG 2. Every year, the report also features a special section on a selected key issue with implications for food security and nutrition in the region. This year the special section is on Food Loss and Waste.

The report is organized as follows. Chapter 2 assesses the current food security and nutrition situation and discusses the progress made in the region in two key areas: i) food insecurity and hunger, based on two indicators – the Prevalence of Undernourishment (PoU) and the levels of moderate and severe food insecurity based on the Food Insecurity Experience Scale (FIES); and ii) malnutrition, based on SDG indicator 2.2.1 on stunting and SDG indicator 2.2.2 on wasting and overweight among children under five years of age. Chapter 3 presents an analysis of issues, trends and national and regional policy and programme initiatives for nutrition-sensitive food systems. Considering the central role of smallholder farmers in helping to achieve SDG 2 and the need to invest in inclusive and sustainable food systems that integrate poor households in a growing economy, Chapters 4 and 5 present some discussion on linking smallholders to markets, as well as prices, food security and nutrition in the context of declining world export prices and recent policy responses. Finally, Chapter 6 presents a review and analysis of the regional experience on the special theme: Food Loss and Waste – Towards a More Efficient Food System in Asia and the Pacific Region.

REGIONAL OVERVIEW OF THE FOOD SECURITY AND NUTRITION SITUATION



While acknowledging the commendable progress made by Asia and the Pacific region in reducing hunger and malnutrition, the 2016 Regional Overview report (FAO 2016a) cautioned against complacency in the fight against hunger, given the still high number of hungry and undernourished people in the region, the growing pressure on natural resources and the newer dimensions of malnutrition such as obesity and hidden hunger. The report also noted the slowdown in progress against hunger in recent years and the need to pay more attention to growth of the agriculture sector, support for

diverse food systems, and public investment in quality health care, nutrition education and sanitation. Against that background, this section reviews the food security situation in the region using fresh estimates of the two indicators that have been selected to monitor progress towards the SDG 2, Target 2.1:¹

- Indicator 2.1.1: Prevalence of Undernourishment (PoU), and
- Indicator 2.1.2: Prevalence of moderate or severe food insecurity in the population, based on FIES

¹ Target 2.1 of SDG 2 seeks to end hunger and ensure access by all people – in particular, the poor and people in vulnerable situations – to safe, nutritious and sufficient food at all times.

The prevalence of undernourishment

The PoU indicator is an estimate of the proportion of the population whose typical food consumption is insufficient to provide the dietary energy levels required to maintain a normal active and healthy life.² FAO has produced estimates of the PoU since 1974 and these have been used to monitor the World Food Summit target and the Millennium Development Goal (MDG) 1C target at national, regional and global levels since 1999 for almost all countries in the world.

The new estimates of the PoU show that the slowdown in the fight against hunger continues and the number of hungry people in the region may be on the rise

FAO has revised PoU estimates based on: (i) more accurate estimates of Dietary Energy Supply (DES); (ii) updated estimates of the coefficient of variation for habitual food consumption; and (iii) updated estimates of the range of normal requirements for the average individual in the

country. Furthermore, in the absence of Food Balance Sheet (FBS) data for several countries for 2016, FAO has made new projections for the Asia-Pacific region as a whole, as well as for the main subregions, based on whatever data are available. These estimates show that there was a substantial slowdown in the rate of reduction in the PoU during the period 2010-2015, compared with the five years before that. Furthermore, the projections for 2016 indicate that both the PoU and the total number of undernourished people may have actually begun to rise in the region (Figure 1). During 2015-2016, South Asia and East Asia subregions are estimated to have experienced a reduction in the absolute number of undernourished people (Table 1). In Southeast Asia, on the other hand, there was an estimated increase in the PoU, in both percentage and absolute terms. These trends are worrisome and point to the urgent need to step up investment in agriculture, particularly for smallholder and marginal farms.

Figure 1: Undernourishment in Asia and the Pacific Region

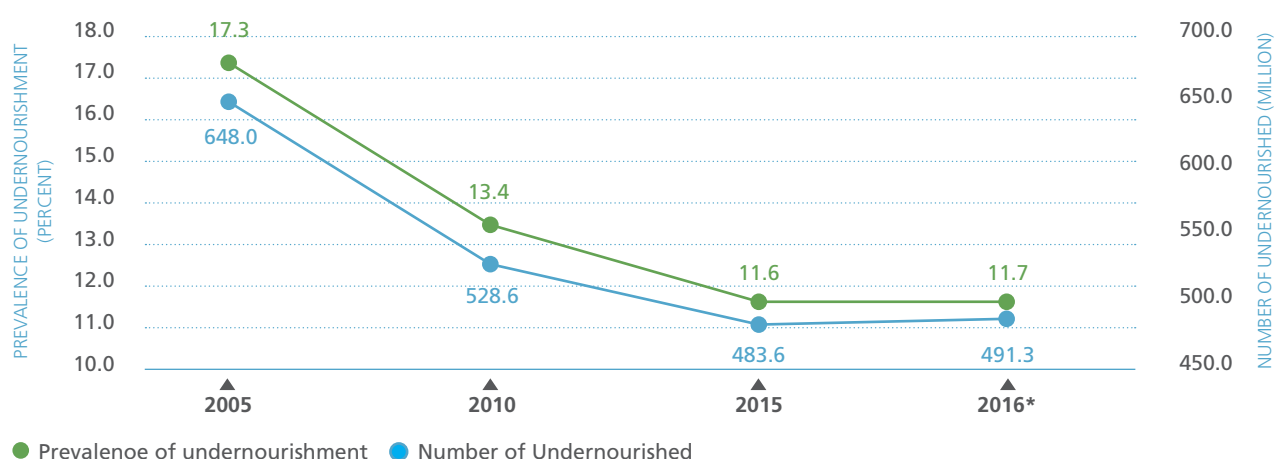


Table 1: Number of undernourished (million) and prevalence of undernourishment in Asia and the Pacific region in 2016

Subregion	2010		2015		2016*	
	No.	Percent	No.	Percent	No.	Percent
World	794.6	11.5	776.7	10.6	815.2	11.0
Asia & the Pacific	528.6	13.4	483.6	11.6	491.3	11.7
East Asia	178.4	11.3	147.1	9.1	145.5	9.0
South Asia	271.4	15.9	272.2	14.9	266.8	14.4
Southeast Asia	74.1	12.4	59.6	9.4	73.9	11.5
Oceania	1.8	5.0	2.5	6.4	2.7	6.8

* Estimated values

Source: FAO

² The indicator is defined as the probability that a randomly selected individual from the reference population is found to consume less than his/her calorie requirement for an active and healthy life.

Estimated PoU for 2016 can be explained, at least in part, by agricultural performance in the 2015/16 marketing seasons

The production of cereals explains much of the variation in the estimated PoU, although the overall food security outcome is influenced by many factors, including incomes and food prices. Weather is also a crucial factor, not only for cereal production, but also for other food products including animal-source foods, through its impact on fodder and grazing.

According to Crop Prospects and Food Situation reports (FAO 2017a) and Global Information and Early Warning System Country Briefs (FAO 2017b), several countries in the region suffered from poor weather during crop seasons in 2016. For example, in Thailand, although cereal production recovered in 2016/17, the country went through two consecutive years of reduced outputs, by 8 percent in 2014/15 and 13 percent in 2015/16. Likewise, Myanmar also suffered from dry weather conditions linked to the 2015/16 El Niño phenomenon as well as from floods in several regions, which negatively affected cereals and most likely other field crops. Other affected countries in the region were Indonesia, Mongolia, Timor-Leste and Viet Nam. In Indonesia, the late onset of the rainy season and erratic precipitation due to El Niño reduced or delayed planting, which resulted in significant localized production losses, particularly in eastern parts of the country with high concentrations of highly vulnerable subsistence farming families.

In South Asia, production outcomes improved for some countries. Pakistan had a bumper wheat harvest in 2016 and other crops also performed well due to favourable weather. In India as well, cereal production recovered markedly after two consecutive bad seasons. In some other cases in South Asia – e.g. Sri Lanka – governments managed to maintain aggregate food supply either through imports or by drawing down stocks where available despite declines in cereal production.

Food insecurity as experienced by people – the Food Insecurity Experience Scale

A second indicator adopted by the 2030 Agenda for monitoring progress on hunger is the prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES). Under the “Voices of the Hungry” project, FAO has been collecting FIES data through the Gallup World Poll in more than 140 countries and territories since 2014 (FAO 2016b).³ It is expected that as part of the 2030 Agenda, all countries, with some experimentation, assessment and capacity building, will collect and analyse their own experience-based food insecurity official data and use them for national, regional and global reporting.

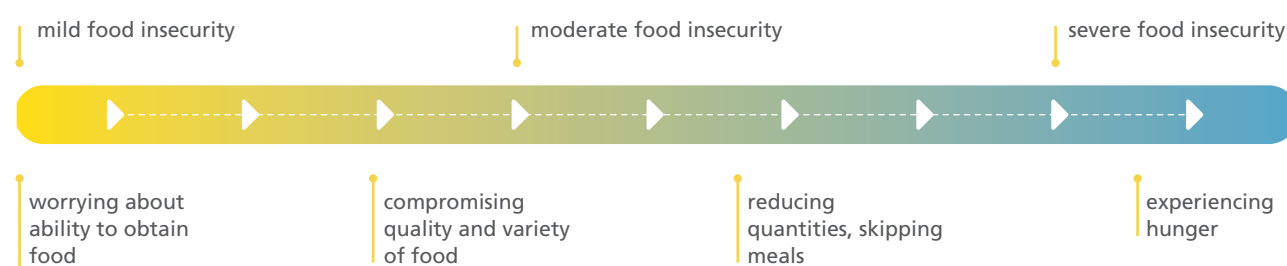
In contrast to several other indicators that are based on food consumption or similar data, the FIES establishes a metric for food insecurity based on people's direct responses to questions regarding their access to food of adequate quality and quantity. Experience-based food security indicators complement the existing suite of food security indicators by better capturing the access dimension of food security.

The FIES-based indicators have been judged to be analytically sound, cost-effective (as the FIES module is easy to implement), excellent from the standpoint of timeliness of reporting, and formally comparable across countries. The indicators can also provide disaggregated information, such as the severity of food insecurity according to place of living (for example, rural and urban) and gender when data are collected through adequately representative surveys.

The FIES Survey Module is composed of eight yes/no questions along a scale that covers a range of severity of food insecurity (Figure 2). Respondents are asked questions such as whether at any time during a certain reference period they have worried about their ability to obtain enough food, their household has run out of food, or they have been forced to compromise the quality or quantity of the food they ate due to limited availability of money or other resources. Based on the responses, and using appropriately selected thresholds, FAO calculates the prevalence of severe food insecurity.

³ Further details of the project including the details of methodology can be found at <http://www.fao.org/in-action/voices-of-the-hungry/en/#.V8Zfkvl96V4>

Figure 2: The Food Insecurity Experience Scale



Prevalence rates for experienced food insecurity in Asia

The global FIES survey by FAO currently covers only 18 countries from Asia.⁴ Based on those data, Table 2 shows the estimated prevalence rates for two subregions of Asia from 2014 to 2016. In terms of the overall trend, at the global level the severe food insecurity seems quite stable (the change from 2015 to 2016 is not significant considering the margin of error). Within Asia, East and Southeast Asia have

seen a rise from 2015 to 2016 in experienced severe food insecurity levels whereas Central and South Asia experienced a decline. These trends are consistent with the PoU trends although the two estimates are based on different methods and data. Such consistency in the movement of these two indicators reconfirms the setbacks in progress towards reducing hunger in the region and reinforces the need for enhanced investment in sustainable food systems.

Table 2: Percentage of people affected by severe food insecurity in the region measured using the FIES, 2014-2016

	Severe food insecurity – prevalence			Severe food insecurity – number of people		
	2014	2015	2016	2014	2015	2016
	%			millions		
World	9.2 (±0.5)	8.8 (±0.4)	9.3 (±0.4)	665.9 (±0.4)	645.1 (±31.7)	688.5 (±27.6)
Asia	7.7 (±0.1)	7.0 (±0.7)	7.0 (±0.6)	337.0 (±34.1)	306.7 (±30.1)	309.9 (±26.0)
Of which:						
Central and South Asia	14.4 (±0.5)	12.3 (±1.6)	11.1 (±1.3)	268.7 (±36.2)	233.1 (±31.1)	211.9 (±24.4)
East and Southeast Asia	2.0 (±0.2)	2.1 (±0.3)	3.1 (±0.5)	44.7 (±5.1)	48.1 (±7.6)	70.5 (±11.8)

Notes: Number of people living in households where at least one adult has been found to be severely food-insecure, as a percentage of the total population. Margins of error are in parentheses.

Source: FAO, Voices of the Hungry project.

It must be said, however, that despite these recent setbacks, the fundamentals for meeting food energy requirements in the region remain sound. The World Bank's latest report on global economic prospects (World Bank 2017a) projected a continuation of the current strong gross domestic product (GDP) growth for most countries of the region during the coming years, as well as low and stable inflation. The 2016 report of the global food security assessment by the Economic Research Service of the United States Department of Agriculture (USDA), which is based on a demand-oriented

model that incorporates both incomes and prices, also projects substantial improvements in food security for most countries of Asia (Rosen *et al.* 2016). Weather-related supply shocks could, however, potentially put at risk some of the progress made in improving the food security situation. With climate change, this stability dimension of food security needs to be addressed on a more urgent basis, by scaling up programmes such as research on climate-smart crop varieties and efficient irrigation systems, as well as crop and livestock insurance and targeted safety nets.

⁴ The Gallup World Poll reaches about 150 countries annually, with the aim of representing 90 percent of the world population. Pacific Island states are currently not included due to the combination of the limited size of their populations and the relatively higher cost of surveying in those countries.



Malnutrition among children – insufficient progress to meet the 2030 targets

SDG target 2.2. seeks to end all forms of malnutrition by 2030, including achieving by 2025 the internationally agreed targets on stunting and wasting in children under five years of age, and addressing the nutritional needs of adolescent girls, pregnant and lactating women and older persons.⁵ This target is to be monitored based on three indicators – i.e. the prevalence of (i) stunting, (ii) wasting and (iii) overweight – among children under five years of age.

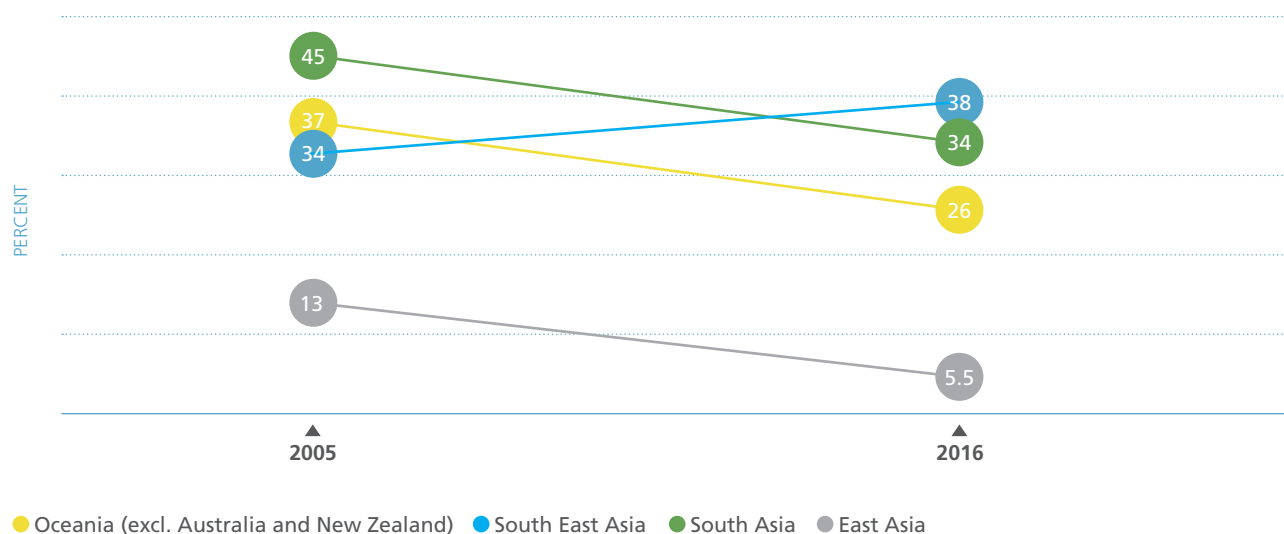
Many countries of the Asia-Pacific region have made impressive progress in reducing the prevalence of stunting for children under five years of age but progress is still inadequate for many to meet the target set by the World Health Assembly

The region witnessed impressive reductions in stunting prevalence over the past decade. For the region as a whole, the prevalence fell on average from 38 percent to 24 percent, with nearly all countries registering declines except Pakistan, Papua New Guinea and Vanuatu (Table 3).

The annual reduction rate was very high, over 5 percent, for three countries, and in the 3-5 percent range for four countries. But despite these gains, stunting prevalence remains high in the region – around 24 percent in Asia and 38.3 percent in Oceania. This translates to about 82 million stunted children in the region, with South Asia accounting for 75 percent of these, followed by Southeast Asia (18 percent), East Asia (6 percent) and Oceania (1 percent). The 2016 edition of the Global Nutrition report assessed how many countries in the region were likely to meet the World Health Assembly (WHA) target for 2025 based on United Nations Children's Fund (UNICEF), World Health Organization (WHO) and World Bank 2015 joint malnutrition estimates. For this region, out of 23 countries with relevant data, ten countries were found to be on track to meet the 2025 target (Afghanistan, Bangladesh, Bhutan, Cambodia, China, Democratic People's Republic of Korea, Maldives, Mongolia, Philippines, and Viet Nam). This assessment remains largely valid and a large number of countries in the region risk not meeting the international target on stunting.

⁵ The internationally agreed targets are those set in 2012 by World Health Assembly (WHA) for improving maternal, infant and young child nutrition. The WHA specified six global nutrition targets for 2025, three of which are covered under SDG target 2.2. Given that the main focus of this report is on SDG monitoring, this report does not present an assessment on WHA targets on anaemia, birth weight and exclusive breastfeeding.

Figure 3: Prevalence of stunting in children under five year of age



Source: UNICEF/WHO/World Bank Group Joint Child Malnutrition Estimates, 2017 edition.

Table 3: Country level prevalence rates for stunting among children under five years of age

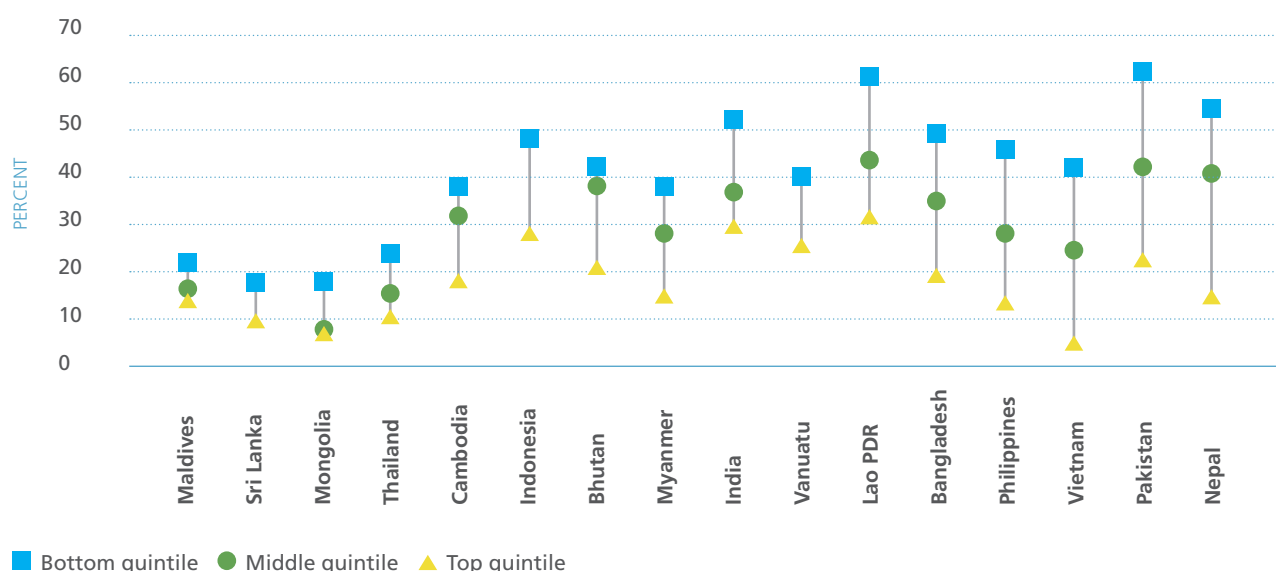
Subregion	Country	Prevalence (percent)	
		Around 2000	Around 2015
East Asia	China	17.8	9.4
	DPR Korea	51.0	27.9
	Mongolia	29.8	10.8
Southeast Asia	Cambodia	49.2	32.4
	Indonesia	42.4	36.4
	Lao PDR	48.2	43.8
	Malaysia	20.7	17.7
	Myanmar	40.8	29.2
	Philippines	38.3	30.3
	Thailand	18.1	16.3
	Timor-Leste	55.7	50.2
	Viet Nam	43.4	24.6
South Asia	Afghanistan	53.2	40.9
	Bangladesh	50.8	36.1
	Bhutan	47.7	33.6
	India	54.2	38.4
	Maldives	31.9	20.3
	Nepal	57.1	37.4
	Pakistan	41.5	45.0
	Sri Lanka	18.4	14.7
Oceania	Fiji	7.5	–
	Papua New Guinea	43.9	49.5
	Solomon Islands	–	32.8
	Vanuatu	25.7	28.5
Asia and the Pacific	–	40.7	29.5

Stunting prevalence remains very high among certain population subgroups

Most demographic and health surveys provide statistics on prevalence by key socio-economic categories, the most prominent being place of residence (rural/urban and subregion), maternal education, and wealth quintiles (measured on the basis of household possession of consumer assets). These data are useful not only for understanding how progress is being made but also to formulate appropriate interventions for targeting those groups for whom progress is slower. Such data are available for about 20 countries of the region, including data from repeat surveys for seven countries.

As with most developmental outcomes, stunting prevalence varies markedly between poor and rich households. The stunting rates for the poorest, middle and richest quintiles are shown in Figure 4, with the length of the line indicating the level of absolute inequality. As can be seen, Bangladesh, Nepal, Pakistan, the Philippines and Viet Nam are among the most unequal countries within the region when it comes to stunting rates. There is less inequality in richer countries such as the Maldives and Thailand, and, in general, countries with higher GDP per capita tend to have smaller gaps in stunting rates between the rich and poor

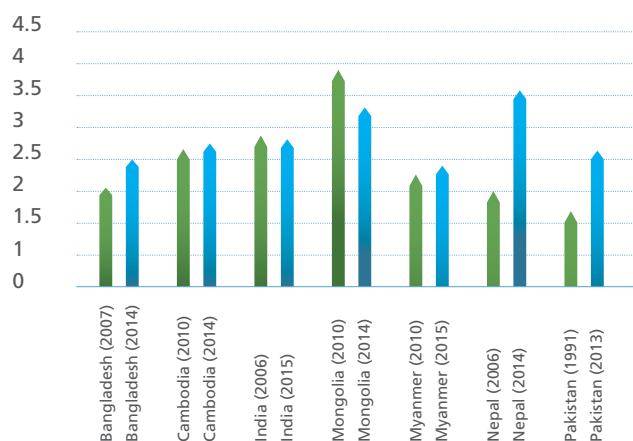
Figure 4: Stunting rates by wealth quintiles



Another interesting question is what has happened to these inequalities over time – data are available for two or more survey years for seven countries. The ratio of stunting rates between people in the bottom wealth quintile (the poorest) and in the top wealth quintile (the richest) has increased over time in five of the seven countries (Figure 5), with the increase in the ratio being particularly large in Bangladesh, Nepal and Pakistan. In Bangladesh, for example, prevalence fell between 2007 and 2014 by 9 percent for the bottom quintile but by 26 percent for the top quintile,

which explains why the inequality ratio rose. In contrast, the other four countries (Cambodia, India, Mongolia and Myanmar) witnessed a much more equitable outcome. A definitive analysis to explain these divergent patterns is beyond the scope of this report although this pattern could be partially due to inequity in access to some key underlying and immediate determinants of malnutrition. It is important to take this aspect into account for policy and programme intervention, especially when stunting declines relatively slowly for the poorer quintiles.

Figure 5: Ratio of stunting rates between poorest and richest wealth quintiles



Place of residence is another important socio-economic factor that reflects inequality in the prevalence of stunting. Based on data for the period 2010–2014 for 20 countries of the region, prevalence for the rural areas was 11 percentage points higher (simple average) than for the urban areas (23 percent for urban, 34 percent for rural). The rural/urban ratio ranged between 1.23 for Bangladesh to 4.0 for China; it was above 1.5 for 9 of the 20 countries. There was only a slight negative correlation between the national average of stunting prevalence and the ratio – that is, countries with a lower national average tended to have a higher gap between the locations. Though stunting prevalence is on average lower in urban areas, it is still high, reaching up to 50 percent in some cases. Furthermore, because urban areas tend to have higher rates of income inequality, stunting prevalence rates among the urban poor are often higher than rural averages.

Maternal education is also an important underlying determinant of stunting and therefore many surveys report prevalence data by level of maternal education. Based on the data for eight countries of the region, the simple average of stunting prevalence was 46 percent for mothers with no education, 40 percent for those with primary education and 25 percent for those with secondary education.

These aspects have also been analysed in two recent studies. One of them (Black et al. 2013), based on data from 79 countries, found that prevalence for the bottom wealth quintile was 2.47 times (range 1.00–7.64) that of the top quintile (which is very close to 2.53 for the 20 Asian countries). For place of residence, the average level of stunting in rural areas was 1.45 times higher (range 0.94 to 2.94) than in urban areas (again almost the same as for the 20 Asian countries). Another study (Bredenkamp

et al. 2014), based on data for 80 countries covering 2000 and 2012, found that both prevalence and inequality fell in only 19 percent of the countries covered, with the overall tendency in the vast majority of cases being strong persistence of inequality. They also found that countries with higher average prevalence tend to have larger socio-economic inequality.

In summary, both the review for Asia and the global studies point to similar patterns, namely: a high degree of inequality in stunting prevalence by key socio-economic subgroups; the tendency for the inequality to persist; and the high positive correlation between inequality and national average prevalence. These findings point to the importance of pro-poor economic growth, targeting specific interventions to disadvantaged subgroups and investment in tackling other drivers of malnutrition such as sanitation, pre-natal and post-natal health care, adequacy and quality of diet during the first 1000 days of life, and access to safe drinking water. These data also suggest that monitoring the progress on stunting, and similar other indicators, included as part of the 2030 Agenda, should also specifically focus on monitoring progress for key disadvantaged subgroups such as the poorest quintile, women and ethnic minorities.

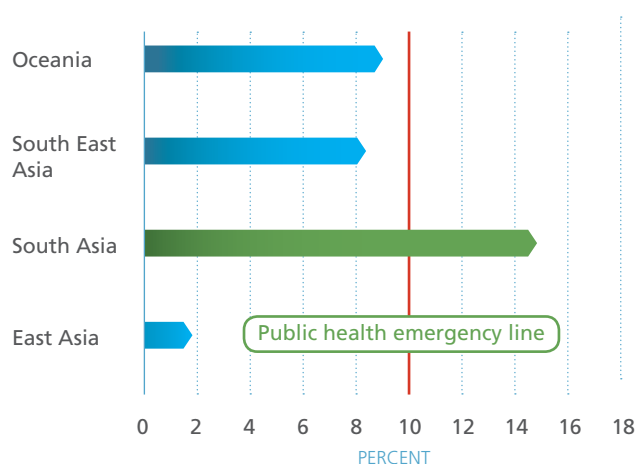
Prevalence of wasting has declined more slowly than for stunting

Child wasting refers to a child being too thin for his or her height. Most often wasting is a result of recent and severe weight loss, often associated with acute starvation and/or severe disease. In some cases wasting may be caused by chronic unfavourable conditions. WHO defines moderate wasting using a weight-for-height indicator between -3 and -2 z-scores (standard deviations) of the international standard or by a mid-upper arm circumference between 11 cm and 12.5 cm, and severe wasting using a weight-for-height z-score < -3.0. This is also often referred to as severe acute malnutrition. Severe wasting is a life-threatening condition requiring urgent treatment such as medical care and/or ready-to-use therapeutic foods via community-based management of acute malnutrition initiatives. Wasting is associated with the deaths of 800 000 children annually, 60 percent of which are associated with severe wasting.

In recent years, the prevalence of wasting in the region as a whole was about 9.9 percent, with a very low rate for East Asia (1.9 percent) but much higher rates for Southeast Asia (8.9 percent) and Oceania (9.4 percent). South Asia, with prevalence in excess of 15 percent, is deemed to be experiencing a state of public health emergency when it comes to wasting (Figure 6). Of the 28 million children under five that are wasted in South Asia, 9 million are severely wasted, i.e. experiencing severe

acute malnutrition. The WHA target is to reduce and then maintain childhood wasting below 5 percent. This means that South Asia will need to reduce prevalence by more than two-thirds by 2025 and Southeast Asia and Oceania must reduce prevalence by almost half.

Figure 6: Wasting Prevalence 2016



Source: UNICEF/WHO/World Bank Group - Joint Child Malnutrition Estimates 2017 edition

Although the malnutrition debate often tends to focus more on stunting, the consequences of wasting can be quite serious. As noted above, wasting can be a life-threatening condition requiring urgent treatment. According to some estimates, severely wasted children are, on average, nine times more likely to die than their healthy counterparts (Black et al. 2013) and even higher mortality has been reported when children are both wasted and stunted (WHO 2014a). A slow rate of progress in reducing the prevalence of wasting is therefore of serious concern. The Global Nutrition Report (GNR) 2016 identified lack of knowledge on the underlying drivers of wasting and inaccurate reporting among the many weaknesses that need to be overcome to keep the “no one left behind” promise.

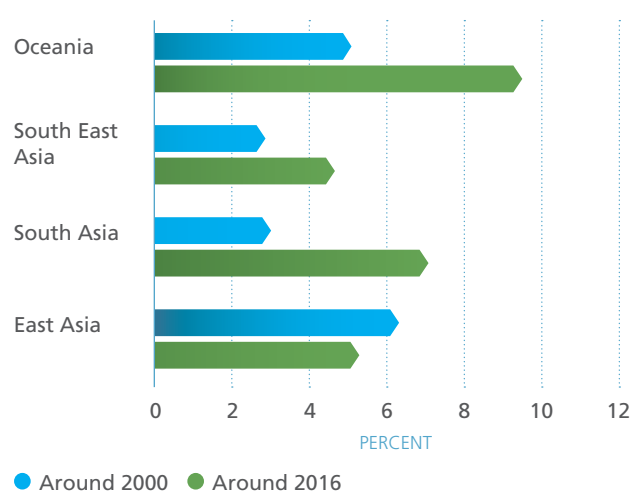
The prevalence of overweight among children under five is also relatively high and has been increasing significantly in recent years

Overweight among children under five is defined as weight-for-height in excess of two standard deviations of the WHO child growth standards median.⁶ This includes both overweight and obesity. Overweight children are at a higher risk of being obese when they are adults and

of developing serious health problems, including non-communicable diseases (NCDs), such as type 2 diabetes, high blood pressure, asthma and other respiratory problems, sleep disorders and liver disease. All these have high economic costs, both in terms of increased costs for the health care system and reduced economic productivity of the overweight children when they join the workforce. Overweight and obesity prevalence for adults is increasing in every region and almost every country in the world.

Based on the latest data, the prevalence of overweight for the most recent period was 5.5 percent for the region as a whole, which is a 38 percent increase from 2000 prevalence rates (Figure 7). Among subregions, the prevalence rate for overweight children was the highest in Oceania, consistent with very high rates of adult overweight and obesity in that subregion. Child overweight prevalence is increasing in every region except East Asia, although China did experience a sharp rise in overweight prevalence from 3.6 percent in 2000 to 6.6 percent in 2010. Fourteen out of 21 countries in the region for which there are data are at risk to miss or off course to meet the 2025 WHA targets according to the 2016 GNR (see Table 4).

Figure 7: Overweight prevalence among children under five around 2000 and 2016



● Around 2000 ● Around 2016

Source: Calculated from FAOSTAT data.

⁶ In children, overweight is defined as high weight-for-height. In adults, it is typically defined as high body mass index (weight divided by the square of height).

Table 4: Progress towards achieving the target on reducing overweight in children under five years of age

Status	Countries
On course, good progress	Bangladesh, DPR Korea, India, Lao PDR, Sri Lanka, Vanuatu, Viet Nam
On course, at risk	Cambodia, China, Maldives, Myanmar, Nepal, Pakistan, Philippines, Timor Leste
Off course, some progress	Indonesia, Malaysia
Off course, no progress	Thailand, Republic of Korea, Papua New Guinea, Mongolia, Bhutan

Note: Status is defined as i) “on course, good progress” if current prevalence < 7 percent and AARR ≥ 0; ii) “on course, at risk” if current prevalence < 7 percent and AARR < 0; iii) “off course, some progress” if current prevalence ≥ 7 percent and AARR > 0; and iv) “off course, no progress” if current prevalence ≥ 7 percent and AARR < 0.

Source: IFPRI, 2016.

Overweight and obesity are complex and multifaceted problems, and so require comprehensive responses working hand in hand with the actions to achieve other global child and maternal nutrition targets. Overweight is also interlinked with lack of progress in other nutrition targets. For example, suboptimum growth indicative of stunting has been shown to increase the risk of overweight. Additionally, breastfeeding and good maternal health and nutrition are also shown to reduce the risk of children becoming overweight later in childhood and adolescence. Required responses to the problem are well documented. A Policy Brief by WHO dedicated to under-five overweight (WHO 2014b) calls upon policy-makers to prioritize the following actions in five areas: i) food and agricultural policies that promote healthy diets throughout the lifetime; ii) formulation of food-based dietary guidelines for all age groups and actions; iii) family and community-based measures for successful behaviour change during childhood towards healthy lifestyle and dietary practices throughout life; iv) research and analysis on the root causes of overweight and obesity, including availability and access of healthy and diversified foods; and v) an enabling environment that promotes physical activity and tackles sedentary lifestyle.

Reducing undernutrition requires interventions in a number of nutrition-sensitive areas besides direct, nutrition-specific interventions

The UNICEF conceptual framework, first outlined in 1990, continues to be the main framework for identifying the multifactorial causality of undernutrition. It presents three categories of drivers at three hierarchical levels—immediate, underlying and basic. The immediate causes are inadequate dietary intake and disease. The underlying causes are household food insecurity, inadequate care and feeding practices, unhealthy household environment and inadequate health services. And basic causes, affecting the overall environment and underlying causes, include household access to adequate quantity and quality of resources, inadequate financial, human, physical and social capital, and sociocultural, economic and political context.

The relative importance of various possible interventions, as well as their sequencing, should vary to some extent by country and socio-economic subgroups within a country. This is where applied research is helpful, to determine what specific factors are most effective in reducing malnutrition and which interventions would be most cost-effective. The increasing availability of household survey data has encouraged analysts to undertake such studies.

As an example, Headey et al. (2016) applied econometric methods to household survey data from four South Asian countries (Bangladesh, India, Nepal and Pakistan) to determine statistically significant drivers of long term reductions in child stunting. They found almost the same factors for all four countries: assets, maternal and paternal schooling, being born in a medical facility, open defecation, birth intervals and number of children. Of these significant factors, three factors in particular were dominant in explaining most of the stunting reductions in all four countries: i) improvements in material well-being; ii) increases in female education; and iii) improvements in sanitation. The main conclusion was that rapid nutritional change at a national level requires substantial progress in most if not all of these areas.

A separate analysis by Smith and Haddad (2015) also focused on identifying factors that explain long-term reductions in stunting. Using econometric methods and data for 116 countries, they identified that access to safe water, sanitation, women's education, gender equality, and the quantity and quality (percentage of dietary energy from non-staples) of food available were key drivers of reductions in stunting between 1970 and 2010. In addition, income growth and governance were two essential basic drivers. Based on the significance and size of estimated coefficients, they provided a rough ranking of the underlying determinants in terms of their future potency in reducing child stunting: percentage of dietary energy from non-staples was first, followed by access to sanitation and women's education. For South Asia, besides continued improvements in women's education and food availability, three determinants stood out in particular for greater focus: access to sanitation; dietary diversity of the available food; and gender equality.

In summary, the analysis points to variable rates of progress across countries in the region on reducing the prevalence of undernutrition. Furthermore, a large number of countries are not on course to meet the 2025 target set by the WHA. What is even more worrisome is that there is a high degree of inequality in undernutrition prevalence within countries and the tendency is for these inequalities to persist. Promoting more equitable progress requires smarter interventions targeted towards disadvantaged

subgroups. This also points to the importance of periodic household surveys and high-quality data. For many countries in the region, the latest surveys are several years old. This has hampered analysis on what worked and what did not. While the key indicator for the 2030 Agenda is PoU at the national level, the review pointed to the importance of monitoring prevalence – and its drivers – for key socio-economic groups, and formulating interventions targeted to them.

PROMOTING HEALTHY DIETS THROUGH NUTRITION-SENSITIVE FOOD SYSTEMS



A growing number of studies on the evolution of global diets point to two main findings. One, the intake of food items generally recognized as healthy (fruit, vegetables, beans and legumes, nuts and seeds, wholegrains, milk, total polyunsaturated fatty acids, fish, plant omega-3s and dietary fibre), has increased globally during the past three decades but falls short of what is essential for addressing

nutrition and health challenges. And two, the trend towards increased consumption of items considered as unhealthy such as highly processed meats, sugar-sweetened beverages, saturated fat, trans fats and sodium has been gaining strength. Taken together, the diet challenge facing most countries is to increase the intake of healthy items while curbing the consumption of those considered as unhealthy.

This challenge is being taken increasingly seriously in recent years as the potential of healthy diets to tackle the burden of malnutrition is recognized. For example, it has been estimated that by 2020 nearly 75 percent of all deaths and 60 percent of all disability-adjusted life years will be attributable to NCDs, with poor diets (and lack of exercise) being a key cause of this trend (Lim et al. 2012, Murray and Lopez 1997).⁷ Likewise, it is recognized that nutrition-specific interventions will not be effective in addressing various forms of malnutrition without the strong backing of nutrition-sensitive interventions.⁸

The Second International Conference on Nutrition (ICN2) held in Rome in 2014 recommended a number of actions towards promoting healthy diets through nutrition-sensitive food systems. The 2030 Sustainable Development Agenda does not explicitly address healthy foods or targets but this subject is closely linked to several SDGs, notably SDG 2 on hunger and malnutrition, SDG 3 on health and SDG 12 on sustainable consumption and production. Subsequent to the launch of the Agenda 2030, the United Nations General Assembly adopted a UN Decade of Action on Nutrition, 2016-2025, with the aim of ending malnutrition in all its forms and providing a clearly defined and time-bound operational framework that works within existing structures and available resources to implement the commitments made at the ICN2 and the 2030 Sustainable Development Agenda. The six action areas adopted by that Decade of Action include all the recommendations of the ICN2, including those on food systems and healthy foods.⁹

What is a healthy diet?

While there is no one “ideal” diet that is right for everyone, there is a fair degree of consensus among experts on what constitutes a healthy diet. At a general level, a balanced diet includes a variety of foods that supply the different kinds and amounts of nutrients required for maintaining good health. Two important considerations underlie healthy diets. One is the principle of moderation – i.e. that excessive intake of even a healthy food item could make it unhealthy. The second is that, while the basic principle of what constitutes a healthy diet remains the same for all people, its exact make-up will differ across societies and countries based on traditional food habits and preferences. Where there is adequate scientific evidence, WHO has recommended desirable levels of intake for some foods (Box 1).¹



⁷ NCDs are the leading cause of death globally. The Global Action Plan for Prevention and Control of NCDs 2013–2020, including a comprehensive monitoring framework with 25 indicators and 9 voluntary global targets, was endorsed by the 66th World Health Assembly in May 2013. This action plan provides a roadmap for regional and national actions for developing and implementing policies and programmes to reduce the burden of NCDs within the regional socio-economic, cultural, political and health system contexts (Source: http://www.searo.who.int/entity/noncommunicable_diseases/documents/sea_ncd_89/en/)

⁸ The former refers to more direct actions that address the immediate determinants of nutrition (micronutrient supplementation, health interventions, etc.) while the latter responds to the underlying determinants of adequate nutrition by enhancing the contribution of other areas such as agriculture, education, sanitation and social protection.

⁹ The six cross-cutting and connected action areas are: (a) sustainable, resilient food systems for healthy diets; (b) aligned health systems providing universal coverage of essential nutrition actions; (c) social protection and nutrition education; (d) trade and investment for improved nutrition; (e) safe and supportive environments for nutrition at all ages; and (f) strengthened nutrition governance and accountability.

Box 1: WHO guidelines on healthy diet for adults

A healthy diet contains fruits, vegetables, legumes (e.g. lentils, beans), nuts and whole grains (e.g. unprocessed maize, millet, oats, wheat, brown rice).

At least 400 g of fruits and vegetables a day (not including potatoes, sweet potatoes, cassava and other starchy roots).

Less than 10 percent of total energy intake from free sugars, about 50 g for a healthy body weight consuming about 2 000 kcal per day (ideally below 5 percent of total energy intake).

Less than 30 percent of total energy intake from fats (unsaturated fats such as found in fish, avocado, nuts, sunflower, canola and olive oils are preferable to saturated fats such as found in fatty meat, butter, palm and coconut oil, cream, cheese, ghee and lard).

Less than 5 g of salt per day, ideally iodized salt.

Industrial trans fats (found in processed food, fast food, snack food, fried food, frozen pizza, pies, cookies, margarines and spreads) are not part of a healthy diet.

Source: WHO Healthy Diet Fact Sheet, September 2015.



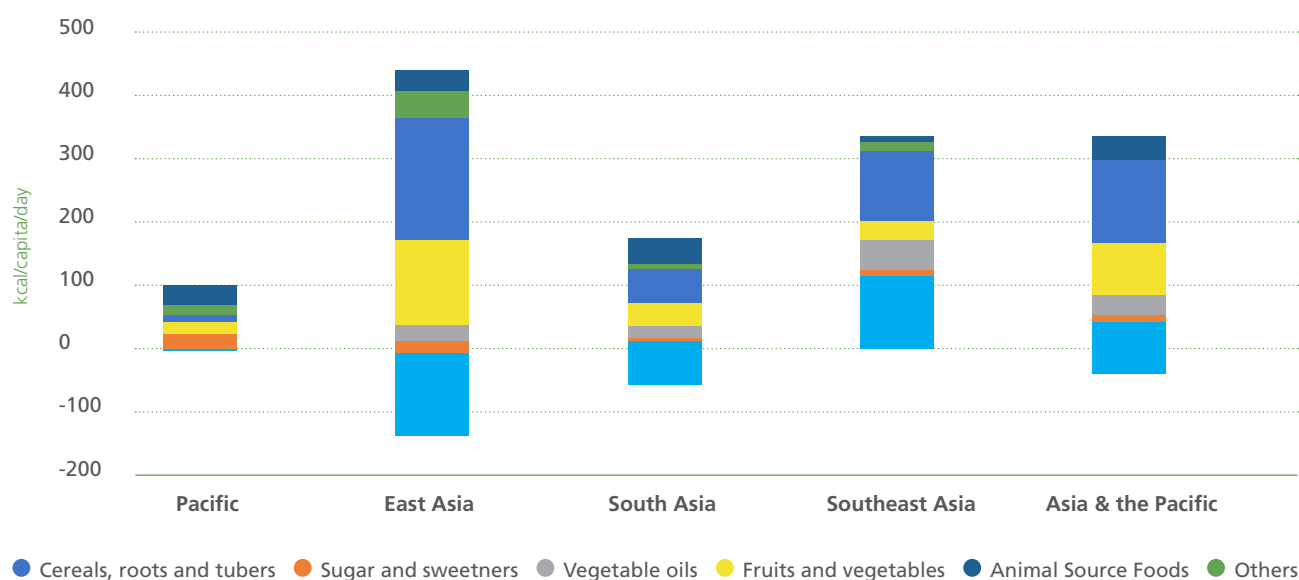
Dietary trends in Asia and the Pacific

The region as a whole has made significant progress on healthy diets but large disparities exist across and within countries

Diets in the region have undergone a rapid transition during the past few decades, with substantial improvement in overall diet quality. Between 2000 and 2013 (the most recent data available), the contribution of cereals and starchy roots declined by more than 65 calories per person per day while that of animal-source foods increased by more than 100 calories per day, and that from fruits and vegetables by more than 60 calories per day (Figure 8).

Animal source foods are valued, up to a healthy range, for their contributions to high-quality protein and a variety of micronutrients (vitamin A, vitamin B12, riboflavin, calcium, iron and zinc) that are difficult to obtain in adequate quantities from plant source foods alone. The consumption of meat and milk in this region grew at compound annual growth rates of 5 percent and 4.3 percent per year, respectively, between 1980 and 2013, compared with 2.5 percent and 1.4 percent per year at the global level. Likewise, the consumption of protein from fish and seafood increased in the region by over 75 percent between 1990 and 2011.

Figure 8: Change in food category intake by Asia-Pacific Sub-Region 2000 compared to 2013 (weighted by population)



Source: FAO Food Balance sheet data.

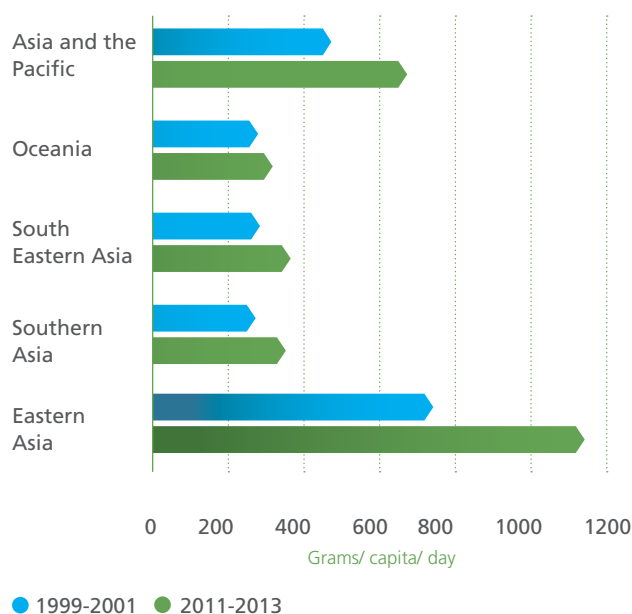
What follows provides additional information on trends in apparent consumption (hereinafter also referred to as consumption)¹⁰ of four selected food groups – fruits and vegetables, pulses, fish, and milk and dairy products – with a view to highlighting trends and differences across countries in the region, as well as the level of adequacy relative to what is desirable or prescribed.

For **fruits and vegetables** combined, Figure 9 shows that average apparent intake exceeded 400 g/day, the WHO recommended level, in Eastern Asia but was marginally

below the threshold for South Asia and Southeast Asia, with a substantially lower level for the Oceania subregion. Average intake exceeded the 400 g/day mark for 11 of the 26 countries (with another three close to 400 g/day) while the average was below 200 g/day for six countries. One area of concern is that the rate of growth of per capita availability slowed down for 15 of the 26 countries during the 2000s compared with the rate a decade earlier. Thus, the two main challenges are inadequate apparent consumption in roughly half of the 26 countries in the region, and a deceleration in rate of supply growth in a large number of countries.

¹⁰ Apparent consumption is defined here as production + imports – exports – stock build-up – feed – seed – losses – other non-food uses. Thus, consumption as assessed here is not measured directly, but as a residual of other uses.

Figure 9: Fruits and vegetables, intake



Source: FAO data.

Pulses are ranked high as a healthy food item in addition to having a lower environmental footprint. Pulses are traditionally an important component of the diet in South Asia but much less so in other subregions of Asia and the Pacific. Consumption is only 18 g/day for the region as a whole (8 g/day excluding India) with intakes below 10 g/day in 12 of the 22 countries of the region. In 2011-2013, average intake was 3.6 g/day in East Asia, 9 g/day in Southeast Asia, 17 g/day in Oceania and 33 g/day in South Asia. Moreover, availability has increased only nominally over the years, with the growth being stagnant in precisely those countries where consumption is very low.

Fish also ranks high as a healthy food.¹¹ However, there is no WHO guideline on a desirable level of intake. Average availability of fish in the region is fairly high: 104 g/day for Oceania, 95 g/day for East Asia, 91 g/day for Southeast Asia but only 18 g/day for South Asia. In 2011-2013, 19 of the 26 countries with data had availability of 50 g/day or more, with over 100 g/day for 9 of them. While average intakes are generally on the higher side, there is a decelerating trend in their growth rate across the region. Compared to other regions, fish consumption in Asia is generally much more important relative to meat consumption. In Southeast Asia, South Asia, Micronesia

and Melanesia, fish accounts for about half of combined fish and meat consumption, while in North America, South America and Europe it accounts for only about 10 to 20 percent.

Apparent consumption of **milk** in the region as a whole doubled in 21 years; from 1990 to 2011 it rose from 75 to 150 g/day, with the highest increase – over five times – in East Asia, and increases of about 1.6 times in South Asia and Southeast Asia and a small decline in the Oceania subregion. Average supply in 2011-2013 was 236 g/day in South Asia, 88 g/day in East Asia, 86 g/day in Oceania and 50 g/day in Southeast Asia (for comparison, one glass of milk is about 240 g). The average rate of growth of consumption in the region was higher during 2000-2013 (3.8% per annum) than in the 1990s (3% per annum), due primarily to recent rapid growth in China. For the region excluding China, however, growth has been slower since 2000 than it was in the 1990s. There is no WHO guideline on desirable level of milk intake, but only three countries had apparent consumption in excess of one glass per day (the Maldives, Mongolia and Pakistan). Apparent consumption was below 100 g/day for 15 countries. The data also show that the growth rate in apparent intake in the 2000s was negative for 4 of the 7 countries with intakes already below 50 g/day in 1999-2001 (Lao PDR, Malaysia, the Philippines and Timor Leste).

While reviewing trends in national average apparent consumption, it is also important to consider the fact that the distribution of food items among individuals within a country is never even and so there is always a large segment of the population that consumes less than the national average. Thus, the national average apparent consumption must be well above the recommended level if most of the population is to consume that recommended level. An exercise, based on the same method and within-country distribution parameter as used for all foods by FAO in estimating the PoU, shows that the average supply of fruits and vegetables has to be about 655 g/day to ensure that 95 percent of the individuals in the country have access to 400 g/day of fruits and vegetables. In 2011-2013, average apparent consumption of fruits and vegetables was below 655 g in 22 of the 26 countries covered, with only China, Lao PDR, the Maldives and Republic of Korea having more. Likewise, using the same method for milk, about 370 g/day is required to ensure that 95 percent of the population has access to one glass per day (240 g/day). In 2011-2013, only two (Mongolia and Pakistan) of the 26 countries had average intake of milk of 370 g/day or over.

¹¹ Although there is no explicit guideline on desirable level of intake, according to WHO, regular fish consumption (1-2 servings per week) is protective against coronary heart disease and ischaemic stroke and is recommended. The serving should provide an equivalent of 200-500 mg of eicosapentaenoic and docosahexaenoic acid. Source: http://www.who.int/nutrition/topics/5_population_nutrient/en/index13.html

Consumption of unhealthy food items and nutrients seems to be rising steadily in the region

Data on the intake of foods considered unhealthy are not easily available in national or international databases. But a growing number of studies assessing these trends indicate that while the consumption of food items generally considered as healthy is rising across the region, increased sale of food items considered as unhealthy has also been gaining strength. A key challenge therefore is to reorient food systems to promote healthier diets through supportive food and trade policies, education and awareness campaigns.

For example, in a study focussed on Asia, Baker and Friel (2016) reviewed trends in market penetration by transnational food and beverage corporations at the retail, manufacturing and food service sectors and found that the sale of ultra-processed foods high in fat, salt and glycaemic load is rapidly increasing in the region.¹² The study argued that the main driver of this trend is increased market power of the transnational food and beverage corporations to influence the availability, price, desirability and ultimately consumption of such foods in a region conducive for such penetration due to rapid income growth, urbanization, young and growing populations, and increasingly open markets. According to a study cited in Global Panel (2016), much of the consumption growth during 2000-2015 of ultra-processed foods and beverages in lower-middle-income countries and upper-middle-income countries across the world can be explained by growth in the Asia-Pacific region.

For **sugar**, FAO FBSs provide information on apparent consumption. The WHO guideline for a healthy diet is to limit free sugar¹³ intake to less than 10 percent of the total energy intake, ideally below 5 percent for additional health benefits. The FAO data show that in 2011-2013 the ratio was over 10 percent in 9 of the 26 countries in this region, between 5 and 10 percent for 9 countries and below 5 percent for the remaining 8 countries. Besides the level being below 10 percent in 65 percent of the countries, the other good news is that the growth rate of the ratio has been low and stable in about 75 percent of the countries covered.

Government initiatives to encourage healthy diets

Elements of a framework for promoting healthy diets are outlined in various ICN2 recommendations. These include: i) stimulated production of local and indigenous foods, especially by smallholders; ii) efficient and effective trade; iii) diversification of crops including underutilized traditional crops; iv) more production of fruits and vegetables; v) appropriate intakes of animal-source products; vi) adoption of international guidelines on healthy diets; vii) regulatory and voluntary instruments such as marketing, publicity and labelling policies; and viii) economic incentives or disincentives.

What follows provides an overview of initiatives taken by governments in the region, categorized into four areas: i) supportive policies and public investment; ii) targeted interventions or projects that promote diversified nutritious foods; iii) taxation of unhealthy foods and other fiscal policies; and iv) awareness-raising campaigns based on education, information and advertising.

Creating an enabling environment through supportive policies and public investment

Production of various types of foods is determined by both agro-ecological conditions (comparative advantage) and public policy supporting specific products. There is an emerging view that certain foods with high nutritional value are facing disincentives due to governments providing a disproportionate level of support and incentives to cereals (Pingali 2015, IFPRI 2015 and 2016, World Bank 2014). This view has also been echoed in food policy studies in Asia. For example, an agricultural expenditure review of the Philippines noted that public support has been disproportionately targeted to rice and some other import-competing products and has undermined crop diversification towards high-value products such as tropical fruits (World Bank 2007). Similar examples are frequently cited for other countries in the region (Soekirman 2011 cited in UNSCN 2016, Gillespie et al. 2015).

The recommendation that follows from these views is that public support and incentives need to be rebalanced so that agriculture becomes more nutrition-sensitive. A review of recent initiatives on food policies in the region points to governments seriously considering these recommendations and implementing new programmes aimed at stimulating

¹² The study uses data on consumption trends from Euromonitor International for 12 countries (Australia, China, India, Indonesia, Japan, Republic of Korea, Malaysia, New Zealand, Philippines, Singapore, Thailand and Viet Nam). The period reviewed was early 2000s to 2013.

¹³ Free sugars include monosaccharides and disaccharides added to foods and beverages by the manufacturer, cook or consumer, and sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates. Source: http://www.who.int/elena/titles/guidance_summaries/sugars_intake/en/

the production and marketing of foods considered healthier while continuing to support and incentivise the traditionally supported cereals. As an example, India has in recent years launched a number of large-scale production programmes (“mission schemes”) on fruits, vegetables, coarse cereals, pulses, milk and oilseeds. Pulses, for example, have been given similar policy attention as have rice and wheat in terms of support prices, procurement, stockholding and distribution through public safety nets. India has also launched ambitious programmes on cold chains and related modern infrastructure aimed at reducing post-harvest losses and improving marketing efficiency of relatively perishable products such as fresh fruits, vegetables, fish, meats and dairy products, all considered healthy foods.

In Thailand, in 2016 the government approved a budget of 35 billion baht (US\$1 billion) to support a two-year extension of the debt repayment period, and provide loans to fruit farmers to improve water storage capacity and grow new fruit trees. Other policy initiatives that have the potential to stimulate the growth of diverse foods could include relaxation of land use restrictions as well as incentives to diversify land away from rice, notably in Viet Nam, Thailand and Republic of Korea (see Chapter 5 for more details).

Governments in the region are also paying greater attention to dairy development. For example, in Nepal the government’s 2016/17 budget provided for a 50 percent subsidy (for farmers rearing more than 50 cows and buffaloes) on the total cost of chaff-cutting machines that meet approved standards. Machinery imports were also exempted from customs duties. In Sri Lanka, the government made a decision to import 20 000 milk cows from Australia for upgrading small- and medium-scale dairy farming. In Viet Nam, a milk industry development plan was launched by the government in February 2016 to improve its competitiveness through the application of advanced technologies. Under Indonesia’s *Road Map of Indonesian Dairy 2015 2025*, higher production targets have been set, support to dairy farming stepped up, and a target of per capita milk consumption established at 80 g per day (approximately one-third of a glass).

Most governments in the region have projects to promote diversified food production, but these interventions need to be scaled up

While food policy provides an enabling environment for a healthier food system, targeted interventions through agricultural investment projects have been for decades an

important vehicle for extending production programmes to disadvantaged regions and food-insecure households. Such projects, sometimes assisted by external funding agencies, support the production of healthier food items such as fruits, vegetables, legumes, small-scale livestock and fisheries, as well as other traditional crops. Some of these interventions have been found to have a positive effect on the production and consumption of foods rich in protein and micronutrients, although the effect on farm incomes and overall diet of poor people remains unclear (Masset *et al.* 2011). For example, the homestead food production programmes implemented by Helen Keller International in Bangladesh, Cambodia, Nepal and the Philippines significantly improved dietary diversification by increasing animal food consumption as well as raising household incomes (Talukder *et al.* 2010). Similarly, the Nepal Agriculture and Food Security Project, funded by the Global Agriculture and Food Security Program, has been found to stimulate production and consumption of nutritious foods among participating households in disadvantaged hilly and mountainous regions.

The global development community has committed to raise funding substantially for nutrition and so the outlook for targeted investment projects is bright. Nutrition sensitive measures were also accorded high profile in 2013 by the *Global Nutrition for Growth Compact*, signed on 8 June 2013 by world leaders and endorsed by 90 stakeholders, including development partners, businesses, scientific and civil society groups, and subsequently welcomed in the 2013 *Lough Erne G8 Leaders’ Communique*. The *Compact* secured new commitments of US\$4.15 billion to scale up nutrition-specific actions by 2020 and almost US\$19 billion committed towards improving nutrition outcomes through nutrition sensitive investments between 2013 and 2020. Mobilization and utilization of these resources requires government support for identifying and formulating new projects.

While there is scope for agricultural projects to be made more nutrition-sensitive, there is a debate as to whether their scope should cover nutritional outcomes such as stunting. Some observers have argued that it is important to be realistic and limit the objectives of such projects to measurable outcomes closer to what agriculture can deliver, such as increasing supply of and access to diverse and nutritious foods. It is also important to keep the design and implementation of projects with nutrition components as simple as possible, at least initially, until difficulties associated with managing and coordinating multisectoral activities within bureaucracies are resolved.

Taxing and regulating unhealthy food items

Several countries have introduced taxes on unhealthy foods and drinks, or are contemplating such a response. The most cited examples are Denmark's "fat tax," Hungary's "junk food tax" on a range of products high in fat, sugar and salt, and France's tax on sweetened drinks. Mexico introduced a tax on sugar-sweetened beverages in 2014 in response to surging costs of treating obesity-related diseases and Peru has announced plans to tax junk food. Taxing unhealthy foods is one common response suggested in a large number of studies and commentaries on improving diet quality in Asia and the Pacific region.

There is limited experience within this region in the design and implementation of such measures. Thow *et al.* (2010) documented the implementation of soft drinks taxes linked to obesity in four Oceania countries (Fiji, Nauru, French Polynesia and Samoa). Both import taxes and excise (production) taxes were used. The study notes that public support for these taxes was influenced by the severity of the health problem. Although a rigorous impact study was not undertaken, the study found through limited surveys that the taxes were effective in reducing consumption of soft drinks while raising consumption of local alternatives such as fruit juices and coconut water. Recently the Government of Samoa also implemented a policy based on a study that analysed the fiscal and health impact of a "fat tax" on food and beverages high in sugar and salt. The study found that applying a simple 20 percent ad valorem excise tax on food and beverage items that contribute most to high sugar, salt and fat intake can raise substantial financial revenue for the government while reducing salt, fat and sugar intake (Martyn *et al.* unpublished). Similarly, in 2006 Fiji imposed a 5 percent tax on imported carbonated sugar-sweetened beverages, and has announced in the 2016-17 budget a hefty increase in taxes on sugary drinks, among other products.

Another relevant policy change was Malaysia's abolition of its sugar subsidy in October 2013, explicitly citing the growing prevalence of diabetes. Sugar was one of several regulated products whose price was subsidized for many years. The impact of this measure on sugar consumption, it seems, is yet to be assessed.

A study by Basu *et al.* (2014), based on econometric analysis using data for over 100 000 households in India, found that an excise tax of 20 percent on sugar-sweetened beverages could reduce the prevalence of overweight and obesity by 3 percent and type 2 diabetes by 1.6 percent over the period 2014–2023 if consumption of sugar-sweetened beverages continued in line with past trends. However, the impact was estimated to be about 50 percent higher if consumption trends accelerate as predicted

by some analyses of the beverage industry. The main conclusion was that sustained taxation on sugar-sweetened beverages at a relatively high rate could be an effective policy instrument to curb their consumption, which is consistent with the conclusions reached by Mytton *et al.* (2012).

One example of an effort to regulate food standards comes from India where the government in 2015 amended the maximum allowable limits of trans fatty acids in fats, oils and fat emulsions (products such as margarine and fat spreads or hydrogenated vegetable oils) to be 5 percent by weight. The previous limits were higher – for example, 10 percent for hydrogenated vegetable oils.

Encouraging healthy food habits through awareness-raising

A fourth pillar of responses towards a healthy food system is promoting healthy food habits through awareness-raising campaigns based on education, information and advertising. This is one of the recommendations of the ICN2 Framework for Action.

One insight from studies focused on transnational fast food and carbonated soda companies is that these businesses enjoy some degree of market power to influence consumption through advertisements. In response, standard recommendations include measures to curtail these advertisements, mandatory labelling indicating the amount of harmful items such as sugar and regulation of product formulation so that the products have a lower content of harmful ingredients. One example of such an initiative is the global "Dump Soda" campaigns, including in some Asian countries, with goals that include stopping marketing to children under age 16, stopping soda sales in schools and urging companies to sell sodas in smaller portions.

In addition, educating consumers about the adverse health effects, including through campaigns in schools and publicly funded advertisements to counter the messages from industry, are also standard recommendations. Other responses include collaborating with the industry itself to lessen the harmful effects of food products, as well as initiatives by the food industry on a voluntary basis. Besides discouraging the consumption of unhealthy foods, governments and civil society organizations could also encourage healthy foods by creating demand for nutritious and sustainable food through information campaigns and social marketing efforts, product labelling, etc.

In conclusion, specific measures needed for improving food systems to promote healthy diets, while discouraging consumption of unhealthy items, have been articulated



in various global, regional and national fora on nutrition. Above all, the 2014 ICN2 Framework for Action provides a number of recommended actions based on consensus among most countries (FAO-WHO/ICN2 2014).

Despite the considerable progress made during the past two decades, the analysis in this chapter shows that average national availability of food items generally considered healthy is short of desirable levels for a majority of countries of the region. Also worrisome is the trend in the growth rate of per capita availability, which has slowed down for some of these items relative to the

growth rate in the 1990s. There is also a dearth of periodic dietary surveys to assess progress and identify priorities.

In order to increase consumption of nutritious foods and reduce malnutrition, governments can: improve the enabling environment through supportive policies and public investment; implement targeted interventions and projects that promote diversified nutritious foods; tax unhealthy foods; and conduct awareness-raising campaigns based on education, information and advertising. Many steps are being taken in these directions, but more needs to be done.

LINKING SMALLHOLDERS TO REMUNERATIVE MARKETS



Smallholder farmers remain a critical part of Asian food systems and no strategy for eradicating hunger and malnutrition can succeed without investing in small farms. Indeed, there are no examples in the history of agricultural development that have resulted in mass poverty and hunger reduction without sharp increases in productivity in smallholder agriculture (Lipton 2005). Improving the productivity of smallholders and ensuring remunerative market linkages must therefore be high on the development agenda. The 2030 Agenda for Sustainable Development addresses the issue of smallholders with a specific target as part of SDG 2. The target is, “By 2030, double the agricultural productivity and the incomes of small-scale food producers, particularly women, indigenous people, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets, and opportunities for value addition and non-farm employment”. In this target, there is an explicit recognition that smallholders provide a critical entry point

for building dynamic rural economies and they need to be resourced with inputs and technology and linked to higher value markets.

Most of the activities on smallholder market linkage (SHML) will be driven by markets and private investment. But governments have a crucial role in facilitating this process through legislation, policies and projects. When it comes to smallholders, markets often fail by not being inclusive and governments can play a role by ensuring access to resources and inputs on fair terms or investing in infrastructure that would not be profitable for the private sector to undertake. The 2030 Agenda’s commitment to double productivity and incomes is an opportunity to redouble efforts to link smallholders to markets on fair and equitable terms.

This section reviews ongoing initiatives on strengthening SHML in the Asia-Pacific region, highlighting efforts being made through legislation and policies, and agricultural projects focused on SHML.

The building blocks for successfully linking smallholders to markets

The broad mechanisms or building blocks for effectively linking smallholders to markets are well known and widely discussed. Table 5 presents one such framework, based on an FAO document that served as a background paper for a high-level debate on this topic in 2015 in Rome. Illustrated with policy initiatives and numerous projects from around the world, the framework identified six mechanisms and a number of elements or components. The framework points to the existence of a variety of markets (labour, outputs,

credit) and conditions of exchange (barter, input-credit, shareholding). This topic was also the subject of a detailed study by the Committee on Food Security, Investing in Smallholder Agriculture for Food Security, in which four areas were identified for public action: i) smallholder access to productive assets; ii) collective investments to overcome limited assets (e.g. producer groups); iii) enabling markets; and iv) enabling institutions (HLPE 2013). Most other studies on this topic essentially point to similar areas.

Table 5: Six broad mechanisms and instruments for enhancing smallholder linkage to markets

Broad mechanisms	Elements/ instruments
Public investment in infrastructure, research and development and policy frameworks	Market facilities, rural roads, research and development on local and indigenous crops, provision of credit and financing, insurance, appropriate legal and policy frameworks
Public procurement and local purchase from smallholders	Schemes like Brazil's Fome Zero, World Food Programme's Purchase for Progress and Thailand's school milk programmes that procure local foods from smallholders and provide predictable markets (using schools, food reserves, food aid, relief operations, prisons, hospitals, etc.)
Collective action through smallholder organizations and cooperatives	Farmers' organizations (including cooperatives)
Partnerships with the private sector	Suitable business models identified and supported – producer organizations, contract farming or outgrower schemes, formal and informal public-private partnerships
Product differentiation	Marketing products through new forms of product differentiation (voluntary standards and labels such as organic, Fair Trade, farmers' labels, Geographic Indication and quality-linked-to-origin labels)

Source: Based on FAO (2015), background document for a Committee of World Food Security debate on SHML.

Policies, legislation and projects facilitating smallholder linkage with markets

Policy regimes in Asia and the Pacific are mostly supportive of the process of establishing SHML and most governments seem to be increasingly facilitating this process. While legislation and policies are often specific to one or another building block (e.g. contract farming, cooperatives, tenure rights, subsidies and customs relief on imported inputs), a new generation of targeted interventions or projects with a holistic perspective on SHML are being designed and implemented by governments, often with donor funding. Both these initiatives are supporting the process of SHML in the region.

Initiatives on policies and legislation

Governments can assist the process of SHML through legislation and policies. The government policies that are most pertinent in this context are those encouraging the formation of efficient rural financial markets (credit, insurance), investment in rural physical infrastructure, legislation to enable formation of groups, and creation of an enabling environment for the food industry, retail sector and other downstream supply chain actors to encourage better integration of farmers in higher-end value chains.

One policy area where governments continue to push reforms is in financial markets, facilitating access

to essential inputs and services such as credit and insurance. By way of illustrating some recent initiatives, in Afghanistan, the Agricultural Development Fund (ADF), created in 2010 with a US\$100 million grant, transitioned in 2015 into an independently managed, government-owned financial institution to provide credit to small commercial farmers and agribusinesses. The ADF also channels lending through other financial and non-financial intermediaries. In Bangladesh, the government has substantially increased agricultural and rural credit for smallholder farmers. All commercial banks are mandated to expand farm loans and reduce interest rates from 8 to 2 percent for production of pulses, oil seeds and spices. In January 2016, commercial banks launched low-cost loans for dairy farmers at 5 percent interest on borrowing from the central bank's refinancing fund, which was created to encourage dairy farming, with priority given to women and marginal farmers.

In Bhutan, the Rural Enterprise Development Corporation, Ltd. was established in 2016 as a state-owned enterprise to support microfinance in rural areas. It has funded nearly 200 projects in vegetable, dairy and poultry ventures at a lending rate of 4 percent, and announced in January 2017 that it will soon increase its funding for similar projects by a factor of five. In 2016, Nepal raised the interest subsidy on loans to agriculture and removed the previous limit of 10 million Nepalese rupees loan under the subsidy. In Pakistan, the Credit Guarantee Scheme for Small and Marginalized Farmers became operational in 2016, encouraging banks to grant credit to small-scale farmers who previously lacked access. Under the scheme, the government guarantees up to 50 percent of loans to small farmers (i.e. those with less than 5 acres of irrigated and 10 acres of non-irrigated land).

On risk management, a Micro Agriculture Insurance Scheme was launched in Cambodia in the second half of 2015 with the aim of insuring smallholder farmers against weather-related shocks and climate change. In Indonesia, a rice insurance scheme provides a subsidy on premium costs of around US\$10 per hectare while insured value in the case of crop failure is around US\$418. In Nepal, for the 2016/17 season, the government announced an increase in subsidy on insurance premiums by up to 75 percent for agriculture and livestock. In India, the government launched a modified National Agricultural Insurance

Scheme in 2012 which envisages coverage of all food crops and covers all farmers, not just those who may have taken agricultural loans. The premium rates vary from 1.5 percent to 3.5 percent of the sum insured for food crops. In the case of horticultural and commercial crops, actuarial rates are charged. Small and marginal farmers are entitled to a subsidy of 50 percent of the premium and the subsidy is contributed equally by the Government of India and the states. The subsidy is to be phased out over a period of five years. Though exact data are not available, media and government reports suggest that insurance coverage has increased manifold since the launch of the modified National Agricultural Insurance Scheme.

Another important policy area for SHML is encouraging group approaches such as cooperatives and producer companies, as well as contract farming. In this region, while no country has a policy against forming farmers' organizations, some governments have been encouraging this by providing preferential treatment to such bodies. For example, in Nepal, cooperatives are encouraged by providing higher rates of subsidies than to individual farmers or businesses. Thus, customs tariffs on farm machinery are fully rebated to those cooperatives that farm collectively by pooling land into larger units. Likewise, interest subsidy on loans for land development and mechanization is 75 percent for cooperatives of marginalized and landless farmers versus 50 percent for individual farmers. The government also provides a higher rate of subsidy on crop and livestock insurance to farmers who enrol in the programme through cooperatives. In China, the 2007 Law of Professional Farmers' Cooperatives is credited for positive contributions in several areas on SHML. The law itself is said to have been enacted in response to frequent reports of food safety scandals, with their source often at the farm level (Ding et al. 2015). The initiative facilitated access by cooperative members to key production services and promoted vertical coordination in agrifood chains. This process was supported by the government stepping up subsidies for investment in cold chain and logistics, land consolidation and production inputs for specific high-value sectors. The process was simultaneously pushed with initiatives called Production Base (PB) and Direct Farm (DF) programmes aimed at modernizing agrifood systems (see next subsection).

Assisting smallholders to markets through targeted interventions

Policies and legislation provide an enabling environment for the growth of supportive institutions and private investments in value chains linked to smallholders. With a critical mass of rural physical infrastructure in place and functioning financial markets, notably access to credit and insurance services, SHML becomes a private sector activity led by downstream supply chains. Until then, targeted interventions primarily led by the public sector are essential. Thus, one finds numerous targeted projects in lower-income countries and in disadvantaged regions of even middle-income countries, many funded by international development partners – development banks, bilateral governments and civil society.

A snapshot of these interventions is provided in Table 6 which illustrates key features of six interventions focused on SHML, including some features that are considered innovative in those countries. All except one are medium to large agricultural projects funded by international development banks. The projects include several common features such as organizing small farmers into groups to enhance economies of scale and standardization in productive and marketing activities, co-funding or matching grants provided by the projects, etc. All such projects also have components for productivity-enhancing interventions at the farm level so that the business is profitable to small farmers.



Table 6: Main features of selected targeted interventions linking smallholders to markets

Country/project	Main components/innovative features
Philippines Partnership Against Hunger Programme (launched in December 2013)	<ul style="list-style-type: none"> • Procure foods from smallholders and families in agrarian reform beneficiaries' organizations • Supply this food to public feeding programmes • Provide support services (extension, credit, insurance) • PAKISAMA (a national confederation of organizations of small-scale farmers, fishers and indigenous peoples) also engaged in the programme process
Mongolia Livestock and Agricultural Marketing Project (2013-2017)	<ul style="list-style-type: none"> • Project fully dedicated to SHML (60 percent outlay on linking livestock farmers with markets, 40 percent on raising livestock productivity and quality to support market linkage) • Incentives to commercial buyers/processors for investment (processing plants, etc.) in partnership with farmers and farmers' organizations (on a shareholding basis or contract)
Sri Lanka Agriculture Sector Modernization Project (2017-2021)	<ul style="list-style-type: none"> • 60 percent of project outlay on agricultural value chains for SHML • Other components: productivity enhancement, new institutions, partnerships between farmers' organizations and agribusinesses • Matching grants to participating farmers/farmers' organizations • Partial Credit Guarantee scheme to encourage involvement of financial institutions and agribusinesses
Nepal Commercial Agriculture Development Project (CADP) (2009-2015) and Project for Agriculture Commercialization and Trade (PACT) (2010-2018)	<ul style="list-style-type: none"> • Commercial Agricultural Fund and Commercial Agricultural Alliance in CADP; matching grant scheme for supporting value chains in PACT • Promoting private business investment under cost-sharing arrangements among farmers, business and government projects • Significant component in both projects on community-based market infrastructure (cold storage, farm-to-market roads, small markets, product testing, agroprocessing technology); in PACT, 10 percent outlay for ensuring value chain outputs meet food standards • Involvement of many non-governmental organizations for social mobilization and capacity building • In PACT, 75 percent of outlay for agriculture and rural business development
China Production Base (<i>sheng chan jidi</i>) (PB) and Direct Farm (<i>nongchao duijie</i>) (DF) programmes	<ul style="list-style-type: none"> • Objectives: modernization of agrifood system and improved food safety • A response to concerns that downstream retail revolution did not significantly change productivity upstream and supply chains • PB and DF establish direct relationships between farm and retail • PB is a farmers' organization that manages production in farms, under contract or outgrower schemes or under a sublease • Direct procurement from PB by large retailers encouraged • Private service providers emerged and played valuable role • Proliferation of PB and DF programmes facilitated by 2007 Law of Professional Farmers' Cooperatives

Source: Compiled from project documents and other sources. The illustration for China is not a typical project intervention like others, but its features are similar and so it is also presented in the Table.

Overall, these interventions play an important role in disadvantaged regions of most countries in the region where infrastructure is inadequate and financial markets are weak. The key issue is one of scaling up these successful interventions at the national level. In that context, the International Fund for Agricultural Development (IFAD)'s 2016 evaluation of its work on smallholder access to markets (IFAD 2016), based on over 30 projects implemented over the years, including some in Asia, offers valuable lessons. For example, the review noted the need for context-specific programme development,

taking into consideration the specific risks smallholders face. Often, this requires in-depth assessment of specific stakeholder needs and the risks associated with market participation as well as expectations in terms of returns. The evaluation also found that productivity-enhancing measures must be a component of projects whose primary focus might be on market linkages. Furthermore, it is important to incorporate gender considerations in such programmes in view of the close association between expanding market access to women and increased household food security and nutrition.

PRICES, POLICY AND FOOD SECURITY



Food prices are among the most important indicators of what is happening to food markets. From the perspective of food security (particularly in terms of access and stability), both dimensions of prices – level and volatility – matter. Price levels affect households' ability to purchase food as well as the incomes of farmers. When food prices rise, net sellers of food gain, but when food prices decline, net buyers of food gain.¹⁴ In the Asia-Pacific region, net buyers – such as small farmers, those with non-farm employment and landless labourers – outnumber net sellers (who tend to be large farmers with a surplus to sell), even in rural areas. High price volatility on the other hand can create risks for both net sellers and net buyers, while also affecting market instability and food insecurity.

Because of these effects of volatility, ensuring the smooth functioning of food markets is addressed in SDG 2 Target 2.c: "Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility". An "Indicator of food price anomalies" has been proposed for monitoring progress on this target and FAO is working on developing the indicator.

When food prices rise, everyone notices. This is what happened in 2008 and 2011 when high food prices attracted worldwide attention and generated significant policy responses including increased support to agriculture

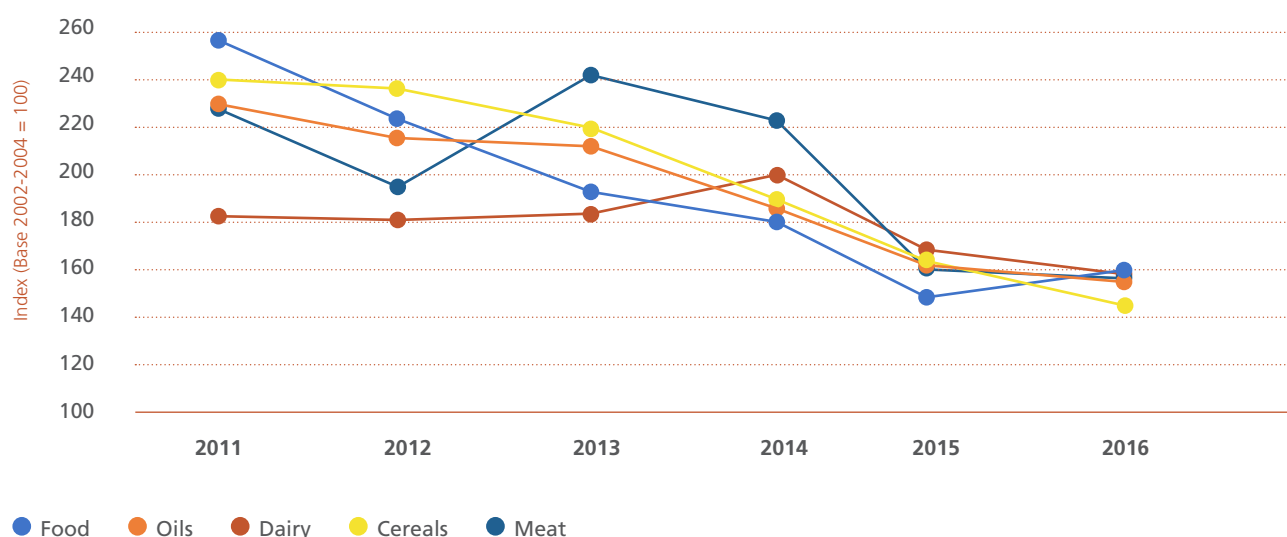
¹⁴ Many households buy and sell food. A net seller is one for which the total sales of food exceed total purchases, while for a net buyer the reverse is true.

aimed to ensure sufficient domestic supplies and trade measures such as restricting exports (in net-exporting countries) or reducing import barriers (in net-importing countries). While governments and the international development community implement measures aimed at stabilization and social protection in times of rising prices, the periods of relatively stable and secularly declining prices can provide much needed space to establish policy measures aimed at long-term food and nutrition security. In view of that background, this chapter reviews the food price situation in the region in the context of the large declines in world food prices since 2011, the policy responses and the implications for food security and nutrition.

International food prices

World export prices of key foods have been declining for the past few years and are not forecast to increase in real terms over the medium term. Figure 10 presents trends in FAO food price indices, which measure world export prices, during 2011-2016. For cereals as well as the composite food index,¹⁵ prices have been falling steadily since 2011 (FAO 2016c). Relative to 2011, the indices in 2016 were lower by 39 percent for cereals, 36 percent for oils, and 30 percent for food as a whole. For dairy products, the index in 2016 was lower than in 2013 by 37 percent and for meat products by 21 percent between 2014 and 2016.

Figure 10: FAO food price indices, 2011-2016

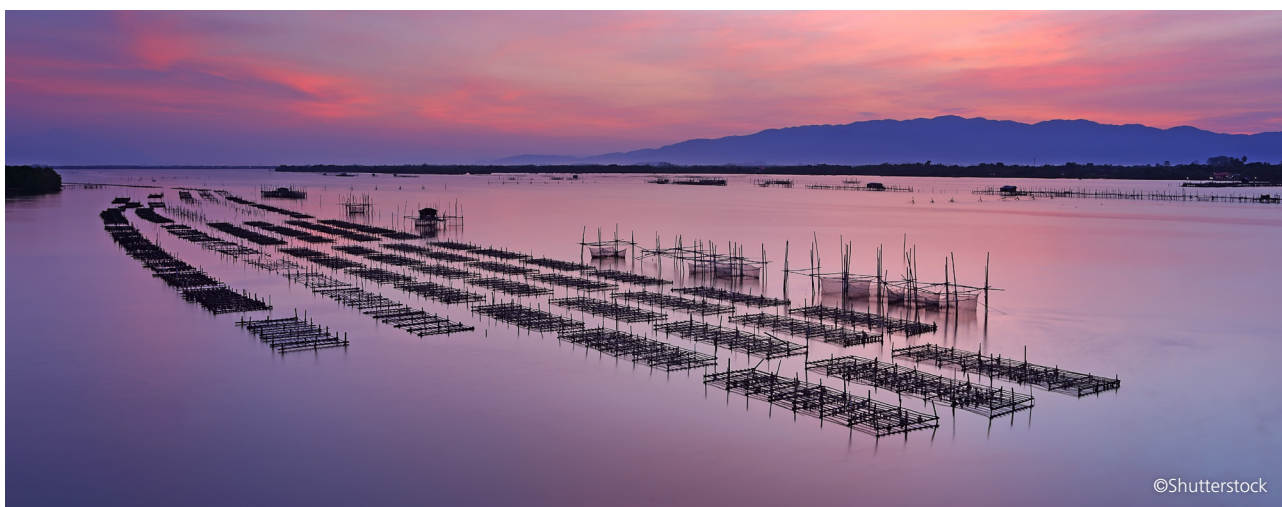


Source: FAOSTAT.

The outlook for the medium term, based on projections by both OECD-FAO and the World Bank is, on the whole, for food prices to rise modestly in nominal terms through 2025 but remain stable or fall slightly in real terms (OECD-FAO 2016, World Bank 2017b). Cereal prices, with the exception of some selected coarse grains, are projected to decline in real terms while meat

prices will trend moderately downward. Dairy prices are expected to trend upwards due to comparatively stronger demand for dairy products. Overall, agricultural prices are projected to be structurally higher than in the decade before the 2007-2008 price spike, but declining over the medium-run in real terms.

¹⁵ The Food Price Index consists of the average of five commodity group price indices (meat, dairy, cereals, vegetable oils and sugar) weighted with the average export shares of each of the groups for 2002-2004.



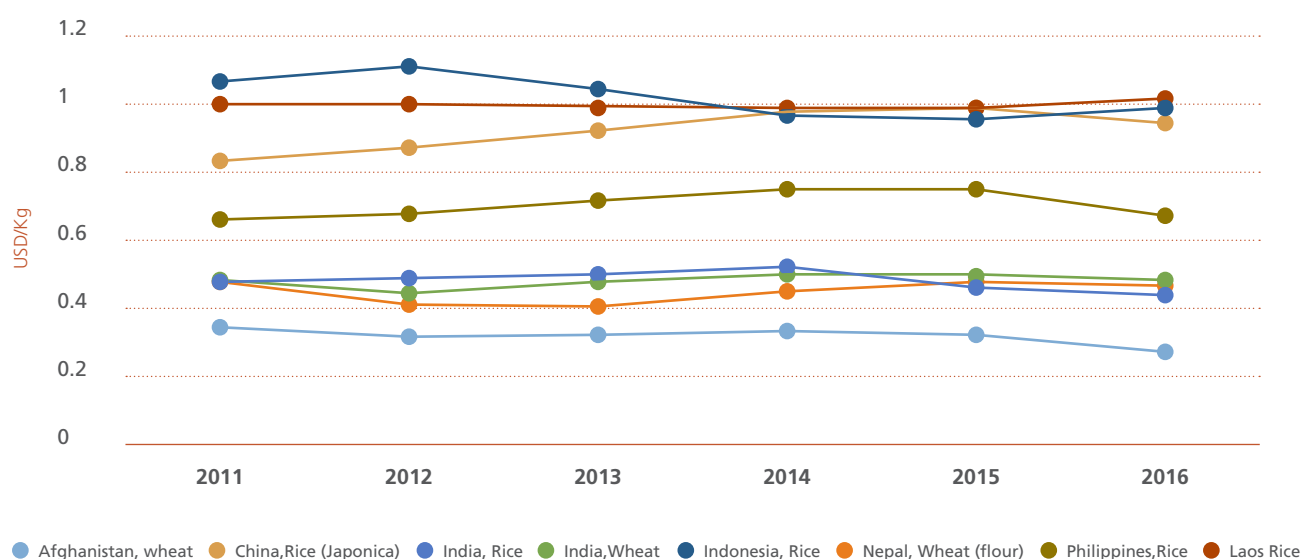
Domestic food price inflation

World prices serve as reference prices but ultimately it is the domestic prices that directly affect food producers and consumers. The extent to which world market price signals are transmitted to domestic prices depends on various factors such as the volume of trade relative to total production or consumption, trade openness, and price interventions in food markets.

Movement of domestic prices of selected cereals since 2011 is shown in Figure 11. As expected, the domestic prices do

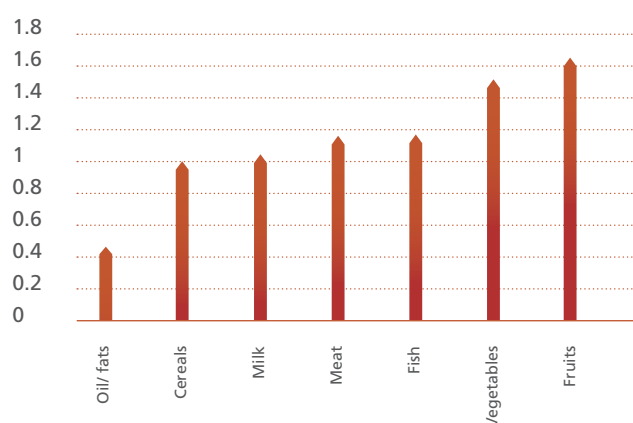
not fully track the world prices due to various interventions, but the domestic price of main staple cereals in the region – rice and wheat – have mostly remained stable with marginal rises or declines depending on the market. Further analysis also shows that inflation in higher value products like fruits, vegetables, meat and fish generally tends to be higher than cereals (Figure 12). In large part, this seems to be due to both the lower tradability of the former products as well as higher rigidity in supply response.

Figure 11: Domestic prices of selected cereals in selected markets, 2011 to 2016



Source: FAO Global Information and Early Warning System

Figure 12: Relative Price increases of various food sub-groups (2014-2016) in the region as a ratio of prices for cereals



Note: Based on data from Afghanistan, Bhutan, India, Malaysia, Nepal, Pakistan, Philippines and Thailand

An overview of recent policy responses

Government policies evolved over the past year as some countries have started to discourage rice cultivation at the margins, while others have reduced the magnitude of subsidies. One constant, however, has been the implementation of price policies to stabilize domestic prices in the face of shocks to domestic harvests or declines in international prices.

In South Asia, countries continued to implement policies, some of them with the goal of stabilizing domestic prices, often by lowering or raising import tariffs. For example, in response to reduced domestic harvests and rising domestic prices, India lowered wheat import tariffs from 25 percent to 10 percent in September 2016, and then to zero in December 2016.¹⁶ In Bangladesh, major floods caused serious damage to the main *boro* season crop, leading to a year-on-year domestic price increase of more than 70 percent for coarse rice (May 2016 to May 2017). In response to the high prices, the government announced that it would import up to 600 000 tonnes of rice through government-to-government deals with neighbouring countries including India, Thailand and Viet Nam. In addition, the government lowered the import tariff substantially from 25 to 10 percent and the Central Bank removed the Letter of Credit margin on rice imports until 31 December. Rice prices also surged in Sri Lanka due to drought-induced crop shortfalls, and in response import

tariffs were reduced in early 2017 to approximately US\$99 and then US\$33 per tonne, from a previous tariff of more than US\$330 per tonne.

Pakistan, in contrast, has raised import tariffs four times during the past two to three years, but the objective was the same as in the cases noted above – to stabilize domestic prices. In this case, the government was reacting not to poor domestic harvests, but rather to falling world prices that were putting downward pressure on domestic prices. As of August 2016, the wheat tariff had reached 60 percent.

With regard to policies aimed at diversifying agricultural land use, in East and Southeast Asia, several governments are starting to implement policies designed to discourage rice cultivation in favour of alternative crops or land uses. In the Republic of Korea, the government has implemented a production adjustment programme to encourage the gradual conversion of 88 000 hectares of rice land to other uses by 2018. In Viet Nam, the government announced a scheme under which farmers would be paid 3 million Vietnamese Dong (US\$134) for every hectare of land switched from rice to maize, as sustaining rice exports became difficult due to falling world prices, while maize demand and imports were soaring. In Thailand, the government is implementing a five-year Agricultural Restructuring Programme (2015-2019), encouraging farmers to diversify some land away from rice. While water shortage was the principal reason, this initiative is also linked to continued slack export demand for rice (the government also instituted a subsidy to rice farmers to provide support to falling domestic prices, although the subsidy was much smaller than the one initiated by earlier governments). Other countries in the region, however, continue to encourage rice cultivation through high domestic prices (caused by import restrictions).

In summary, the foregoing review shows that a number of policy responses were aimed at price stabilization. However, some of these instruments will not be accessible once the provisions of the new WTO Ministerial Decision on export competition signed at the Nairobi conference in December 2015 come fully into effect.¹⁷ Also for this reason, and given the fact that import surges could occur in the future, the incorporation of a Special Safeguard Mechanism (a policy tool under negotiation in the Doha Development Round that will allow developing countries to raise tariffs temporarily to deal with such surges) remains valid.

¹⁶ The national average monthly price of wheat increased by almost 20 percent between September and November 2016.

¹⁷ Developing countries will remove export subsidies by 2018, with a longer time frame in some limited cases. In addition, developing countries will keep the flexibility of covering marketing and transport costs for agriculture exports until the end of 2023, while the poorest and food-importing developing countries will enjoy additional time to cut export subsidies.

But the real challenge is to move towards a policy regime that is flexible enough to be applicable to both rising and declining prices. Schemes that accumulate public stocks through procurement prices substantially out of line with market prices and land policies that restrict farmers' choice to specific crops whose prices are under downward pressure are not flexible policies. Neither is a producer assistance scheme under which farm support prices are raised every year for political or other reasons, although a deficiency payment scheme would be more flexible.

Sharp increases in world prices typically lead to headlines around the world. Over the past few years, however, as world food prices have been declining, there has been less public concern over the state of the world food economy.

Nevertheless, it is important that governments and other stakeholders not become complacent, for two reasons. First, while declines in world food prices have the potential to help many poor food consumers, they also put many poor farmers at risk of deteriorating livelihoods. Thus, there is a need to invest in rural roads, education, health care and other public goods to improve farm productivity, production and profits. Such investments will also facilitate continued structural transformation and diversification of farm household incomes towards nonfarm activities. Second, given the fundamental importance of food in both production and consumption for the poorest of the poor, stepped up investments in the food economy will be essential if we are to achieve the SDG goal to "leave no one behind".

REDUCING FOOD LOSS AND WASTE – TOWARDS A MORE EFFICIENT FOOD SYSTEM IN ASIA AND THE PACIFIC REGION



Reducing food loss and waste (FLW) has the potential to offer a triple win: for food security and nutrition; for higher income for farmers and supply chain actors; and for the environment. With an estimated one-third of all food produced in the world lost or wasted, the potential gains in all three areas are considerable (Gustavsson *et al.* 2011). In terms of food security, this would translate into more than one billion additional tonnes of food that could be consumed, but is currently lost. The opportunity cost of this loss will increase steadily as the cost of maintaining past trends in crop yields rises. And much of this loss affects fruits and vegetables, which are especially good sources of nutrition. The second win is in reclaiming the income foregone by lost and wasted food, estimated to be roughly US\$940 billion per year globally, including US\$310 billion in developing countries. The third win is for the environment. Food that is grown but then is lost or wasted consumes about one-quarter of all water used by agriculture each year, and uses cropland the size of China, besides generating about 8 percent of total global anthropogenic greenhouse

gas emissions annually. It is not surprising that these huge potential gains have stimulated the resurgence of worldwide attention on this issue.

Reduction of FLW is now part of the 2030 Agenda under SDG 12, which seeks to “ensure sustainable consumption and production patterns.” Target 12.3 under this goal is “for halving per capita global food waste at the retail and consumer levels and reducing food losses along the production and supply chains, including post-harvest losses, by 2030”. The FLW reduction goal was also included as one of the five targets in the *Zero Hunger Challenge* launched by the UN at the Rio+20 Conference in 2012.

Considering that FLW takes a heavy toll on food security, this year’s report features this as a special theme. The purpose is to introduce the subject, discuss measurement and monitoring issues, take stock of national and international initiatives, and derive some insights and messages for policy-makers and practitioners in the region.



Defining and measuring food loss and waste

Two essential steps for implementing the 2030 Agenda are establishing a baseline and selecting an indicator for monitoring progress. A substantive work programme is underway on these measures. The terms “post-harvest loss,” “food loss,” “food waste,” etc. are often used interchangeably but refer to different dimensions of the problem. The concepts, as currently understood and used, are presented in Box 2. FAO is also the custodian of the Global Food Loss Indicator (SDG Indicator 12.3) being developed, which is based on a model using observed variables that influence food losses (for example, road density or weather) to estimate quantitative pre- and post-harvest losses. In defining these terms, FAO has remarked that these definitions are to serve as global references because stakeholders in different contexts around the world may operationalize the concepts differently. In other words, these are not cast in stone and are subject to adjustment and refinement if necessary, following feedback and assessment of the functionality of the terms. Depending on their priorities and monitoring systems, countries may adopt other indicators to more directly track food losses and/or waste for food categories of importance to their own food and nutrition security.

In general, the incidence of food waste (FW) has been found to increase and that of food loss (FL) to decrease as countries become richer (Figure 13). This means that, in practice, developing countries will pay much more attention to FL than to FW. This region has many countries with low per capita incomes but also with high incomes – almost one-third of the countries had per capita income exceeding US\$10 000 in 2015 (in Purchasing Power Parity terms). This means that, for them, FW is also a significant issue to be addressed. This is the case particularly in urban centres. Indeed, as shown in Figure 13, FW in industrialized Asia (which includes China, Japan, and Republic of Korea) already exceeds that in Europe. A 2017 report indicates that China’s per capita restaurant FW is already approaching that of western countries (Wang et al. 2017). FW varies by consumer groups, restaurant categories, and meal purposes (social dining, informal individual dining, dining in buffets, etc.) Moreover, even for many countries with lower incomes, FW is likely to be high in cities, notably in restaurants, hotels, etc. Therefore, both FL and FW should be relevant issues in the region.

Box 2: Conceptual definitions of food loss and waste

Food – refers to any substance – whether raw, processed or semi-processed (including drinks) – that can be consumed and that provides micronutrients and macronutrients. Further, the edible portion of food refers to that component of food that a population of a specific cultural or economic group normally consume.

Food supply chain – describes the connected series of activities to produce, process, distribute and consume food.

Post-harvest loss (PHL) – refers to quantity losses that take place between harvest and retail.

A further distinction is between quantitative PHL in mass (e.g. kg) of food, and *qualitative PHL*, meaning reduction of nutritional and economic value, food safety and/or consumer appreciation.

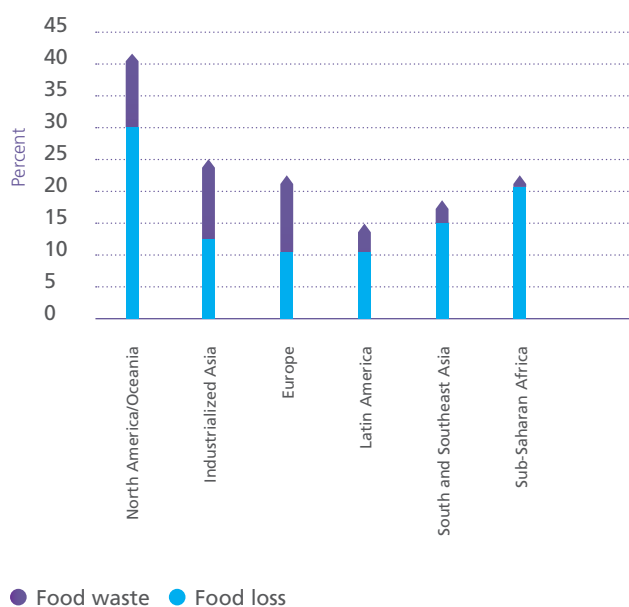
Food loss (FL) – refers to the decrease in quantity or quality of food that occurs during production (harvest/mature stage) and at various distribution segments of the food supply chain, up to retail. It includes “pre-harvest loss + loss at harvest + post harvest loss.”

Food waste (FW) – refers to discarded or alternative (non-food) use of food that is safe and nutritious for human consumption along the entire food supply chain. FW occurs predominantly, but not exclusively, at the final consumer level when food which is fit for consumption is not consumed but wasted, mainly by choice or negligence.

Food loss and waste (FLW) – includes both FL and FW; that is, losses throughout the entire chain from production to consumption.

Source: Definitional framework of food loss as amended by an FAO Internal Consultation, 29 May 2017.

Figure 13: Food loss and waste in various regions



Source: Based on the data in Lipinski et al. 2013 and Gustavsson 2011.

A review of food loss estimates in the region

Estimates of FL in the region are based on two main sources of information. One is the estimates used in the database on FBSs maintained by FAO, which are available for most countries, for numerous food products and for many years.

The other is the field-level FLW surveys that governments, development agencies and researchers undertake from time to time. These could be nationally representative surveys or could be smaller surveys for some area of a specific country and for specific food value chains, typically with no specific periodicity. These surveys also provide the basic data for updating the FBSs. So essentially, the FBSs are the only standardized data on FL available for all countries, food items and years, and thus provide the “world-view” on food losses.

Preparing broadly comparable international statistics, however, inevitably requires translating or adjusting the conceptual definitions into more operational ones based on data and measurement challenges. According to FAO’s Statistics Division, operational definitions and boundaries used by FBSs in estimating food losses are as follows:

- ▶ Losses in the FBSs cover quantitative losses only; qualitative losses are excluded in loss measurements as it is difficult to capture them consistently and they cannot be measured accurately through existing measurement efforts.
- ▶ Non-edible parts are included in measurement of food quantities, as FAO Agricultural Statistics consistently considers gross quantities along the food supply chain for all products and utilizations.
- ▶ Value chain boundary definitions are consistent with the definitions of agricultural production and with the FBS framework. The measurement of post-harvest losses

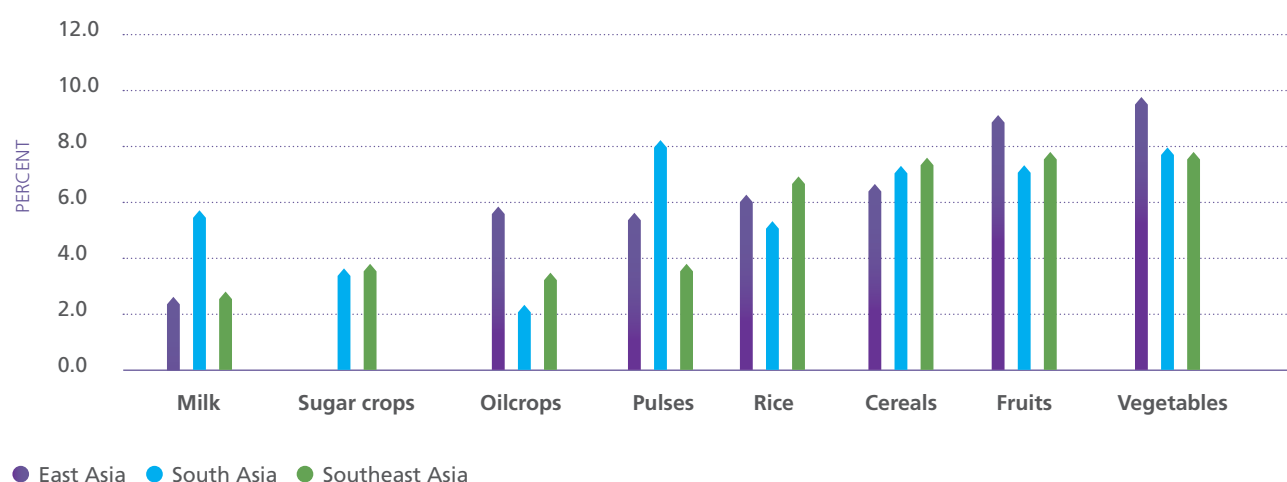
starts on-farm at post-harvest/post-slaughter level and covers up to, but not including, the retail level. This definition is consistent with agricultural production, which measures net harvest losses.

- Pre-harvest and harvest losses are therefore not considered in FBS “losses.” Harvest losses, however, can be measured through crop-cutting surveys and compared with the potential yield at harvest.

- For definitional simplicity, “waste” covers the supply chain from retail to the consumer and does not distinguish the end-stage of waste.

The FBSs contain data on FL for 26 countries of the region. Based on these data, Figure 14 shows averages across the subregions.

Figure 14: Food loss across sub-regions



Source: FAO Food Balance Sheets.

A number of observations can be made based on these data. First, as is well documented, FL is relatively high for fruits and vegetables. Second, the percentage of FL does not vary systematically across the various subregions. For two food groups, milk and pulses, losses are higher in South Asia than in East Asia and Southeast Asia, but for fruits and vegetables the losses are higher in East Asia. And third (not shown in the Figure), there were very few cases where FL levels showed marked rises or declines. For example, of the 18 countries with data, there were only three cases where percentage loss for rice in 2011-2013 was higher by one percentage point than in 1999-2001 and only two cases where it was lower. This was also true for fruits and vegetables and other food items. This could be either because the percentage losses did not change much in reality or because updated estimates were not available for FAO to revise them. This indicates the difficulty in monitoring progress towards SDG Target 12.3, given the quality of the estimates currently available.

Other than FAO FBSs, survey results available in the public domain are the major sources for estimates of FL. While these surveys do not necessarily cover all food items and are not always nationally representative, they do often provide estimates of losses along the supply chain, which is valuable for identifying particular segments of the chain where losses are high – i.e. critical loss points. These critical loss points can serve as indicative points for the conduct of statistical measurements of losses in supply chains. Survey reports also often provide narratives on why losses are high or low. What follows presents an overview of FL estimates in the region based on a sample of available surveys.

One set of comprehensive estimates of post-harvest loss comes from India. Commissioned by the Government of India, this was a nationwide sample survey covering 45 crops and livestock products with estimates for 2013-2014 (Jha et al. 2015). This survey updated similar previous surveys conducted in 2005-2007 and 2010-2011. Box 3 presents the main findings.

Box 3: India – food loss estimates for 2013-2014

The study estimated total post-harvest loss for selected foods as a percentage of production. Losses are higher for fruits, vegetables, some oilseeds and marine fish, while losses for the rest are in the 5-7 percent range. For some food categories, the loss ranges were as follows:

1. Cereals: 4.6 percent (for maize) to 6 percent (for sorghum)
2. Pulses: 6.4 percent (for pigeon pea) to 8.4 percent (for chickpea)
3. Oilseeds: 3.1 percent (for cottonseed) to 10 percent (for soybean)
4. Fruits: 6.7 percent (for papaya) to 15.9 percent (for guava)
5. Vegetables: 4.6 percent (for tapioca) to 12.4 percent (for tomato).

The study also identified steps of the supply/value chain where losses were relatively high (i.e. critical loss points). These operations were as follows:

1. Cereals, pulses and oilseeds: delayed harvesting, improper threshing and poor storage practices
2. Fruits and vegetables: poor storage, transportation and marketing (with large losses specifically for vegetables during harvest month due to a glut in the market)
3. Marine fish: the practice of discarding uneconomical fish
4. Poultry: poor storage, transportation and marketing at the wholesale and retail levels.

Lack of cold chain infrastructure, including low-cost cold storage facilities in villages, was identified as the main reason for high levels of losses in the case of fruits, vegetables, fish, meat and milk. The total losses for all covered products amounted to about US\$15 billion, which approximates 6.2 percent of India's GDP from the agriculture sector in 2012-2013.

Source: Based on the ICAR-CIPHET study (Jha et al. 2015).

For China, two recent papers have collated available estimates and presented their own assessments in the form of means and ranges (Liu *et al.* 2013, Liu 2014). For grains, a study by Liu *et al.* (2013) suggests a total post-harvest loss of 13.4 percent, with 26 percent of those losses at harvest, 42 percent during storage, 9 percent in transport and 23 percent in processing. In a subsequent study, Liu (2014) reports the range of FL for grains is 13-29 percent. For fruits and vegetables, the range is 20-30 percent in Liu *et al.* (2013) and 35-40 percent in Liu (2014). For various meats, the range is 3-15 percent as reported by Liu *et al.* (2013) and 13-20 percent in Liu (2014). The latter study also provides an estimate of FL for fish at 9.2 percent. In summarizing the estimates, Liu (2014) notes that: i) estimates on losses across the supply chain are seldom complete (with most estimates focusing on cereals only); ii) poor storage contributes the most to FL for all types of food; and iii) technological and infrastructural changes over the past decades have most likely reduced FL in China while FW may have surged given growing affluence and urbanization.

In the Philippines, estimates from the Philippine Center for Postharvest Development and Mechanization show

post-harvest losses to be approximately 16 percent for rice and 10 percent for maize. For onions, the total loss was 11.6 percent with 50 percent of those losses occurring at harvest, 38 percent in hauling and 12 percent in other operations. For mango, the loss ranged between 15.7 percent and 21.5 percent. For bananas, in contrast, 63 percent of the total loss, which was in the 23-24 percent range, was at the retail level, followed by 31 percent at the wholesale level and only 6 percent during collection, distribution and storage. For fish, one study for 2006 showed FL in the 25-30 percent range.

Overall, these studies and surveys show that the FL levels estimated using FAO FBSs are on the whole lower than estimates from various field-level surveys. The surveys not only show larger loss estimates in general, but also fairly high levels of loss for fruits and vegetables in particular. In most cases, there are no official estimates, nor nationally representative surveys taken on a periodic basis. Developing a harmonized methodology, establishing a baseline at the country level for the critical loss points identified through field level measurements, and monitoring progress over time is therefore a big challenge towards implementing systematic cost-effective measures for reduction of FLW.

Initiatives in the region on reducing food loss and waste

Lack of data notwithstanding, governments, the private sector and civil society organizations have been active in initiating post-harvest loss reduction programmes or integrating substantive post-harvest components within agricultural development projects with the specific objective of managing quality and reducing losses in the chain. After all, it is clearly in the interests of all to reduce these losses if it can be done in a cost-effective manner. Some of these initiatives are illustrated below. to more directly track food losses and/or waste for food categories of importance to their own food and nutrition security.

Illustration of government-led initiatives that reduce post-harvest loss and food waste

In India, the government has raised incentives over the years to encourage private investment in cold chains, and value addition and preservation infrastructure. These incentives include partial financing of the costs as well as tax and fiscal incentives. About US\$130 million was allocated for such schemes during 2011-2015, almost all of which was used – an indicator of strong response by the private sector. Grants were also provided to cold storage schemes under other programmes such as the National Horticulture Mission. Foreign direct investment policy has also been relaxed to allow 100 percent foreign investment for processing. Recent policy announcements have signalled further reforms aimed at enhancing efficiency and reducing post-harvest losses, with special focus on fruits and vegetables.

Another example of an agricultural project fully focussed on FL reduction comes from Timor-Leste, where an IFAD-funded project (2011-2015) implemented post-harvest loss interventions involving the distribution of airtight drums for maize storage, as well as shellers and mills. Farmers had to pay 20 percent of the cost (US\$10) of the drum while 80 percent was subsidized by the project. The project trained smallholders in good harvesting and post-harvest management practices and distributed 42 200 drums to about 23 000 farm households. A recent study commissioned by FAO assessed the impact of these interventions in one project location and found that, with good practice and the introduction of improved storage (drums) as well as shellers and small-scale mills, there was a drastic reduction in post-harvest losses (Guterres 2017). Similarly, a recent technical cooperation project implemented by FAO in horticultural supply chains in three South Asian countries – Bangladesh, Nepal and Sri Lanka – showed that capacity development of smallholders in good harvesting and post-harvest management practices, coupled with the introduction of appropriate levels of technologies, were effective in improving quality and shelf

life and considerably reducing post-harvest losses in fruits and vegetables. The use of plastic crates as bulk packaging during transportation of horticultural crops significantly reduced transport losses in all supply chains where these improvements were piloted. The improved technologies and practices introduced into the supply chains also increased net returns over costs for all three supply chain actors – farmers, wholesalers and retailers.

According to the National Environment Agency of Singapore, the amount of FW generated in Singapore increased by almost 50 percent in the past ten years and is expected to increase further with the growing population and economic activity. Reducing food wastage, redistributing unsold/excess food and recycling FW are important components of Singapore's national waste management strategies to work towards Singapore becoming a Zero Waste Nation under the Sustainable Singapore Blueprint of 2015.

The government of Malaysia in 2016, rolled out a MYSaveFood programme, in partnership with FAO and SWCorp Malaysia – a government agency tasked with tackling the issue of FW in the country – to educate its citizens on food wastage.

Similarly, in an effort to change the food culture by reducing waste and recycling, the Government of the Republic of Korea established a comprehensive and successful policy mix aimed at FW treatment and recovery. In 2010, the Ministry of Environment, in collaboration with the Ministry for Food, Agriculture, Forestry and Fisheries and the Ministry for Health, Welfare and Family Affairs, carried out a FW reduction project by signing agreements for voluntary cooperation with different sectors. The sectors included restaurants, hotels, schools, rest areas on highways, etc. Restaurants were encouraged to use fewer small side-dish plates and adopt eco-friendly menus; cafeterias in public institutions launched a "no-leftovers day" once a week. Furthermore, the government introduced a volume-based FW fee system.

A more comprehensive initiative that covers the entire food supply chain and targets multiple stakeholders comes from Japan. Since the Food Waste Recycling Law was enacted in 2001, the Government of Japan has introduced a range of measures including conducting surveys with food wholesalers, retailers, processors, distributors and consumers, and providing targeted guidelines for reducing FLW. This has resulted in progressive reduction of FLW of around 2-4 percent a year (Liu et al. 2016). Similarly, China's "Clean Your Plate" campaign is said to have resulted in a reduction in FW although there are no precise estimates of the extent of this reduction.

These are just a few illustrative examples and many more can be cited from practically all countries in the region. Most such initiatives are implemented as part of an overall agricultural development programme to improve the efficiency of post-harvest operations and thus reduce FL. With the 2030 Agenda, and heightened campaigns on reducing FLW, it is expected that governments will respond even more actively in the coming years.

Private sector initiatives contributing to reduction of food loss and waste

Recognizing the business case for improving efficiency and reducing losses in the food supply chain, the private sector has also been implementing measures that contribute to FLW reduction. These measures take the form of capacity development for small farmers (such as on-farm training and improved management systems), encouraging the adoption of innovative technological solutions and production practices, reducing in-store food losses, partnering with food redistribution programmes and stakeholder training to reduce losses at harvest, storage and distribution. A number of supermarkets in the region have been working with smallholder farmers to improve produce quality along the marketing chain and also, in the process, to reduce losses while assuring smallholders a guaranteed market and improved prices for their produce. For example, a supermarket in Sri Lanka recently equipped an organized group of banana farmers – trained under an FAO technical cooperation project – with plastic crates so they could supply the supermarket with de-handled bananas. In this way, post-harvest operations were transferred to the field level. The investment in packaging resulted in better quality bananas with a longer shelf life, and reduced levels of losses in the supply chain. Smallholders benefited from a 20-40 percent increase in income as a result. Similarly, under a recently concluded IFAD-funded project implemented by FAO in Lao PDR, a packing house facility was constructed, after which a public-private partnership was developed with a

Thai company to operate the facility on a leasing basis. The Thai company invested in and facilitated logistical arrangements through a cold chain system to support cross-border trade to Thailand and international trade to the Near East. Produce that does not meet quality requirements for the Thai and export markets is sold in local markets.

There are also a number of private sector-led initiatives for reducing FW at the consumption end. For example, Food Bank Singapore receives donations from manufacturers, retailers and distributors of food items that are safe and fit to eat but may have lost their commercial value due to the approaching sell-by date, labelling/packaging errors, discontinued brands, surplus inventory or minor recipe variations, and distributes them to more than 130 member beneficiaries. Member beneficiaries then provide this food to the people who need it. A similar system has been established in Malaysia with a British supermarket chain.

These are just a few illustrative examples. There are many more similar campaigns by food companies in the region. Based on these initiatives, it appears there is now an emerging broad consensus on policy and programme responses to FLW reduction (see, for example, Box 4 for an illustration of some of the causes and potential solutions). There are several common elements to these responses, such as the importance of education, extension and demonstration of best agricultural and handling practices; investment in post-harvest infrastructure and transportation; developing contract linkages between processors and farmers; developing marketing cooperatives; support for the organization of smallholders and market facilities, etc. An increasing number of analysts also stress the importance of economic analysis in the choice of improved technologies, taking into consideration effects on the entire supply chain as well as profitability for farmers and stakeholders, along with the cost of food in mass markets.

Box 4: An illustration of identified problems and their solutions

Problem	Response
Premature harvesting (loss in nutritional and economic value due to poor post-harvest quality) as a result of distress sales and poor credit access	Organizing small farmers in groups to provide credit, warehouse receipts, etc. Training smallholders on maturity indices for harvest.
Fresh foods discarded from supermarkets due to “poor appearance” (weight, size, shape, etc.)	Convincing consumers/supermarkets that what matters is safety and quality, not appearance.
Poor storage facilities and lack of infrastructure	Investing in infrastructure and transportation (governments create the basics, private sector follows up with more investment). Creating an enabling environment to allow smallholders access to credit to improve transport facilities.
Failure to comply with food safety standards	Promoting extension, knowledge, good agricultural and handling practices.
Lack of post-harvest and processing facilities and technologies	Facilitating smallholder access to credit to acquire simple and appropriate post-harvest technologies. Developing contract linkages between processors and farmers, incentivizing private sector and service providers to invest in facilities and link to farmers.

The next steps

There is now an emerging consensus that reducing FLW can be a promising means to improve food security and increase the resource use efficiency of food production. However, the problem cannot be solved by a single string of actions or by individual actors alone. It requires identifying root causes of the problem and multistakeholder coordinated action towards implementing context-specific solutions that are technically, economically and socially feasible.

FAO's Statistics Division is currently in the process of working towards the development of measurement protocols that are duly endorsed by the UN Statistical Commission and the international community at large. It is anticipated that countries will share data as needed to make standard measurement possible. Ideally, countries will adopt the methodology to estimate food losses. FAO's Statistics Division will also ensure that the indicators for SDG 12.3 are monitored.

Solutions that are technically, economically and socially feasible can be used to build an evidence base and

inform sectoral policy development as well as investment requirements for scaling up interventions to generate country-level impact. FLW often results from multiple interrelated causes including inadequacy of technical knowledge, inappropriate technology, poor handling practices, poor infrastructure and poor coordination among supply chain actors. Since about 2012, many studies have called for addressing the issue in a holistic manner and through a multidisciplinary lens. But the recommendations of most of these studies remain quite general and are inadequate to provide context-specific guidance. Specific solutions or interventions also need to be vetted for their cost-effectiveness and social acceptability. There is also a need to better understand the experience of existing, adopted measures/investments for FLW reduction. Further, considering that many attractive technologies have high fixed costs that make it difficult for individual smallholders and small businesses to adopt them on their own, there is a need to create collective institutions that will facilitate access to these technologies, such as group ownership and custom hiring services. This in turn may require an enabling legal framework.

Investment in cold chain infrastructure will also be essential to reduce FL, especially for high-value perishable products such as fish, meat and milk products. With good pre- and post-harvest management practice, supported by appropriate packaging technologies and transport practice, investment in cold chain infrastructure may not be necessary for most tropical fruits and vegetables. Most of the investment requirements for cold chain development will have to come from the private sector, although governments may be able to accelerate the process with small subsidies.

In addition, considerable scope exists for strengthening food processing capacity, particularly that of small and medium enterprises, to reduce FLW. This requires developing technical knowledge and building capacity in post-harvest handling, value-added processing and preservation, strengthening food packaging systems, logistics systems, and investment in an appropriate level and scale of new technologies targeted at small and medium enterprises and creating an enabling environment

for the food sector of these enterprises within the context of FLW reduction.

Finally, although FLW reduction is country- and context-specific, sharing of experiences remains key to achieving results. Many multistakeholder initiatives on FLW have taken shape in recent years, both globally and regionally, including a High Level Multistakeholder Consultation on Food Loss and Food Waste convened in Bangkok by FAO in August 2013. In that consultation, government-designated representatives from 22 countries across the region endorsed a joint communique to work together and create regional and national multistakeholder networks towards reducing FLW. Such initiatives help raise awareness, bring stakeholders together to share best practices, mobilize additional resources, and help support joint implementation of programmes and projects. A dedicated FLW platform would be useful for the specific needs of the Asia-Pacific region. Such a platform could also be instrumental in fostering South-South collaboration to address the issue of FLW reduction.

REFERENCES

- Baker, P. & Friel, S. 2016. Food systems transformations, ultraprocessed food markets and the nutrition transition in Asia. *Globalization and Health* 2016 12:80. doi: 10.1186/s12992-016-0223-3
- Basu, S. *et al.* 2014. Averting obesity and type 2 diabetes in India through sugar-sweetened beverage taxation: An economic-epidemiologic modeling study. *PLoS Med* 11(1): e1001582. doi:10.1371/journal.pmed.1001582
- Black, R.E. *et al.* 2013. Maternal and child undernutrition and overweight in low-income and middle-income countries. *Lancet* 2013, 382 (427–51). [http://dx.doi.org/10.1016/S0140-6736\(13\)60937-X](http://dx.doi.org/10.1016/S0140-6736(13)60937-X)
- Ding, J., Huang, J., Jia, X., Bai, J., Boucher S. & Carter, M. 2015. Food safety special issue: Direct farm, production base, traceability and food safety in China. *Journal of Integrative Agriculture* 2015. doi:10.1016/S2095-3119(15)61127-3
- FAO. 2015. *CFS High-Level Forum on Connecting Smallholders to Markets*. Background Document, 25 June 2015. <http://www.fao.org/3/a-av042e.pdf>
- FAO. 2016a. *Regional Overview of Food Insecurity: Asia and the Pacific*. Regional Office for Asia and the Pacific, Bangkok, Thailand. <http://www.fao.org/3/a-i6481e.pdf>
- FAO. 2016b. *Methods for estimating comparable rates of food insecurity experienced by adults throughout the world*. FAO, Rome. <http://www.fao.org/3/c-i4830e.pdf>
- FAO. 2016c. *Food Outlook*. October 2016 FAO, Rome. <http://www.fao.org/3/a-i6198e.pdf>
- FAO. 2017a. *Crop Prospects and Food Situation*. March 2017, FAO, Rome. <http://www.fao.org/giews/reports/crop-prospects/en/>
- FAO. 2017b. *Country Briefs, GIEWS - Global Information and Early Warning System*. FAO. <http://www.fao.org/giews/country-analysis/country-briefs/>
- FAO-WHO/ICN2 2014. *Framework for Action: From Commitments to Action*. Conference Outcome Document ICN2 2014/3 Corr.1, ICN2, Rome, 19-21 November 2014. <http://www.fao.org/3/a-mm215e.pdf>
- Gillespie, S., van den Bold, M., Hodge, J. & Herforth, A. 2015. Leveraging agriculture for nutrition in South Asia and East Africa: examining the enabling environment through stakeholder perceptions. *Food Security* 7 (3): 463–477. <http://link.springer.com/article/10.1007/s12571-015-0449-6>
- Global Panel 2016. *Food systems and diets: Facing the challenges of the 21st century*. Global Panel on Agriculture and Food Systems for Nutrition, London, UK. <http://glopan.org/sites/default/files/ForesightReport.pdf>
- Gustavsson, J., Cederberg, C., Sonesson, U., van Otterdijk, R. & Meybeck, A. 2011. Global food losses and food waste – Extent, causes and prevention. Rome, FAO. www.fao.org/docrep/014/mb060e/mb060e00.pdf
- Guterres, A. 2017. *Case study of post-harvest interventions to reduce maize losses in Timor-Leste*. Study conducted for FAO, RAP, Bangkok. April 2017.

- Headey, D., Hoddinott J. & Park, S. 2016. Drivers of nutritional change in four South Asian countries: a dynamic observational analysis. *Maternal & Child Nutrition* 12 (Suppl 1): 210–218. doi: 10.1111/mcn.12274
- HLPE 2013. *Investing in smallholder agriculture for food security*. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome. http://www.fao.org/fileadmin/user_upload/hlpe/hlpe_documents/HLPE_Reports/HLPE-Report-6_Investing_in_smallholder_agriculture.pdf
- IFAD 2016. *Smallholder Access to Markets Evaluation Synthesis*. Independent Office of Evaluation. November 2016 Report No. 4214. <https://www.ifad.org/documents/10180/9cc12cf2-fe1a-4c8f-bfc8-c2ec0a9811ff>
- IFPRI 2015. *Global Nutrition Report 2015: Actions and Accountability to Advance Nutrition and Sustainable Development*. Washington, DC. <http://www.globalnutritionreport.org/>
- IFPRI 2016. *Global Nutrition Report 2016: From Promise to Impact: Ending Malnutrition by 2030*. Washington, DC. <http://www.globalnutritionreport.org/>
- Jha, S., Vishwakarma, R., Ahmad, T., Rai, A. & Dixit, A. 2015. *Report on Assessment of Quantitative Harvest and Post-Harvest Losses of Major Crops and Commodities in India*. ICAR-All India Coordinated Research Project on Post-Harvest Technology, ICAR-CIPHET, Ludhiana, India. http://www.ciphnet.in/upload/sph/MOFPI_percent20REPORT1.pdf
- Lim S.S., Vos T., Flaxman A.D. et al. 2012. A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010 *Lancet* 380: 2224–60.
- Lipinski, B. et al. 2013. *Reducing Food Loss and Waste*. Working Paper, Installment 2 of Creating a Sustainable Food Future, World Resources Institute, Washington, D.C. <http://www.worldresourcesreport.org>
- Lipton, M. 2005. *The family farm in a globalizing world: The role of crop science in alleviating poverty*. 2020 Discussion Paper No. 40. Washington, DC: International Food Policy Research Institute.
- Liu, G. 2014. *Food Losses and Food Waste in China*. Document TAD/CA/APM/WP(2013)26/FINAL, Working Party on Agricultural Policies and Markets, OECD, Paris. [http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=TAD/CA/APM/WP\(2013\)26/FINAL&docLanguage=En](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=TAD/CA/APM/WP(2013)26/FINAL&docLanguage=En)
- Liu, J., Lundqvist, J., Weinberg, J. & Gustafsson, J. 2013. Food losses and waste in China and their implication for water and land. *Environmental Science Technology* 47(18): 10137–44. dx.doi.org/10.1021/es401426b.
- Martyn, T., Reeve, E., Bollars, C., Naseri, A. & Thow, A.-M. unpublished. Taxes on food and beverages as a public health strategy: the evidence from Samoa. Unpublished manuscript.
- Masset, E., Haddad, L., Cornelius, A. & Isaza-Castro, J. 2011. *A systematic review of agricultural interventions that aim to improve nutritional status of children*. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London. https://assets.publishing.service.gov.uk/media/57a08abde5274a27b2000737/Masset_etal_agriculture_and_nutrition.pdf

- Murray C.J. & Lopez, A.D. 1997. Global mortality, disability, and the contribution of risk factors: Global Burden of Disease Study, *Lancet* 349:1436–442.
- Mytton, M., Clarke, D., and Rayner, M. 2012. Taxing unhealthy food and drinks to improve health. *BMJ* 2012 344:e2931My. doi: <https://doi.org/10.1136/bmj.e2931>.
- OECD-FAO 2016. *OECD-FAO Agricultural Outlook 2016-2025*. OECD and FAO. <http://www.fao.org/3/a-i5778e.pdf>
- Pingali, P. 2015. Agricultural policy and nutrition outcomes – getting beyond the preoccupation with staple grains. *Food Sec.* 2015 7:583–591. <https://link.springer.com/article/10.1007/s12571-015-0461-x>
- Rosen, S., Thome, K. & Meade, B. 2016. *International Food Security Assessment, 2016 2026*. GFA-27, U.S. Department of Agriculture, Economic Research Service, June 2016. www.ers.usda.gov/publications/gfa-food-security-assessment-situation-andoutlook/gfa-27.aspx
- Smith, L. & Haddad, L. 2015. Reducing child undernutrition: Past drivers and priorities for the post-MDG era. *World Development* Vol. 68:180–204. doi.org/10.1016/j.worlddev.2014.11.014
- Talukder, A. et al. 2010. Homestead food production model contributes to improved household food security and nutrition status of young children and women in poor populations: lessons learned from scaling-up programs in Asia (Bangladesh, Cambodia, Nepal and Philippines). Field Actions Science Reports, *Journal of Field Actions*, Special Issue 1. <http://factsreports.revues.org/404>
- Thow, A.M. et al. 2010. Taxing soft drinks in the Pacific: implementation lessons for improving health. *Health Promotion International* Vol. 26(1). doi:10.1093/heapro/daq057
- UNSCN 2016. *Impact Assessment of Policies to Support Healthy Food Environments and Healthy Diets – Implementing the Framework for Action of the Second International Conference on Nutrition Discussion Paper*, United Nations System Standing Committee on Nutrition. https://www.unscn.org/files/ICN2_TPM/UNSCN_Impact_Assessment_Nutrition_ICN2_Discussion_Paper_3_FINAL.pdf
- Wang L.E., Liu, G., Liu, X., Liu, Y., Gao, J., Zhou, B., Gao, S. & Cheng, S. 2017. The weight of unfinished plate: A survey-based characterization of restaurant food waste in Chinese cities. *Waste Management* 66:3-12.
- WHO 2014a. Global nutrition targets 2025: *wasting policy brief*. WHO/NMH/NHD/14.8. Geneva: WHO. http://apps.who.int/iris/bitstream/10665/149023/1/WHO_NMH_NHD_14.8_eng.pdf?ua=1
- WHO 2014b. *Global nutrition targets 2025: childhood overweight policy brief*. WHO/NMH/NHD/14.6. Geneva: WHO. http://apps.who.int/iris/bitstream/10665/149021/2/WHO_NMH_NHD_14.6_eng.pdf?ua=1
- WHO 2015. *Healthy Diet. Fact Sheet N°394*. September 2015, WHO. http://www.who.int/nutrition/publications/nutrientrequirements/healthydiet_factsheet394.pdf
- World Bank 2007. *Philippines: Agriculture public expenditure review*. Washington, DC: World Bank. <http://documents.worldbank.org/curated/en/508941468298444655/Philippines-Agriculture-public-expenditure-review>

-
- World Bank 2014. *Learning from World Bank history: Agriculture and food-based approaches for addressing malnutrition*. Agriculture and Environmental Services Discussion Paper no. 10, World Bank, Washington, DC. <http://documents.worldbank.org/curated/en/497241468168227810/Learning-from-World-Bank-history-agriculture-and-food-based-approaches-for-addressing-malnutrition>
- World Bank 2017a. *Global Economic Prospects: Weak Investment in Uncertain Times*. January 2017, Washington, DC: World Bank. doi:10.1596/978-1-4648-1016-9.
- World Bank 2017b. *World Bank Commodities Price Forecast, January 2017*. <http://pubdocs.worldbank.org/en/926111485188873241/CMO-January-2017-Forecasts.pdf>



2017

Asia and the Pacific

REGIONAL OVERVIEW OF FOOD SECURITY AND NUTRITION

INVESTING IN FOOD SYSTEMS FOR BETTER NUTRITION

KEY MESSAGES

- ▶ **The fight against hunger is slowing** and as we reassess progress we are concerned that the number of hungry people in Asia and the Pacific region may have already begun to rise. This means that many countries in this region risk not meeting the 2030 target of ending food insecurity.
- ▶ **Malnutrition and stunting among children below the age of five remains high in many countries in the region**, with large disparities among population groups. Recent initiatives –such as multisectoral approaches, amended policies and interventions that are more nutrition-sensitive – are helping, but these efforts need to be considerably scaled up.
- ▶ **More people in Asia and the Pacific region are moving towards healthier diets**, although the availability of nutritious foods is still inadequate in many countries. **However, on average, the consumption of food items considered unhealthy is also on the rise.** A key challenge is to reorient food systems in a way that will help promote healthier diets through supportive food and trade policies, education and awareness campaigns.
- ▶ **Smallholder farmers need better access to more profitable markets if they are to escape poverty and food insecurity.** While some technical assistance projects have been effective in improving rural livelihoods, it is essential to address systemic weaknesses at the national level by promoting farmer organizations, investing in improved rural infrastructure and improving the functioning of rural financial markets.
- ▶ **In view of the overall trend in declining food prices in recent years, and a relative abundance of food, there is less public concern over the state of food security; nevertheless, it is important that governments and other stakeholders not become complacent.** Given the fundamental importance of food in both production and consumption for the poorest of the poor, stepped up investments in the food economy will be essential if we are to achieve the SDG goal to “leave no one behind.”
- ▶ **Reducing food loss and waste offers a triple win – for food security, higher farm income and the environment.** While current knowledge on the extent and incidence of food loss along the supply chain, or hotspots in the chain, is inadequate, recent government initiatives addressing this challenge are encouraging.

ISBN 978-92-5-109965-0



9 789251 099650

I7930EN/1/10.17