



ENDING RURAL HUNGER MAPPING NEEDS AND ACTIONS FOR FOOD AND NUTRITION SECURITY

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www.endingruralhunger.org

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Table of Contents

Executive Summary	7
CHAPTER 1 – Introduction	15
1.1. A global priority – food and nutrition security in the 2030 sustainable development agenda.....	16
1.2. Why rural hunger?.....	18
1.3. A data-driven approach to identifying FNS priorities.....	20
1.4. Outline of the remainder of the report.....	23
CHAPTER 2 – Setting the scene: Hunger trajectories to 2030	25
2.1. Access to food	27
2.2. Malnutrition	28
2.3. Agricultural productivity gaps.....	29
2.4. Vulnerability.....	32
2.5. International action for agriculture: From crisis-driven reactions to a sustained, strategic partnership.....	33
CHAPTER 3 – Mapping developing country needs, policies, and resources in FNS	36
3.1. Where are FNS needs greatest?	38
3.2. Where are FNS policies strongest?.....	40
3.3. Where are FNS resources and investments highest, and where are they most scarce?.....	42
CHAPTER 4 – Assessing developed countries’ contributions to ending rural hunger	50
4.1. Domestic agriculture and biofuel policy	51
4.2. FNS aid policy.....	53
CHAPTER 5 – Actions for ending rural hunger	56
5.1. Recommendations for developing country governments	57
5.2. Recommendations for developed country governments.....	64
CHAPTER 6 – Other key players in the push to end rural hunger	69
6.1. The role of multilateral institutions	70
6.2. The role of the private sector.....	74
6.3. The role of South-South cooperation	77
CHAPTER 7 – Collective action for ending rural hunger.....	80
7.1. Four priorities in need of collective action	81
7.2. Organizing for collective action	88
CHAPTER 8 – Concluding remarks	92
References	94
Data sources.....	96
List of Abbreviations.....	98
Appendices.....	99

List of Figures

Figure E1. Ending undernourishment: Prevalence of undernourishment in the developing world, historical trends and projections.....	8
Figure E2. How great are FNS needs?.....	10
Figure E3. Stronger FNS policies are associated with lower FNS needs.....	10
Figure E4. Donor domestic policies and FNS aid policy.....	12
Figure 2.1. Ending undernourishment: Prevalence of undernourishment in the developing world, historical trends and projections.....	27
Figure 2.2. Ending malnutrition: Prevalence of stunting in the developing world.....	28
Figure 2.3. Agricultural productivity: Cereal yields in developing countries, 1960-2013.....	29
Figure 2.4. Transforming agricultural productivity in low-yield countries: Average cereal yield in countries with yields below 2 metric tonnes per hectare in 2013.....	31
Figure 2.5. Reducing greenhouse gas emissions from agriculture: Global GHG emissions from the agricultural sector.....	32
Figure 2.6. The correlation between food prices and international support for FNS.....	34
Figure 3.1. How great are FNS needs?.....	39
Figure 3.2. Top 10 countries: Greatest FNS needs.....	39
Figure 3.3. How strong are FNS policies?.....	41
Figure 3.4. Top 10 countries: Strongest FNS policies.....	41
Figure 3.5. Aid to FNS sector breakdown.....	43
Figure 3.6. Investment in FNS by region.....	45
Figure 3.7. How much is invested in FNS?.....	45
Figure 3.8. Fragile states.....	46
Figure 3.9. 10 Countries with largest rural populations.....	47
Figure 4.1. How do domestic policies rate? Agricultural and biofuel policy Index scores.....	52
Figure 4.2. How strong is FNS aid policy?.....	53
Figure 4.3. How well are FNS investments targeted?.....	54
Figure 5.2. Comparison of FNS needs: Burundi and Madagascar.....	57
Figure 5.3. Comparison of FNS needs: Mexico and Uruguay.....	57
Figure 5.4. Stronger FNS policies are associated with lower FNS needs.....	59
Figure 5.5. Comparison of FNS policies: Nigeria and Vietnam.....	60
Figure 5.6. Higher domestic FNS spending is associated with lower FNS needs.....	62
Figure 5.7. Spending on domestic agricultural subsidies dwarfs spending on FNS aid.....	64
Figure 5.8. Spending on domestic agricultural subsidies, OECD total.....	65
Figure 5.9. Comparing volumes and quality of donors' FNS aid.....	66
Figure 6.2. Multilateral targeting: ODA is focused on countries with higher needs.....	71
Figure 6.3. Multilateral targeting: OOF is focused on countries with stronger policies.....	72
Figure 6.4. Multilateral vs. bilateral targeting.....	73
Figure 6.6. FDI targeting: Countries with stronger policies receive more foreign investment.....	75
Figure 6.8. China, India, and Brazil FNS assistance is concentrated in countries with highest needs.....	78
Figure 7.1. Global integration in agriculture vs. manufacturing.....	82
Figure 7.2. Projected change in cereal crop yields due to climate change, average 1980-2009 compared with average 2040-2069.....	84
Figure 7.3. CGIAR spending 1990-2030.....	86
Figure 7.4. Share of agricultural land owned by small-scale farmers.....	87
Figure 7.5. New forums for collective action.....	90

List of Tables

Table 5.1. Impact evaluations of agricultural interventions by intervention type	56
Table 6.1. FNS disbursements by multilateral institutions, 2009-2013 average.....	70
Table 6.5. Top 10 countries: Recipients of agricultural FDI 2009-2013 average.....	74
Table 6.7. Top 10 countries: Recipients of FNS assistance from China, India, and Brazil	77

List of Boxes

Box 2.1. The concept of food and nutrition security: A brief history	26
Box 3.1. Data limitations in assessing FNS	37
Box 3.2. Identifying aid for FNS	43
Box 3.3. The special case of fragile states.....	46
Box 3.4. The special case of countries with large rural populations.....	47
Box 4.1. New Zealand's path in reforming agricultural subsidies.....	52
Box 5.1. India's transitions in FNS priorities.....	58
Box 5.2. Fome Zero: Achieving the end of hunger in Brazil.....	61
Box 5.3. Public investments in FNS: China's achievements	63
Box 7.1. Strengthening national markets through agricultural commodity exchanges.....	81
Box 7.2. The World Trade Organization's role in promoting global FNS	83

Executive Summary

Executive Summary

Ending world hunger forms a realistic objective, attainable within 15 years. The ambition has now been formally enshrined in the Sustainable Development Goals (SDGs), recently adopted by all 193 member countries of the United Nations (UN). Success will not come easily. It requires at least doubling the current rate of progress.

A new approach is needed. The international community must shift from a pattern of erratic political attention and inadequate measurement of the underlying issues to a sustained, strategic, and evidence-based commitment to food and nutrition security (FNS). This implies systematic and quantitative review of how well individual countries are doing in FNS, the strategies being undertaken, and the investments being made, especially in the developing world. In turn, this information needs to be aligned with an assessment of what developed countries are doing to contribute to—or detract from—progress. Such a mapping can help identify priorities and promote actionable follow-up at global, regional, and national levels.

This report focuses on one core element of the new global goal for 2030: ending *rural* hunger. Of the 795 million people in the world who are undernourished, perhaps three-quarters of them live in developing countries' rural areas.¹ Unlike in urban areas, ending hunger in rural areas is primarily about promoting transformational change in local food and agricultural systems. It is about more than growing enough food. It is about demand for as well as supply of food; quality as well as quantity; an adequate diet today and assurance of one tomorrow.

This aspect of food security requires a particular focus on the needs of small-scale farms, including the special challenges faced by women farmers. Today there are about 500 million small farms, and they provide livelihoods for up to 2.5 billion rural people. Much of the march to end hunger will be determined by what happens on these farms.

For at least 40 years, political commitment to FNS challenges has fallen short of the task, as have

the associated reforms of policies and public investments. Attention has waxed and waned alongside trends in food prices. When prices spike, politicians come forward with new promises and commitments. But when prices subside, urgency is lost and attention dissipates. There has been too little long-term strategy or accountability. As a consequence, progress in ending hunger has been too slow.

This report presents one element of a new set of tools aiming to help track and compare efforts of developing and developed country governments to end rural hunger. It contains the key results and actionable recommendations of a comprehensive effort to quantify the rural FNS needs, policies, and resources in 116 developing countries, alongside an assessment of 29 developed countries' domestic agricultural and biofuel policies plus FNS aid policies.

The report is accompanied by a new interactive website, www.endingruralhunger.org, – that presents the full results of our analysis alongside all the underlying data. We encourage readers to explore the website as a “living” complement to the contents of this text and hope that policymakers and researchers will use the data to conduct their own analyses.

Why the end of rural hunger is within reach

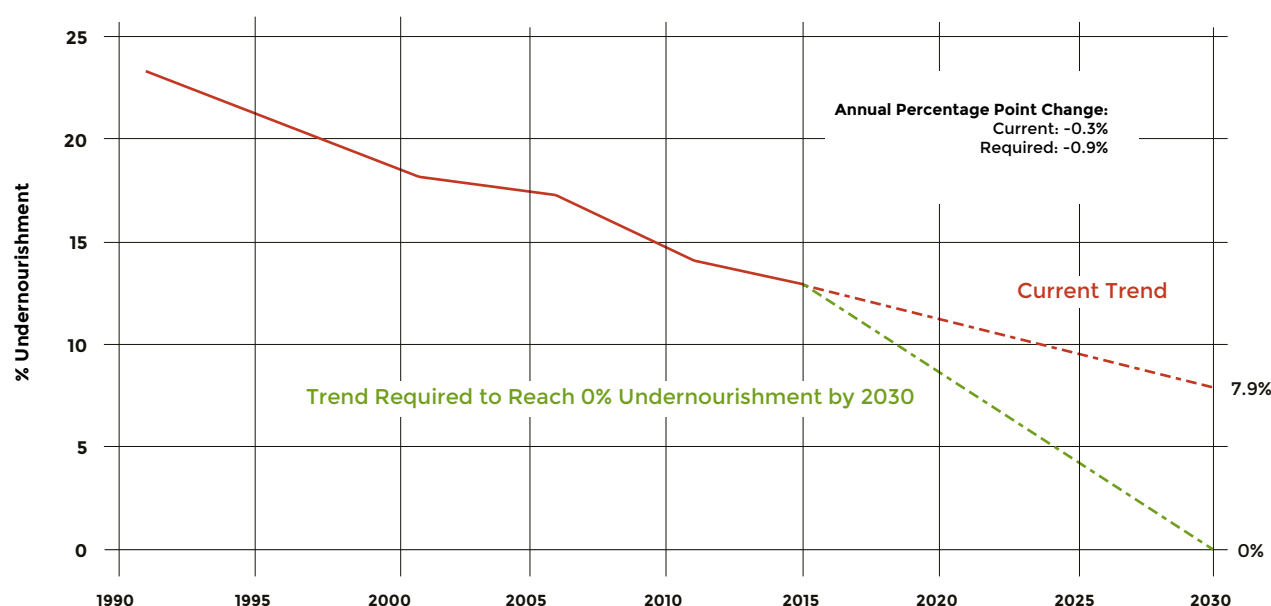
We believe the SDG target to end hunger should be interpreted in a manner consistent with the spirit of the new 2030 agenda—that no one should be left behind. Practically speaking, we believe this means making sure the policies, investments, and safety nets are in place to enable every person in every community to lift himself or herself out of hunger. Even though the world continues to urbanize rapidly, there will still be more than 3 billion people in rural areas in 2030, so rural policy efforts and investments must be sufficiently comprehensive and well-funded to match the scale of this challenge.

Based on current trends, the world is not on course to meet any of the relevant SDG targets by the 2030 deadline: ending hunger, ending malnutrition, doubling the agricultural productivity of small-scale farms, or ensuring sustainable and resilient agricultural practices. Figure E1, for example, compares the baseline trajectory of undernourishment, as computed by the Food and Agriculture

1. See WFP, “Who Are the Hungry?”, World Food Programme, <https://www.wfp.org/hunger/who-are>. Data on hunger (undernourishment) are computed on the basis of probabilities embedded in models. They are therefore a rough guide rather than based on actual observations. The Food and Agriculture Organization calculates that about half the world's hungry people are smallholder farmer families, 20 percent are landless families dependent on farming, and 10 percent are in communities dependent on herding, fishing, or forest resources.

Figure E1. Ending undernourishment:

Prevalence of undernourishment in the developing world, Historical trends and projections



Source: FAO, State of Food Insecurity (2015), FAO, World Agriculture Towards 2030/2050 (2012) and own calculations

Note: Developing World Only

Organization (FAO), to the rate of progress that would be needed to bring undernourishment down to zero percent by 2030. Achieving the end of undernourishment will require nearly a trebling of current rates of progress. (See Chapter 2 of the report for similar trajectories for the other relevant SDG targets.)

Although a business-as-usual approach will not be good enough, six recent trends offer promise that the end of rural hunger lies within reach.

1. Distortions in global agricultural markets have fallen substantially. Subsidies in developed countries, while still high, are at their lowest level in a generation, and most developing countries have reversed decades-long anti-agricultural biases in their development strategies.
2. Global resources for FNS are increasing. Countries are using more of their own domestic revenue. Aid for FNS has nearly doubled over the past decade, and significant new resources for agriculture are being made available in the form of non-concessional lending and foreign direct investments.
3. Public and private actors are increasingly collaborating to solve global FNS problems. This includes new strategies for integrating small-scale farms into global value chains; sharing lessons across borders; and establishing guidelines, with essential civil society input, for responsible business investments in agriculture.
4. The global SDG negotiations have amplified attention to infrastructure priorities such as energy and transport that are essential for boosting small-scale farmers' physical and informational connectivity with markets.
5. Agricultural research is making inroads on many key farming constraints. This includes the development of new seed varieties that are tolerant of drought and flooding and are fortified to improve nutrition.
6. A number of high-level initiatives have recently been announced at major meetings of the UN, G-20, G-7, and African Union. If sustained and properly scaled, these could signify the start of long-term international leadership. There are also a number of prominent national examples, such as Brazil and Ethiopia, that illustrate how domestic political leadership can play a crucial role in fighting hunger.

To be sure, we are not yet at a point where we can be confident of making sufficiently rapid progress to end rural hunger by 2030. But each of these trends demonstrates the types of progress that, if further accelerated, can get the job done.

Mapping FNS needs, policies, and resources

A focused strategy for ending rural hunger requires an evidence base that specifies both the nature of the challenges at hand and the actions that might be required to address them. To that end, *Ending Rural Hunger* collects, curates, and structures 80 indicators across 116 developing countries to quantify three crucial dimensions of the challenge:

- **Needs** tell us how far each country lies from the defined SDG targets and which of the underlying challenges are most pressing.
- **Policies** matter because we know sound government actions are essential to success—on issues ranging from the rural investment climate to support for women to provision of rural safety nets.
- **Resources** are essential to financing the necessary actions to end hunger. Public investments, funded by governments' domestic revenue, foreign aid, and international borrowing from multilateral agencies and other sources, as well as private investments by domestic and foreign business, will drive rural structural transformation. Spending and advocacy by nongovernmental organizations (NGOs) and philanthropies can help ensure that everyone benefits from these investments.

Our methodology enables us to build assessments for sub-categories under each of these three key elements. For example, overall needs comprise scores for access to food; malnutrition; agricultural productivity gaps; and vulnerability to production, price, and environmental shocks.² Policy scores are based on assessments of agriculture-focused economic policy and political prioritization of FNS. Resources are calculated in rural per capita terms and are summed across public and private flows

(except domestic private investment, for which data are not available).

Figure E2 presents the first of our major results: an indexed map of overall FNS needs. (Similar maps for policies and resources are included in Chapter 3 of this report; maps of sub-category scores and specific indicators are available at www.endingrural-hunger.org.) Countries in Europe and Latin America are generally found to have the lowest needs. And while Africa shows tremendous variation in country-level results, the 10 countries with the greatest overarching needs are all located in the region: Eritrea, Chad, Liberia, Central African Republic, Zambia, Malawi, Democratic Republic of Congo, Madagascar, Burundi, and Niger.

Diving a layer deeper, our methodology allows differentiation according to differing types of FNS needs. For example, sub-Saharan African countries are shown to have an especially serious problem with undernourishment and access to food. South Asia and East Asia and the Pacific suffer disproportionately from malnutrition. In Latin America and the Caribbean, lower cereal yields appear to be a relative problem. Meanwhile, the Middle East and North Africa region is most susceptible to climate change and other shocks. Developing countries thus need to prioritize efforts based on their respective FNS challenges.

As shown in Figure E3, we find that countries with lower needs tend to have stronger FNS policies and greater FNS resources, after controlling for region and income levels. A good policy framework is paramount, as is ensuring neutrality of policy impact on urban versus rural investments. Comparative rankings of FNS policies allow an assessment of which policies are most in need of reform both across and within countries. We find, for example, that Benin, Burkina Faso, and Cambodia have the best overall policy scores among low-income countries. South Africa, Mozambique, Liberia, and Mali are among the sub-Saharan African countries with the best gender policy score. However, every developing country, even those with strong overall policies, has areas in need of improvement. For example, we find that in many countries, fostering better policies toward women farmers and improving local scientific and extension services might be particularly important.

Many developing country governments can also improve FNS by raising the level of public spending. Several African countries have institutionalized this objective by agreeing to dedicate at least 10 percent of their budget to agriculture and by creating

2. Malnutrition consists of undernutrition (indicated for example by stunting and wasting in children younger than 5 years old) as well as overnutrition (overweight/obesity). Although overnutrition problems are growing, even in rural areas of developing countries, we have focused our attention in this report on undernutrition.

Figure E2. How great are FNS needs?
Index Scores, 0-100

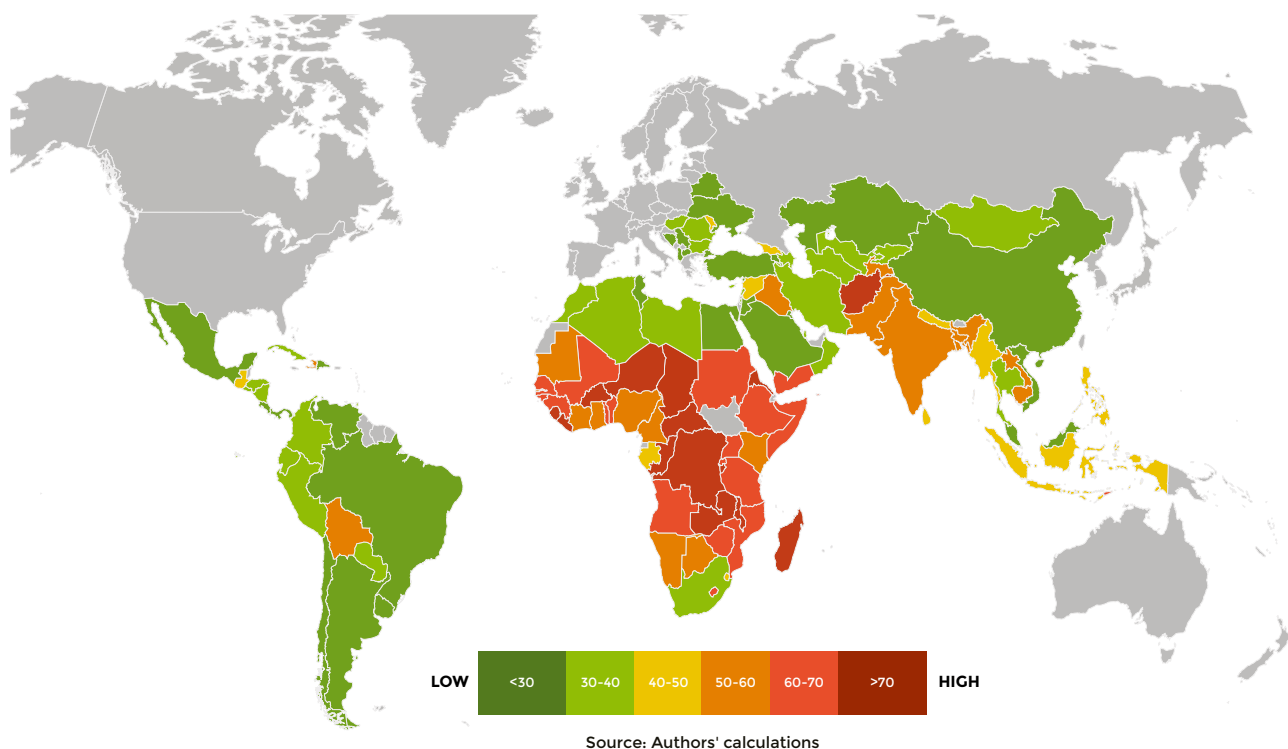
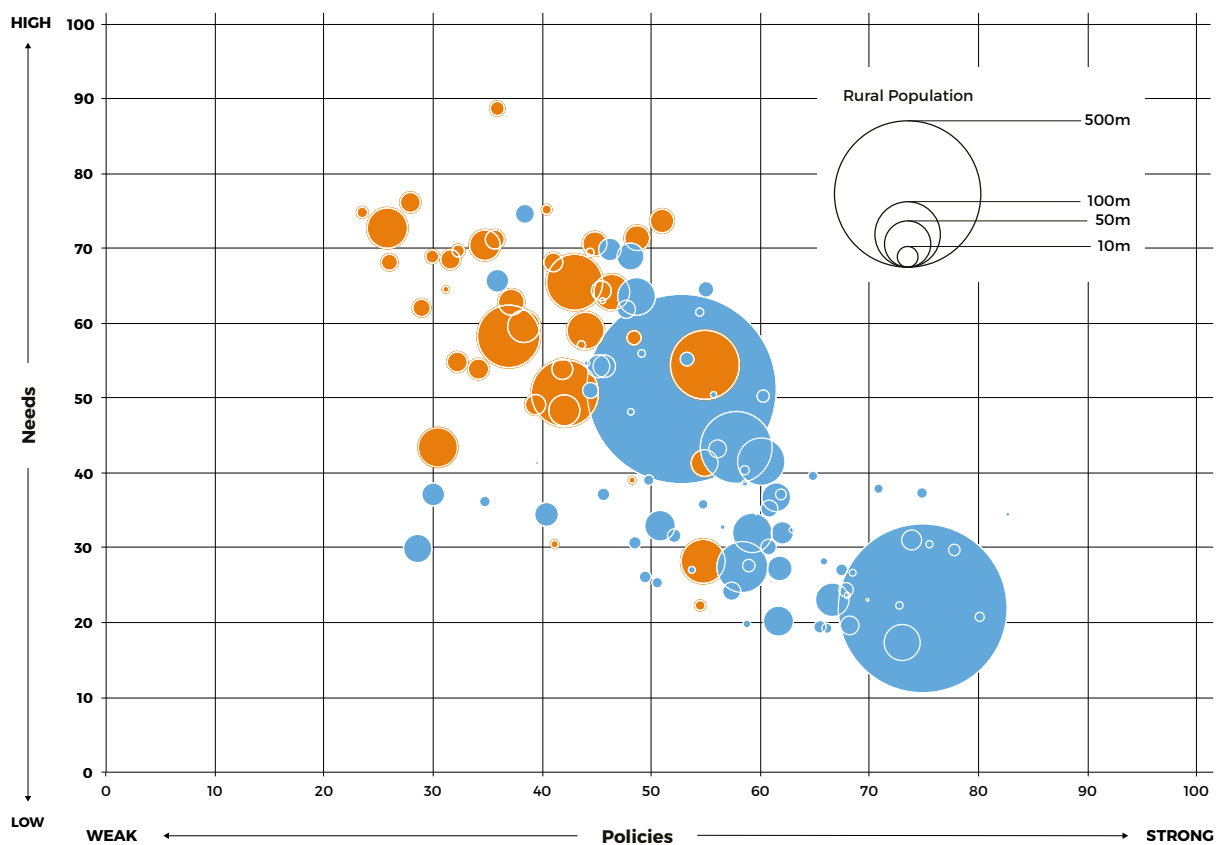


Figure E3. Stronger FNS policies are associated with lower FNS needs



the Comprehensive Africa Agriculture Development Programme, even though most are not yet reaching this goal. But in many low-income countries, the absolute amounts that can be mobilized are small relative to the size of their rural populations and the scale of their needs. Sub-Saharan Africa still has the most low-income countries, and on average the region's governments spend only \$23 per rural capita per year on FNS, compared with \$100 for all other developing countries. Several countries, including the Democratic Republic of the Congo, Mali, and Uganda, spend less than \$10 per rural person per year. This is to cover everything from rural roads to irrigation, research, cooperative support, and extension services.

Figure E3 also underscores the challenge of fragile and conflict-affected states, which are highlighted on the chart. These countries are home to about 900 million rural people and present a particular challenge for ending hunger, because they have the highest needs but the worst policies and lowest investment levels. Nine of the ten countries with the most serious hunger challenges are on the Organization for Economic Cooperation and Development (OECD) list of fragile states. On average, governments of fragile states spend roughly half the amount on FNS, per rural capita, than non-fragile states—\$16 per capita, compared with \$26 for non-fragile low-income and lower middle-income countries. A substantial increase in effort, on the part of both their own governments and their partners in the international community, will be needed to end rural hunger in fragile states. Donors and developing country governments could also do much more to link development and humanitarian efforts in fragile states, for example, through cash programming, more flexible budgeting to respond to early warning indicators of vulnerability, and shifting resources to crisis prevention over relief. Building institutions and developing skills in fragile states could be priorities for policy reform.

Assessing developed countries' contributions to ending rural hunger

While developing countries have the principal responsibility for their own populations' FNS, developed countries can also make substantial contributions by reducing distortions they cause to global agricultural markets and by improving FNS aid. They would get better value from their public spending, compared with current allocations, by reducing domestic subsidies and investing more

abroad in FNS. This would help to end poverty and hunger and simultaneously to reduce greenhouse gas emissions.

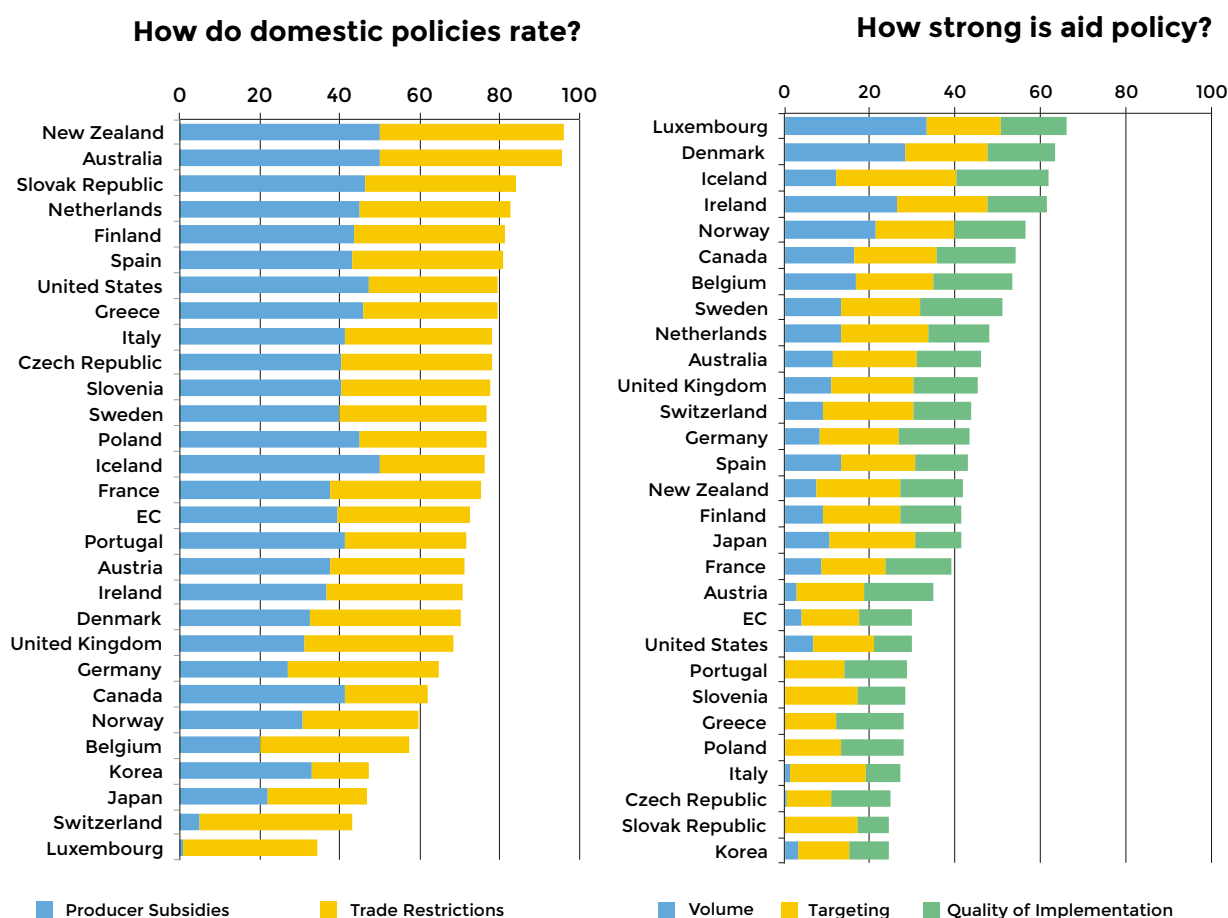
Because of their economic size, developed countries play a major role in driving well-functioning global agricultural markets. For example, their domestic agricultural policies—particularly large producer subsidies and, increasingly, bio-fuel subsidies and mandates—have significant global impacts. Although the level of subsidies has halved in the past 30 years, from 40 percent of gross farm receipts to 20 percent, total subsidies in the 29 member countries of the OECD's Development Assistance Committee (DAC) still amount to around \$250 billion annually.

Developed countries also maintain relatively high border tariffs on agriculture as well as a high share of "peak" tariffs (those over 15 percent). They also use non-tariff barriers to block agricultural imports. Simple applied tariff rates on agriculture in the European Union (EU) are currently 13.2 percent, compared with 4.2 percent for non-agricultural goods. In the United States, they are 5.3 percent and 3.1 percent, respectively. Consequently, although globalization has made major advances in other sectors of the global economy, agricultural markets remain highly fragmented. As one measure, the share of agricultural exports in total global agricultural value added is only 40 percent, compared with over 100 percent in manufacturing. And while this ratio for manufacturing has doubled over the past 20 years, it has risen only marginally for agriculture.

The left panel of Figure E4 ranks developed countries based on their domestic agricultural policies. At the top of the list, New Zealand and Australia distort global trade the least. The Slovak Republic and Netherlands are not too far behind. At the other end of the scale, South Korea, Japan, Switzerland, and Luxembourg have the most distorting policies among members of DAC.

The second key dimension for developed country contributions to FNS comes through financial resources. Developed countries, through their bilateral programs, disburse roughly \$7 billion of aid for FNS per year, excluding humanitarian emergency food aid (although some humanitarian aid does serve long-term purposes). This works out to less than 0.03% of DAC countries' aggregate income, or fewer than three cents out of every 100 dollars. Although foreign aid and domestic subsidies come from different budget processes and are not an

Figure E4. Donor domestic policies and FNS aid policy
Index Scores, 0–100



Source: Authors' calculations

apples-to-apples comparison, in relative terms this implies that a 4 percent cut in domestic subsidies would free up enough resources to permit a doubling of aid.

Of course, how aid dollars are spent also matters greatly. As indicated by the right panel of Figure E4, our methodology ranks developed countries' FNS aid policies based on their volume, quality, and—crucially—effectiveness in targeting support to countries with high need and good policies but scarce resources. Within the quality measure, we assess whether resources are tied, fragmented, or volatile, plus the extent to which they focus on gender issues and research.

Note that values from Figure E4's left and right panels should not be simplistically added together. They represent two qualitatively different issues that should each be considered on its own terms. The Aid Policy scores show that Luxembourg, Denmark, Iceland, and Ireland stand out for their strong performance. Meanwhile, newer providers

of official development assistance (ODA) such as the Czech Republic, the Slovak Republic, and South Korea all have lower scores—they are still building up their aid systems.

Of course, for both domestic policies and aid, the biggest global impact comes from the actions of large countries. Unfortunately, the largest aid donors to agriculture in absolute dollar terms—the United States and Japan—have only middling sub-scores on aid quality. Improvement in their aid policies could have significant global impact.

In fact, most developed countries could target their aid much better. Donors face clear trade-offs in how to target, as countries with high needs often have weak policies, but some donors deal with these trade-offs better than others. In our assessment, the best-targeted FNS aid comes from Iceland, Ireland, and Switzerland, while the worst-targeted aid is from Greece, South Korea, and the Czech Republic.

Collective action for ending rural hunger

While it is useful to identify what targeted actions are needed to help end rural hunger, we also believe that greater impact can be achieved if countries act on multiple policy fronts at the same time. For example, access to credit is more valuable if there is also access to agricultural inputs, road networks, nearby markets, and extension services. The gains are greater when multiple actors contribute together. Accordingly, we also consider the role of other key players, including multilateral organizations, private business and foreign investors, and providers of South-South cooperation. Along with civil society, these development partners will need to play a crucial role in multi-stakeholder partnerships, organized around the main transformations that will be needed to end hunger.

For their part, multilateral organizations channel 37 percent of agricultural aid, roughly \$4.6 billion per year, plus an additional \$3.6 billion annually in non-concessional loans to middle-income countries. Our methodology shows that the targeting of their FNS aid and quality of aid delivery is notably better than the average DAC bilateral donor. So multilateral agencies should do more. Given prevailing low real interest rates in capital markets in developed countries, there will be more opportunities for these agencies to borrow from public financial agencies, or on private capital markets, and on-lend to developing countries on favorable, albeit non-concessional, terms in order to increase investment resources for FNS.

The business community must also play a major role in ending hunger. Private enterprise is the largest source of investment and the biggest player in agricultural markets. Domestic and foreign direct investment (FDI) in agriculture can bring many of the modern farming techniques, inputs, marketing channels, and know-how needed for efficient supply. Private participation in partnerships covering nutrition, sustainable sourcing, and food loss and waste is already making a difference. FDI is starting to play a larger role in developing countries, reaching \$11 billion in agricultural investments a year, but it remains concentrated in just a few countries, including China, Brazil, and Argentina, where markets are relatively large. With the 2014 global adoption of Principles of Responsible Investment in Agriculture, and better policies in more developing countries, the contribution of private business can expand exponentially. To do so, companies will

need to respect the role of civil society organizations and smallholder representatives to ensure gains are shared.

South-South cooperation also makes important contributions in some countries. The large emerging economies, including Brazil, China, and India, all have important programs of cooperation in FNS. Drawing from their own experiences, they have valuable lessons to share on implementation. The beneficiary countries of South-South cooperation have some of the highest needs. FNS is an area where further cooperation could play a far more significant role building on similarities in agro-ecological conditions and knowledge-sharing activities.

Ultimately, if all of these actors and developing and developed country governments are going to maximize their impact on ending rural hunger, they will need to cooperate in strong multi-stakeholder partnerships. To that end, we believe there are four key areas where collective action offers the greatest potential to expand domestic policy space and have an impact on FNS needs in multiple countries:

1. Integrating sub-national, national and global food and agricultural commodity markets.
2. Achieving agricultural intensification that is environmentally sustainable and resilient.
3. Delivering new advances in location- and crop-specific research, technology and extension services.
4. Transforming family farms from subsistence enterprises to small-scale commercial businesses.

A range of partnerships, initiatives, and multilateral forums already exists to coordinate collective action in these areas. But they do not yet operate optimally to achieve transformations on a global scale. Greater alignment is required among organizations and initiatives. Each partnership should assess its delivery on a set of key attributes, including voice for smallholders and family farmers; strong leadership from the convener; inclusive representation with platforms for discussion; pooling of resources; shared goals and principles with an ambition of achieving results at scale; scalable pilot projects; commitment to rigorous evaluation and knowledge-sharing; and transparent collection and dissemination of easily accessible data.

Conclusion

Rural hunger can be ended by 2030. Reaching this historic milestone, however, will require dramatically scaled-up efforts from all stakeholders involved—among developing countries, developed countries, scientists, educators, private investors, multilateral institutions, NGOs, and advocacy organizations. Each of these actors has an important role to play in catalyzing the transformative change that will be needed to meet the SDG targets for FNS. Their commitment and engagement must be sustained and steadfast right through to 2030 and beyond.

Our research underscores the importance of three key action areas for developing country governments and introduces disaggregated measures to help establish priorities on each. First, the data allow developing country governments to identify and rigorously measure priority FNS needs, distinguishing between access to food, malnutrition, smallholder yields, and vulnerability. While all are important, the scale and nature of the challenge are distinct in each country. Second, governments can assess where they must strengthen FNS policies and political commitment, especially for smallholders, women, climate change, and research and extension by reviewing how they compare to their peers and to the best-practice frontier. Third, governments can act to mobilize resources for public investment while promoting private investment, whether from domestic sources or mobilized from abroad, and scaled according to their populations, needs, and policies.

Developed countries, meanwhile, have their own three key contributions to make. First, they can reduce distortions in domestic agricultural and bio-fuel policies and in their agricultural trade policies. Second, they can raise the quantity and improve the quality of FNS aid. Third, they can better target aid to countries with high needs and strong policies but limited resources. Within these countries they can further prioritize the areas of greatest need and help ensure that cross-cutting issues of gender and climate change are incorporated in FNS investments.

Ending rural hunger depends on strong and committed leadership among governments, international organizations, policymakers, analysts, businesses, civil society organizers, and local communities around the world. All stakeholders need to base their strategies on evidence of FNS needs, policies, and resources, ensuring contributions toward global FNS goals are of appropriate scale and coherence. To that end, we hope the *Ending Rural Hunger* project provides useful tools for agenda setting, dialogue and action, helping to kick-start progress where humanity needs it most.

CHAPTER 1

Introduction

1.1

A global priority – food and nutrition security in the 2030 sustainable development agenda

Today, in an era of plenty, 795 million people are hungry and 160 million children under the age of 5 are stunted.³ While absolute poverty has fallen sharply over the past decade, hunger and malnutrition have proven to be more persistent scourges in poor households, especially for women and girls. Since 1990 the share of the developing world living in poverty has fallen by more than two-thirds, but the share of the developing world living with hunger decreased by only around 45 percent. Thus, while the Millennium Development Goal (MDG) target to halve absolute poverty was met five years ahead of schedule, the hunger MDG was narrowly missed.⁴ Meanwhile, over the past decade, volatility in the prices of many key crops has soared, threatening food security for the millions of poor households that spend much of their income on food. Longer-term collective challenges—such as how to provide a nutritious diet to 9 billion global inhabitants by 2050 while adapting to climate change and using sustainable production techniques—loom ominously on the horizon.

A growing body of empirical evidence suggests that improving FNS by transforming agriculture is not only a principal pathway to ending hunger, but is also crucial to progress on a number of other development priorities. Agriculture is both an engine of economic growth and a source of livelihoods.⁵ Growth in the agricultural sector is significantly more effective in reducing extreme poverty than growth originating in other sectors of the economy.⁶ Women with nutritious diets give birth to healthier babies. Children who are well fed go on to do better in school, earn higher incomes as adults,

and achieve better long-term health outcomes.⁷ Agriculture will also be vital to combat climate change, but only if there are changes to current land and nutrient management practices that degrade the environment. In fact, agriculture and forestry generate a quarter of all greenhouse gas emissions, but these sectors could account for a large share of the most cost-effective carbon abatement interventions.⁸ In short, without substantial progress on food and nutrition security, it will be increasingly difficult to realize other development priorities in health, education, economic growth, and environmental sustainability. Conversely, progress in these other areas will help achieve the FNS goals.

Against this backdrop, it should be no surprise that FNS and agricultural transformation have emerged as global priorities in the United Nations' 2030 sustainable development agenda. Agriculture was at the center of development debates of the 1960s and 1970s before falling out of fashion in the 1990s. It is now back in the spotlight. A plethora of new initiatives—linking developing country governments, donors, the private sector, philanthropies, scientists, and civil society—has emerged since the turn of the century to ramp up progress in promoting agricultural productivity and food security. These include the 2003 pledge (reaffirmed in 2014) by African heads of state in Maputo to devote 10 percent of their national budgets to the agricultural sector and to establish a Comprehensive Africa Agriculture Development Programme (CAADP); the 2006 launch of the Alliance for a Green Revolution in Africa (AGRA); commitments by the G-8 at its 2009

3. FAO, *The State of Food Insecurity in the World, 2015* (Rome: FAO, 2015), and WHO, "Global Health Observatory (GHO) data" (Geneva: WHO, 2015).

4. United Nations, *The Millennium Development Goals Report 2015* (New York: United Nations, 2015).

5. World Bank, *World Development Report 2008: Agriculture for Development* (Washington, DC: World Bank, 2007).

6. Luc Christiaensen, Lionel Demery, and Jesper Khul, "The (Evolving) Role of Agriculture in Poverty Reduction—An Empirical Perspective," *Journal of Development Economics* 96, no. 2 (2011).

7. See, for example: Paul Glewwe, Hanan G. Jacoby, and Elizabeth M. King, "Early Childhood Nutrition and Academic Achievement: A Longitudinal Analysis," *Journal of Public Economics* 81, no. 3 (2001); J. Hoddinott et al., "Effect of a Nutrition Intervention During Early Childhood on Economic Productivity in Guatemalan Adults," *Lancet* 371, no. 9610 (2008); Harold Alderman and Elizabeth M. King, "Investing in Early Childhood Development," World Bank, <http://go.worldbank.org/TWVTMQZL20>; and Zulfiqar A. Bhutta, "Early Nutrition and Adult Outcomes: Pieces of the Puzzle," *The Lancet* 382, no. 9891 (2013).

8. IPCC, *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, ed. C.B. Field et al. (Cambridge: Cambridge University Press, 2014).

summit in L'Aquila, Italy, to increase funding for food security; the 2012 launch of the New Alliance for Food Security and Nutrition, which seeks to promote private investment and policy reforms in African agriculture; the 2013 G-20 Food Security and Nutrition Framework; and the G-7 Broad Food Security and Nutrition Development Approach adopted in 2015 at Schloss Elmau, Germany.

The renewed focus on food and nutrition security is also now enshrined in the Sustainable Development Goals, the set of international objectives designed to galvanize global development through 2030. Goal 2 of the SDGs is to “End hunger, achieve food security and improved nutrition and promote sustainable agriculture” (Appendix 1 lists the FNS goal and its targets in their entirety). It includes five specific outcome targets and three action targets, of which the operative language is as follows:

- **2.1** By 2030, end hunger ...
- **2.2** By 2030, end all forms of malnutrition ...
- **2.3** By 2030, double the agricultural productivity and incomes of small-scale food producers ...
- **2.4** By 2030, ensure sustainable food production systems and implement resilient agricultural practices ...
- **2.5** By 2020, maintain the genetic diversity of seeds ... plants ... animals ...
- **2.a** Increase investment ... in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks ...
- **2.b** Correct and prevent trade restrictions and distortions in world agricultural markets ...
- **2.c** Adopt measures to ensure the proper functioning of food commodity markets ...

Implementing these simply worded targets will require a major expansion and reorientation of effort by all stakeholders. It will require a disaggregation of the challenge into components: rural and urban hunger and malnutrition; undernutrition and overnutrition (obesity and overweight); supply of sufficient food and access to a safe and nutritious diet.

In this report, we do not try to tackle all of these elements but instead focus on what can be done to achieve rural food and nutrition security and to end rural undernutrition. The heart of this effort must be an integrated, multi-sectoral approach to transform rural economies.

The *Ending Rural Hunger* project, of which this report is one component, is designed to support the knowledge base to inform strategic decision-making for investments and policy actions to achieve the global goal for rural FNS. The project collects, curates, and aggregates the data needed to identify priorities for ending rural hunger around the world. The full database is available at www.endingruralhunger.com. Drawing on 106 indicators from 26 sources, it is an effort to systematically and comprehensively map the current FNS landscape, identify needed policy changes in developed and developing countries, and improve the targeting of resources provided through international cooperation.⁹ Ultimately our hope is that this information will encourage data-driven, evidence-based policy in support of advancing FNS and hastening the end of hunger: to help resources flow to the countries and challenges where they will have the greatest impact, and to push for reforms where policies are ineffective or incoherent.

This report introduces key results that emerge from the data: where FNS needs are greatest, what policy reforms and investments are needed, and which developed countries are making the biggest relative efforts to ending rural hunger, through their domestic agricultural and biofuel policies, trade policies, and FNS aid. A companion volume of country profiles provides summary snapshots for each of the 116 developing countries and 29 developed countries in our data set. The results presented here only scratch the surface of what is included in the full data set. We encourage interested readers to explore in greater depth online. We also suggest that policymakers, NGOs, academics, private sector investors, and all others who are committed to ending hunger by 2030 use the data for their own strategic or advocacy purposes—recognizing that they may want to focus on a particular region, country, issue area, or indicator. In making the data publicly available and easily accessible, we aim for this report to be the beginning of a global conversation.

9. More detailed information on each specific indicator used to construct the index can be found in the methodology notes available at www.endingruralhunger.org.

1.2 Why rural hunger?

Hunger exists in all countries, rich and poor alike, in rural villages, and in large cities. But while impoverished farmers, struggling slum dwellers, and homeless people in rich countries may all feel the same pang of hunger, the extent of the problem differs across locations and the interventions needed to address such deprivations are very different. The keys to ending hunger in urban areas and in developed countries lie primarily in strengthening safety nets, creating jobs, and boosting incomes—interventions that typically have little to do with agricultural production per se. While we do not mean in any way to diminish the importance or urgency of such efforts, they are not our focus here.¹⁰

Instead, this report is about how to help the hundreds of millions of undernourished people living in rural areas escape hunger over the next 15 years. Most of these people are among the approximately 2.5 billion people currently living and working on about 500 million small-scale farms across the developing world. For these people, ending hunger in the medium term is intrinsically linked to promoting well-functioning food and agricultural systems in developing countries, which can provide enough income to farmers and their families to allow them to escape from poverty.¹¹ Strong agricultural systems can ensure that consumers can afford to buy adequate food and can provide the right incentives and information so families choose to eat nutritious and balanced diets. They are based on efficient markets that respond to price signals, optimize production, minimize waste, and foster scientific innovation and the deployment of new technologies. They promote agricultural production that is resilient and sustainable, and they do not degrade the environment and ecosystems on which they depend.

Without better local agricultural systems,

increases in total global production of food, driven by large industrial farms, are unlikely to significantly affect food and nutrition security for most of those living in hunger in rural areas. This follows from the recognition that the challenge of ending hunger is not just about whether enough food is produced in the aggregate, but also about whether households have enough income to afford quality, healthy food; it is a question of both supply and demand. As we look toward a distant future, 50 or perhaps 100 years from now, we can imagine a world in which agricultural production and ensuring everyone has enough to eat are two separate problems, as they are in rich countries today. In such a world, most people will have moved to cities

“Hunger exists in all countries, rich and poor alike, in rural villages and in large cities. But while impoverished farmers, struggling slum dwellers and homeless people in rich countries may all feel the same pang of hunger, the extent of the problem differs across locations and the interventions needed to address such deprivations are very different.”

10. Similarly, while we recognize that obesity is a critical malnutrition challenge in developed countries and increasingly in many developing countries as well, we do not address the issue in this report.

11. For a similar conception of food security as a system, see Olivier Ecker and Clemens Breisinger, *The Food Security System: A New Conceptual Framework* (Washington, DC: International Food Policy Research Institute, 2012).

and family incomes will depend on urban jobs and wages. But the structural transformations of rural to urban migration happen slowly—on average, the share of a low-income country’s population living in rural areas falls by only about 1 percentage point every three years—so over the medium term, and certainly between now and 2030, improving food and agricultural systems in developing countries appears to be the surest path to address local supply and demand for food.

Finally, it is worth emphasizing that in choosing to focus on food and agricultural systems in developing countries, we are necessarily excluding other factors that are important to ending hunger.¹² We recognize that FNS is a complex issue nested within other development priorities, and that ending hunger also requires progress on economic growth, peace, gender, trade, education, and sanitation—to name a few. Yet, in part precisely because FNS is so closely integrated with so many other development objectives, it would be impractical to develop

a framework incorporating every factor that affects FNS. Moreover, we know that meeting the global goal for rural FNS will demand particular attention to the specific constraints of agriculture and rural development. While hunger will fall alongside broader development progress, it will not do so quickly enough to meet the SDG targets without more and better interventions to boost agricultural systems. So strengthening food and agricultural systems will be necessary, although not sufficient, to end rural hunger. Governments across the world recognize this. In a recent survey of 40 developing countries, only economic growth was mentioned more often than agriculture and natural resource management as one of the top three challenges for the next five to 10 years.¹³

12. In the short-term, ending hunger is often achieved by the delivery of emergency or humanitarian food aid. This is not a sustainable solution. This analysis does not therefore deal with humanitarian assistance, but focuses on long-term, sustainable solutions to hunger.

13. Robin Davies and Jonathan Pickering, “Making Development Co-Operation Fit for the Future: A Survey of Partner Countries,” OECD Development Co-operation Working Papers (Paris: OECD, 2015).

1.3

A data-driven approach to identifying FNS priorities

Ending rural hunger will require both greater resources and greater political commitment, but of course neither is easy to muster. The domestic budgets of many developing country governments are strained, as are the foreign aid budgets of many developed countries. And politicians in both sets of countries who are seeking reforms to agricultural market-distorting policies will need to pick their targets carefully—reform is fraught with political pitfalls. Given this reality, it is crucial that those devoted to ending rural hunger around the globe focus their energy, attention, and efforts where they are most needed and likely to have the greatest impact.

To do so, it is necessary to identify the specific challenges and obstacles, both within and across countries, that stand in the way of meeting the global FNS goal. The obstacles could be technological, such as a lack of enhanced seed varieties appropriate to the local climate. They could be financial, including not enough funding for agricultural development from either the domestic government or international donors. They could be related to bad policies, such as a poor investment climate or the lack of a national strategy to promote nutrition in developing countries. They could be linked to large market-distorting domestic subsidies in developed countries. Obstacles could also be related to difficulty in adapting to the physical environment, such as too little rainfall, or deficient irrigation or other infrastructure. In most cases, multiple obstacles will be in play.

The *Ending Rural Hunger* project builds the database necessary for identifying these obstacles, for both developing and developed countries. The developing country analysis draws on 80 indicators for 116 countries.¹⁴ We analyze the FNS context of each country along three critical dimensions: **needs**, which we define as the four primary SDG targets related to FNS; **policies**, which comprise both economic policies and political commitment to FNS;

“We analyze the FNS context of each developing country along three critical dimensions: needs, policies, and resources. The analysis then identifies how developed countries’ domestic agricultural and biofuel policies—notably producer subsidies and trade restrictions—and FNS aid volumes and policies affect rural hunger around the world.”

and **resources**, which consist of public and private funding available for FNS. The developed country analysis draws on 26 indicators for 29 development partners, and it identifies how developed countries’ domestic agricultural and biofuel policies—notably producer and consumer subsidies, and trade restrictions—and FNS aid volumes and policies affect rural hunger around the world.

By comparing countries against the best and worst performers in each indicator for which they have data (a “distance to the frontier” approach), we can ensure that all the indicators are linked on a common scale.¹⁵ We can then group them into relevant categories and construct scores for aggregate composite indexes. Our approach allows benchmarking across peer countries, for example, those in the same region, with similar income levels or similar agro-climatic conditions. Thus the data allow an assessment of national circumstances in a comparative perspective.

As an example of how such data can change the dialogue, consider the question of how development partners might think about performance-based assessments to allocate resources among countries. Traditionally, they use general indicators such

14. We exclude countries with populations less than 1 million, with fewer than 25 percent of the needed indicators, and with less than 5 percent of agricultural land planted to cereals.

15. The methodology is fully described in the website endingruralhunger.org.

as per capita income or governance to allocate aid. But they should be more direct in the allocation of FNS aid to countries where needs are highest, policies are strong, and resources are low. Needs, in turn, can be broken down into undernourishment, malnutrition, productivity gaps, and vulnerability—each may be relevant to consider in country allocations.¹⁶ Similarly, in building country assistance or operational strategies, it is useful to know if the policy environment is supportive and, if not, in which areas it is most problematic. Judgments on these issues can be informed by comparisons with regional and income-group peers. Furthermore, knowing how much money others are spending, and hence the marginal contribution of an additional dollar of investment going into the sector, is fundamental to strategy implementation.

We are not the first to put together a database of FNS indicators. A number of other institutions have produced related data exercises. For example, the Economist Intelligence Unit's *Global Food Security Index* measures food security across 109 countries; the FAO's *State of Food Insecurity* and the accompanying *FAOStat* database provide a wide range of indicators on food security, agricultural production, trade and prices; and the multi-stakeholder *Global Nutrition Report* publishes nutrition country profiles for each of the UN's 193 member states. All of these publications have produced valuable insights, and indeed we have benefited tremendously from each.¹⁷

The *Ending Rural Hunger* project differs from these other exercises because it provides additional layers of analytical structuring designed to produce actionable findings. Our indexes offer three particular contributions: (1) they are squarely focused on the SDG targets, which were only recently adopted; (2) they comprehensively address needs, policies, and resources in a single framework; and (3) they link developed country actions, both domestic policies and aid activities, to the challenge of ending rural hunger in developing countries. Furthermore, we have tested the indexes and selected underlying

indicators to ensure they help explain the empirical patterns showing that some countries are doing better than others in ending hunger.

The driving motivation of this project is to produce *actionable* data to inform strategic decision-making. A developing country minister may want to know how the country's agricultural productivity compares with that of other countries at similar levels of development, or whether its economic policies are more or less supportive of agriculture than its peers. An aid agency with a mandate to invest in climate resilience may want to know which countries' agricultural sectors are most vulnerable to climate change. Another development partner focused on the South Asian region may want to know what particular needs are most urgent in those countries and which countries in the region are most in need of additional funding. An NGO advocating for more justice in international trade policies may want to know which developed countries have policies that most distort global agricultural markets. A multinational agricultural company may want to know which countries have the most favorable investment climates. If the firm decides to invest and wants to contribute to strengthening food security in the host country, it may want to know which FNS needs are greatest. This project's database aims to be useful to each of these actors.

By combining fine-grained indicator data with broader composite category scores, our indexes allow users to form judgments at either a very general level (for example "we must improve our policies") or at a level of greater detail, to identify more specifically where the issues may lie (for example "access to financial services is particularly weak in this country"). Imagine a policymaker who is interested to know that an improvement in the "rural investment climate" has a significant impact on reducing malnutrition (it does), but if the policymaker then wishes to know how to improve the rural investment climate it is necessary to drill down to the details. It could be that the country is scoring poorly on women's access to land, or on the conditions under which rural financial services can develop. This could be because smallholders have no processes for organizing a dialogue with governments, or that large businesses are hampered by

16. Malnutrition is a combination of undernutrition (stunting and wasting) and overnutrition (overweight and obesity). In this report, we focus on undernutrition. For convenience, despite not being technically accurate, we use the term "malnutrition" to refer only to undernutrition in the rest of this report.

17. IFPRI also produces a Global Hunger Index, an average of undernourishment, child stunting, and child mortality. The Hunger and Nutrition Commitment Index ranks 45 developing countries on its policies and commitment to ending hunger. We use many of these judgments in our exercise.

the inability to enforce the rule of law. Our methodology permits—indeed encourages—this kind of comparative analysis.¹⁸

We recognize, of course, that data analysis forms only one piece of a much larger endeavor. The real challenge will be to translate the analytical messages into changes in actual behavior. History has shown that quantitative metrics and benchmarks can play a valuable role in both shaping resource allocation decisions and, especially, in sustaining momentum and accountability for tracking and achieving global goals. On issue areas where strong political commitment has been matched with clear, well-tracked benchmarks, the international community has made dramatic progress. A good example is in increasing immunization rates across the developing world or access to antiretroviral drugs for those with HIV/AIDS. Conversely, to take an example of how the lack of quantitative tracking metrics can undermine global goals, consider the 1975 pledge to halve post-harvest food losses in developing countries over the subsequent 10 years. It was strongly backed by then-U.S. Secretary of State Henry Kissinger and officially endorsed in a resolution of the UN General Assembly. Did the world achieve this goal? Almost certainly not, but the true answer is that nobody knows, because nobody was measuring. We do know that the 1985 deadline came and went, and that no one seems to have paid much attention. There appears to have been no serious assessment over how close or far the world had come to the goal, or what may have explained any divergence; there was certainly no significant political reckoning over the deadline. Indeed, even in 2015, food loss and waste are estimated to account for perhaps 30 to 40 percent of total production, but there are no reliable data that can be applied on a country-by-country basis and integrated into national plans.

The SDGs are designed to be different. Over the next 15 years, the international community will need to closely review and follow up on progress on these goals, to understand where advances are taking place and where improvements are coming more slowly, if at all. Without meaningful metrics to track progress and measure the actions that will deliver change, it will be impossible to generate the political momentum to galvanize reforms, or to hold actors accountable for outcomes. With this report, we have tried to show what questions can be usefully answered with available data and where the most important data gaps lie.

“The SDGs are designed to be different. Over the next 15 years, the international community will need to closely review and follow-up on progress, to understand where advances are taking place and where improvements are coming more slowly, if at all.”

18. There is much discussion about the appropriate number of indicators to choose in reviewing progress on the SDGs, with some concern being raised about overloading the measurement system. This has some merit in the aggregate, but the experience of key drivers of health outcomes suggests it is the availability of real-time implementation data (numbers on Directly Observed Treatment courses administered per month, bed nets delivered, health professionals in the field, people tested for HIV, and so forth) that made a material difference. Each sector needs its own detailed management information system. Our indicators could be the start of development of such a system for FNS.

1.4

Outline of the remainder of the report

This report consists of eight chapters. Following this introduction, Chapter 2 sets the scene by comparing current trajectories in hunger, malnutrition, agricultural productivity, and the environmental sustainability of agricultural practices to the newly agreed international targets. We show that achieving these targets will require us to considerably “bend the curve” and accelerate rates of progress beyond business as usual.

Chapter 3 provides a comprehensive mapping of 116 developing countries’ needs, policies, and resources critical to ending rural hunger around the world. Such a mapping is designed to systematically evaluate the nature of the FNS challenge, creating the knowledge base to inform strategic decision-making for the needed investments and actions. We also provide in-depth analyses of the FNS challenge in two particularly important groups of countries: fragile states and those with the largest rural populations.

Chapter 4 assesses contributions by 29 developed countries (the members of the OECD’s Development Assistance Committee) toward ending rural hunger. We examine and rank their domestic agricultural and biofuel policies, agricultural trade restrictions and FNS aid volumes and policies to see where they contribute to—and detract from—the global effort to end rural hunger.

Chapter 5 builds on the analyses of the previous two chapters to provide broad policy recommendations for developing and developed country governments. For developing countries, these recommendations include using comparative data to identify their specific FNS needs and prioritize areas for action; strengthening their policies and political commitment to FNS; and ensuring adequate public investment in agriculture and FNS. For developed countries, recommendations include reforming domestic agricultural and biofuel policies to improve the functioning of global food commodity markets;

increasing the volume and improving the effectiveness of delivery of aid for FNS; and targeting FNS aid to those countries where its impact is likely to be largest, namely where needs are high and policies are strong but resources are limited.

Chapter 6 analyzes the roles of three other key players in the FNS system: multilateral institutions, foreign investors, and emerging economies. For each we consider both their current contributions to ending rural hunger in developing countries and how these roles may evolve and expand in the coming 15 years.

Chapter 7 moves beyond the roles and recommendations for individual actors and explores four critical issues where international collective action is necessary: integrating national and global agricultural markets to create opportunities for inclusive growth in rural areas; improving the resilience of food production and consumption patterns against the threat of climate change; boosting location- and crop-specific research, technology, extension and training services to enhance agricultural productivity; and ensuring that small-scale farms can operate as productive entrepreneurs rather than subsistence farmers. We look at how the international community is currently organized to deliver on these collective action challenges and consider the need for strengthened partnership.

Finally, Chapter 8 offers some concluding remarks.

CHAPTER 2

Setting the scene: Hunger trajectories to 2030

CHAPTER 2

Setting the scene: Hunger trajectories to 2030

The starting point for this analysis is to define the specific dimensions of FNS needs identified in the SDGs. We focus on the FNS needs highlighted in the four primary targets of the global goal for FNS: access to food, malnutrition, agricultural productivity gaps, and vulnerability. Since we are ultimately focused on mapping needs and actions at the country level, we exclude the fifth target, genetic diversity, from our analysis, as it is better measured at the global level.

In each of these four dimensions of need, we project trends of key indicators over the next 15 years, comparing baseline business-as-usual scenarios to the trajectories needed to meet the SDG targets. As will be seen, the world needs to “bend the curve” substantially to achieve each target since current trajectories will fall well short. Achieving such transformational change will require sustained, strategic commitment from both developing and developed countries. Yet historically international support for FNS has been reactive and crisis-driven. Thus the world will need to find ways to sustain commitment through a strengthened global partnership to meet the FNS global goals.

“Historically, international support for FNS has been reactive and crisis-driven. Thus, the world will need to find ways to sustain commitment through a strengthened global partnership.”

Box 2.1

The concept of food and nutrition security: A brief history

Over the past several decades, the international community's working definitions of the food security problem have evolved along with its collective understanding of the key drivers of hunger and malnutrition. The 1943 Conference on Food and Agriculture at Hot Springs, Virginia—which laid the groundwork for the creation of the FAO, and was a key precursor to the founding of the United Nations—focused on the “secure,” “adequate,” and “suitable” supply of food, which was considered necessary to fulfill Franklin Roosevelt's goal of achieving “freedom from want.” While the Hot Springs delegates adopted a holistic definition of the problem, addressing not just food availability but also access and nutritional quality, their main focus was on achieving sufficient supply of key staples.

In 1966, the International Covenant on Economic, Social and Cultural Rights recognized the “fundamental right of everyone to be free from hunger.” In order to realize this right, the agreement called on state parties to “improve methods of production, conservation and distribution of food by making full use of technical and scientific knowledge, by disseminating knowledge of the principles of nutrition” and “... to ensure an equitable distribution of world food supplies in relation to need.” Eight years later, in the midst of soaring grain prices, the FAO convened the first World Food Conference, in Rome. It, too, focused on food supply, defining food security as the “availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices.” Food security was equated narrowly with ensuring a sufficient supply of staple foods.

In the early 1980s, the concept of food security expanded considerably, thanks in part to the pioneering academic work of Amartya Sen. In *Poverty and Famines* (1981), Sen argued that famines were not caused solely by an inadequate supply of food, but also by constrained demand, when those living in poverty could not afford basic foodstuffs. Food security was as much about social and economic factors as the raw production of agricultural products. Reflecting this new consensus, in 1983 the FAO updated its definition

of food security to “ensuring that all people at all times have both physical and economic access to the basic food that they need.” In 1986, the World Bank published the influential report “Poverty and Hunger,” which drew attention to the temporal dimensions of food security—some individuals live in chronic hunger, associated with structural poverty, while others face transitory food insecurity due to temporary shocks and vulnerabilities.

Meanwhile, the international development community started paying more attention to nutrition, recognizing that food security was not simply about having enough to eat but also about eating the right foods for a healthy and active lifestyle. This led to the 1992 International Conference on Nutrition, jointly sponsored by the FAO and the World Health Organization. This was the first global conference devoted specifically to nutrition.

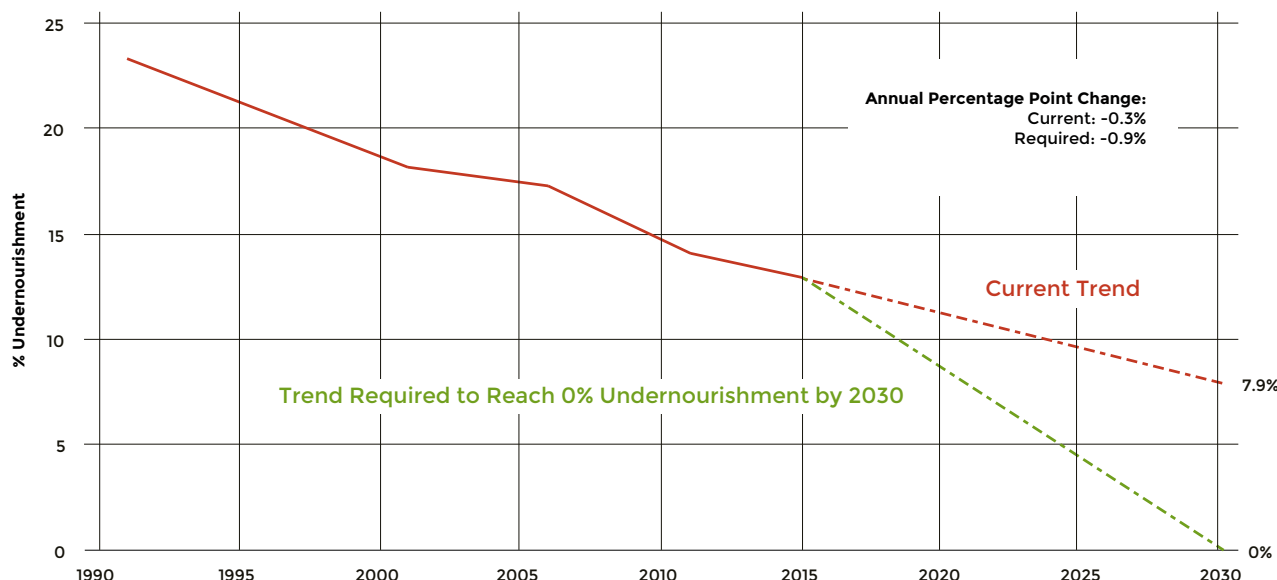
At the 1996 World Food Summit, delegates adopted a definition of food security reflecting a more complex and expansive understanding of the challenge: “Food security exists when all people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.” This definition continues to be widely used today (although the FAO later updated “physical and economic access” to “physical, social and economic access” and there is continued debate as to whether to include nutrition as part of food security). It is associated with four common pillars of food and nutrition security—availability, access, stability, and utilization.

Food security today is understood as comprising both supply and demand factors; as addressing both food quantity and food quality; and about having both enough to eat today and assurance that there will be enough to eat tomorrow. This report's emphasis on four dimensions of FNS needs—access to food, malnutrition, agricultural productivity gaps, and vulnerability—echoes the established definition's multifaceted and complex understanding of FNS. At the same time, it seeks to introduce new metrics for measuring each of these four elements and analyzing their interactions.

2.1 Access to food

Figure 2.1. Ending undernourishment:

Prevalence of undernourishment in the developing world, historical trends and projections



Source: FAO, *State of Food Insecurity* (2015), FAO, *World Agriculture Towards 2030/2050* (2012) and own calculations

Note: Developing World Only

At its heart, ending rural hunger is about ensuring that everyone living in rural areas in developing countries—most of whom earn their incomes directly or indirectly through agricultural production—can afford enough quality food to eat. Access to food, largely measured by caloric deficiency and undernourishment, is thus closely linked to rural poverty and to within-household inequities that can prevent women and girls from getting enough to eat. While the issues of poverty and hunger do not completely overlap—and under current measurement capabilities it is not possible at a global level to say what share of those living in extreme poverty are undernourished, and vice versa—progress in access to food will depend on boosting rural incomes and extending markets into all geographic areas.

One of the most common measures of access to food is the prevalence of undernourishment, defined as the share of the population with food consumption below minimum energy requirements.¹⁹ The prevalence of undernourishment in the

developing world has fallen from 23 percent in 1990 to 13 percent. Nearly two-thirds of those currently undernourished live in South Asia and sub-Saharan Africa.

The current baseline trajectory from the FAO indicates that, as of 2015, there are 795 million undernourished people globally, of whom 780 million are in the developing world (12.9 percent of the population). Projecting forward, FAO estimates that 7.9 percent of the developing world population will still be undernourished in 2030 (Figure 2.1).²⁰ This baseline thus projects the rate of undernourishment to fall by about 1 percentage point every three years between now and 2030. Achieving the first SDG target—to end hunger by 2030—will require nearly tripling this rate of progress, to 2.7 percentage points every three years.²¹

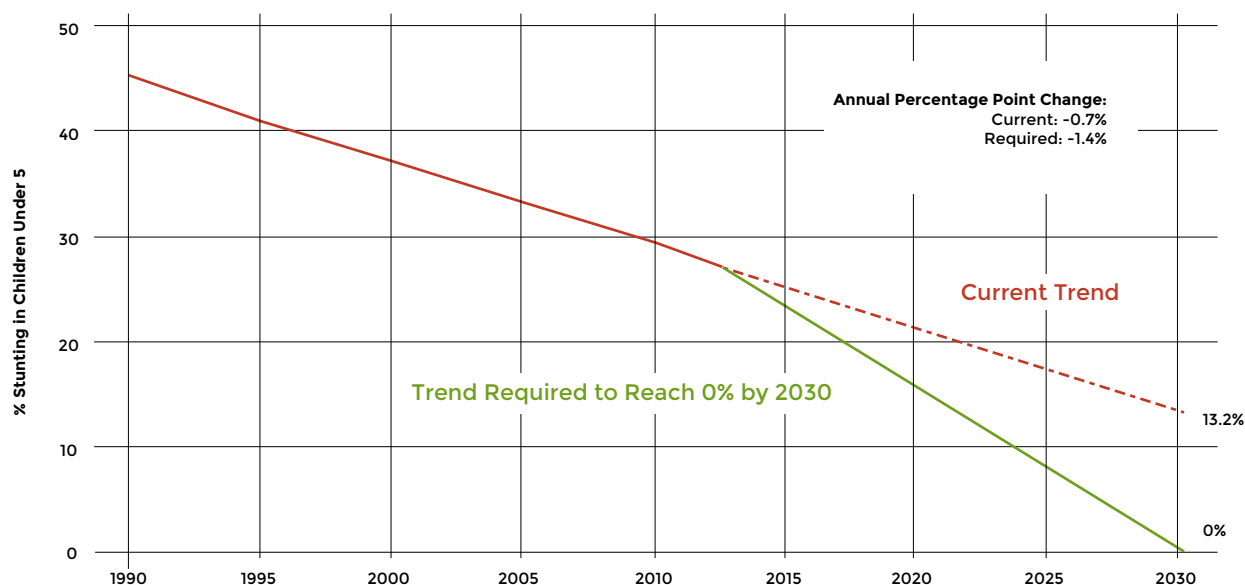
20. Nikos Alexandratos and Jelle Bruinsma, “World Agriculture Towards 2030/2050: The 2012 Revision,” ESA Working Paper no. 12-03 (Rome: FAO, 2012).

21. Note that we adopt a literal definition of ending hunger, as in achieving an undernourishment rate of 0 percent. We interpret the SDG target as meaning giving help to every person in every community to lift himself or herself out of hunger. This embodies the spirit of the 2030 sustainable development agenda to leave no one behind. Practically speaking, we believe this means making sure that policies, investments, and safety nets are sufficiently comprehensive and funded so as to be able to reach all the 3 billion people who will still reside in rural areas in 2030.

19. Undernourishment is not easily observed and is currently measured through modeling exercises, rather than through direct observation. Although not ideal, it is the most widely used indicator of inadequate calorie intake. FAO, in partnership with Gallup, is experimenting with survey-based data on access to food.

2.2 Malnutrition

Figure 2.2. Ending malnutrition:
Prevalence of stunting in the developing world



Source: World Bank, World Development Indicators (2015) and own calculations

Note: Developing World Only

Even when individuals are meeting suggested minimum caloric intakes, if they do not have diverse and healthy diets that allow for the utilization of sufficient nutrients, they will not be able to lead productive, active lifestyles and achieve their full potential. Malnutrition combines undernutrition (the focus in this report) and overnutrition (overweight and obesity).²² Undernutrition leads to risky pregnancies and a diminished ability to perform physical work or to achieve full cognitive potential. It transmits poverty across generations. Undernutrition today is concentrated primarily in sub-Saharan Africa and South Asia.

The prevalence of stunting (low height for age) among children under 5, one of the most common indicators of malnutrition along with wasting (low weight for height), decreased from 45 percent of the developing world population in 1990 to 27 percent by 2013, less than 1 percentage point per year.

If global stunting continues to decline at the same rate as recent history, it would still exceed 13 percent by 2030. In order to end stunting, the rate of decline would have to almost double, reaching more than 1.4 percentage points per year (Figure 2.2).²³

“At its heart, ending rural hunger is about ensuring that everyone living in rural areas in developing countries—most of whom earn their incomes directly or indirectly through agricultural production—can afford enough quality food to eat.”

22. Although the focus here is on undernutrition, we recognize that overweight and obesity are growing issues in developing countries, including in rural areas.

23. The SDG target for malnutrition calls for an end to malnutrition by 2030, depicted in Figure 2.2, but also for the achievement by 2025 of a reduction by 40 percent in the number of children under 5 who are stunted.

2.3

Agricultural productivity gaps

Low agricultural productivity leads to less availability of food for families, communities and countries. The issue is particularly important for family farmers, who are the backbone of agricultural systems throughout much of the developing world, especially in Africa and South Asia. When these farmers have low yields and lack innovative technologies, they produce less, are less able to integrate into markets, and receive lower incomes for their efforts. Agricultural productivity growth is a powerful engine for ending hunger as it helps to raise incomes of farmers directly, boost off-farm rural wages and lower local food prices.²⁴ It can indeed be a primary driver of “structural transformation” in helping workers move from low return labor in farming to higher return labor in other sectors.²⁵

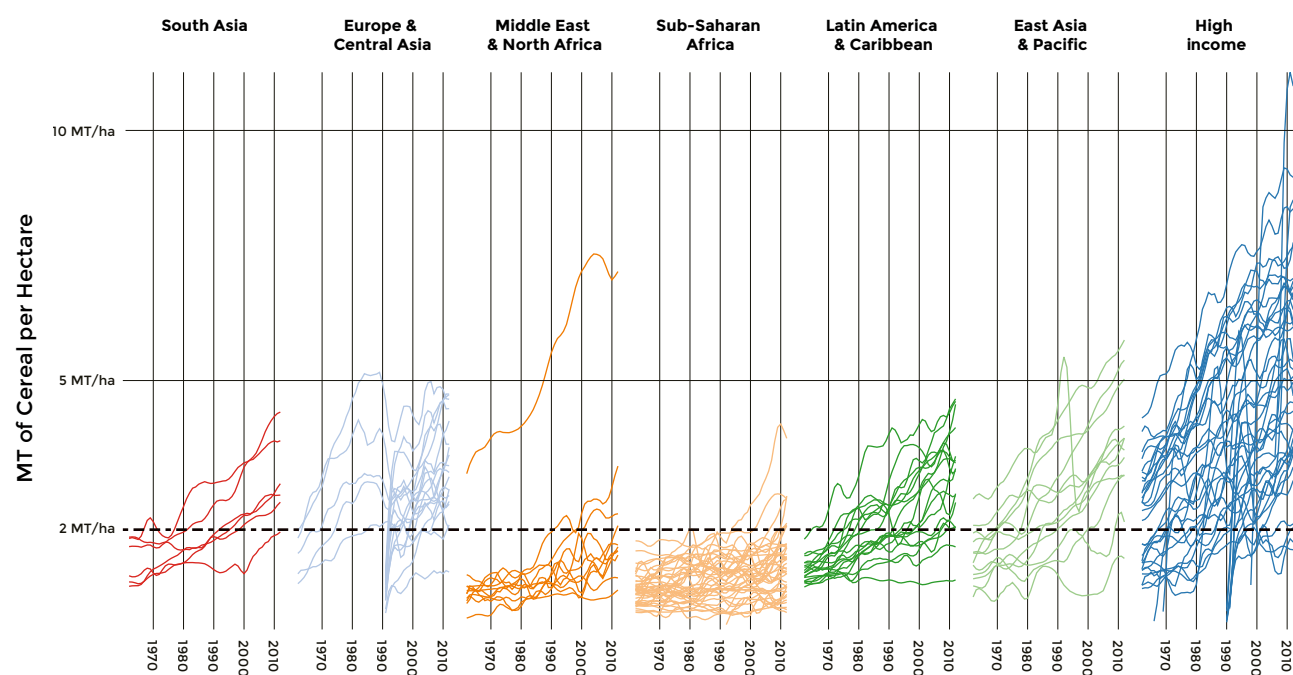
24. Maros Ivanic and Will Martin, “Poverty Impacts of Improved Agricultural Productivity: Opportunities for Genetically Modified Crops,” *AgBioForum* 13, no. 4 (2010).

25. Peter C. Timmer, “Managing Structural Transformation: A Political Economy Approach,” WIDER Annual Lecture (Helsinki: UNU-WIDER, 2014).

It remains a deep global challenge that agriculture is the one major sector that continues to see global divergence in productivity per worker, unlike the forces of convergence that are underway in the manufacturing and services sectors, in addition to GDP per capita. This is likely due to a combination of factors, ranging from the very geography-specific nature of plant technology that inhibits agricultural technology diffusion, or barriers to rural-urban migration in some countries, and the uneven nature of productivity-boosting complementary public goods such as roads.

Some analysts argue that the best path to boosting agricultural productivity is through large farms and by expanding area under harvest. There are a few limits to this logic. The first is that hundreds of millions of hungry and extremely poor people both live on, and are self-employed on, their own small farm. There would often be huge social disruption if these communities were somehow quickly displaced by large corporate entities. A second is that many of the most successful cases of agricultural

Figure 2.3. Agricultural productivity:
Cereal yields in developing countries, 1960-2013



Source: FAO, FAOStat (2015)

productivity supporting broader structural transformation have actually taken place through primarily smallholder agriculture, especially in Asia. So it is not necessarily the case that progress will take shape only through large farms. A third interwoven issue is that potential land availability differs tremendously by country. From 2000 to 2010, Tanzania expanded its area harvested by 83 percent, while Indonesia expanded by 26 percent. Myanmar increased by 38 percent.²⁶ Notwithstanding the complex ecosystem questions of expanding area planted, a large number of other geographies—such as Rwanda, southern Uganda or western Kenya—have high population densities and simply have limited capacity for expansion. It is against this backdrop that we focus on the critical issue of boosting smallholder productivity.

To that end, one basic measure of successful food and agricultural systems is achieving cereal yields of at least 2 metric tons per hectare (t/ha). This is a key threshold for sustained agricultural productivity growth and, more broadly, for economy-wide development. The early successes in Asia's Green Revolution were associated with jumps in yields from about 1 t/ha up to 2 to 3 t/ha (or higher).

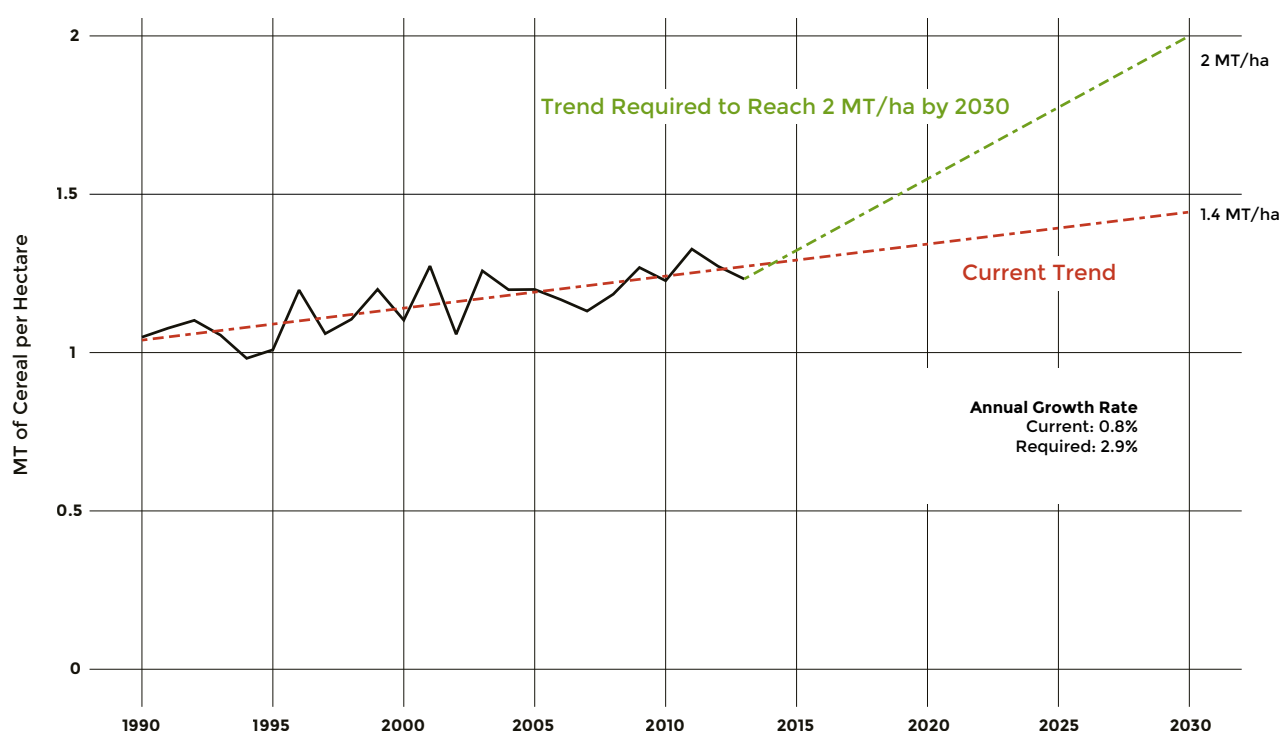
Although yields are only one partial measure of productivity, achieving this level of yield is consistent with sufficient agricultural productivity to allow farmers enough income to start to save and invest for the future, and for society to encourage labor to shift away from agriculture into manufacturing and services while ensuring there will be enough food to eat. Excluding major mineral exporters and socialist economies, no developing country with yields of at least 2 t/ha has experienced sustained negative per capita economic growth since 1965.²⁷

On average, cereal yields in developing countries have risen by 2.1 percent per year since 1965. But there are sharp differences across countries and regions. In 1965 there were 119 countries—home to 2.3 billion people, or 77 percent of the global population—with cereal yields below 2 t/ha (Figure 2.3). Over the subsequent decades, as the advances of the Green Revolution spread (although mostly in Asia and Latin America, not in sub-Saharan Africa), more and more countries passed the 2 t/ha mark. By 2013, there were 60 countries—home to less than 900 million people, or 13 percent of the global population—with cereal yields below 2 t/ha; 158 million

26. John W. McArthur, "Agriculture's Role in Ending Extreme Poverty," in *The Last Mile in Ending Extreme Poverty*, ed. Laurence Chandy et al. (Washington, DC: Brookings Institution Press, 2015).

27. John W. McArthur and Gordon C. McCord, "Fertilizing Growth: Agricultural Inputs and their Effects in Economic Development," Global Economy and Development Working Paper no. 77 (Washington, DC: The Brookings Institution, 2014).

Figure 2.4. Transforming agricultural productivity in low-yield countries:
Average cereal yield in countries with yields below 2 metric tonnes per hectare in 2013



Source: World Bank, World Development Indicators (2015) and own calculations
Note: Only countries with less than 2 MT/ha in 2013

undernourished people live in these countries, mostly in sub-Saharan Africa.

Today these 60 countries have a combined average cereal yield of 1.2 t/ha, and they have achieved only very slow yield growth over time—just 0.75 percent per year since 1990. Based on current trajectories, then, they would reach only 1.4 t/ha by 2030. In order to reach 2 t/ha by that point, the pace of productivity growth would need to rise to nearly 3 percent a year (Figure 2.4).

Are such rapid advances in yield feasible? History suggests the answer is yes, though it will be difficult. For example, Brazil sustained average annual yield increases of 3.2 percent and Paraguay 3.5 percent over the decade between 1985 and 1995. From 1965 to 1975, China managed 3.6 percent, Indonesia 4.0 percent, and South Korea 3.8 percent. But no sub-Saharan African country has achieved this fast a rate of progress, so a distinct improvement in that continent will be needed.

Yields can and should be increased in a sustainable way. Access to water and water efficiency are crucial, as well as more and better use of fertilizer. But planetary boundaries in nitrogen and phosphorous are being reached.²⁸ With the right science and appropriate technologies, there does not have to be a trade-off between sustainable agriculture and growth in yields. Indeed, in many instances, over-use of chemical inputs has reduced yields, so win-win solutions are in sight.

28. We have not found appropriate indicators to measure these issues at the country level, but suggest they be incorporated as and when they become available.

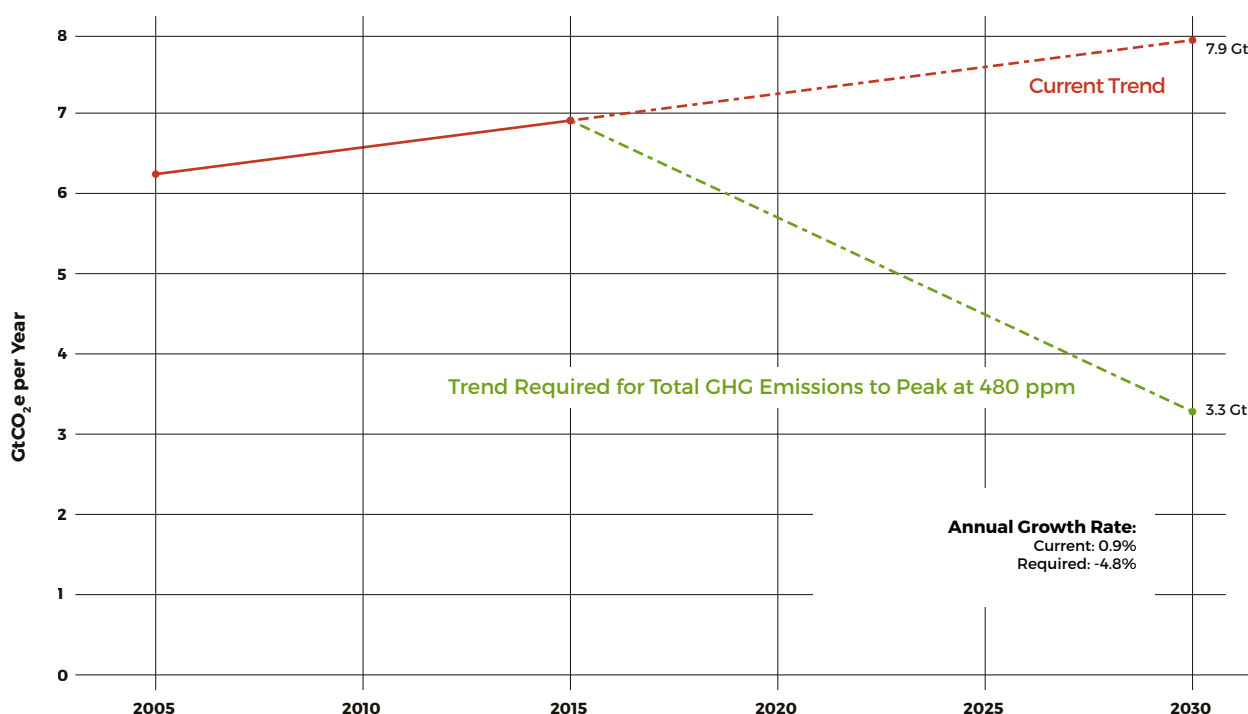
2.4 Vulnerability

Food and agricultural systems can be vulnerable to production, consumption, and environmental shocks. This lack of stability strains agricultural systems and makes it difficult for farmers and families to plan for the future. Some families are chronically vulnerable; others are vulnerable to shocks. Improving the sustainability and resilience of agricultural production is crucial for ensuring that gains in reducing hunger and malnutrition are not later reversed.

even more than the power sector.²⁹ Through better cropland and pasture management, reduced slash-and-burn agricultural practices, reforestation, and other practices, net carbon emissions from the sector could decline by 60 percent by 2030. Increasing the environmental efficiency of agricultural production will need to play a central role in any plan to substantially limit carbon emissions.

Figure 2.5 presents the current trend in global carbon emissions from the agricultural sector,

Figure 2.5. Reducing greenhouse gas emissions from agriculture:
Global GHG emissions from the agricultural sector



Source: McKinsey (2009) and own calculations

Indeed, agricultural practices will need to be substantially transformed to prevent a catastrophic warming of the planet. Today agriculture, forestry, and land use combined account for 24 percent of global greenhouse gas emissions—more than industry, transport, or buildings, and second only to energy generation. Developing countries account for the great majority of these emissions. Significantly, agriculture and forestry have the greatest emissions abatement potential by 2030,

alongside the estimated path needed to ensure that total global emissions peak at 480 parts per million, the level necessary to keep global temperature increases due to climate change below 2 degrees Celsius.³⁰ As can be seen, emissions will need to change course dramatically to meet this target.

29. McKinsey and Company, *Pathways to a Low-Carbon Economy Version 2 of the Global Greenhouse Gas Abatement Cost Curve* (McKinsey and Company, 2009).

30. Analysis based on *ibid.*

2.5

International action for agriculture: From crisis-driven reactions to a sustained, strategic partnership

The graphs above demonstrate that achieving the FNS global targets will not be easy. And rightly so: the purpose of the goals is to galvanize global action and accelerate progress beyond a business-as-usual scenario, to bend the curve toward the end of hunger. The goals are designed to set ambitious targets, highlighting what could be achieved if the international community substantially increased its collective efforts. The SDGs are based on the recognition that achieving sustainable development demands a partnership between rich and poor countries as a foundation for global action.

Historically, however, international commitment to ending hunger has been inconsistent and inadequate. Over the past 40 years, global attention to the issues of FNS and agriculture has responded far more to crises than to longer-term challenges.

In September 1973, for example, speaking to the World Bank's Board of Governors at a time when food prices were spiking, then-President Robert McNamara argued that "without rapid progress in smallholder agriculture throughout the developing world, there is little hope either of achieving long-term stable economic growth or of significantly reducing the levels of absolute poverty."³¹ He went on to decry, however, that "neither political programs, nor economic plans, nor international assistance—bilateral or multilateral—have given the problem serious and sustained attention."

In his speech McNamara laid out an agenda calling for the World Bank and the international community as a whole to commit to ambitious increases in foreign assistance to the agricultural sector. At that time, only 3 percent of aid was devoted to agriculture. By 1979, agriculture's share had risen to 13 percent of total aid. In constant dollar terms, it increased by a factor of five between 1972 and 1979 (Figure 2.6).³²

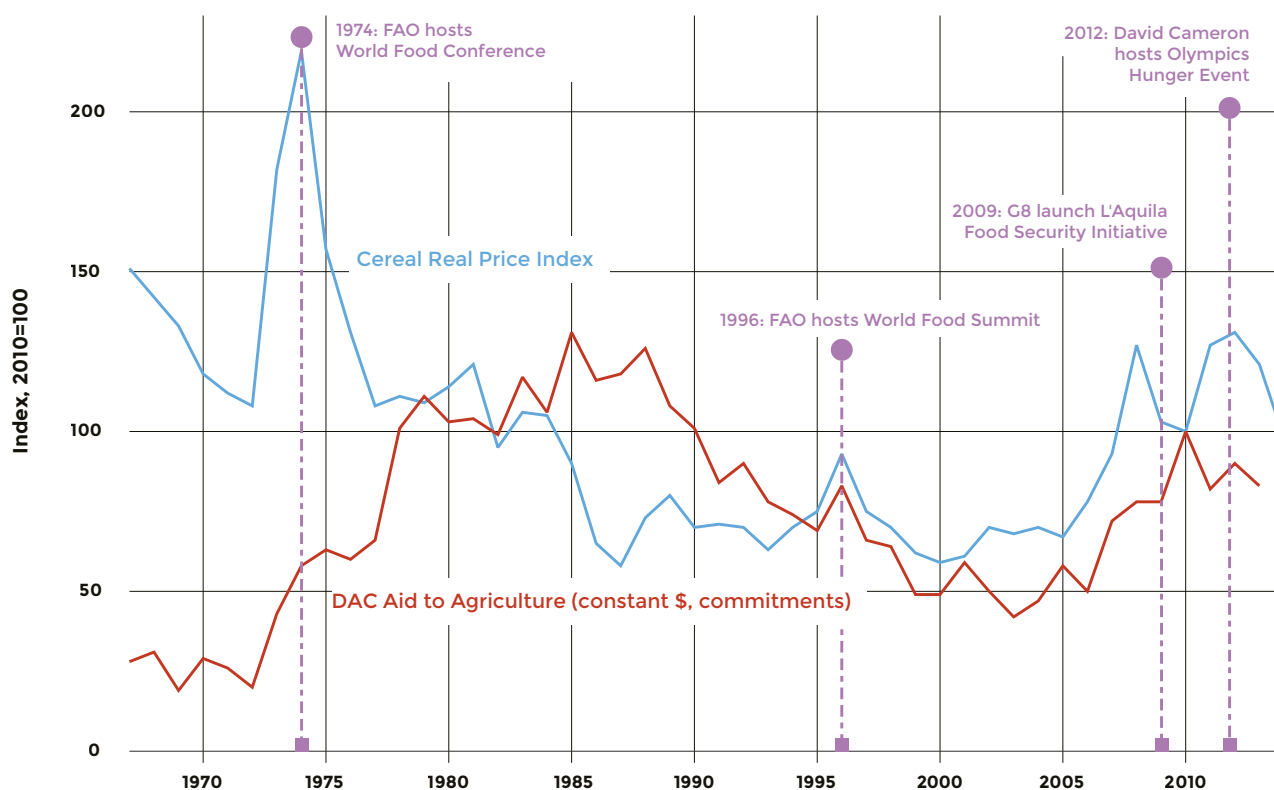
Over the subsequent decades, however, the international community's interest in agriculture faded. Support stayed roughly constant for most of the 1980s, then in the late 1980s international assistance to agriculture began a long decline, bottoming out in the mid-2000s. By then real aid to agriculture was at the same level as it had been in the mid-1970s, and the share of total aid to agriculture had fallen all the way back to 3 percent. Agriculture was back on the periphery of the global development agenda. In 2007, the World Bank's Independent Evaluation Group published a review of support to agriculture in sub-Saharan Africa over the preceding couple of decades. The report's central finding was that "the agriculture sector has been neglected both by governments and the donor community, including the World Bank."³³ This was nearly the same lament McNamara had expressed in 1973.

Since the mid-2000s, aid to agriculture has once again rebounded, doubling in real terms between 2006 and 2010, while initiatives like the Global Agriculture and Food Security Program have been set up in response to sharp increases in cereal prices. But it is not yet clear if this represents a new, sustained commitment to agriculture, or rather a temporary prioritization. Indeed, since 2010, aid to the sector has declined slightly, and agriculture's share of total aid has yet to surpass 6 percent since falling below that level 30 years ago.

33. Independent Evaluation Group, *World Bank Assistance to Agriculture in Sub-Saharan Africa: An IEG Review* (Washington, DC: World Bank, 2007).

31. Robert S. McNamara, "Address to the Board of Governors," Speech at the 1973 Annual General Meeting, 1973.

32. OECD, "Agriculture, Forestry, and Fishing," QWIDS (Paris: Organisation for Economic Co-Operation and Development, 2015).

Figure 2.6. **The correlation between food prices and international support for FNS**

Source: World Bank, Commodity Price Data - The Pink Sheet (2015) and OECD QWIDS Database (2015)

Figure 2.6 depicts long-term trends in real cereal prices and aid to agriculture, alongside markers noting the major international actions and conferences on FNS. Since the late 1970s, aid volumes and international attention to FNS have waxed and waned alongside trends in food prices. Historically, global leaders have called for transformative changes during moments of temporary price spikes. Once prices subside, the urgency is lost, then other causes grab the spotlight, and promises are all too often forgotten.

“Neither political programs nor economic plans, nor international assistance...have given the problem serious and sustained attention.”

—Robert McNamara, 1973

In order to achieve the SDGs, the international community will need to move beyond the reactive, crisis-driven approach to supporting FNS and agriculture that has characterized much of the past 30 years. What is needed is a sustained, data-driven, long-term commitment, one founded in strategic decision-making and more effective partnerships, plus accountable review and follow-up on who is doing what, where. This is the only way to bend the curve to end hunger and malnutrition, transform smallholder productivity, and ensure resilient and sustainable agricultural practices by 2030.

“The Agriculture sector has been neglected both by governments and the donor community including the World Bank.”

—World Bank Independent Evaluation Group, 2007

CHAPTER 3

Mapping developing country needs, policies, and resources in FNS

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As the previous chapter underlined, ending rural hunger and ensuring food and nutrition security across the developing world by 2030 is an ambitious goal. Quite simply, that goal will not be reached if business as usual continues: significant changes are required in order to achieve the necessary rate of progress.

The first step to ending rural hunger is to conduct a comprehensive mapping of the current FNS landscape. Only with this information at hand can the international community begin to identify priorities, focus efforts, and allocate funding in an evidence-based manner. This chapter presents the headline findings of such a mapping. More detailed interactive results are available at www.endingruralhunger.org.

The mapping starts by quantifying the needs, policies, and resources critical to ending rural hunger in each developing country. In each area, there are a number of proxy indicators, albeit often with significant gaps in coverage. By including several indicators at a time, it is possible to include many more countries in the analysis, because not all countries have data for all indicators but most countries have data for at least some indicators. In all, we compiled 80 indicators from 26 data sources and benchmarked countries against each other on each of these.³⁴ Where data for multiple years are available, we have calculated averages for the five-year period 2009 through 2013. This provides a snapshot of the current landscape and prevents outlier data points from driving the results. For example, cereal yields might be volatile from year to year, but a five-year average should provide a reasonable picture of differences across countries.

- By **needs**, we mean the specific FNS targets of the SDGs. There is still no international agreement on which indicators will actually be used to monitor the SDGs, but our list suggests that it is feasible to quantify the targets as currently presented. Nonetheless, there are data gaps (identified below) that, if filled, would help strengthen the measures.
- By **policies**, we mean the key enabling conditions for progress in FNS: the market infrastructure to allow farmers to operate effectively, the national economic policies to encourage efficient investment, and the domestic political commitment to prioritize ending hunger. The role and functioning of institutions and governance are a major element of how policies are implemented. We include some indicators on the strength of these institutions that are, by nature, qualitative judgments by experts or else based on survey results.
- By **resources**, we mean the crucial sources of financing directed to FNS available in developing countries. This includes domestic government spending, official development assistance, other official lending flows, foreign direct investment, and philanthropic and NGO spending—although the only data on this last source are from U.S.-based organizations. Note that we do not include domestic private investment due to lack of available data.

Each country's index scores for each area can be mapped to show where the needs are greatest, policies strongest, and resources most scarce. The maps below show the intensity of each measure in each country. Of course, each country's impact on global outcomes is affected by its size and influence.

34. Appendix 2 contains the index structures for our analyses of both developing and developed countries, as well as the full list of indicators and their sources and descriptions.

Data limitations in assessing FNS

Quality data are the necessary foundation for strategic decision-making among governments, donors, and private sector investors alike. Yet we find that the extent and quality of data for FNS require significant improvement. There are three crucial issues: availability, reliability, and difficulty in measurement. All three issues limit the potential cross-country analysis of FNS.

First, some crucial FNS indicators are simply not measured and available. While the SDGs explicitly call for doubling the productivity of small-scale farms, at present there are no comparable, cross-country data specifically on the productivity of small-scale farms. Similarly, very little country-specific data are available on how much food is lost or wasted (post-harvest or post-market) in developing countries, although rough regional estimates have been compiled. Systematic data on domestic private investment in agriculture, a key driver of progress, are not available. Very few agricultural indicators are disaggregated by gender, even though many key FNS indicators may vary systematically between men and women. An initial database on access to rural insurance has been discontinued on the grounds that it did not adequately reflect ground realities. Other variables are available for certain countries or regions but have limited coverage. Of the 80 indicators we use in our developing country database, 15 are available for fewer than half of developing countries.

Second, even where data are available, reliability is an issue in terms of quality and comparability. The statistics collected and published by the FAO are based on reporting from national statistical agencies. But due to a lack of reliable reporting from member countries, FAO data experts have had to generate their own estimates of basic production data for nearly 70 percent of African countries.³⁵ This means that even straightforward production data for most African countries could be unreliable. This presents a challenge to strengthen national statistical offices, something that the Paris 21 initiative³⁶ and the new Global Partnership for Sustainable Development Data are responding to.

Data on more complex or nuanced issues such as undernourishment, the capital stock in agriculture, or the environmental impact of agricultural production are often derived from modeling and extrapolation rather than real data collection. Data on governments' domestic public spending on agriculture are also out of date and of questionable comparability because the various statistical agencies take different approaches to including or excluding line items like "rural roads" that serve multiple purposes.

Third, a number of issues and priorities are important for FNS but are inherently difficult to measure and quantify. For example, strong leadership—among politicians, government bureaucrats, and entrepreneurs in the private sector—is a crucial ingredient in designing and implementing a successful national strategy for ending hunger, but good metrics for capturing leadership are hard to find. And when it comes to trying to estimate the effects of climate change on agricultural productivity, so many factors and assumptions must be built into agro-climatic models that ultimately we must accept that there will always be high levels of uncertainty in such projections.

There are reasons to hope that agricultural data will improve in the future. For example, new technologies such as cellphones may decrease data collection costs. More rigorously designed and implemented household and agricultural surveys have potential for better measuring the production and consumption of small-scale farms.³⁷ Satellite imaging can potentially provide cheaper, more accurate, and more regionally disaggregated data on physical and environmental issues. There are efforts to create agreed protocols for how to measure food loss and waste. Increasing political attention is being devoted to the issue. For instance, the UN has recently launched an Inter-Agency and Expert Group on Food Security, Agricultural and Rural Statistics to document good practices and guidelines on concepts, methods, and statistical standards. A Global Open Data for Agriculture and Nutrition program (GODAN) has brought together 100 partners to improve data. However, whether such renewed energy actually translates into better information remains to be seen.

For our purposes, in creating indexes we have chosen not to produce any original data, but instead to rely on pre-existing data, all of which are publicly available. Our indexes, therefore, are only as strong as the original data on which they are built. While we have assiduously reviewed available sources to exclude any data that we deemed inaccurate or unreliable, it may still be the case that certain indicators for particular countries have flawed data. The nature of our index—which averages across indicators measuring similar concepts, building up from raw data to aggregate component scores—minimizes the impact of any single inaccurate data point on the overall findings. Ultimately, we hope one of the outcomes of this project is to focus policymakers on the value of high-quality data for FNS and to encourage further investment in this critical priority.

35. FAO, *Independent Evaluation of FAO's Role and Work in Statistics* (Rome: FAO, 2008), p. 8.

36. Partnership in Statistics for Development in the 21st Century

37. See discussion in Gero Carletto, Dean Jolliffe, and Banerjee Raka, "From Tragedy to Renaissance: Improving Agricultural Data for Better Policies," Policy Research Working Papers no. 7150 (Washington, DC: World Bank, 2015).

3.1 Where are FNS needs greatest?

We calculate overall FNS needs scores as an average of four sub-index scores:

- **Access to food** includes measurements of undernourishment as well as estimates of rural poverty, from both an income and multidimensional perspective.
- **Malnutrition** includes measurements of the lack of dietary diversity and the degree of child stunting, wasting, and anemia.
- **Agricultural productivity gaps** includes measurements of cereal yields, the extent of family farming, total factor productivity growth in agriculture, rural infrastructure, and access to inputs such as modern seed varieties, transport, fertilizer, and financial services.
- **Vulnerability** includes measurements of production shocks over the past decade, the susceptibility of household budgets to food price increases, and agro-climatic vulnerabilities in the medium and longer term.

Figure 3.1 maps the overall FNS needs scores in 116 developing countries. Countries with the greatest needs are found in sub-Saharan Africa, while South Asia also has sizable needs. In general, Central and Eastern Europe, East Asia, Latin America, and the Middle East and North Africa have lower overall FNS needs. These regional aggregates, however, hide important differences—Bolivia, for example, has high needs compared with its neighbors. South Africa has much lower needs than the rest of sub-Saharan Africa. Unsurprisingly, the countries with the greatest needs tend to be poor and fragile states (Box 3.3), many of which are landlocked. The countries with the lowest needs tend to be relatively well-off, middle-income countries with modern agricultural sectors. From a global perspective, what happens in India, China, Indonesia, Pakistan, Bangladesh, Nigeria, Ethiopia, Vietnam, the Philippines, and Egypt will dominate aggregate statistics because of their large rural populations (Box 3.4).

The 10 countries with the highest estimated needs per capita—and thus the furthest distance to travel to end hunger—are listed in Figure 3.2. All are in sub-Saharan Africa. All, except Zambia, are low-income countries. All, except Zambia, are on the OECD list of fragile states (Box 3.3). Other than the Democratic Republic of Congo, most of the countries listed as having the most intense hunger needs have relatively small populations.

A substantial increase in effort, on the part of both their own governments and their partners in the international community, will be needed to end rural hunger in fragile states. Unsurprisingly, fragile states have the weakest agricultural policies and least resources to invest in FNS. They could be given greater attention by the international community. At present donors provide even less FNS development aid to fragile states as elsewhere, in terms of dollars per rural capita, partly because of absorptive capacity in some of these countries. More efforts are needed to develop suitable, scalable interventions.

In addition to FNS development aid, some fragile states get considerable amounts of humanitarian aid, some of which is used for longer-term developmental purposes as well as immediate relief. But donors and developing country governments could do much more to link development and humanitarian efforts, for example, by cash programming, more flexible budgeting to respond to early warning indicators of vulnerability, and shifting resources to crisis prevention over relief. One particular constraint in fragile states is that there are fewer good opportunities for fixed investments because of a high level of physical or policy insecurity. A higher priority in those places could be institutional development and skills development.

3. Mapping developing country needs, policies, and resources in FNS

Diving deeper into the results, the index scores capture different composition of needs in each region. Sub-Saharan Africa and South Asia have the greatest prevalence of undernourishment. Residents of these regions, along with those in East Asia and the Pacific and, to a lesser extent, the Middle East and North Africa, tend to have higher prevalence of malnutrition. Productivity issues for small-scale

farmers are acute in sub-Saharan Africa and parts of Central America and the Caribbean, while countries in the Middle East and North Africa are more vulnerable to shocks. These variations in needs reinforce the importance of disaggregating needs into the four components in order to inform decisions on strategy.

Figure 3.1. How great are FNS needs?

Index Scores, 0-100

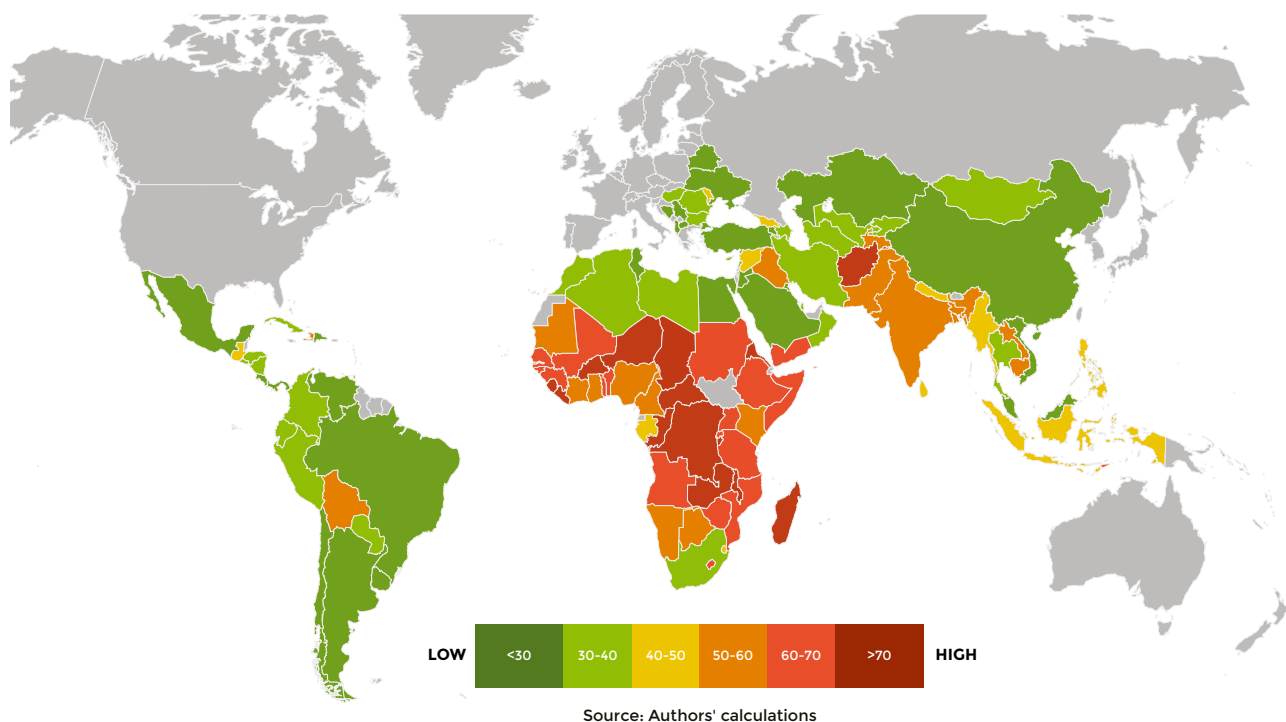
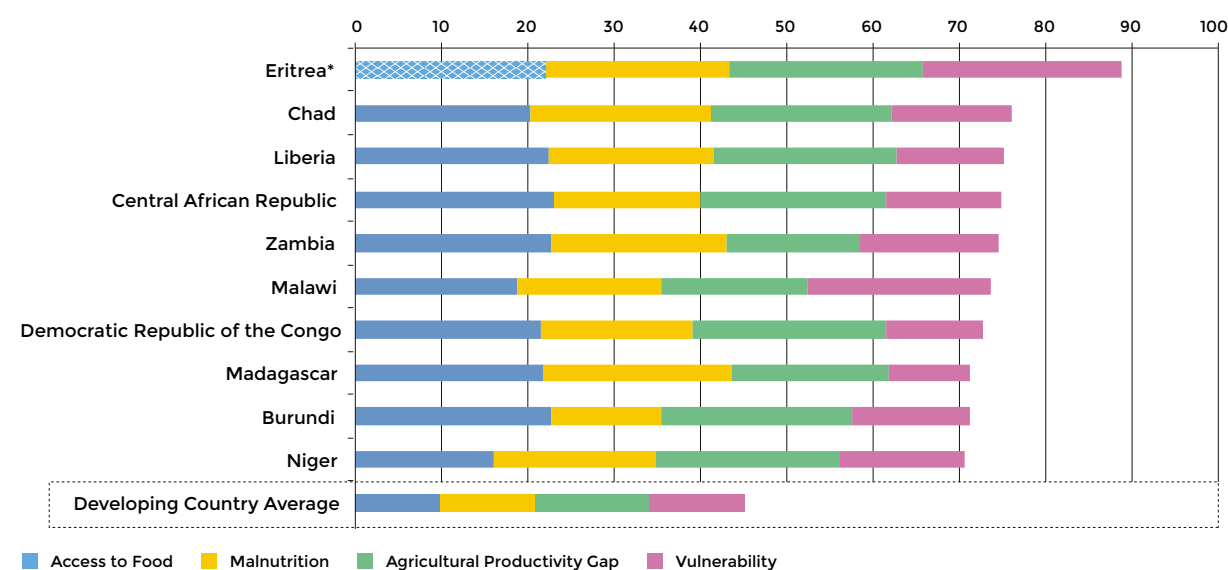


Figure 3.2. Top 10 countries: Greatest FNS needs

Index Scores, 0-100



3.2

Where are FNS policies strongest?

The overall FNS policy score is an average of scores on two sub-indexes: agricultural economic policy and political prioritization.

- **Agricultural economic policy** includes measurements of the rural investment climate; pricing and trade distortions that affect national agricultural markets; and the level of expertise in science, technology, and extension services.
- **Political prioritization** includes measurements of the government's prioritization of agriculture, nutrition, rural social assistance, and the enabling environment for women farmers.

As Figure 3.3 shows, there is considerable variation among policy scores for developing countries. The countries with the best policy environments are commonly in Latin America and Central and Eastern Europe, although China, Malaysia, and South Africa stand out, too. The countries with the weakest policy environments are primarily but not exclusively in sub-Saharan Africa, the Middle East, and Central Asia.

While all of the countries with the best policy environments are middle- to higher-income countries, many of the countries with the worst policy environments are among the poorest in the world. This is not surprising, because many of the indicators included in our analysis of policy environments

“The countries with the weakest policy environments are primarily but not exclusively in sub-Saharan Africa, the Middle East, and Central Asia.”

are inevitably *outcome* measurements rather than *effort* measurements. And since strong policy environments can be expensive and difficult to implement, poor countries with weak institutions are unlikely to receive high scores on the index, even when their governments are committed to ending hunger. For example, we found that sub-Saharan Africa countries faced generally greater hunger challenges than other regions, even after controlling for their own policies and incomes. This might be due to specific challenges of geography, technology, or global market access.

Moreover, even among countries with strong overall FNS policy scores, nearly all have certain areas where there is considerable room for improvement. For example, both Hungary and China are among the top 10 developing countries in overall FNS policies and political prioritization, yet Hungary has high applied tariffs on agricultural imports while China rates relatively poorly on its use of non-tariff barriers on agricultural imports.

3. Mapping developing country needs, policies, and resources in FNS

Figure 3.3. How strong are FNS policies?

Index Scores, 0-100

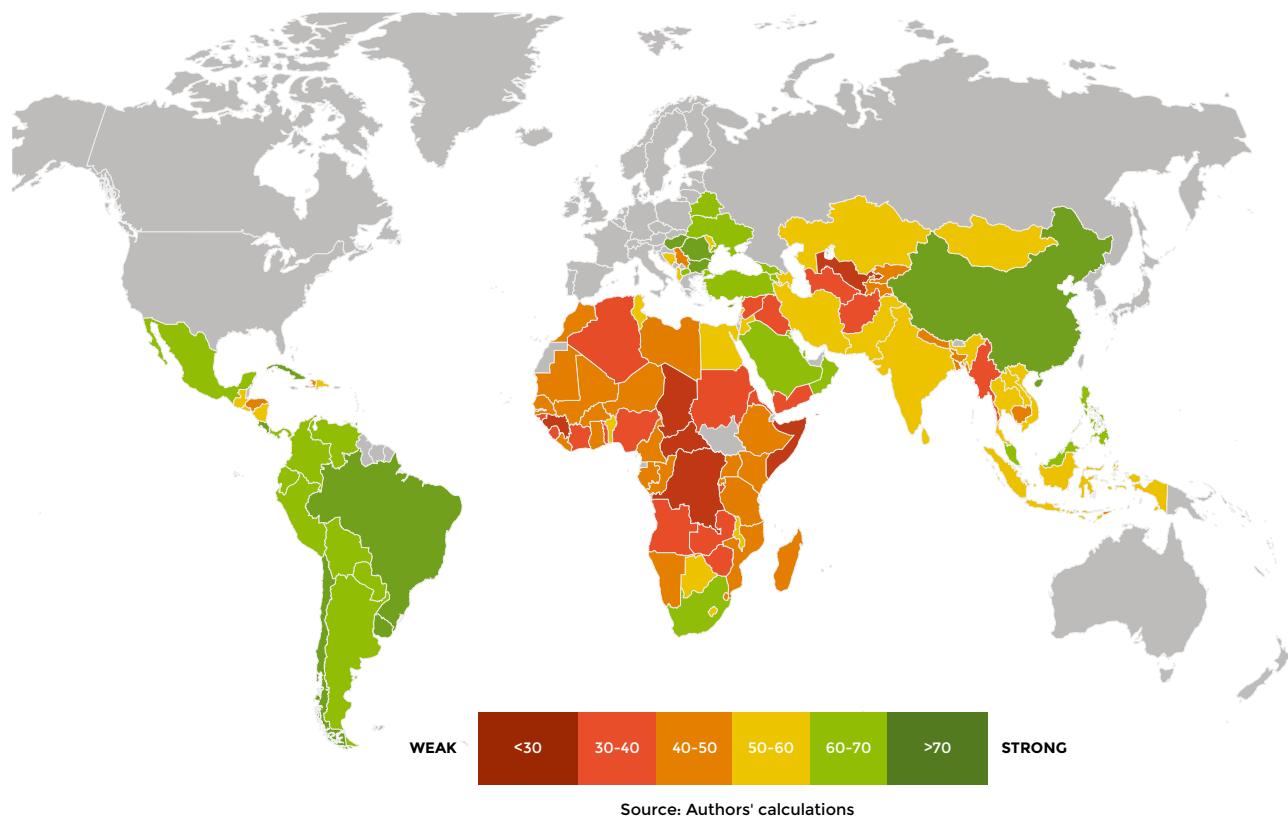
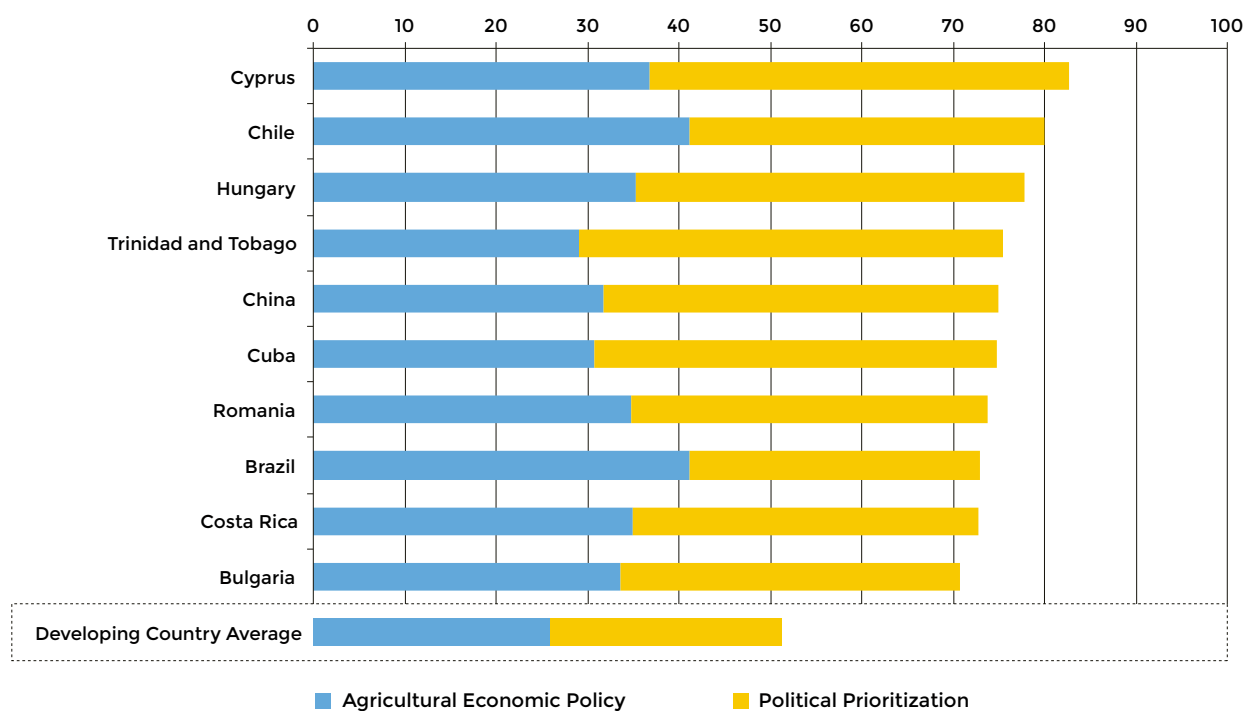


Figure 3.4. Top 10 countries: Strongest FNS policies

Index Scores, 0-100



Source: Authors' calculations

3.3

Where are FNS resources and investments highest, and where are they most scarce?

How much money is available for promoting agriculture and FNS in developing countries? The question is more difficult to answer than one might expect, given the lack of comparable data across different sources of funding. Our methodology brings together data on both public and private resource flows for FNS in developing countries, creating the most comprehensive cross-country assessment of resources yet available for ending rural hunger. Our overall measure of resources for FNS includes sums of the following sub-categories:

- **Public investment** includes measures of domestic public investment (that is, government spending on agriculture), official development assistance (ODA) for FNS, and other official flows (OOF) for FNS, including non-concessional loans from international institutions such as the World Bank plus loans and grants from emerging economies such as China, India, and Brazil.
- **Private external investment** includes measures of foreign direct investment by multinational corporations in the agricultural sector as well as spending by private philanthropies and NGOs (U.S.-based only) on FNS projects in developing countries.³⁸

Our data set excludes what is almost certainly the largest source of agricultural investments in developing countries: domestic private investment, notably farmers' own investments in their land and assets. Unfortunately, no reliable cross-country data are available on private investment in agriculture. In light of this, our results should be interpreted as how much financing is available for FNS in developing countries beyond the resources committed by their own private sectors.

Unless otherwise noted, all resource figures are expressed in rural per capita terms: that is, we are primarily interested in how much money is available for each person living in rural areas rather than where overall resources are flowing. This is in keeping with the SDGs' focus on ensuring that no person or country is left behind, rather than focusing primarily on the countries with the most people or the biggest markets.

“Aid for nutrition is very low at just 5 percent of the [FNS] total.”

38. Only US-based philanthropies and NGOs are included because reliable data for NGO, foundation, and other civil society flows from other countries for FNS purposes are not available.

Box 3.2

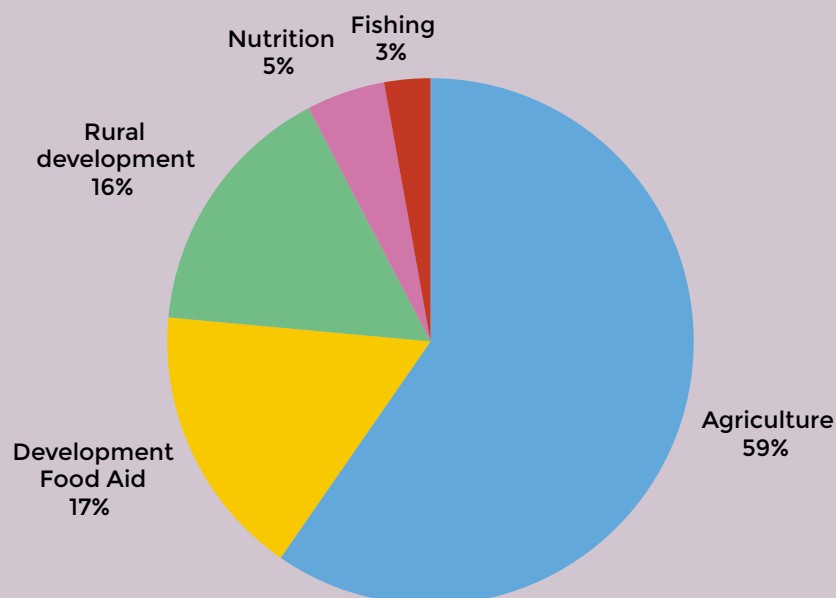
Identifying aid for FNS

To identify official development assistance designated specifically for FNS projects, we rely on the purpose code system used by the OECD's Creditor Reporting System. Our definition of FNS aid comprises five main sub-categories. The first is agriculture, which includes projects on crop and livestock production; agricultural inputs; land and water resources; extension, education, and research; agricultural financial services; agricultural policy and management; and agri-business. The second is rural development, which includes multi-sectoral projects such as regional development planning or land management and land use. The third is development food aid, which includes the supply of food under national or international programs—importantly, this excludes emergency food aid or humanitarian aid because these flows are primarily aimed at short-term relief for families in immediate distress. (Although humanitarian flows increasingly spill over to longer-term developmental activities, it is hard to identify how much is for short-term relief and

how much for development.). The fourth is nutrition, which includes feeding programs (such as maternal feeding and school meals), provision of micronutrients, nutrition and hygiene education, and similar programs. The fifth is fishing, which includes fishery development, research, and training, as well as policy and management.

Figure 3.5 shows the breakdown of these five main components of FNS aid, looking at aggregate FNS aid from all DAC donors. As can be seen, aid for agriculture accounts for nearly three-fifths of total FNS aid, with rural development and development food aid making up most of the remainder. Aid for nutrition is very low, at just 5 percent of the total. However, these averages mask considerable differences among both aid agencies and recipient countries, so each country's particular distribution may differ considerably.

Figure 3.5. Aid to FNS sector breakdown
Average 2009–2013



Source: OECD QWIDS Database (2015)

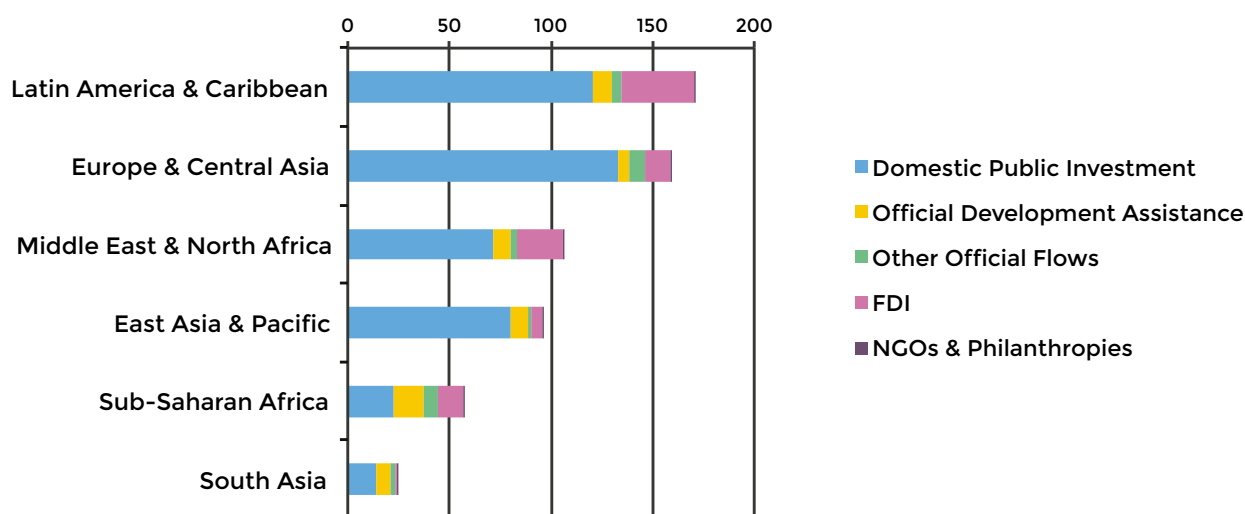
3. Mapping developing country needs, policies, and resources in FNS

Figure 3.6 shows FNS resource flow from the perspective of rural people in developing countries. The variation in available resources is overwhelmingly driven by differences in government spending. For example, in Belarus, Malaysia, Turkey, and Argentina, domestic public investment is \$300 to \$550 per rural inhabitant, while in Myanmar, the Democratic Republic of Congo, Eritrea, and Guinea, the corresponding figure is less than \$4 per rural inhabitant. Moreover, this dispersion appears to be significantly driven by differences in per capita income levels and the consequent ability of the government to raise domestic revenue. It is also driven by differences in the priority given by governments to agriculture as opposed other development investments.

Among relevant sources assessed, we estimate that \$208 billion is available annually for FNS in developing countries. Of this, domestic public investment accounts for \$179 billion; oDA, \$12.2 billion; OOF, \$5.2 billion; FDI, \$11 billion; and funding from NGOs and philanthropies, \$630 million. ODA to FNS is concentrated in sub-Saharan Africa and plays only a minor role in other regions, although in absolute dollars substantial ODA still goes to Latin America. For 17 countries, 12 of which are in sub-Saharan Africa, ODA makes up at least half of the total resources available for FNS. FDI flows to agriculture remain modest overall and are most significant in Latin America and the Caribbean and Europe and Central Asia (Figure 3.7).

Figure 3.6. Investment in FNS by region

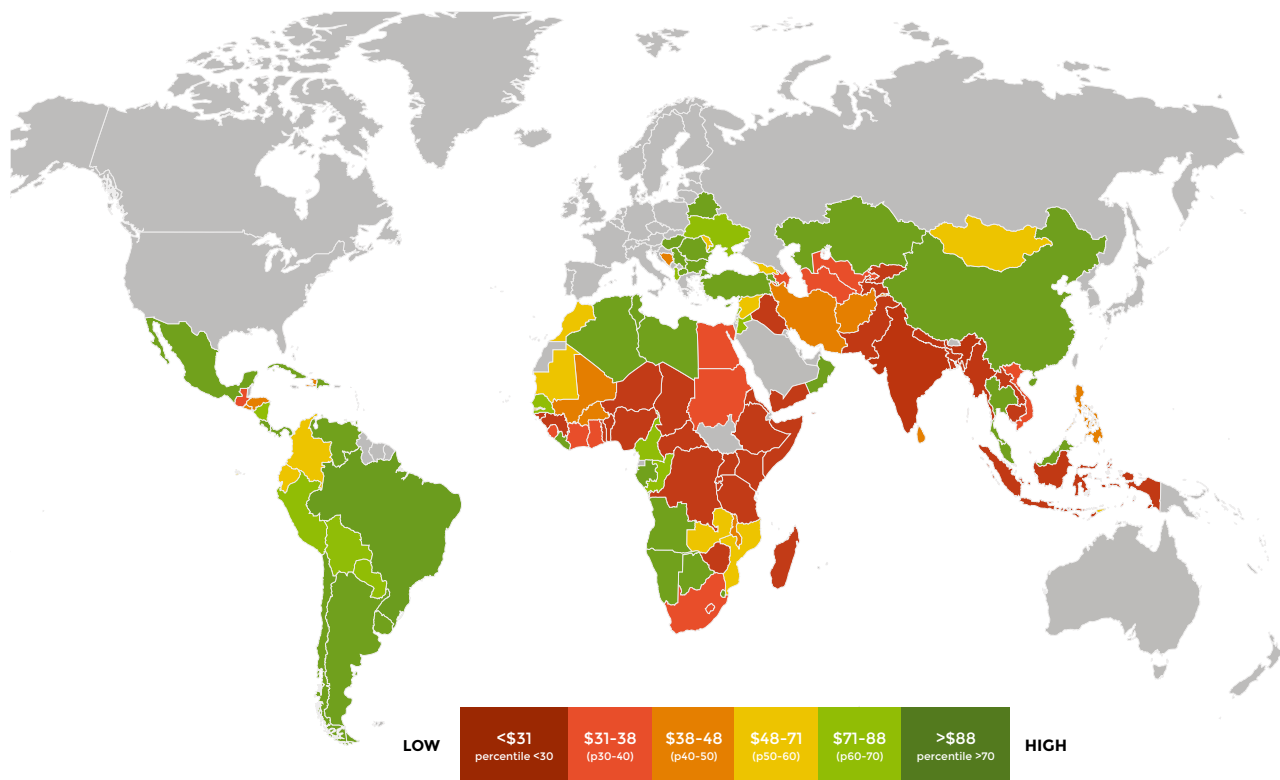
Total resources, USD per rural capita



Source: Authors' calculations

Figure 3.7. How much is invested in FNS?

Total resources, USD per rural capita



Source: Authors' calculations

Box 3.3

The special case of fragile states

The world's fragile states—those beset by conflict, political instability, or weak governance—face the most difficult development challenges. Their paths to ending rural hunger are likely to be substantially more difficult than those of other developing countries.

Figure 3.8 shows why. Fragile states have greater needs than non-fragile states across all four dimensions of FNS.³⁹ Moreover, they have worse scores than non-fragile states on both agricultural economic policy and political prioritization of FNS.

Given their overwhelming needs, fragile states could require substantially more resources to end hunger than other developing countries. Yet on average fragile states have just \$38 per rural capita in total annual funding for FNS, compared with \$52 per rural capita for comparator countries (identified as non-fragile low-income and lower middle-income countries).⁴⁰ Unsurprisingly, this is driven primarily by differences in government spending, which averages just \$16 per rural capita in fragile states compared with \$26 per rural capita in comparator countries. Perhaps more surprising, however, given the scale of their needs, is the fact that fragile states receive less official development assistance than non-fragile states: \$11 per rural capita in fragile states compared with \$14 per rural capita in comparator countries.

Why don't donors give more FNS aid to fragile states, in light of their substantial needs? Donors may not consider FNS a priority among the many other development imperatives in fragile states. On average the FNS sector accounts for 8 percent of the total aid received by fragile states, about the same as the share of FNS aid in total aid. Or donors may be reluctant to engage in countries with weak governance and believe that aid interventions in fragile states are simply less likely to be successful. For example, a recent analysis by the International Fund for Agricultural Development (IFAD) found that its projects in fragile states performed less well than those in non-fragile states, although it's worth noting that the World Bank has found that projects in fragile states are just as likely to succeed as those in non-fragile states.⁴¹

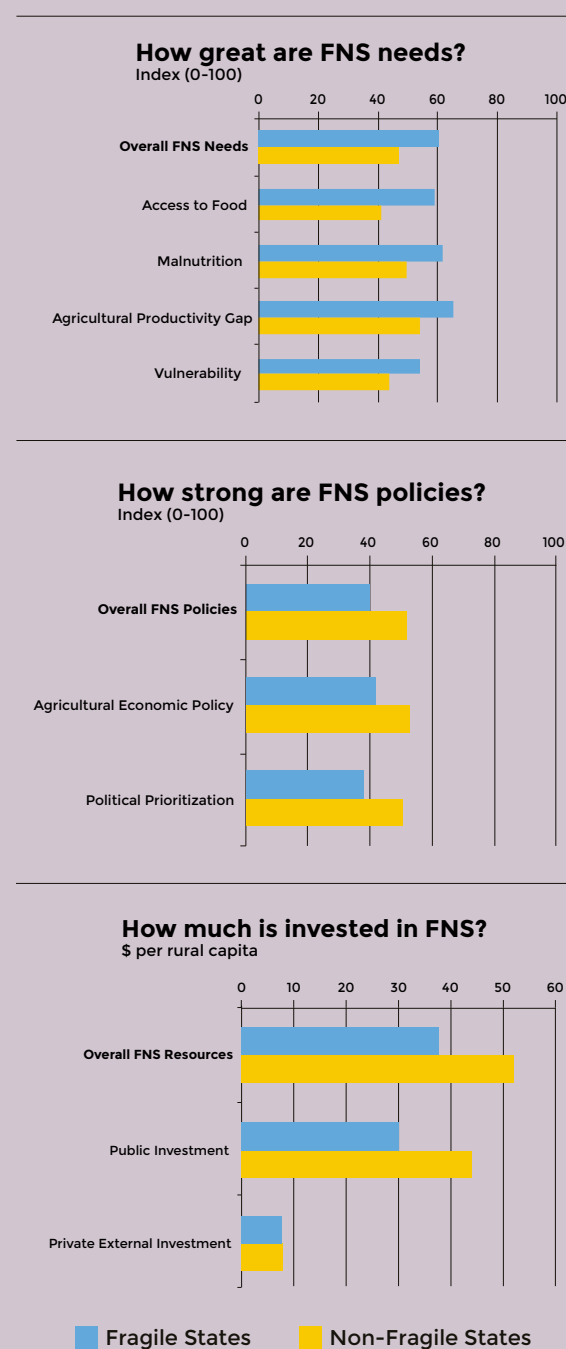
39. We identify fragile states using the OECD, *States of Fragility 2015: Meeting Post-2015 Ambitions* (Paris: OECD Publishing, 2015).

40. Simple averages.

41. IFAD report: IFAD, IFAD's Engagement in Fragile and Conflict-Affected States and Situations (Rome: IFAD, 2014). On World Bank, see: Independent Evaluation Group, *World Bank Group Assistance to Low-Income Fragile and Conflict-Affected States* (Washington, DC: World Bank, 2013) and discussion in Laurence Chandy, "Ten Years of Fragile States: What Have We Learned?," *Global Views* no. 30 (Washington, DC: The Brookings Institution, 2011).

In any case, given the scale of the needs in fragile states, both their governments and donors will need to find ways to do much more—devoting more resources and improving policies—in order to end hunger by 2030.

Figure 3.8. Fragile states



Source: Authors' calculations

Box 3.4

The special case of countries with large rural populations

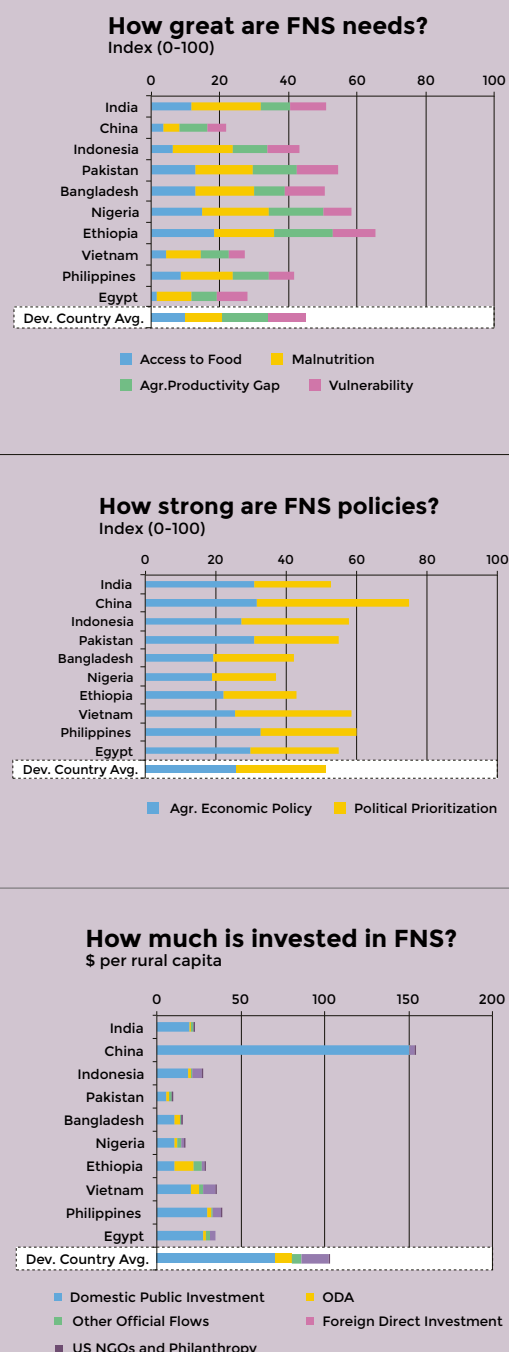
Most of the analysis in this report is concerned with measuring the intensity of FNS challenges within every country. This approach is consistent with the SDGs' philosophy that every country matters and that no one should be left behind. By design this approach doesn't account for differences in the size of rural populations across countries. Yet if we want to understand what drives indicators like the global undernourishment rate, we must pay special attention to those countries with the largest populations. Indeed, the 10 countries with the largest rural populations collectively account for 70 percent of the developing world's rural population; India and China alone account for nearly half.

Figure 3.9 looks specifically at the needs, policies, and resources in these 10 countries. Five of them—India, Pakistan, Bangladesh, Nigeria, and Ethiopia—have total FNS needs above the developing country average and FNS policies at or below the developing country average. They are home to 37 percent of the global population that is undernourished. The other five countries, meanwhile—China, Indonesia, Vietnam, the Philippines, and Egypt—have below-average needs and above-average policies.

The big difference between countries with large populations and others is seen in resource flows. The average developing country spends \$105 per rural capita on FNS, but most large countries spend much less. Excluding China, the other nine large countries spend \$25 per rural capita. China is a clear outlier among large countries, spending more than \$150 per rural capita on FNS, with domestic public investment accounting for 98 percent of this.

Since we are measuring resources in rural per capita terms, some disparity between countries with large populations and others should not necessarily be surprising; if there are economies of scale in FNS projects, for example, in building rural roads in densely populated areas, it would make sense for per capita spending to be lower in countries with large populations. Yet large countries face a generalized negative bias in terms of per capita ODA. The extremely low per rural capita figures for these countries, especially those in sub-Saharan Africa and South Asia, suggest there may be a good case for significantly increasing their resources—domestic or external—available for FNS.

Figure 3.9. 10 Countries with largest rural populations.



Source: Authors' calculations

CHAPTER 4

Assessing developed countries' contributions to ending rural hunger

FNS Country Profiles for all countries included in the ERH database can be downloaded at www.endingruralhunger.org



CHAPTER 4

Assessing developed countries' contributions to ending rural hunger

While the previous chapter focused on developing countries, this chapter assesses the role of developed countries in ending rural hunger. Developed countries affect global hunger through multiple channels. For example, the large size of their own agricultural markets means that developed countries' domestic agricultural policies have substantial impacts on global agricultural supplies and prices. When developed countries distort global markets through subsidies, mandates, and tariffs around agriculture or biofuels, they make it more difficult for poor farmers in developing countries to optimize their production and incomes. In this report we do not make judgments as to what types of subsidies or tariffs might be better or worse, and instead simply adopt a premise that fewer market distortions is best.

Developed countries also make direct monetary contributions to FNS in developing countries through their bilateral aid agencies and contributions to multilateral aid organizations. Some dollars are spent more efficiently than others. As we show below, some donors also rate better than others at targeting their aid to countries where it could do the most good. And there is considerable variation in how effectively donors design and implement interventions in FNS, including their emphasis on supporting FNS research and the degree of focus on gender and climate change issues within their FNS projects.

This chapter assesses developed country contributions to ending rural hunger based on these two pillars: first, domestic agricultural and biofuel policy, and, second, FNS aid policy. The two cannot be compared directly against each other; the scales and objectives are too different. Developed countries currently spend about \$250 billion per year on subsidies supporting their own farmers and consumers, (and an additional estimated \$22 billion in biofuel subsidies and mandates) compared with only \$11.6 billion in development assistance for FNS. An understanding of both sets of issues is needed to make sure that all policies act to reinforce the global effort to end hunger in a coherent way. As with the analysis of developing countries, the text in this chapter presents only a summary of results available from the full data set.

In comparing domestic and aid policies across developed countries, it is important to keep in mind their inherent differences. Very large economies, like the United States or Japan, face different blends of issues than small economies such as Iceland, so rankings should not be over-interpreted. For example, Iceland can (and does) concentrate its aid resources on just a few countries, while the large economies cannot and should not do so given their responsibilities for global governance. Nevertheless, it is instructive to examine the differences across countries and assess the degree to which each one has a coherent approach to global FNS goals across its domestic and foreign aid policies.

“Developed countries currently spend about \$250 billion per year supporting their own farmers (and an additional estimated \$22 billion in biofuel subsidies and mandates) compared with only \$11.6 billion in development assistance for FNS.”

4.1

Domestic agriculture and biofuel policy

Developed countries typically adopt domestic agriculture and biofuel policies to pursue domestic goals such as supporting their domestic farmers and encouraging the growth of clean fuels. Yet these policies can have the indirect effect of distorting global agricultural markets and harming poor farmers in developing countries. Our methodology assesses each developed country's performance in this regard by calculating an average of two sub-indexes:

- **Producer subsidies** includes government transfers to agricultural and fishery producers, as well as the subsidization of biofuels, which compete for land with food crops and thus distort agricultural markets.^{42 43}
- **Trade restrictions** include measures of both tariff and non-tariff barriers that impede trade and distort global markets.

Figure 4.1 presents the rankings for the 29 developed country members of the OECD's DAC on our index for agriculture and biofuel policy. There is considerable variation across countries. New Zealand and Australia clearly come out on top as the countries with the policies that least distort global markets. Meanwhile Luxembourg, Switzerland, and Japan have the most distorting policies, and thus they receive the lowest scores.

42. Biofuel subsidies are estimated at about \$22 billion per year, including approximate values for the indirect effects of mandates. Our data, however, drawn from the OECD database on biofuels, takes into account only the direct producer subsidies for biofuel feedstocks. It does not include the larger indirect impact of mandates. This is an important limitation that will hopefully be addressed in future studies.

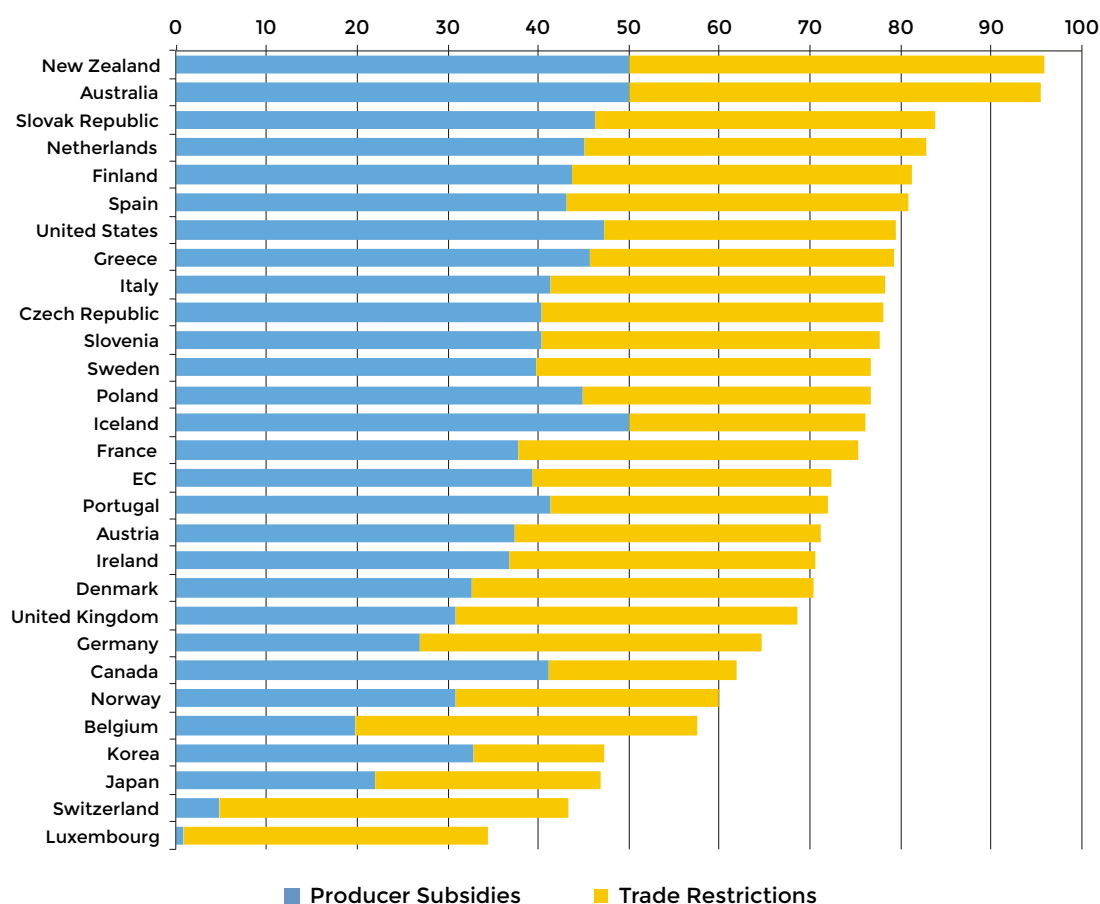
43. Australia, Austria, the Czech Republic, the European Union, Luxembourg, the Slovak Republic, Slovenia, and Switzerland do not provide data to the OECD on fisheries subsidies. Iceland, Italy, Japan, South Korea, New Zealand, Norway, Portugal, Sweden, and Switzerland do not report on biofuel subsidies.

“Domestic agricultural policies in New Zealand and Australia are *much* better on both dimensions than those of other developed countries.”

The distribution of country scores in the index is highly clustered in the middle—the average score is 71, with 19 of the 29 countries receiving scores within plus or minus 10 points of this average, and fewer countries at the extremes. Since the index is built using a “distance to the frontier” approach, this particular distribution of scores is driven by two main factors. First, domestic agricultural policies in New Zealand (96) and Australia (96), the two countries that are clearly ahead of the rest of the pack, are *much* better on both dimensions than those of other developed countries. Domestic support programs are sometime presented to the public as helping domestic farmers become more efficient and competitive producers, but the effect can be precisely the opposite. The New Zealand experience (Box 4.1) shows the long-term efficiency gains that were generated when support systems were cut back.

Second, the cluster of countries that do particularly poorly—including South Korea (47), Japan (47), Switzerland (43), and Luxembourg (35)—are not only well behind the “frontier” set by New Zealand, but indeed also well behind the developed country average score. Thus the overall high scores and low scores stand out considerably from the rest of the group. It should also be noted that all members of the European Union have the same scores for tariffs but may have different trade policy scores because of the difference in how non-tariff barriers are used.

Figure 4.1. How do domestic policies rate?
Agriculture and biofuel policy, index scores 0-100



Source: Authors' calculations

Box 4.1

New Zealand's path in reforming agricultural subsidies

Many supporters of agricultural subsidies in developed countries claim that they're necessary to support the livelihoods of rural families. Even the detractors tend to acknowledge that eliminating subsidies might be politically impossible. Yet the example of New Zealand illustrates that dramatic subsidy reform is possible. New Zealand used to have a heavily protected agricultural sector, but after a series of economic shocks in the 1970s and 1980s, the government decided to eliminate farm subsidies in a major 1984 reform.

The transition was initially painful for farmers who had come to rely on government support, a challenge that can never be overstated. However, the industry quickly transformed itself to become more efficient, letting prices, consumer demand, and resource endowments—rather than bureaucratic policies—determine

production decisions. Prior to the 1984 reform, productivity in the farm sector was increasing at about 1 percent a year. Since the reform, it has increased by nearly 4 percent a year.⁴⁴ Today New Zealand has one of the most dynamic agricultural sectors in the world, exporting across the globe.

While we should be careful not to extrapolate too much from New Zealand's example, and these types of adjustments must always be pursued with great care, it does demonstrate that it is possible for countries to thrive with substantially lower agricultural subsidies.

44. Thomas Lambie, "Miracle Down Under: How New Zealand Farmers Prosper without Subsidies or Protection," Free Trade Bulletin no. 16 (Washington, DC: Cato Institute, 2005).

4.2 FNS aid policy

Scores on FNS aid policy are an average of scores on three sub-indexes:

- **Volume** is a measure of how much each developed country spends in assistance to FNS, relative to the size of its economy.
- **Targeting** is a measure of how well each donor targets its aid to the countries where it is likely to have the greatest impact—namely countries with high needs, strong policies, and few available resources.
- **Quality of implementation** includes measures of the extent to which donors' aid is tied, fragmented, and volatile, as well as measures rewarding donors for focusing their FNS aid on three priority areas: gender, climate change, and agricultural research.

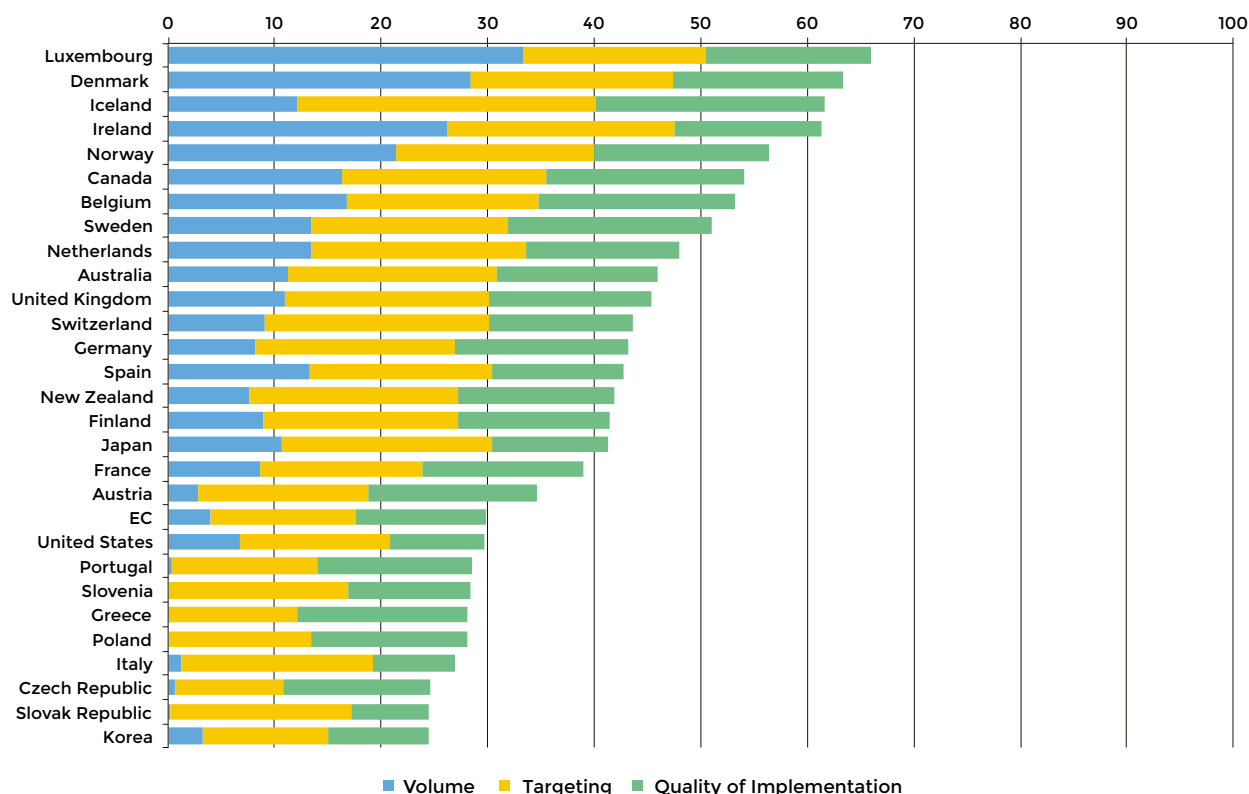
Figure 4.2 presents the rankings for all 29 developed countries on FNS aid policy. Luxembourg, Denmark, and Iceland receive the top scores. All are relatively small in the overall FNS aid landscape. Receiving the lowest scores are the Czech Republic, the Slovak Republic, and South Korea, all relatively new members of the OECD's DAC. The United States and the European Commission are found in the lower third of the list; Japan and most of the large European countries are near the middle.⁴⁵

In Figure 4.2, differences in approach and effort across developed countries are clearly visible through the variance of scores on volume

45. The European Commission is considered separately from its member states because of its size and importance as an independent actor in FNS aid; as such, its scores and those of its member states, are not strictly comparable to those of other countries, particularly with regard to the volume of aid. The volume of aid for the EC is the sum of the aid volumes from the Commission and each member country divided by the EU gross national income.

Figure 4.2. How strong is FNS aid policy?

Index Scores, 0–100



Source: Authors' calculations

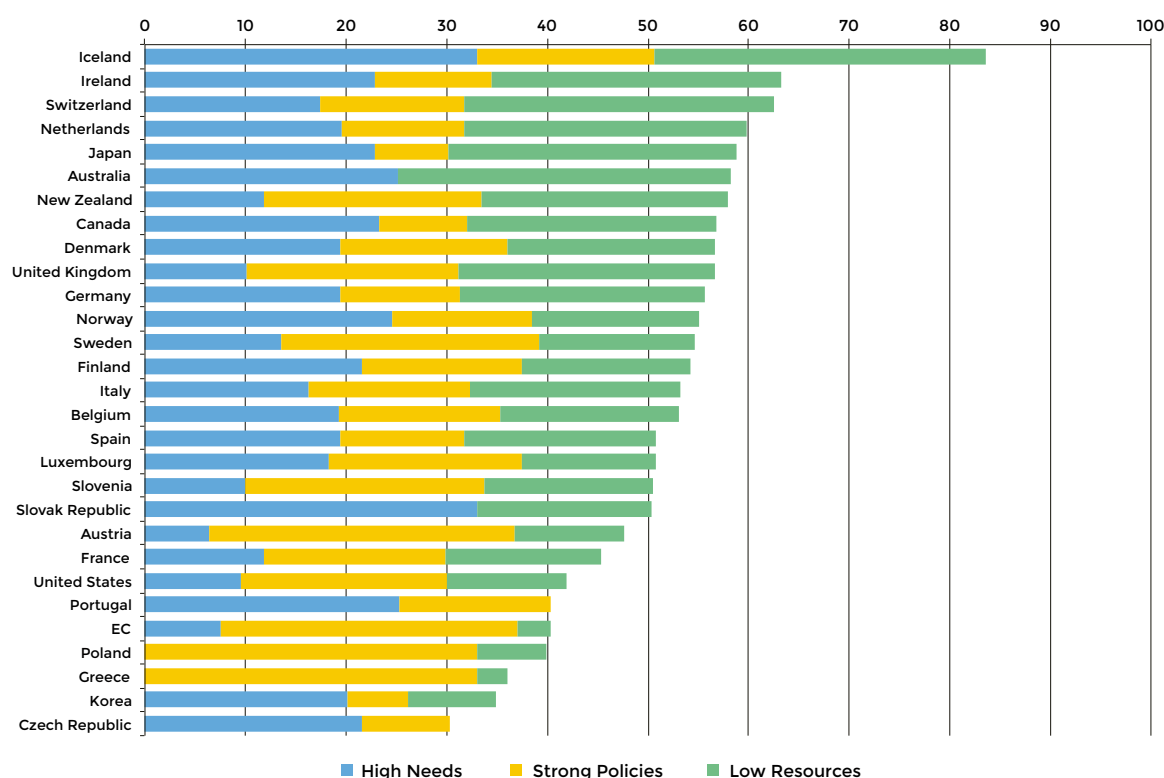
and quality of implementation. In targeting, too, approaches vary as a consequence of strategic choices. As shown in more detail in Figure 4.3, developed countries allocate resources quite differently. Smaller countries tend to target FNS aid more toward countries with high needs. Iceland is selective in disbursing FNS aid to only a handful of countries, a good practice for aid effectiveness. Several individual European countries target FNS aid to countries with strong policies but low needs. Australia, Switzerland, and Japan stand out as targeting FNS aid to countries with the least available resources, typically the poorest countries. The United States does not stand out in any of the targeting categories.

For donors with larger and more comprehensive global FNS aid programs, there are sharp trade-offs in targeting FNS aid. Choosing to focus on countries with the highest needs will often mean operating

where policies are weaker, including in fragile states. However, choosing to concentrate their efforts in countries with strong policy environments will make it difficult to also reach the countries with the greatest needs. Developing countries with strong policy environments also tend to be those allocating domestic resources toward FNS—both are indications of government commitment. So targeting based on strong policies cannot easily be combined with targeting based on resource scarcity.

While donors cannot entirely escape trade-offs between targeting by needs, policies, or resources, this does not imply there is no room for improvement in targeting aid better. Indeed, developing countries that have both high needs and good policies receive no more aid on average than other countries. Improved targeting should be a focus for all donors.

Figure 4.3. How well are FNS investments targeted?
Index Scores, 0–100



Source: Authors' calculations

CHAPTER 5

Actions for ending rural hunger

CHAPTER 5

Actions for ending rural hunger

The previous chapters mapped the FNS landscape in developing countries and assessed developed country governments' contributions to ending rural hunger around the globe. This chapter builds on these analyses by highlighting policy recommendations for both developing country and developed country governments. These are the strategies that can help bend the curve and achieve the end of rural hunger by 2030.

The recommendations offered here are not meant to pinpoint specific interventions to be implemented in particular countries, or to champion certain types of interventions over others. The specific interventions likely to produce the highest returns for a particular place and time will

vary significantly by context. For example, a recent meta-analysis of impact evaluations of development interventions in agriculture found that for all types of interventions there was significant variation in the success of projects (Table 5.1). Of course, the success or failure of individual interventions can be driven by many factors along the stages of the project implementation process, from selection to design to execution. What is clear, however, is that there is no “silver bullet” intervention that works across the diversity of FNS conditions, and no perfect project that can easily be replicated across all countries. Nevertheless, broader recommendations can still be drawn.

Table 5.1. Impact evaluations of agricultural interventions by intervention type

	Number of Interventions	Share of Interventions with Positive Results (percent)
Land Reform	20	65
Extension	26	50
Irrigation	11	64
Natural Resource Management	15	53
Input Technology	11	73
Marketing	14	64
Microfinance	9	67
Other	9	45
Total	115	59

Source: World Bank IEG 2011.

Note: The “Other” category includes interventions such as rural roads and safety nets. Results from a meta-analysis of 86 independent evaluations of agricultural interventions.

5.1

Recommendations for developing country governments

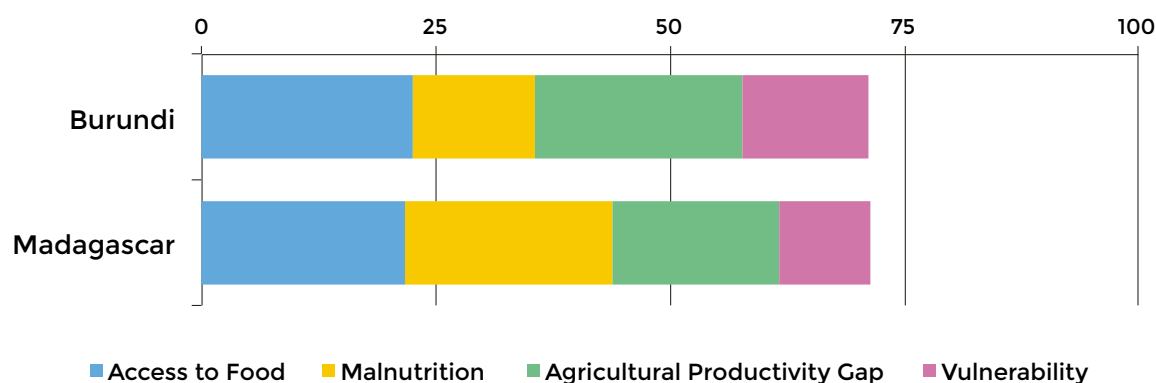
Our research confirms and adds specificity to three priority actions for developing country governments in the drive to end rural hunger. First, governments need to rigorously assess and measure their FNS needs in order to identify where their strategic priorities lie. Second, governments need to ensure that their policies and political commitment for agriculture and FNS are strong and supportive of rural development. And third, governments need to deliver adequate public investments to create strong, sustainable agricultural systems. In each case, better use of data, such as those provided in this project, can compare and validate the adequacy of national FNS programs.

Identify and measure strategic priorities

Developing country governments need to strategically assess their own needs and opportunities. Consider, for example, the comparison between two small sub-Saharan African countries, Burundi and Madagascar. Both have extremely high and similar overall FNS needs. Yet this headline similarity masks considerable differences: Burundi has much higher needs in vulnerability than Madagascar, while Madagascar has greater needs in malnutrition (Figure 5.2). Digging down even further, we find that Madagascar's high malnutrition needs are driven by a particularly high score on a lack of dietary

Figure 5.2. Comparison of FNS needs: Burundi and Madagascar

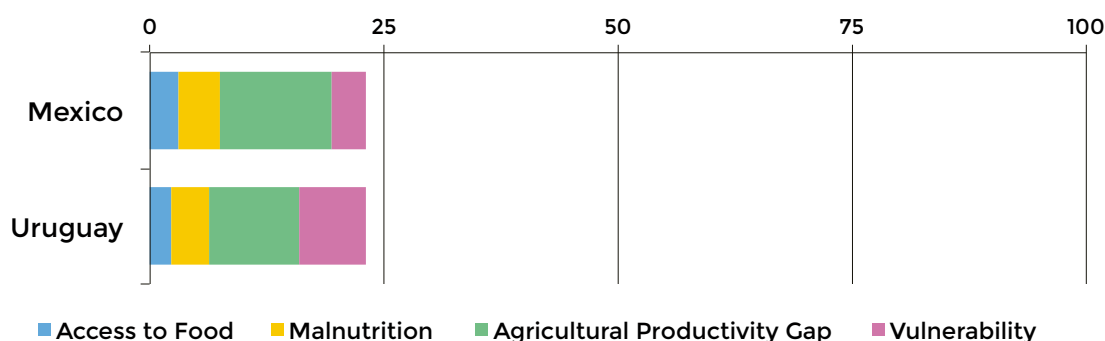
Index Scores, 0-100



Source: Authors' calculations

Figure 5.3. Comparison of FNS needs: Mexico and Uruguay

Index Scores, 0-100



Source: Authors' calculations

diversity. Similarly, Burundi has higher needs in vulnerability primarily because the country faces greater environmental shocks, particularly related to available renewable water resources and projected change in runoff due to climate change.

At the other end of the spectrum, consider two Latin American countries with relatively low overall needs, Mexico and Uruguay (Figure 5.3). Neither has significant needs in access to food or malnutrition. However, compared with Uruguay, Mexico has lower cereal yields and lower agricultural value added per

worker. Uruguay, meanwhile, has higher volatility of agricultural production and of cereal crop yields.

By reviewing quantifiable metrics across the different dimensions of FNS, developing countries can identify where their particular FNS needs are greatest, and they can then organize their policies and resource allocation to address these specific issues. Accurately evaluating needs is the crucial first step toward a rigorous, evidence-based national strategy for ending rural hunger and achieving the global goal for FNS.

Box 5.1

India's transitions in FNS priorities

India suffered from two successive droughts in 1966–67 and 1967–68 and was forced to ask for food aid from the United States, a politically difficult move for a country priding itself as a leader of non-aligned countries. This had a significant effect on the Indian psyche and policy. It is one reason that India quickly and readily adopted the high-yield variety of seeds linked to the Green Revolution.

For almost five decades now, Indian policymakers have focused their FNS policy on increasing the supply of domestically produced food to feed a growing and richer population. This has had considerable success. For the decade 1970 to 1980, India had a net surplus availability of cereals (excess of production over consumption) of approximately 10 million metric tons (MMT) a year. This net surplus increased steadily each decade, and for the past 25 years the net surplus has averaged around 40 MMT per year.

Minimum support prices for output (with guaranteed government procurement), control of prices of essential commodities, promoting the right to food and a food distribution system with substantial consumer subsidies have all been the defining characteristics of the Indian policy toward food security. But despite the success with producing food, and policies to make it more accessible by subsidizing food, Indian families have continued to suffer from significant malnutrition. The statistics (for example, stunting or wasting) show that India has a larger problem than its neighbors, Bangladesh and Pakistan. Malnutrition also rates worse in India than in several desperately poor economies in sub-Saharan Africa.

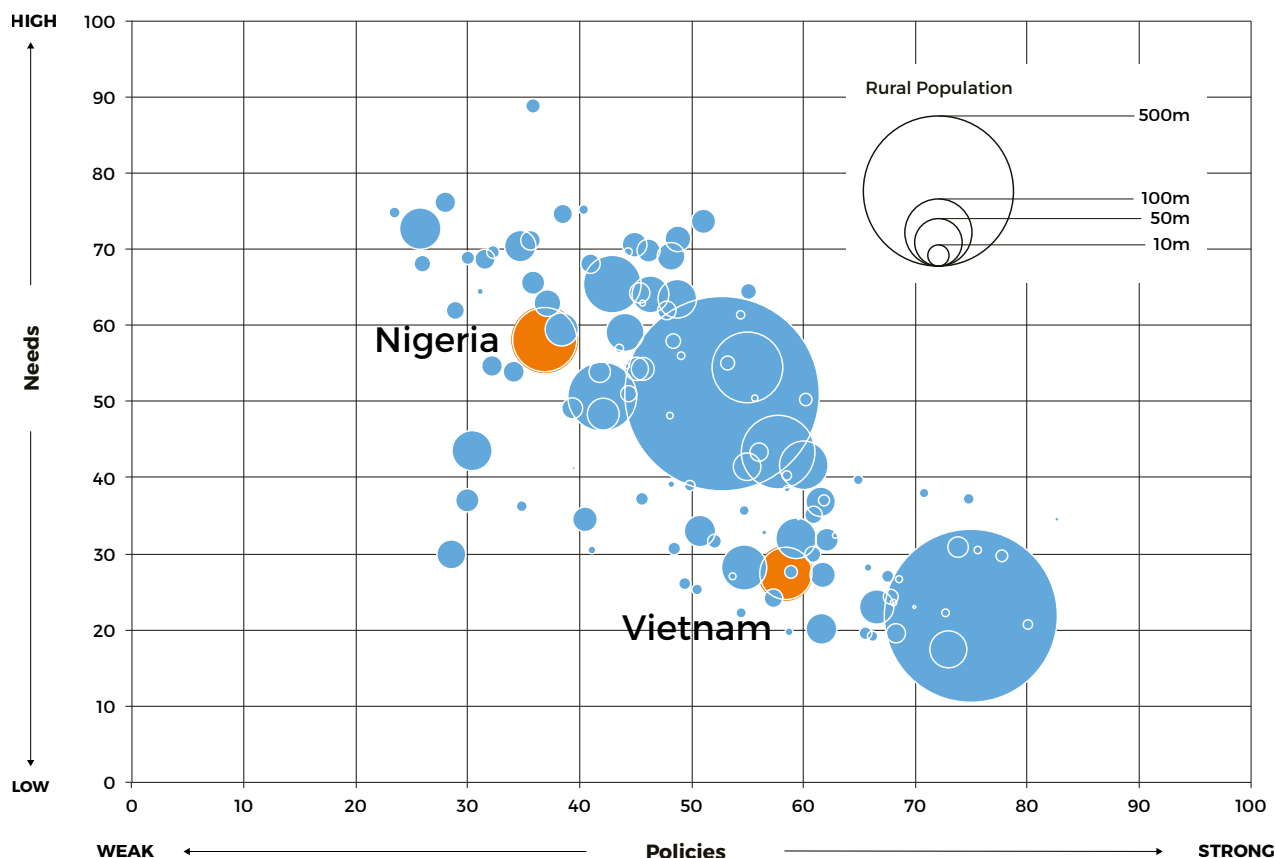
These facts have led to a re-examination of food and nutrition priorities. Malnutrition has been linked to the widespread practice of open defecation

by maybe half the population in India. India's prime minister, Narendra Modi, highlighted the problem in a high-profile address on Independence Day, August 15, 2014. This was the first time a senior official had talked about sanitation, and it marked the start of a new look at national policies and priorities focused on the nutritional health of families rather than the magnitude of national food production.

The Modi government has set specific goals for sanitation—every school will have toilets, with separate toilets for girls. As of August 2015, 360,000 of the 420,000 needed toilets had been constructed, according to data released by the Ministry of Human Resource Development. The focus on government support for food production is also being de-emphasized—food buffer stock targets have been halved (only 30 MMT a year versus stocks of 60 MMT), and it is likely that within three years, the procurement and public distribution system of food will be phased out and replaced by a cash transfer system.

Agriculture is also being reformed. Controls on production and distribution are being lifted, and a national comprehensive crop insurance scheme is under consideration. Funds for irrigation are also being stepped up, and those for electricity and fertilizer subsidies are likely to be cut. In addition, fuel subsidies have been substantially reduced.

In short, India has shifted its focus from producing enough food to reducing malnutrition. It has also moved away from government subsidies that largely privileged large farmers and distorted markets. Instead, it is focusing on market-enhancing programs that will benefit smallholders who currently have few tools to manage risk.

Figure 5.4. **Stronger FNS policies are associated with lower FNS needs**

Source: Authors' calculations

Strengthen policies and political commitment for FNS, especially for women

Developing country governments need to design and implement policies that are generally favorable for agricultural development and that are disaggregated by crop, market, and sub-region. Countries with better FNS policies tend to have lower FNS needs, as Figure 5.4 reveals. Each of the 116 bubbles on the graph represents a developing country, with the size of the bubble reflecting a country's total rural population. The vertical axis measures the country's overall needs score, while the horizontal axis measures the country's overall policy score.⁴⁶ Countries with strong policies tend to have low needs, reflected in the downward sloping trend in the graph. The challenge for developing countries, then, is to move downward on this graph, decreasing their needs.

Strengthening domestic policies is a key pathway toward ending hunger. While we know that

the relationship between FNS needs and policies is partially driven by countries' level of development, crucially we find that even after accounting for differences in per capita incomes, FNS policies have an important effect in determining the depth of FNS needs.⁴⁷ The policy space considered here is a combination of specific issues related to agriculture, such as organizing small farmers or providing secure land tenure, in addition to more general issues on governance, accountability, corruption, and urban-rural bias.

To see the difference that policy makes, consider the two countries highlighted in Figure 5.5: Vietnam and Nigeria, both of which have a GDP per capita of about \$5,500 (in purchasing power parity terms). Vietnam, with a needs score of 27 (24th lowest needs, out of 116 countries) and a policy score of 58 (38th best policy score), is toward the lower right section of the graph. The country has very few trade

46. These are the same scores explained in Chapter 3 of the report.

47. More specifically, in regressions with our needs sub-scores as the dependent variables and policy sub-scores and GDP per capita as explanatory variables (along with regional dummies), the coefficients on the policy sub-scores are regularly found to be statistically significant.

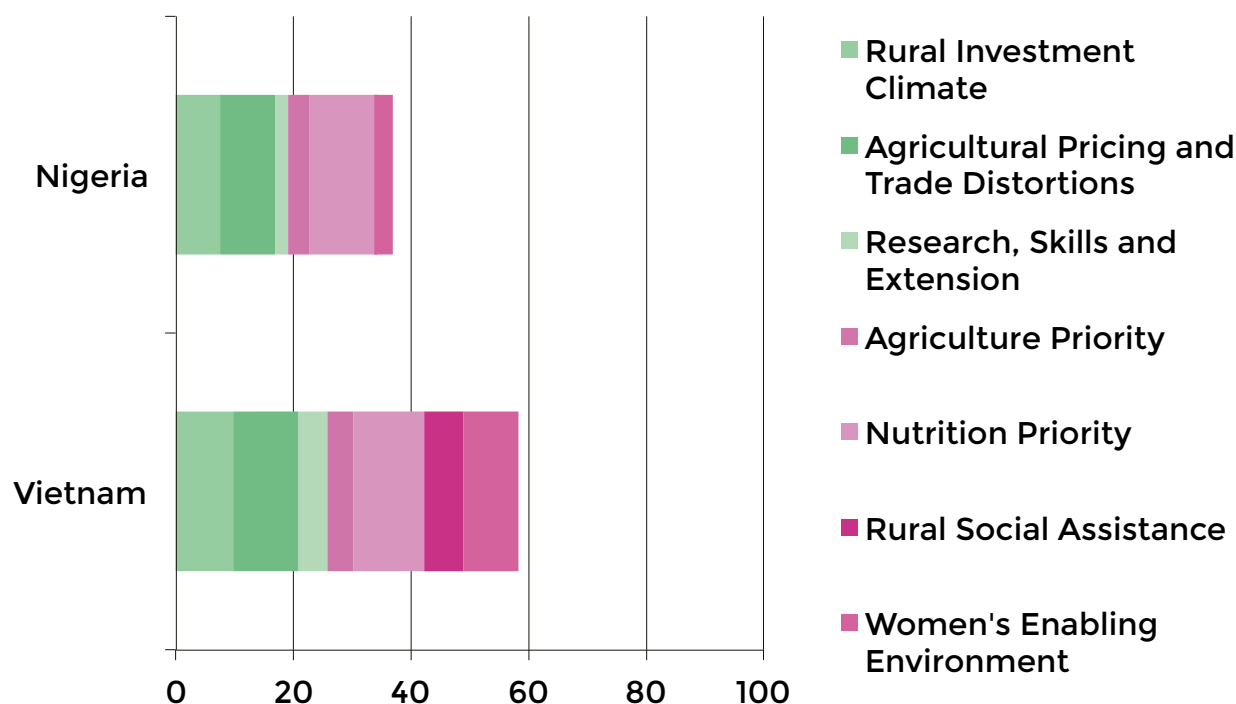
and pricing distortions in agriculture. It also has a good rural investment climate, it prioritizes nutrition, and it provides a strong enabling environment for women. Of course, Vietnam's high overall policy score does not mean there aren't areas for improvement. For example, the country's rural social assistance is only average, and it would benefit from strengthening its research, skills, and extension services for FNS. Propelled by its strong policies, however, and with further improvements and sufficient resources and support, Vietnam appears to be well on track toward ending hunger by 2030.

Nigeria, meanwhile, faces a more difficult path. It has a needs score of 58 (34th highest needs) and a policy score of 37 (20th from the worst policy score). Nigeria has very little rural social assistance, and it also scores poorly on research, skills, and extension, and on women's enabling environment. While Nigeria does have some strong spots, including prioritizing nutrition and relatively few barriers to agricultural trade, overall its current policy environment is considerably less well suited to achieving the FNS targets than that of Vietnam.

One policy area of particular importance, for all countries, is ensuring that women have equal access to critical inputs and infrastructure for agricultural production. Women play a crucial role in managing and operating many small family farms. When they are discriminated against, it is not only an affront to their rights and freedoms, but it substantially decreases their potential productivity and their contribution to the food security of their families, communities, and nations. Specifically, women need equal access to land, assets, and the protection of their property rights, equal access to finance and credit services, and equal access to extension and training services. They also need delivery mechanisms specifically designed to ease their utilization of these services. Another area of importance is in targeting rural social assistance to women. New forms of cash transfers (through mobile money, for example) permit better intra-household targeting and can change the impact of such assistance on spending and the distribution of food within the household.

Figure 5.5. Comparison of FNS policies: Nigeria and Vietnam

Index Scores, 0-100



Source: Authors' calculations

Box 5.2

Fome Zero: Achieving the end of hunger in Brazil

Brazil—which receives a policy score of 73 in our index, eighth highest overall—stands as an example of how a strong policy environment and political commitment can drive domestic efforts to end hunger.⁴⁸ In his inaugural speech in January 2003, President Luiz Inacio da Silva declared, “If at the end of my term every Brazilian person has three meals per day, I will have fulfilled my life’s mission.”⁴⁹ To achieve this goal, that year Lula launched *Fome Zero* (“Zero Hunger”), a wide-ranging project to end hunger in Brazil. Building on the social protection programs initiated under the previous administration, *Fome Zero* was a comprehensive strategy to tackle both the immediate and root causes of hunger and poverty throughout the country.

At the heart of Brazil’s hunger strategy was a three-pronged approach that sought to broadly increase rural incomes, through transfers and job creation; improve agricultural output, through support to family farmers; and enhance food security, through specific, targeted interventions, including school meal programs and educational campaigns around nutrition. The programs in the strategy include a conditional cash transfer initiative to boost school attendance, targeted support for maternal nutrition, a project to end child labor, cooking gas subsidies, and a new food entitlement scheme that replaced old food stamps with new special credit cards that were less susceptible to fraud and misuse.

One key to Brazil’s approach was the pursuit of a dual strategy for agriculture, one that could meet the needs of both large-scale industrial farms and small-scale farmers, to balance the strained relationship between these two groups. Historically, in many countries the institutions and strategies for promoting agriculture have focused significantly more on large farms. For example, in Brazil, as in Ministries

of Agriculture across the world, the interests of large agri-businesses were particularly well looked after, while small-scale farmers were underrepresented in policy decisions. To overcome these challenges, Brazil’s dual strategy relied on two separate government ministries related to agricultural production: a Ministry of Agricultural Development, created in 1999 to specifically look after the interests of small-scale farmers, and the traditional Ministry of Agriculture, Livestock and Supply, which supports the interest of agri-business. An Extraordinary Ministry for Food Security and Fight Against Hunger (MESA) was also created to coordinate *Fome Zero* activities.

Between 2000 and 2012, the prevalence of undernourishment dropped from 12.9 percent to 6.9 percent. Moreover, progress was fastest in the poorest part of the country, the Northeast. And from 2003 to 2009, the incomes of family farmers in Brazil are estimated to have increased by 33 percent (relative to 13 percent for the country as a whole).⁵⁰ The head of the World Food Programme declared that *Fome Zero* was “helping to feed hungry people at a faster rate than any other programme in the world.”⁵¹

Fome Zero is an example of how strong political commitment matched with a comprehensive, multi-sector approach can reap impressive dividends in the fight against hunger. Such political commitment was evident in Lula’s personal endorsement of the program and was sustained by his successor, Dilma Rousseff, even though MESA’s functions have now been folded into the Ministry of Social Development and Fight Against Hunger. The program is also notable in that it explicitly incorporated strong participation from civil society and the private sector, and it balanced micro- and macro-level state interventions.

48. Ending Rural Hunger background paper on Brazil.

49. Quoted in “Brazil’s Lula Promises Change,” *BBC News*, January 2, 2003.

50. FAO, *The Fome Zero (Zero Hunger) Program*, ed. Jose Graziano da Silva, Mauro Eduardo Del Grossi, and Caio Galvao de Franca (Brasilia: Ministry of Agrarian Development, 2011), p. 9.

51. WFP, “Brazil Shows World How to Beat Hunger, Says WFP” (World Food Programme, 2010).

Provide sufficient public investment

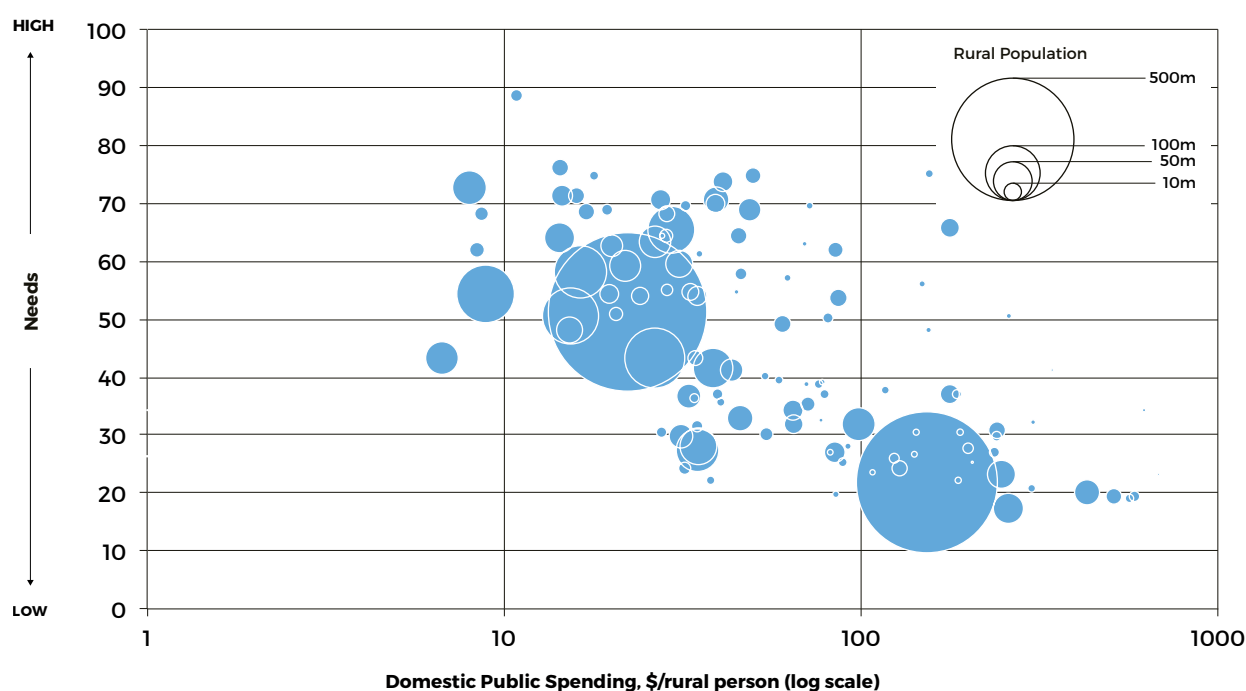
In addition to strengthening their policies, developing country governments will need to ensure sufficient public investment in FNS in order to end hunger by 2030. Public investment is critical to building strong agricultural systems, because much of the needed investments are public goods that will not be provided by the private sector. These include priorities such as irrigation; roads and infrastructure systems; investments in science, research, and extension; the organization of farmer cooperatives; and the provision of rural social assistance. Strong public investment was crucial to many of the early successes of the Green Revolution in Asia, and a lack of public investment appears to be one of the reasons that advances in agricultural productivity have lagged behind in sub-Saharan Africa.

Figure 5.6 shows a clear inverse relationship between government spending on agriculture per rural capita and overall FNS needs. The greater the spending, the lower the FNS needs. So one key path for ending rural hunger is to expand public investment, moving countries down and to the right on this graph. Of course, there is nothing inevitable about this relationship and not all public spending

is equally beneficial. It is a matter of concern that there has been a considerable amount of wasteful public spending in many cases, including on untar- geted subsidies whose benefits are captured by large farmers. Such policies are often undertaken in the name of helping the rural poor, but in practice, if programs are not effectively designed and imple- mented, only a small proportion of total govern- ment spending might actually reach the intended beneficiaries. Thus countries need to not only spend more but also spend more wisely. With this caveat, Figure 5.6 clearly shows that it is extremely difficult to make a serious dent in ending hunger without substantial public spending.

As was the case with policies, the relation- ship between resources and needs is mediated by a country's level of development: richer countries tend to have more government spending and lower FNS needs than poorer countries. Again, however, we find that even after controlling for both GDP per capita and a country's agricultural policies, greater per capita public spending on agriculture is associ- ated with lower overall FNS needs, particularly in combating malnutrition and building resilience.

Figure 5.6. Higher domestic FNS spending is associated with lower FNS needs



Source: Authors' calculations

Box 5.3

Public investments in FNS:
China's achievements

China has halved the number of undernourished people since the early 1990s. Stunting in children under 5 has fallen from 38 percent to 9 percent in the same period. Grain production has doubled since 1978.

These gains have come about from significant and sustained investments in agriculture and rural development, along with reforms to improve farmer incentives. Throughout much of the 20th century, indeed even well before the post-1978 market reforms, the central government has been a key driver of the relevant investments, which focused on such areas as irrigation, fertilizer use, and increased mechanization. China has also invested heavily in agricultural technology. It has developed more than 10,000 new crop varieties, has extended the coverage of modern seed varieties to virtually all farms, and is experimenting with super-high-yield corn and rice varieties.

Ravallion and Chen (2007) have shown that agricultural progress has been responsible for the majority of China's reduction in extreme poverty.⁵² One feature

of China's public investments is that they have been focused on spatial poverty reduction programs, not on agriculture per se. The key central agency has been the Office of Poverty Alleviation and Development, which operates through corresponding agencies at more decentralized administrative units of China—provinces, cities, and counties. Specific poverty-stricken counties were identified, and a poverty alleviation fund was created to increase capital investments in poor areas. Science and technology were explicitly spread to poor areas through a cadre of workers, through technology loans for poor areas and demonstration projects using improved agricultural practices. These efforts have supported advances by whole villages, rather than targeting the poorest households. Schemes such as rural social security, rural cooperative medical care, rural access to roads, and the reduction of agricultural taxes have been adopted to improve rural conditions. Since the adoption of the household responsibility system, which introduced market-oriented reforms into agriculture, farmers and township and village enterprises have also invested heavily in China's countryside, contributing further to the reduction in rural hunger.

52. Ravallion, Martin, and Shaohua Chen, "China's (Uneven) Progress against Poverty," *Journal of Development Economics* 82: 1–42 (2007).

Recognizing the importance of public spending in agriculture to their long-term development strategies, in 2003 African heads of state signed the Maputo Declaration, pledging to devote at least 10 percent of their governments' annual budgets to agriculture. The promise was reaffirmed in the 2014 Malabo Declaration. However, to date only a handful of African countries consistently meet the target.⁵³ On average, sub-Saharan African governments spend only \$23 per rural capita on FNS, compared with \$100 for all other developing countries.

Of course, for many particularly poor countries with underfunded governments, increases in government spending to fill the FNS public investment gaps are not feasible. Even if government spending on agriculture increases as a share of national budgets, in absolute terms the scale of funding required cannot be fully met by government spending. In order to achieve the global goal for FNS, these countries are likely to need considerable outside funding, notably in the form of official development assistance.

53. ONE, *The Maputo Commitments and the 2014 African Union Year of Agriculture* (ONE, 2013).

“There is a clear inverse relationship between government spending on agriculture per rural capita and overall FNS needs. The greater the spending, the lower the FNS needs.”

5.2

Recommendations for developed country governments

While developing country governments will be responsible for taking the lead in ending rural hunger, there is much that developed country governments can do to contribute to—or detract from—this goal. Our research identifies three priorities for developed country governments. First, they need to scale back the protections and support they apply to their domestic agricultural sectors, which distort global markets and decrease the welfare of poor farmers in developing countries. Second, they need to improve both the quantity and quality of their FNS aid to developing countries. Third, they need to better target their FNS aid to where it will have the greatest impact: in countries with high FNS needs, strong FNS policies, and limited other resources available.

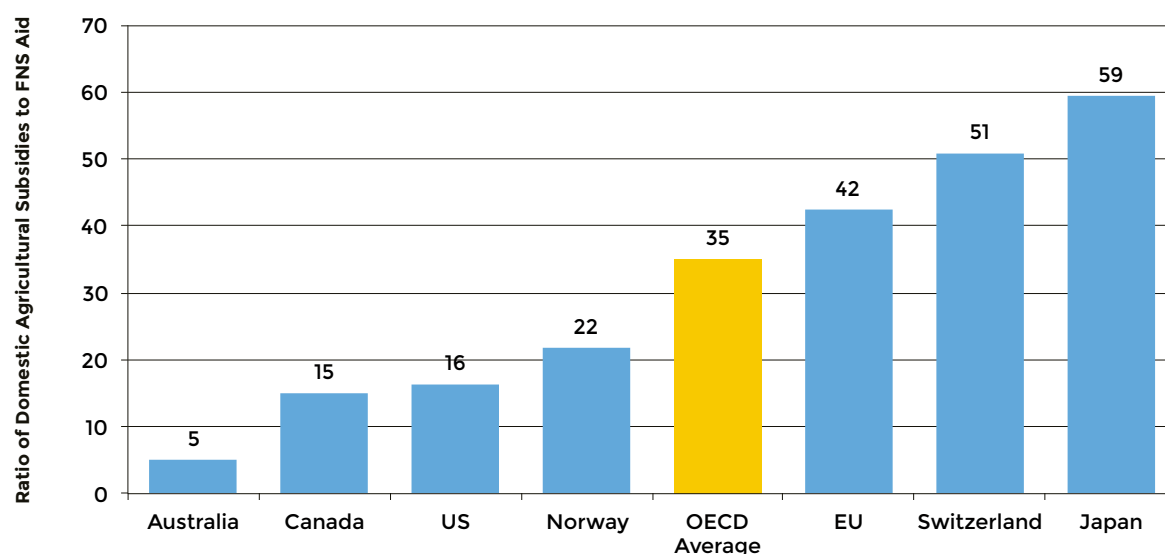
Remove distortions in domestic agricultural policies

Most developed countries heavily subsidize their domestic agricultural producers. In 2013 OECD countries provided some \$250 billion in support to their domestic farmers, equal to 20 percent of the total value of their agricultural production. The

consequences of these subsidies are crop-specific and hence location-specific, but in general they distort and depress global prices, leading to lower earnings for farmers in developing countries. They prevent global agricultural markets from functioning freely and fairly, leaving farmers in the developing world with the field tilted against them.

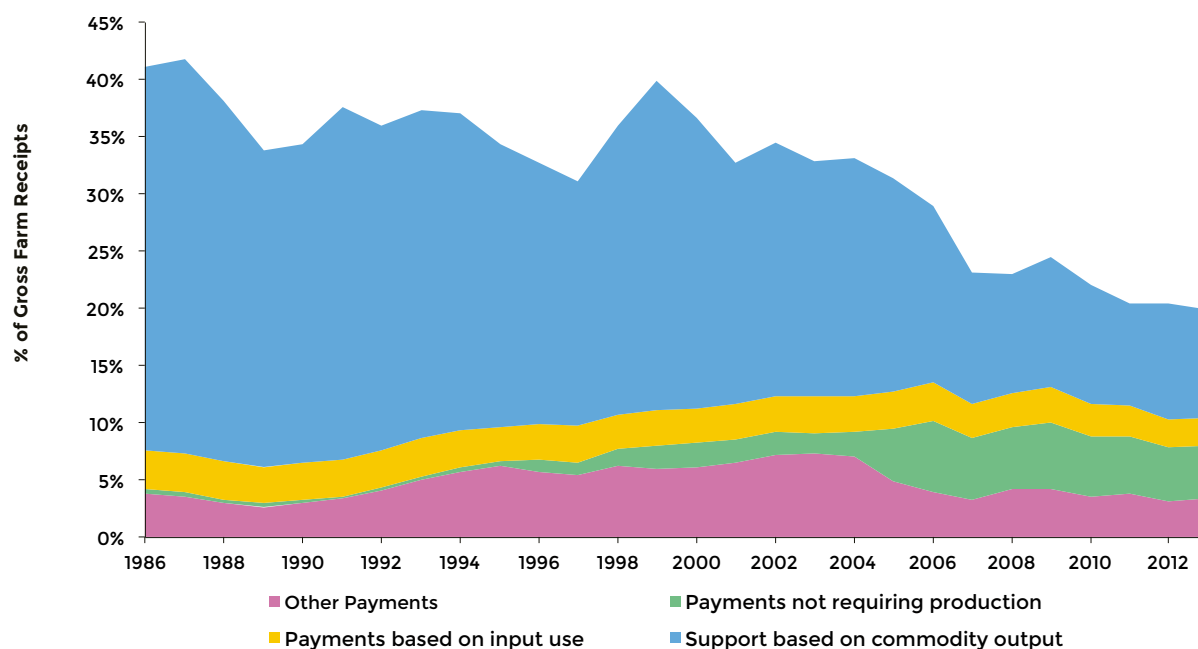
Although the numbers are not strictly comparable, developed countries' spending on domestic subsidies completely dwarfs their spending on supporting FNS in developing countries. On average, between 2009 and 2013 OECD countries spent 35 times as much on domestic subsidies as on aid to FNS; Japan spends 59 times as much helping its domestic farmers as it does helping poor farmers in the developing world through aid to FNS (Figure 5.7). Funding for domestic subsidies and international assistance typically come out of separate budgeting processes, but it is worth noting that if developed countries decreased their 2013 spending on distorting domestic subsidies by just 4 percent, and instead devoted that same amount of money to aid for FNS, this would *double* ODA to FNS.

Figure 5.7. Spending on domestic agricultural subsidies dwarfs spending on FNS aid



Source: OECD Producer and Consumer Support Estimates Database (2015), OECD QWIDS Database (2015) and own calculations

Note: Data are 2009–2013 averages. EU spending includes analysis of DAC members only.

Figure 5.8. **Spending on domestic agricultural subsidies, OECD total**

Source: OECD Producer and Consumer Support Estimates Database (2015) and own calculations

The positive underlying news is that the level of subsidies provided to domestic farmers has been falling in recent years. As Figure 5.8 shows, the total producer support estimate for OECD countries is down from 41 percent of gross farm receipts in 1986 to 20 percent in 2013, and the composition of these subsidies has shifted away from highly distorting measures based on increased production (which have a greater impact on global markets) to less-distorting measures that are more divorced from farmers' production decisions (and therefore have less impact on global markets). But continued progress on removing existing distortions remains urgently needed, and, worryingly, there are signs that recent advances have slowed and are perhaps even moving in the opposite direction. The 2014 U.S. Farm Bill, for example, not only maintains high levels of support for American farmers, but also shifts the composition of support away from non-distorting direct payments to new payment programs that are more closely tied to price and output. That, in turn, will be more distorting to global markets.⁵⁴

Improve the quantity and quality of FNS aid

Over the period 2009–2013, OECD donors spent an average total of \$12.2 billion on aid to FNS in developing countries: \$7.6 billion in bilateral aid from DAC donors and \$4.6 billion from multilateral donors. As a point of comparison, this is just 4 percent of the \$291 billion North Americans and Europeans spend on snack food each year.⁵⁵

On a rural per capita basis, aid to FNS comes out to an average of \$3.63 a year—or less than one penny per day—for each of the 3.3 billion people living in rural areas in developing countries. This level of funding will not be enough to end hunger by 2030. And though total aid to FNS nearly doubled in real terms between 2005 and 2010—as food prices spiked—it has since declined again. A substantial increase in aid will be needed to meet the global goal for FNS.

Moreover, donors need to improve not just the quantity of aid to FNS but also its quality. One dollar of aid spent effectively will have a greater impact on ending hunger than the same dollar

54. Randy Schnepf, *2014 Farm Bill Provisions and WTO Compliance* (Washington, DC: Congressional Research Service, 2015).

55. Nielsen Holdings N.V., *Global Snack Food Sales Reach \$374 Billion Annually*, September 30, 2014.

spent inefficiently. There has long been an effort to improve aid effectiveness, with the most formal statement of principles laid out by donors in the Paris Declaration for Aid Effectiveness, adopted in 2005. Unfortunately, donors have been slow to adopt these principles in their FNS aid programs. Compared with other sectors, a high share of aid for FNS is still tied with procurement (including of services such as shipping) restricted to the donor country (or a few other specified countries). Untying food aid and permitting local purchases could save hundreds of millions of dollars annually. Another principle of aid effectiveness is to reduce fragmentation of aid spread across a large number of small projects, and instead to fund larger programs with scale economies. High-quality aid is stable and predictable, and it is recorded on government budgets. Current FNS aid, by contrast, tends to be volatile from the perspective of individual partner countries, reducing the benefits substantially. On average, volatility of aid at current levels could reduce the net present value by as much as 20 percent.⁵⁶

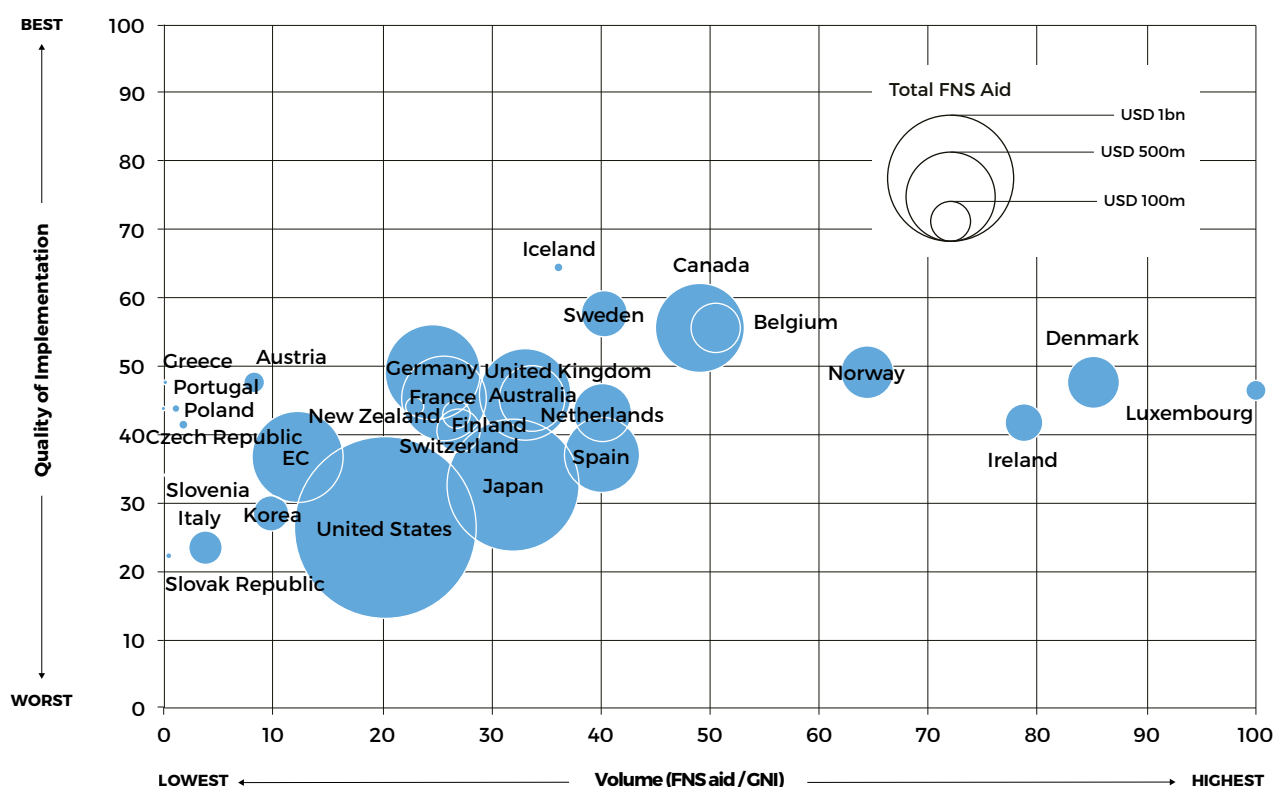
56. Homi Kharas, "Measuring the Cost of Aid Volatility," Wolfensohn Center for Development Working Paper no. 3 (Washington, DC: The Brookings Institution, 2008).

Beyond the Paris principles, other factors specific to FNS aid would improve quality. Where FNS aid is aimed at improving agricultural systems, it should use country systems and follow government priorities. It should also ensure that climate mitigation and adaptation are built into project design. Similarly, when FNS aid is aimed at reducing malnutrition and improving household access to food, it should ensure that the role of women is properly recognized. When cash transfers are allocated to women household members, they result in greater spending on food and better dietary outcomes.

Figure 5.9 compares donors' share of FNS aid in gross national income with the quality of their aid. The size of bubbles is scaled to the total dollar amount disbursed by each donor. There is a positive correlation between donor commitment to FNS as a priority, measured here by spending effort, and the quality of FNS aid implementation.

The donors in the top right of the chart, those that perform well on both volume and quality, are all relatively small providers relative to overall FNS aid; only Canada disburses more than \$200 million a year. Indeed, the largest FNS donors in

Figure 5.9. Comparing volumes and quality of donors' FNS aid (indexes 0-100)



Source: Authors' calculations

Note: The size of the bubble represents total FNS aid. The volume on the x-axis shows the ERH index score, based on the share of FNS aid in each donor's GNI.

absolute volume, the United States (disbursements of \$2.1 billion) and Japan (\$1.1 billion), are among the poorer performers in both volume relative to the size of their economies and aid quality. Neither country focuses much on climate change or the role of women in their FNS aid programs; nor do they focus proportionately on other public goods such as research and extension services. Since collectively the United States and Japan account for more than 40 percent of bilateral ODA to FNS, improvements in these countries—in both volume as a share of gross national income and aid quality—have the potential for significant impact on the FNS aid system overall.

“Current FNS aid tends to be volatile from the perspective of individual partner countries, reducing the benefits substantially.”

Target aid across and within countries

Efficiently targeting aid is important not only *across* countries but also *within* countries. Consider, again, the case of Vietnam. Our data suggest that Vietnam’s FNS needs are concentrated primarily in malnutrition: the country is 60th out of 116 countries in terms of its malnutrition needs, while its needs in other areas are relatively far lower: 84th in access to food, 102nd in agricultural productivity gaps, and the 111th in vulnerability. Given this needs profile, it would make sense for donors disbursing aid in Vietnam to concentrate their efforts on trying to help the country tackle its malnutrition challenge. Yet, only 0.4 percent of the FNS aid Vietnam receives is targeted to basic nutrition, much less than the average that donors spend elsewhere on nutrition (5 percent of FNS aid).

Similarly, our data suggest that one of the key FNS constraints in El Salvador is access to finance for farmers. Only 12 percent of the rural population has an account at a bank, credit union, or other financial institution. However, while on average donors spend 2 percent of their overall FNS aid on agricultural financial services, just 0.3 percent of the FNS aid El Salvador receives is targeted at agricultural financial services. There is clearly scope for donors to do a much better job strategically allocating their aid for FNS so that it better aligns with the FNS priorities within developing countries.

CHAPTER 6

Other key players in the push to end rural hunger

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In addition to developing country governments and developed country donors, a number of other key players and partners are involved in promoting food security, and their contributions are likely to be critical to achieving the global goal for FNS. Indeed, given the modest near-term outlook for expansion in ODA from developed countries, other financing sources will most likely provide a substantial part of

the additional resources required to end rural hunger. Some of these sources will tap into the world's private savings and will be intermediated through multilateral agencies or multinational firms. This section considers the roles that multilateral institutions, private multinational corporations, and South-South cooperation can play in ending rural hunger.⁵⁷

57. In addition, civil society has played a key role in shaping norms and establishing principles for responsible investment, for example, over land and water rights. We do not separately consider them here as they have no data that fit into the framework we have developed.

6.1 The role of multilateral institutions

While most FNS development funding goes directly from bilateral donors to partner countries, an important share is also channeled through multilateral institutions. These institutions can then on-grant the funds or leverage them with resources obtained by borrowing from private capital markets, official financial institutions, or sovereign wealth funds. Each multilateral institution has a different mix of financing sources.

Within FNS, the key multilateral institutions include the Food and Agriculture Organization, the World Food Programme, the International Fund for Agricultural Development, the World Bank, and regional development banks. Collectively, multilateral institutions manage \$8.2 billion per year for

FNS projects and programs: \$4.6 billion in grants and low- or zero interest credits (ODA) and \$3.6 billion in loans (Table 6.1). Multilateral institutions account for 37 percent of total official development assistance in FNS, slightly higher than their share of ODA across all sectors (31 percent). They account for almost all the official lending for FNS, since few bilateral donors make any loans in this sector.

In addition, multilateral institutions provide more than just money. They also set norms and advocate for improved policies. As actors with broader constituencies and sometimes greater perceived legitimacy than individual donors, NGOs, or companies, multilateral bodies have a special ability to shape the global agenda around food security. As

Table 6.1. FNS disbursements by multilateral institutions, 2009-2013 average
(constant 2013 dollars millions)

Institution	Concessional Finance (ODA)	Non-Concessional Finance (OOF)	Total
World Bank	1,698.5	2,657.3	4,355.9
International Fund for Agricultural Development (IFAD)	722.0	340.3	1,062.3
Food and Agricultural Organization (FAO)	575.1	n/a	575.1
CGIAR Fund	614.0	n/a	614.0
African Development Bank (AfDB)	336.6	256.8	593.4
UN Agencies	83.7	n/a	83.7
Arab Fund (AFESD)	104.8	181.0	285.8
Asian Development Bank (AsDB)	172.8	0.02	172.8
OPEC Fund for International Development (OFID)	64.2	60.8	125
Andean Development Corporation (CAF)	n/a	114.5	114.5
Other Multilateral Institutions	204.4	39.3	243.7
Total	4576.1	3650.02	8,226.07

Source: OECD CRS, CGIAR budget documents, FAO Audited Accounts

6. Other key players in the push to end rural hunger

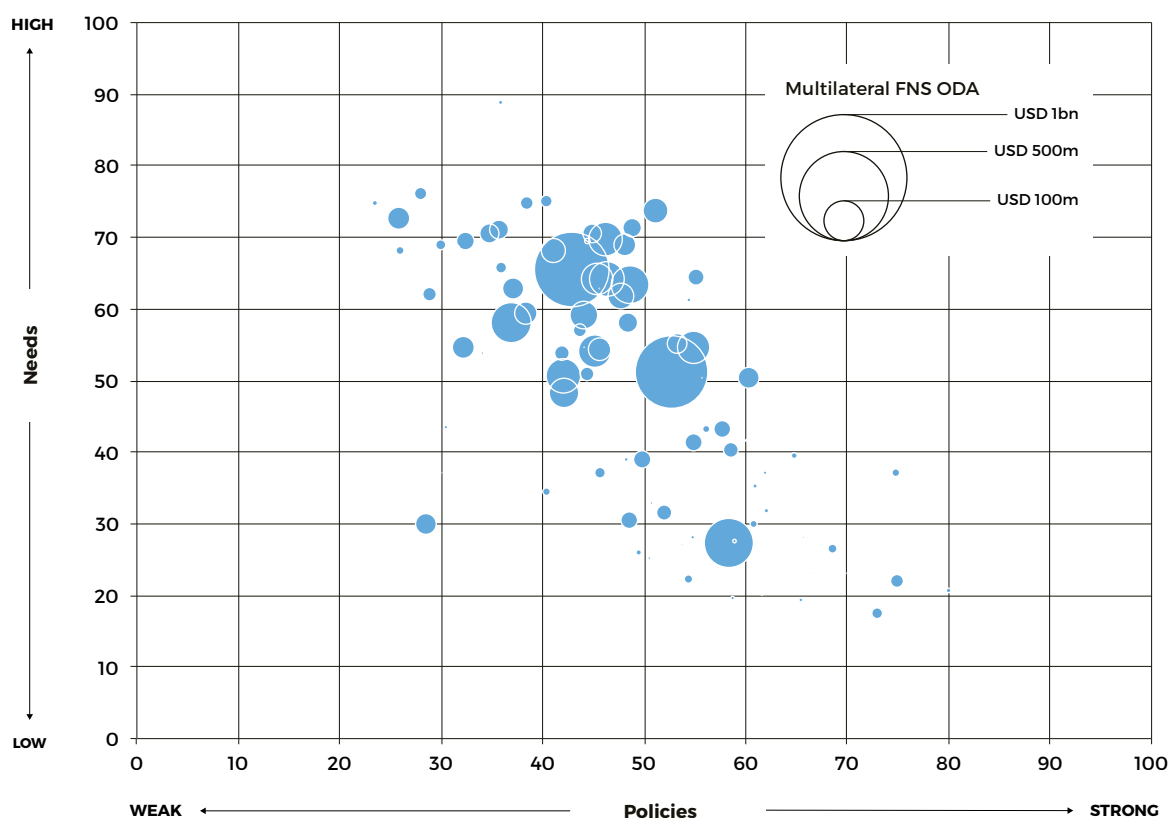
just one example, the FAO is the international community's leading reservoir of knowledge and data about FNS, and its annual *State of Food Insecurity in the World* report is the most authoritative review of global progress on undernourishment. As another example, the World Bank Group is influential in shaping the conditions to support responsible agricultural investments, such as the Roundtable on Sustainable Palm Oil. Multilateral institutions can also play major roles in advancing global norms and coordination campaigns. These can range from flagship initiatives, such as the UN's leadership in coordinating the global SDG conversation, to more targeted, issue-specific campaigns, such as the Committee on World Food Security's (CFS) Principles for Responsible Investment in Agriculture and Food Systems.

How well do multilateral institutions target their FNS spending? Figures 6.2 and 6.3 once again plot all developing countries based on their needs and policy scores. In the top image, the size of the bubble represents total concessional multilateral spending, while in the bottom image it is total non-concessional multilateral spending.

As can be seen, concessional multilateral spending is concentrated among the countries with the highest needs. Indeed, 82 percent of concessional

“Multilateral bodies have a special ability to shape the global agenda around food security.”

Figure 6.2. Multilateral targeting: ODA is focused on countries with higher needs
Constant 2013 USD, millions.



Source: Authors' calculations

6. Other key players in the push to end rural hunger

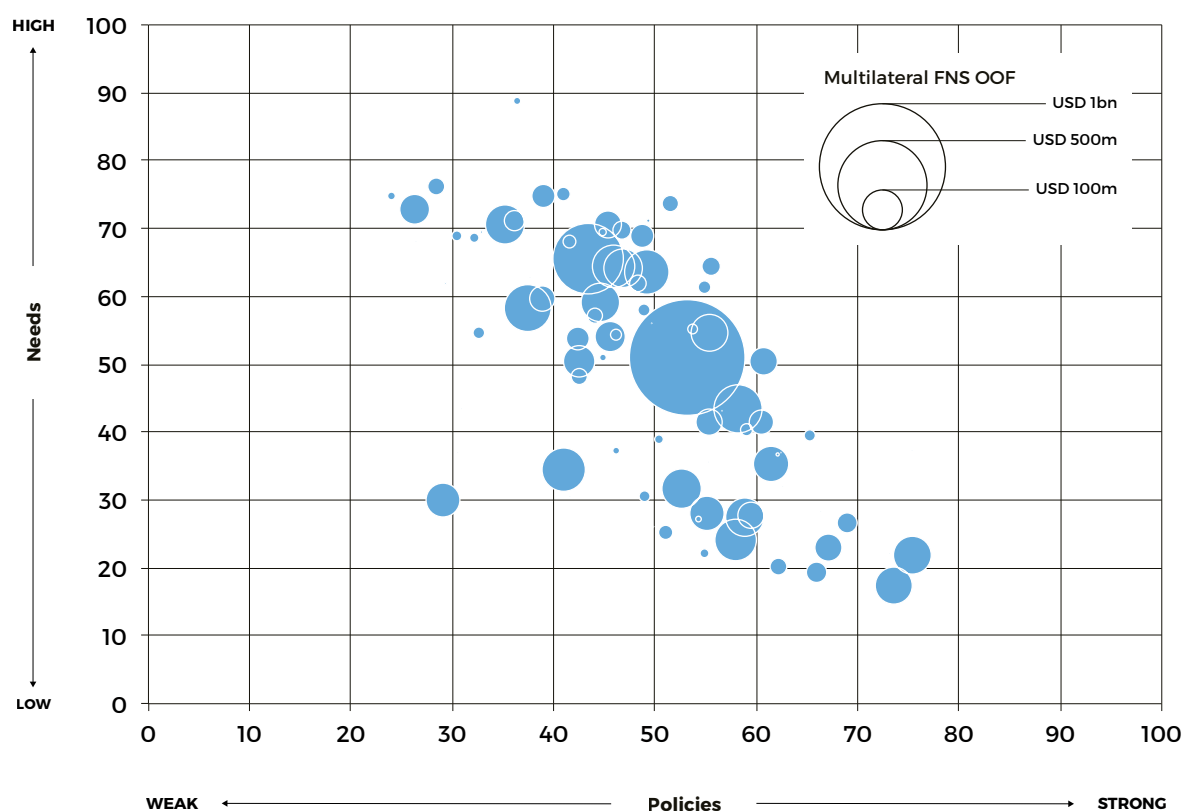
multilateral spending in FNS goes to countries with needs scores above 50, compared with only 71 percent for all bilateral official development assistance. This is no coincidence, as many multilateral institutions are mandated to provide concessional finance to only the poorest countries, which will generally have the greatest needs. For example, the International Development Association, the concessional arm of the World Bank, generally operates only in low-income countries. Overall, concessional multilateral spending receives a strong targeting score of 71 on our index (Figure 6.4).

Meanwhile, non-concessional spending (that is, loans, noted as “other official flows,” or OOF, in Figure 6.4), is more concentrated among countries with higher incomes and stronger policy environments. Some 55 percent of non-concessional

multilateral spending in FNS goes to countries with policy scores of more than 50, compared with only 34 percent for all bilateral official development assistance. This underlines that non-concessional lending is particularly well suited to meeting the needs of middle-income countries that have relatively strong policies and that are well placed to be able to repay loans in the future. Overall, on our index non-concessional multilateral spending receives a targeting score of 62, driven by a high score in targeting to countries with good policies.

The differences in the targeting of concessional and non-concessional multilateral spending highlight the benefits of using two different instruments to address the challenges in two respective categories of countries: on one hand, those with high needs, relatively weak policy environments,

Figure 6.3. Multilateral targeting: OOF is focused on countries with stronger policies
Constant 2013 USD, millions.



Source: Authors' calculations

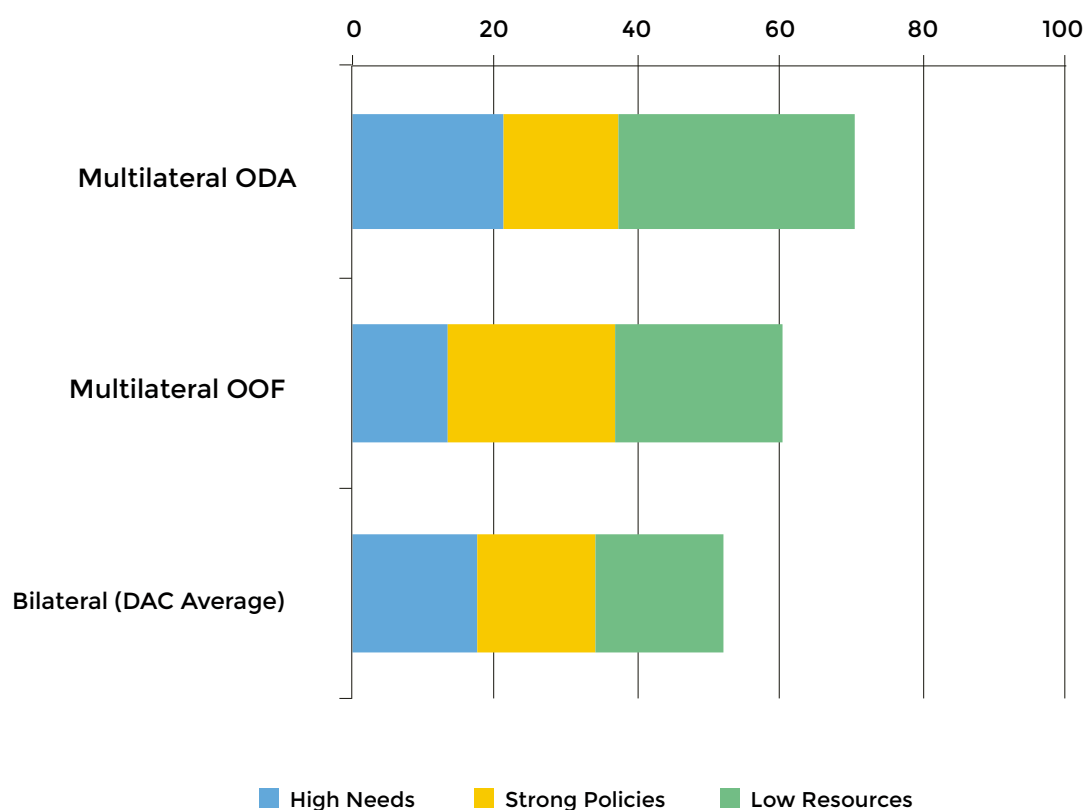
6. Other key players in the push to end rural hunger

and low available resources, where grants and concessional credits should be targeted; and on the other hand, those with moderate needs, relatively strong policy environments, and greater available resources, which can still benefit from loans on favorable terms from multilateral institutions.

Multilateral agencies must scale up their activities if rural hunger is to be ended. The most likely path appears to be by borrowing from official financial organizations in developed countries (such as

Germany's KfW) or from private capital markets, taking advantage of current low real interest rates, and on-lending these funds to middle-income developing countries for FNS investments. This would then also permit multilateral agencies to shift their concessional (grant-oriented) resources toward fragile states and those least able to repay loans. In this way, activity could be scaled up across all countries.

Figure 6.4. **Multilateral vs. bilateral targeting**



Source: Authors' calculations

6.2 The role of the private sector

In recent years, engaging the private sector in the fight against hunger has emerged as a key priority. This trend has been driven by a growing recognition that building better-functioning agricultural markets forms a key driver of food security. With this understanding, the role that business can play—through expanding value chains to include small-scale farmers; providing inputs like seeds, fertilizer, or credit; improving product quality; and providing technical assistance—has become more clear. If the public sector sets the stage of providing the basic infrastructure for markets—price information, transport infrastructure, commodity exchanges, property rights—along with core regulations to promote food safety and enhance responsible investments, then private business will create more opportunities for small and large farmers alike.

Private business is also a promising source of additional investments that will be needed in many developing countries, as the demand for funds far outstrips what is likely to be imminently forthcoming from developed country aid agencies. This is one of the important motivations behind new “public-private partnership” initiatives such as the New Alliance for Food Security and Nutrition and the Private Sector Window of the Global Agriculture and Food Security Program. At the same time, driven in part by the increase in commodity prices over the past eight years, many large multinational corporations see new profit opportunities for investing in agriculture in developing countries. And while profit motives are the overwhelming driver of investment decisions, many multinational corporations and financial institutions also take commitments to corporate social responsibility very seriously, and are eager to play a role in catalyzing long-term development successes. Taken together, these factors have produced new energy and excitement around the potential of business to play a central role in ending hunger, as long as the potential downsides—for instance, that unregulated business investments could result in grabbing land and water rights from local smallholders and indigenous people—are avoided.

Domestic business investments likely dwarf all other resources for FNS. Government policies and regulations will shape how they evolve. In addition, foreign investments into developing country agriculture have been growing. Data on external business investments into FNS areas are at best partial, but when we look at reliable sources, we estimate that annual average FDI flows to agriculture in developing countries from 2009 to 2013 totaled \$11 billion—about the same as the \$11.6 billion in official development assistance for FNS, though substantially less than the \$179 billion in domestic government spending. Moreover, this investment is concentrated among a relatively small number of countries: the top 10 recipients receive 70 percent of the total (Table 6.5).

Table 6.5. Top 10 countries: Recipients of agricultural FDI 2009-2013 average

	Millions	Share of Developing Country Total (%)
China	\$ 1,931	17.5
Brazil	\$ 1,133	10.3
Argentina	\$ 868	7.8
Cameroon	\$ 618	5.6
Indonesia	\$ 603	5.5
Mexico	\$ 551	5.0
Turkey	\$ 507	4.6
Vietnam	\$ 437	4.0
India	\$ 421	3.8
Ukraine	\$ 408	3.7
All Other Countries	\$ 3,310	32.3
Total	\$ 10,787	100

Source: Financial Times. fDi Markets (2015)

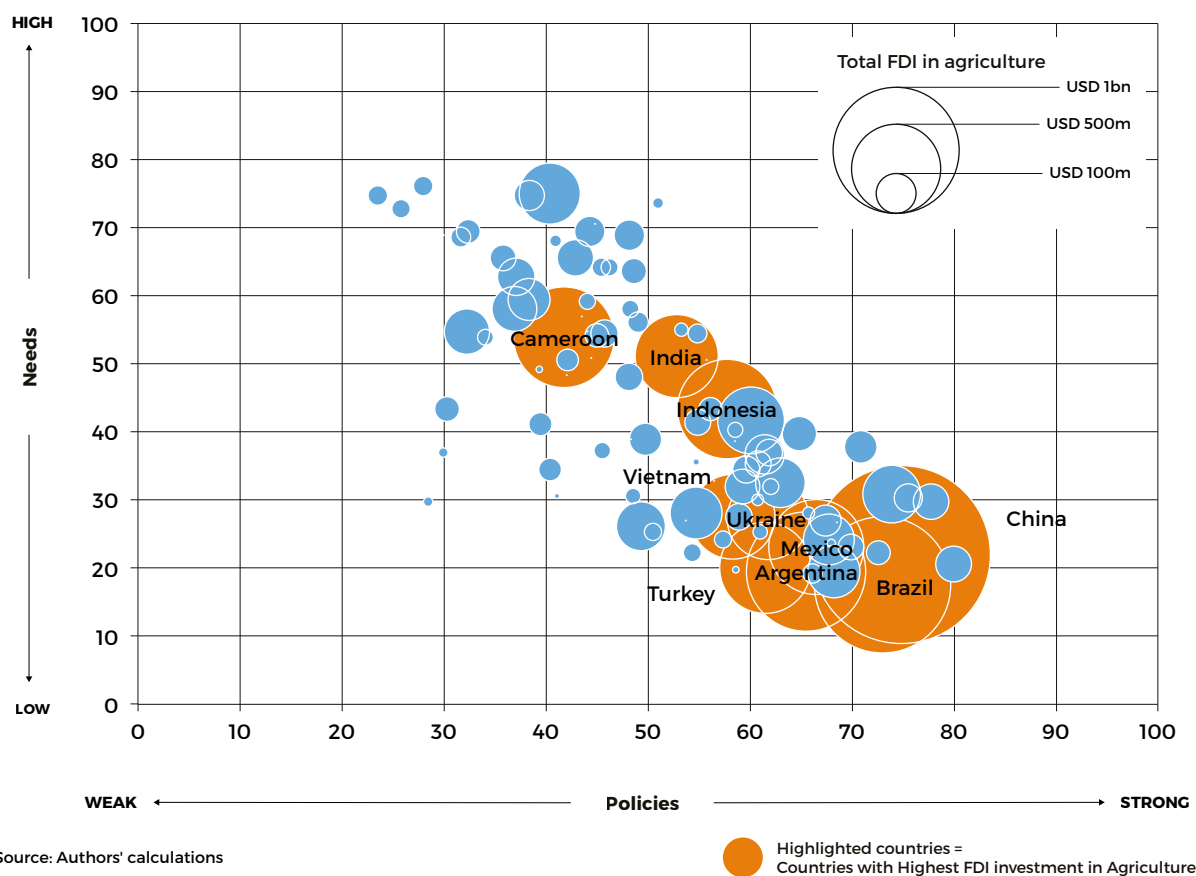
Figure 6.6. FDI targeting: Countries with stronger policies receive more foreign investment

Figure 6.6 once again plots all developing countries based on their FNS needs (vertical axis) and FNS policies (horizontal axis), with the size of the bubble this time scaled to represent total FDI in agriculture. As can be seen, most of the countries receiving substantial FDI are toward the bottom right of the graph, in other words those with strong policies but low needs, and presumably ample market opportunities.

Yet, while our data suggest that FDI in agriculture in the countries with the highest FNS needs remains limited, this may be changing. To begin with, sectoral-level FDI data are often patchy, and some FDI may be underreported; thus with future improvements in FDI measurement, more complete data might show greater levels of agriculture investment. Additionally, we have reported average values for the 2009–2013 period because FDI amounts tend to be lumpy from year to year, and thus if FDI is truly growing quickly the data may understate

contemporary investment flows. Today's energy around the potential of private investment may yet turn into tomorrow's deals.

In any case, if private companies are to play a meaningful role in ending rural hunger, they will need to act sustainably and responsibly—both in their investments in developing countries and in their other operations around the world. A number of companies are already making public pledges to do just that. For example, the members of the Consumer Goods Forum, a global network of some 400 companies in the consumer goods industry, recently promised to halve food waste within their operations by 2025.⁵⁸ Many companies appear to be taking steps to reform their value chains to better engage small-scale farms, partially because it

58. Consumer Goods Forum, "Consumer Goods Industry Commits to Food Waste Reduction," The Consumer Goods Forum, <http://www.theconsumer-goodsforum.com/consumer-goods-industry-commits-to-food-waste-reduction>

is often less costly to include small-scale farmers' production than it is to invest directly in farmland.⁵⁹ When they do so, many are also seeing the benefit of investing in training and support for these farmers, to increase their productivity and foster sustainable, long-term business relationships, including through the provision of seeds, fertilizer, and credit.

For example, Unilever, which sources many of its products from small-scale farms (often indirectly through suppliers), has partnered with both Oxfam and IFAD on projects to improve farmer livelihoods. The company notes that with its suppliers and partners, it has provided training to 570,000 small-scale farms.⁶⁰ The International Finance Corporation, the private sector arm of the World Bank, recently published a handbook for multinational companies on how to work with small-scale farms in order to promote both profits and sustainable development.⁶¹ While the investment decisions of private companies will always be driven more by profit than by altruism, if they follow best practices for responsible investment and partner with governments, multilateral institutions, and NGOs, then private companies can boost the bottom line of family farms and contribute to ending rural hunger.

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59. IFC, *Working with Smallholders: A Handbook for Firms Building Sustainable Supply Chains* (Washington, DC: International Finance Corporation, 2013).

60. Unilever, “Livelihoods for Smallholder Farmers,” <https://www.unilever.com/sustainable-living/the-sustainable-living-plan/enhancing-livelihoods/inclusive-business/livelihoods-for-smallholder-farmers/>.

61. IFC, *Working with Smallholders: A Handbook for Firms Building Sustainable Supply Chains*.

6.3

The role of South-South cooperation

Members of the OECD's Development Assistance Committee are not the only countries that provide development support to FNS. Indeed, a growing number of emerging economies have launched their own ambitious overseas cooperation programs, through which they transmit lessons learned in their own fight against hunger. Three large economies are particularly active in FNS assistance to other developing countries: Brazil, China, and India. Tracking the level of support from these emerging economies is difficult because, unlike major Western donors, they do not systematically report their cooperation activities. Scholars have nevertheless sought to gather data from a range of sources—in our analysis we rely on one such source, the AidData.org database. These data are not official and may not reflect the actual level of development cooperation originating from these three emerging economies. Until more comprehensive data are available, however, these data provide an approximate picture of FNS flows from Brazil, China, and India.

Our data suggest the three countries together spend an annual average of \$371 million on

development support for FNS (Table 6.7). China has made large investments in two countries, Angola and Mozambique, and Brazil has also invested heavily in Mozambique. Support to FNS from China, Brazil, and India is equivalent to about 3 percent of OECD aid to FNS.

Interestingly, Brazilian, Chinese, and Indian FNS support is highly concentrated among countries with significant FNS needs, far more so than FNS aid from OECD countries (Figure 6.8). Indeed, the top 10 countries receiving the most FNS assistance from these three donors all have FNS needs that are above the average. While such findings must be interpreted cautiously, given known quality issues with the data, they suggest that FNS support from emerging economies is better targeted toward countries with the highest needs.

In any case, while available data suggest South-South cooperation in FNS so far remains modest, there is reason to believe it may substantially increase in the future. Brazil, Russia, India, China, and South Africa recently launched the “BRICS Bank,” more formally known as the New

Table 6.7. Top 10 countries: Recipients of FNS assistance from China, India, and Brazil

	Total FNS assistance (millions)	FNS assistance per rural capita
Angola	\$ 213.50	\$ 18.58
Mozambique	\$ 125.79	\$ 7.77
Afghanistan	\$ 7.71	\$ 0.36
Malawi	\$ 4.63	\$ 0.37
Cote d'Ivoire	\$ 4.19	\$ 0.45
Zimbabwe	\$ 3.03	\$ 0.34
Somalia	\$ 2.76	\$ 0.45
Cameroon	\$ 2.38	\$ 0.23
Mali	\$ 1.87	\$ 0.21
Haiti	\$ 1.01	\$ 0.21
Other Countries	\$ 4.41	n.a.
Total	\$ 371.28	n.a

Source: Aid Data (2015)

6. Other key players in the push to end rural hunger

Development Bank, with initial capital of \$50 billion. China has also spearheaded the creation of the new Asian Infrastructure Investment Bank (AIIB), which ultimately aims to have \$100 billion in capitalization. While these new funding sources will focus primarily on large infrastructure projects, much of their lending in rural areas may be important for improving agricultural productivity; indeed, the AIIB's website notes that one of its focus areas is likely to be "rural infrastructure and agriculture development." While it is of course far too soon to judge the development impact of either the New Development Bank or the AIIB, their potential contributions to ending rural hunger are considerable.

Ultimately, the promise of South-South cooperation is that it will bring new financing to the fight against hunger and also new ideas, expertise, and strategies. Given that many of these countries have launched successful programs to end hunger domestically in the recent past, they have the opportunity to draw on their own living memories and tacit knowledge in designing and implementing FNS interventions in other countries. For example,

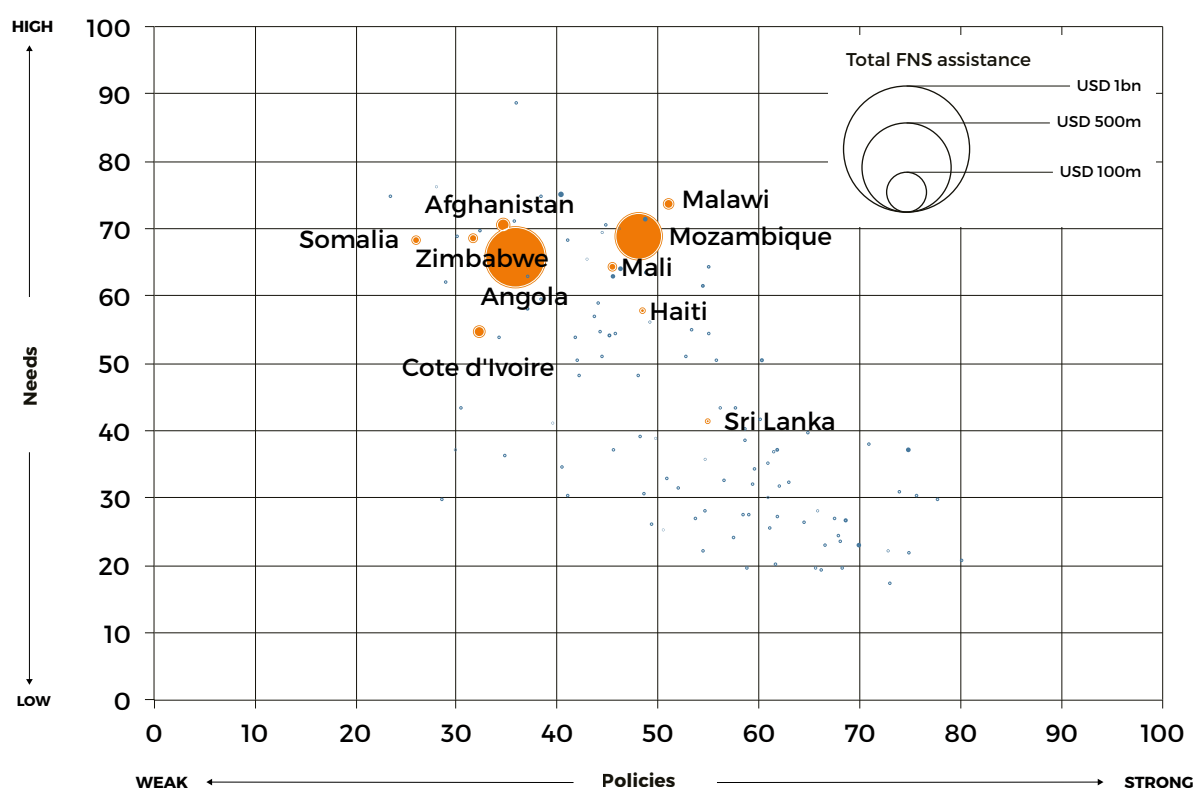
Brazil's development cooperation in agriculture is deeply informed and shaped by its national experience.⁶² The country's PAA Africa program purchases food directly from small-scale farms in Africa to distribute as humanitarian aid in rural and urban food insecure areas in Ethiopia, Malawi, Mozambique, Niger, and Senegal. It was inspired by Brazil's own Food Purchase Program (known by its Portuguese acronym PAA), in which the government procured food directly from family farms to meet food and nutrition security demands.⁶³ Similarly, the country's ProSavana program in Mozambique is designed to capitalize on the agro-ecological similarities between the Brazilian Cerrado and the Nacala Corridor in northern Mozambique.⁶⁴ These examples illustrate the unique insights emerging donors can contribute toward ending rural hunger in developing countries around the world.

62. Ending Rural Hunger Brazil background paper.

63. See Purchase from Africans for Africa, "Brazil's Food Purchase Programme," <http://paa-africa.org/about/paa-brazils-food-purchase-programme/>.

64. Ending Rural Hunger Brazil background paper.

Figure 6.8. China, India, and Brazil FNS assistance is concentrated in countries with highest needs



Source: Authors' calculations

● = Top 10 Recipients: China, India and Brazil assistance.
● = Countries receiving less than USD 1 million.

CHAPTER 7

Collective action for ending rural hunger

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The previous chapters have highlighted the role of individual countries in identifying priority needs, improving policies, and mobilizing resources to end hunger. They also described how a range of stakeholders are contributing to this effort.

While most of the actions to end rural hunger need to happen at the individual country level, we also know that greater cross-border cooperation and collaboration are required. National programs can be limited by financial constraints, an unfavorable global context, lack of knowledge about other country experiences, inability to access scientific advances, human capacity constraints, and other obstacles. This chapter explores how collective action, organized through partnerships, can help overcome these constraints and provide a supportive global context within which strong national programs can be articulated and implemented.

How should collective action be organized? We believe it should focus on coordinated transformations that can otherwise get lost in the details of individual policy responses. For example, field experiences suggest that moving on multiple fronts can lead to cumulative benefits for smallholder farmers. Access to credit is more valuable if there is also access to agricultural inputs, road networks, nearby markets, and extension services. It is therefore useful to step back and assess programs for strengthening smallholders in their entirety and ask what the roles and responsibilities of different stakeholders are in improving smallholder productivity and incomes.

We believe there are four priority areas where collective action is needed, driven by a comprehensive approach between stakeholders in identifying roles and responsibilities: integrating national and global food and agricultural commodity markets; achieving agricultural intensification that is environmentally sustainable and resilient; delivering new advances in location- and crop-specific research, technology, and extension services; and transforming family farms from subsistence enterprises to small-scale commercial businesses.

In each of these areas, individual actors find it useful to cooperate with each other to address the challenge in the aggregate. They can share knowledge, replicate successes, pool resources, make joint commitments, and research and develop shared technologies. Moreover, these priorities are inter-linked. For example, profitable family farms will contribute to, and rely upon, better national and global agricultural markets. Markets will work well only if agro-climatic shocks can be mitigated and wild swings in supply are avoided. Getting small-scale farmers to adapt to climate change will depend on strong local science and an effective extension network. The funding for science and extension, in turn, could depend on the results generated in improving family farm productivity and contributing to inclusive rural growth. This chapter considers how collective action could deliver transformational change in each of these four areas. This is in the spirit of SDG 17, 'Partnerships for the Goals', that explicitly encourages and promotes effective public-private and civil society partnerships.

7.1

Four priorities in need of collective action

Integrate food and agriculture markets, nationally and globally

Strong, well-functioning markets encourage consumers and producers to respond to price signals, allowing for efficient production and decreased volatility. Larger, more integrated markets increase the potential pool of buyers and sellers, leading to opportunities for greater transactions. Yet today agricultural markets are often limited and segmented, at both the national and global levels.

At the national level, there has been important progress in removing anti-agricultural market distortions in recent years, but there remains a need to deepen and extend markets to make sure the poorest are connected. The “urban bias”

many developing country governments historically exhibited, adopting policies that favor urban citizens over rural ones, has been fading over the past four decades.⁶⁵ By 2000, for developing countries as a whole, there was effectively no bias against agricultural production and trade. Yet while many of the most distorting policies have been lifted, local agricultural markets often remain fragmented in space and time. Without adequate warehousing and storage facilities, there are large movements in prices at different times of the year. Farmers often have to sell when supplies are plentiful (at harvest) and buy

65. See Robert H. Bates, *Markets and States in Tropical Africa* (Berkeley CA: University of California Press, 1981).

Box 7.1

Strengthening national markets through agricultural commodity exchanges

Well-functioning markets do not just develop organically. They need sophisticated institutions to support them and to deliver services that match buyers and sellers. Many countries have commodity exchanges to make national markets work better, but only four are on the African continent: in Ethiopia, Malawi, Rwanda, and South Africa.

Commodity exchanges are efficient, regulated markets for specific goods with a pre-approved set of market agents and commonly agreed trade procedures such as auctions or reverse auctions. The “goods” are specified in precise terms: quality (standardized and graded, like white maize versus yellow maize), delivery time (spot or forward), and place (ex-warehouse, delivery at port or in a foreign country). The exchanges guarantee title and ensure that contracts are executed. They attract multiple buyers and sellers because they provide transparency in pricing and competition to ensure the best deal is found. They are centers of information on quality and prices, nationally and around the world; of supply and demand data, weather, and relevant government actions. In short, they make the market.

But commodity exchanges are not easy to set up, and they require significant investment in technology and finance platforms, as well as a physical

infrastructure for storage, delivery, and transport. A credible commodity exchange must be supported by appropriate legal infrastructure, particularly a system of grades and standards, contract enforcement mechanisms, governance in spot markets, and a strong foundation in insolvency law to manage risks associated with defaults and bankruptcies.

A commodity exchange, particularly one that offers trade in futures, cannot be sustained without reasonably sound and predictable policies for fiscal and monetary management and foreign trade. In particular, macroeconomic policy needs to maintain stable, reasonably undistorted real interest rates, exchange rates, and inflation rates. A fair and predictable taxation framework should define fiscal obligations arising from exchange transactions.

Perhaps the biggest problem for exchanges is to ensure that there is sufficient liquidity and depth to attract multiple buyers and sellers and to generate large trading volumes and thereby drive down transaction costs for all participants. For this reason, some countries are looking into regional exchanges, but inevitably this will lead to discussion as to where to host the exchange as that country will get larger-than-average benefits.

when supplies are thinner. Without adequate roads (and information) multiple local markets spring up; middlemen take advantage by arbitraging across these local markets. One study finds they take as much as 20 percent of the value of farm output in Egypt.⁶⁶

At the global level, agricultural markets still remain remarkably closed and distorted, particularly when compared to trade in manufacturing. As a point of comparison, the ratio of manufacturing exports to manufacturing value added—a basic if crude measure of global integration—currently stands at slightly over 100 percent, and it has doubled since 1990. The same figure for agriculture is only 40 percent, and this has only marginally increased over the past 35 years (Figure 7.1). While this divergence partially reflects differences between production processes in manufacturing and agriculture—there tend to be more stages in global value chains in manufacturing, and since manufacturing output doesn't rot it is easier to trade over long distances and time—it also clearly reflects policy choices. Tariffs on agriculture remain significantly above those in manufacturing. Current simple applied tariffs on agriculture in the EU and U.S. are 13.2 percent and 5.3 percent, respectively,

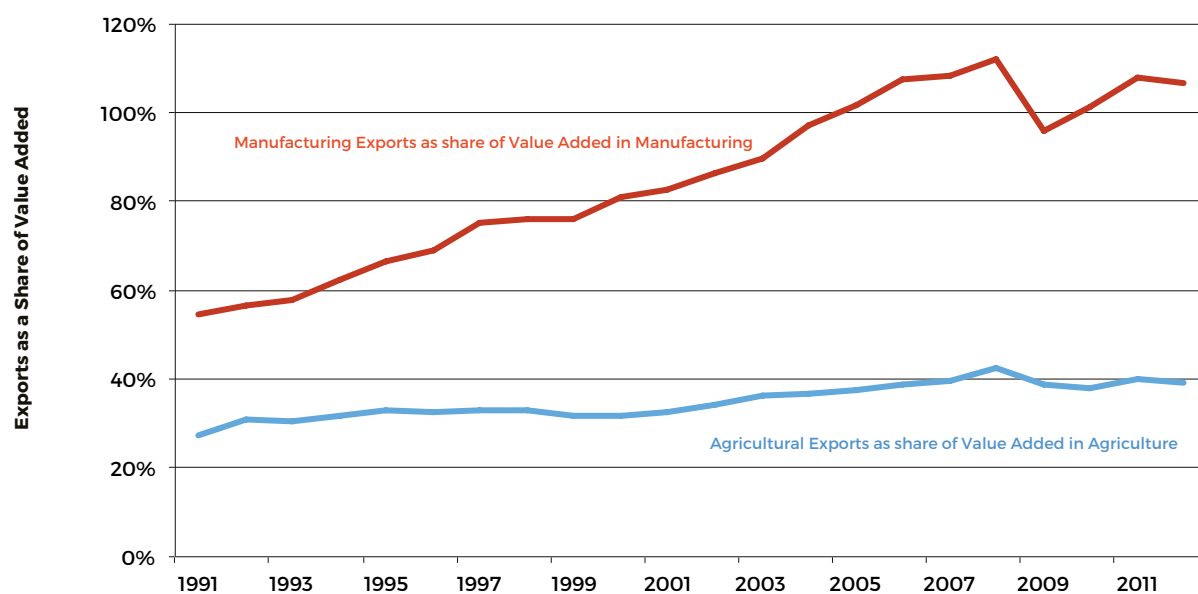
compared with 4.2 percent and 3.1 percent for non-agricultural goods.⁶⁷ And even for those countries with low average applied tariffs in agriculture, individual agricultural product lines at times face extremely high tariffs (the WTO defines these “tariff peaks” as those above 15 percent); developing countries that specialize in these products are particularly hurt by such policies. Moreover, agricultural trade policy today is often marked by a dysfunctional pro-cyclicality: during times of price spikes, when international trade is most needed to stabilize markets, exporting countries instead impose new restrictions such as temporary export bans, and importing countries rush to secure supplies before prices increase further. Both measures further inflame volatility in global markets.

Collective action is needed to strengthen national markets and to further integrate and liberalize global markets. At the national level, there is a need to share lessons across borders on how to build the institutions that allow for market development: local commodity exchanges (Box 7.1), good infrastructure connecting farms to markets and national markets to export markets, and mechanisms for quickly sharing information, on prices, production, and consumption trends, and available inventories.

66. Hafez Ghanem, *The Arab Spring Five Years Later: Toward Greater Inclusiveness* (Washington, DC: Brookings Institution Press, 2015).

67. WTO, “Tariff Profiles,” World Trade Organization, <http://stat.wto.org/TariffProfile/WDSBTariffPFHome.aspx?Language=E>.

Figure 7.1. Global integration in agriculture vs. manufacturing



Source: FAO, FAOStat (2015), World Bank, World Development Indicators (2015) and own calculations

Without adequate warehousing, logistics, and cold storage facilities, markets cannot ensure a smooth supply to meet demand that can vary by time and place.

Similarly, at the global level, pooled international financing for investing in the infrastructure to connect markets—including cross-border infrastructure—may help accelerate progress. We also need collective action in the form of continued multilateral negotiations to lower barriers to trade. Over the years attempts to reach greater trade liberalization in agriculture have proven extremely contentious, and progress has come slowly. Divisions between developed and developing countries on the extent of liberalization in agricultural sectors have been one

of the long-term sticking points of the Doha Round talks at the WTO. In the current negotiations over the Trans-Pacific Partnership agreement, agriculture is again creating difficulties for negotiators. Moreover, just as many national markets need better mechanisms for sharing information, the same is true at the global level. The Agriculture Market Information System is an effort spearheaded by the G-20 to share information among major producing, consuming, and exporting countries to make sure that there is enough information on global stocks and likely supplies to ensure that global markets are properly efficient.

Box 7.2

The World Trade Organization's role in promoting global FNS

The World Trade Organization (WTO) explicitly recognizes the importance of reducing trade restrictions for global food security. For instance, the preamble to the WTO Agreement on Agriculture, negotiated as part of the Uruguay Round in 1994, makes clear that commitments should account for food security. The WTO Doha Round modalities document also mentions food security and commits members to promote market access and to reduce domestic support that distorts trade and export subsidies.

While the Doha Round is still being negotiated, a 2013 WTO Ministerial meeting in Bali discussed the implications of WTO rules that stockpiling of food was trade distorting and therefore subject to

limits previously agreed under the WTO Agreement on Agriculture. As a result, some countries were concerned that their stockpiling program could breach these WTO limits and be WTO inconsistent.

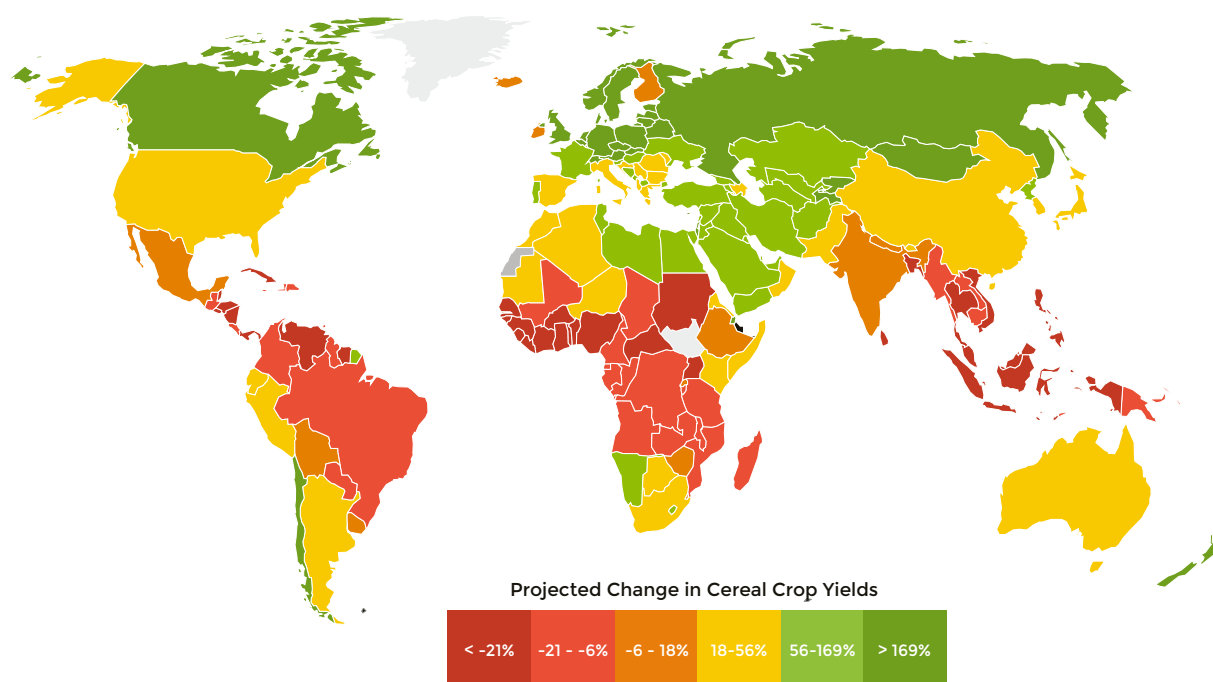
At the Bali meeting, WTO members agreed to a ministerial decision on food security. Under this decision, until a solution to public stockpiling for food security purposes is found, WTO members agreed not to challenge the WTO consistency of such programs using the WTO dispute settlement mechanism. Given concerns about the impact of stockpiling on trade, developing countries also agreed that their food security programs would not distort trade or affect the food security of other countries.

Achieve sustainable and resilient agricultural intensification and manage agro-ecological changes

There is increasing awareness of the connections between agricultural production and environmental constraints. Renewable water resources are a crucial input for agricultural production, yet they are under threat in many countries. Fertilizer necessary for efficient agricultural production utilizes nitrogen and phosphorus, but there is also a risk of exceeding the planetary boundaries in biochemical flows of these crucial elements, leading to eutrophication of key water resources.

Perhaps the most important link between agriculture and the environment, however, concerns the challenge of climate change and the damage being done by agricultural practices such as slash-and-burn cultivation, deforestation, land degradation, animal husbandry, and neglect of soils. Agricultural practices will need to be transformed to achieve sustainable agricultural intensification, limiting or reversing carbon emissions, and reducing water use and other environmental damage. Moreover, even under optimistic scenarios of future carbon emissions, farmers in many developing countries will need to adapt their practices to adjust to a changing

Figure 7.2. Projected change in cereal crop yields due to climate change, average 1980-2009 compared with average 2040-2069



Source: ND-GAIN Index, based on projections in from Rosenzweig, et al., 2013 (<http://www.pnas.org/content/111/9/3268.full>)

climate. Indeed, in some regions farmers are already doing so, such as by altering cultivation and sowing times.⁶⁸

Climate change will affect agricultural production through changes in temperatures and precipitation, increasing prevalence of extreme weather events, as well as the stimulatory effects of increasing carbon dioxide concentration in the atmosphere. The interactions between these various channels are non-linear and difficult to predict, and are expected to vary substantially by region and crop. Figure 7.2 presents a map of projected changes in cereal yields due to climate change comparing recent yields (average 1980–2009) with future yields (average 2040–2069). While increases in yields are expected in Europe, the Middle East, Northeast and South Asia, and North America over this period, many countries in sub-Saharan Africa, Latin America, and Southeast Asia are likely to experience substantial decreases. And over a longer-term period—looking out to 2070 or 2100—the effects of

climate change on yields are expected to be considerably worse, with negative impacts again concentrated in many of the poorest parts of sub-Saharan Africa.⁶⁹

Many of the investments needed to “climate-proof” agriculture will be modest and can be implemented immediately by farmers. They include organic soil restoration, avoiding slash-and-burn agriculture, grassland management, and reversing deforestation. In some cases, such as optimizing fertilizer and pesticide use, better agricultural practices can directly contribute to greater profits while increasing resilience and sustainability at the same time.

Yet a number of mitigation and adaption priorities in agriculture will require collective action across borders. These include setting agreed international targets for lowering emissions, providing better weather forecasting, developing drought- and flood-resistant crops, sharing experiences with mitigation and adaptation techniques, and, in the extreme, better help during food emergencies,

68. IPCC, *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, p. 514.

69. *ibid.*

including weather-related emergencies. While collective action on building resilience into agricultural practices is in its infancy today, it seems likely that significantly more collaborations and partnerships will be arising in this area in the future. To give one example of the kinds of initiatives that are possible, a new partnership between the European Union and the African Union was launched at the UN's third International Conference on Financing for Development in Addis Ababa in July 2015. Called "Building Disaster Resilience to Natural Hazards in sub-Saharan African Regions, Countries and Communities," the €88 million (\$100 million) program will help provide weather forecasts and systems to provide early-warning signals of major natural hazards.

Delivering new advances in location- and crop-specific research, technology, and extension services

Research and development is crucial to sustained agricultural productivity increases in developing countries with low yields. The history of the Green Revolution illustrates how technological advances—crucially paired with sustained public commitment to and investment in agriculture—can produce impressive results. Between 1960 and 2000, for the developing world as a whole, yields for wheat increased by 208 percent, for rice 109 percent, and for maize 157 percent.⁷⁰ By one estimate, if new modern varieties of crops had not been introduced to developing countries, by 2000 per capita calorie consumption in developing countries would have been about 14 percent lower than it was, and the percent of children malnourished about 7 percent higher.⁷¹

Yet, as we have seen, not all countries experienced sustained jumps in yield over the second half of the 20th century. One of the key challenges of agricultural R&D is that it tends to be highly place-specific and crop-specific; given that agricultural activity is strongly dependent on local soil and climate conditions, the productivity-enhancing technologies that work for a certain crop in a certain country may not translate to other countries producing different crops in different climates.

Today there is a great need for R&D investments

specifically targeted to the conditions in those countries that are still struggling with low yields. Yet in only 16 out of 64 developing countries with available data does public spending on agricultural R&D equal at least 1 percent of agricultural GDP. Among countries with yields below 2 t/ha, this figure is just seven out of 34 countries. Among low-income countries, just three out of 21 countries spend more than 1 percent of agricultural GDP on research. Many countries simply do not have the skilled staff; Liberia reports having fewer than five full-time PhD scientists in its agricultural research service. Guinea-Bissau has none.⁷²

Given the fiscal constraints and many competing demands for resources in low-income countries, it is perhaps not surprising that spending on agricultural research is not always a top priority for these countries' governments. The issue is further clouded by mixed evidence on the rate of return on investments in national agricultural research services, perhaps because of capacity limitations in these institutions.⁷³ This suggests there is a substantial need for collective action to drive forward the location- and crop-specific research that is needed by these countries and is currently underfunded and ineffectively spent. New organizations such as the Alliance for a Green Revolution in Africa are already showing results in terms of improved seeds, higher farmer yields and incomes, and training a new generation of PhD scientists.

The primary body for international collective action on this challenge is the Consultative Group for International Agricultural Research (CGIAR), a consortium of 15 agricultural research centers spread throughout the developing world. CGIAR is in the midst of a significant expansion. While its budget was flat in real terms between 1990 and 2006, it has nearly doubled since then, up to about \$1 billion per year, with plans to increase further to \$1.5 billion by 2025 (Figure 7.3).

Spent effectively, these resources could have transformative effects. Investments in research can yield great benefits; by one estimate, every \$1 invested in agricultural R&D to boost yields results in \$34 of benefits, making spending on agricultural R&D one of the best-performing investments in

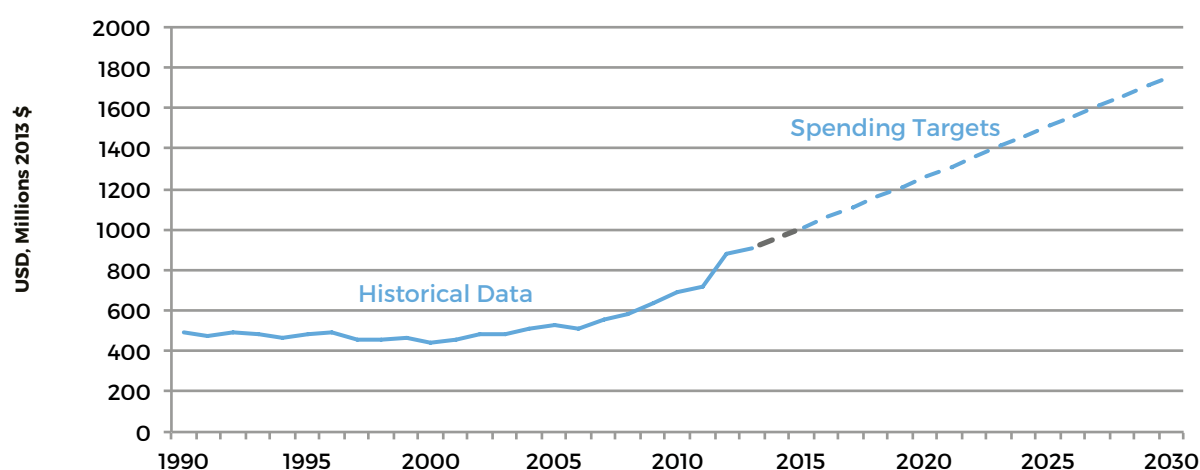
70. Prabhu L. Pingali, "Green Revolution: Impacts, Limits, and the Path Ahead," *Proceedings of the National Academy of Sciences* 109, no. 31 (2012): p. 12303.

71. R.E. Evenson and D. Gollin, "Assessing the Impact of the Green Revolution, 1960 to 2000," *Science* 300, no. 5620 (2003): p. 761.

72. ASTI, *Global Assessment of Agricultural R&D Spending* (Washington, DC: IFPRI, 2012).

73. ONE, *The Maputo Commitments and the 2014 African Union Year of Agriculture*.

Figure 7.3. CGIAR spending 1990-2030



Source: ASTI database (2015) and CGIAR Strategy and Results Framework 2016-2030

Note: Missing data for 2014

international development.⁷⁴ CGIAR has estimated that a 50 percent increase in all agricultural research (both international and national) would result in a 12.5 percent increase in agricultural output growth in sub-Saharan Africa, though with smaller effects in other regions. The greatest impact of further international investments in research will come where national structures are weakest and where less well-researched crops are still widely grown, namely in Africa.

Transform family farms from subsistence enterprises to competitive small-scale businesses

Small-scale agriculture has often been viewed as backwards and non-transformative; the goal of development was to get poor people off small-scale farms and into productive jobs in large-scale commercial agriculture, manufacturing, or services. Even today, a debate persists over whether small-scale farms have any substantial role to play in the medium-term future of development, or if instead of trying to boost the productivity of small-scale farms the development of large scale commercial farms should be prioritized.⁷⁵

In the long term, the development process of labor moving away from small-scale agriculture is likely to continue; the share of the population employed in the agricultural sector has always fallen as countries have grown richer. And many countries in Asia have experienced very successful economic development fueled by smallholder productivity gains. But the processes of structural transformation take time. The share of the rural population in today's low income countries is falling only by 1 percentage point every three years.

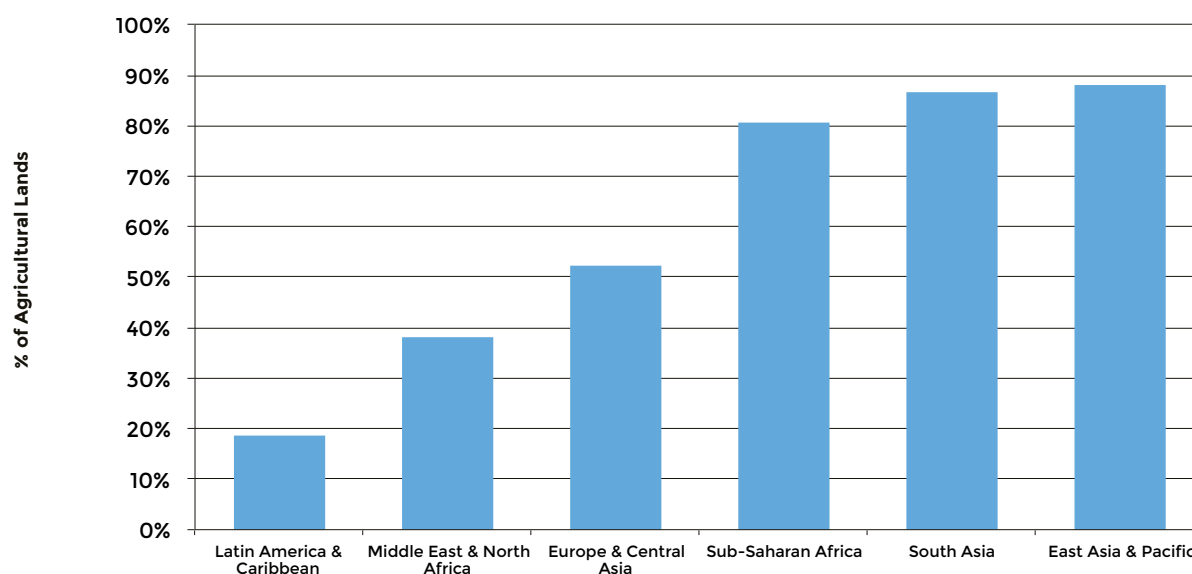
In the short and medium term, the strategy of helping people move off small-scale family farms is unlikely to materially help end hunger by 2030. The scale of the movement of people involved would just be too great. There are currently an estimated 500 million small-scale farms in developing countries, with about 2.5 billion people depending on them for their livelihoods. In sub-Saharan Africa, South Asia, and East Asia, small-scale farms currently account for more than 80 percent of total agricultural land under cultivation (Figure 7.4). It is simply impractical to imagine all of these people will move out of small-scale agriculture by 2030.

Given this reality, it is necessary to help small-scale farms transform from subsistence enterprises to competitive businesses that can fully participate in markets and significantly boost the incomes of farmers.⁷⁶ To achieve this transformation, small-scale farms need better access to inputs such as irrigation, quality seeds, and fertilizers; they need

74. Tewodaj Mogues et al., "The Impacts of Public Investment in and for Agriculture: Synthesis of the Existing Evidence," ESA Working Paper no. 12-07 (Rome: FAO, 2012), and Post-2015 Consensus, "Food Security: What's the Smartest Target?," <http://www.copenhagenconsensus.com/post-2015-consensus/food-security-whats-smartest-target>.

75. See, for example, Paul Collier and Stefan Dercon, "African Agriculture in 50 Years: Smallholders in a Rapidly Changing World?" *World Development* 63 (2014). By contrast, Conway and others have formed an Agriculture for Impact advocacy platform to focus European policymaker attention on support for African smallholders. This platform also convenes the Montpellier Panel to discuss agriculture, trade, ecology, and development in a coherent fashion.

76. For a review of the issues, see Shenggen Fan et al., *From Subsistence to Profit: Transforming Smallholder Farms* (Washington, DC: International Food Policy Research Institute, 2013).

Figure 7.4. Share of agricultural land owned by small-scale farmers

Source: Graub et al (2015) and own calculations

Note: Includes developing countries only. Definition of small-scale farms is based on national government definitions, and thus varies by country, however is most commonly defined as farms less than 10 ha.

to be connected to markets, through better rural roads and access to finance, including risk-mitigation tools such as crop insurance; and they need institutional support to ensure they can compete on a level playing field, including a strong rule of law backed by clear property rights and the ability to organize themselves into cooperatives. Finally, underpinning these reforms small-scale farms will need to be supported by strong rural safety nets. These are essential to ensure short-term shocks—due to crop failure or illness—do not compel farming households to sell off assets or forgo necessary investments in order to cope with immediate consumption needs.

Smallholder farms are not homogeneous. Some have the potential to become profitable businesses; others do not. Support can be given to both groups, but in different ways. Small, potentially profitable farms need help overcoming disadvantages of size—voice in policymaking, organization, integration with value chains, reduced transaction costs for finance, transport, marketing, and information. But programs are also needed to help those on nonprofitable farms to move to other jobs, so education, health, and minimum income support are needed. They can also get jobs in rural areas when off-farm employment is strong. Migrant families often leave women behind to look after family plots,

giving added importance to the need to help women farmers.

Most of these challenges are not traditionally thought of as problems requiring collective action. Indeed, one of the reasons they have persisted for so long is often that governments have not dedicated enough focus to the issues of smallholders; the institutions and strategies for promoting agriculture in many developing countries have focused significantly more on large, commercial farms. One way for governments to overcome this shortcoming is to create a special government ministry specifically tasked with looking after the interests of small-scale farms, as Brazil did (Box 5.2).

Yet, even with more focus from developing country governments, there will still be substantial need for collective action to help transform subsistence farmers into commercial operations. Collective action is necessary for financing interventions directly targeted at small-scale farms, as well as in sharing experiences and knowledge across borders, including about how to scale up programs. Indeed, given that many governments have found it difficult to reach small-scale farms in the past, international collaboration on how to design successful strategies will likely prove beneficial.

7.2 Organizing for collective action

In order to deliver the necessary collective action—on market integration; sustainable agricultural intensification; expanding research, development, and extension services; and transforming small-scale agriculture—the international community will need to rely on institutional forums and partnerships that encourage fruitful collaboration. When well designed and well-run, these organizations and initiatives lower transaction costs, mobilize resources, innovate, create platforms for discussing policy reforms and help coordinate actors to avoid overlap, waste and duplication of effort. This coordination requires sharing knowledge of who is doing what, broad agreement on the goals toward which efforts should be oriented, and review and follow-up to keep progress on track.

Historically, the most common forums for collective action in international development have been multilateral institutions. Five key multilateral institutions are working to spur collective action on the specific challenges identified above. The three Rome-based agencies—the Food and Agriculture Organization (FAO), the World Food Programme (WFP) and the International Fund for Agricultural Development (IFAD)—are the linchpin of international cooperation on FNS. FAO is the key forum for creating and sharing knowledge and data on FNS. The WFP is the world's largest humanitarian agency, and ensures people have food in emergencies and disasters. IFAD is a crucial collective funding body dedicated specifically to projects on rural poverty and agricultural transformation, with a focus on smallholders. In addition to these three, CGIAR is the primary international network for collective action on agricultural research for development, and the World Bank remains an invaluable institution for strengthening local and global markets, funding projects, and advocating for policy reforms to improve the climate for business investments in FNS.

More recently, alongside and with the active participation of the traditional multilateral institutions, a plethora of new partnerships, initiatives, and committees has emerged to help spur collective action. This trend was in part driven by the realization that today collective action for FNS needs to engage a much broader range of stakeholders: not

"In sub-Saharan Africa, South Asia, and East Asia, small-scale farms currently account for more than 80 percent of total agricultural land under cultivation. It is simply impractical to imagine all of these people will move out of small-scale agriculture by 2030."

only the governments that make up the membership of multilateral bodies, but also multinational corporations, scientists, NGOs, and philanthropists, in addition of course to the citizens and small-holder farmers in developing countries who are the intended beneficiaries of FNS interventions. All of these players have a role to play, and all of them must be engaged in strong partnerships to deliver results.

Since 2008, at least 20 new global partnerships and initiatives have emerged in FNS, including Scaling Up Nutrition (SUN), the Global Agriculture and Food Security Program (GAFSP), the New Alliance for Food Security and Nutrition; the Grow Africa partnerships launched by the New Partnership for Africa's Economic Development (NEPAD) and the World Economic Forum, and also the more recent Grow Asia initiative.⁷⁷ To understand how this ecosystem has evolved relating to the four priorities for collective action identified above, Figure 7.5 maps the new institutions and initiatives working on each of these four areas. It does not pretend to present a comprehensive picture, but instead offers a stylized approximation of areas of focus of new multi-stakeholder partnerships.

77. A more complete list of international partnerships and initiatives in FNS is available at endruralhunger.org.

As can be seen, the recent flowering of new initiatives has created a complex web of forums for collective action. This reflects the renewed energy and activity surrounding FNS since the major price spikes of 2007–08, which is to be welcomed—for too long the international community has underinvested in collective action. And each of the new initiatives and partnerships may be individually worthwhile and sensible, and undoubtedly most are making important contributions to global efforts to end hunger. Taken together, however, they have produced a system for coordinating global action that was not purposefully designed but that has evolved in fits and starts in response to a series of political impulses, unforeseen shocks, and individual initiatives. There is a real risk that such a system will result in duplication of efforts and a failure to specialize and achieve economies of scale. We do not necessarily need *more* partnerships, but rather *stronger* partnerships, with global initiatives underpinned by partnerships at the country, sub-regional, or regional level. It is time to reassess the current system and ask whether there are better ways to organize to deliver the collective action that will be needed to achieve the global goal for FNS.

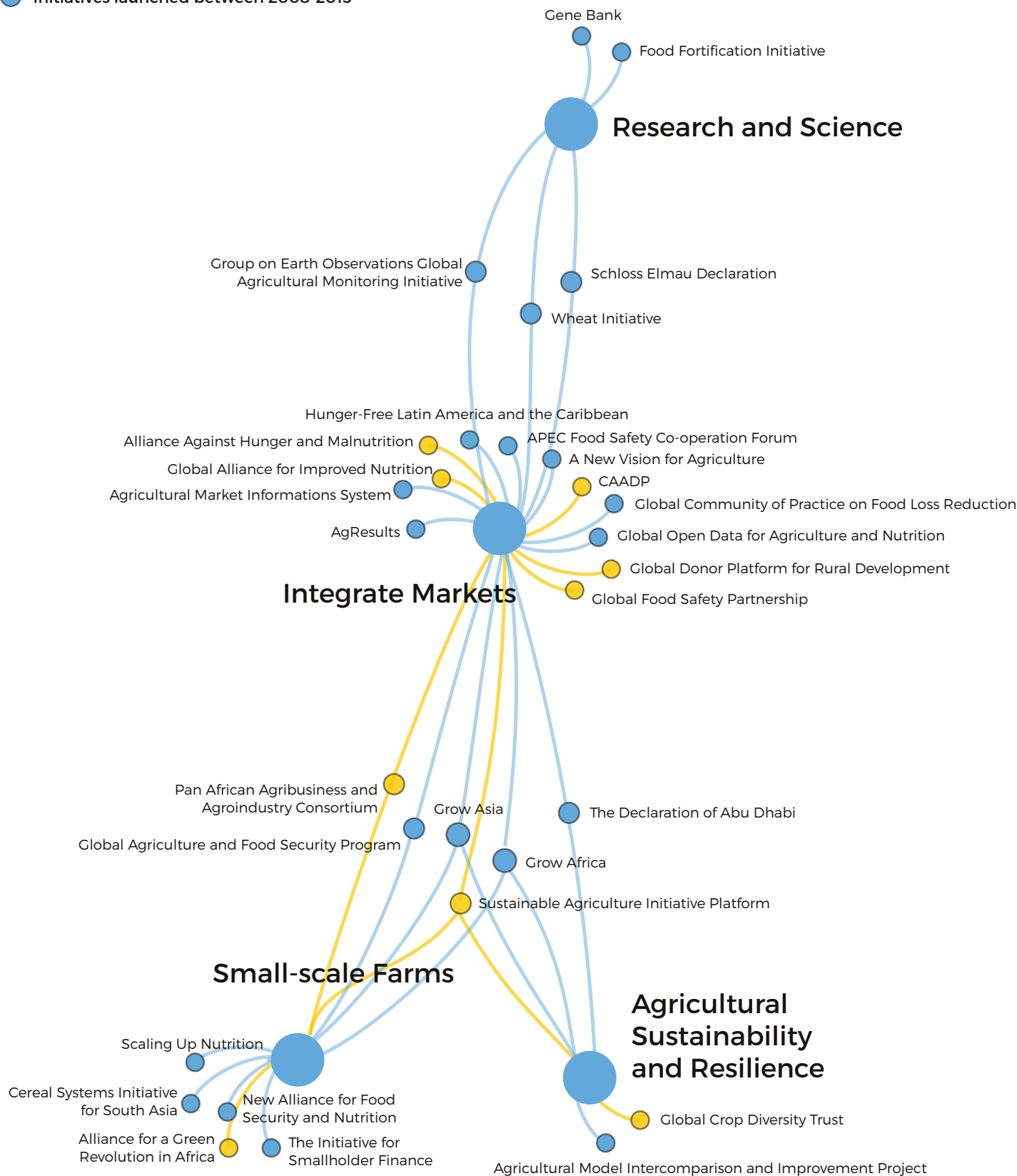
It would be useful for each existing partnership to assess its delivery of basic partnership functions and review the alignment and complementarity of the partnership with others, with a view to reducing overlap and fragmentation. Key functions

of successful partnerships include a governance structure that is inclusive and equal, offering voice to multiple stakeholders. Smallholder and family farmers, as crucial elements of civil society, are often underrepresented in existing forums. Strong leadership from the convener is also needed for partnerships to be effective. Such leadership must ensure that everyone shares a high level of ambition to achieve results at scale, with a clear-headed view of the roles, responsibilities, and risk-sharing of each partner. Partnerships could also develop pilot projects that can be scaled up in areas where progress has been slow, for example, in the reduction of hunger in fragile states and sub-national areas. They should commit to a strong process of rigorous evaluation, and they should share and disseminate knowledge and experiences. They should be transparent in collecting relevant data and making these easily accessible to everyone. Strong partnerships that deliver these functions can be vital drivers of progress on ending rural hunger.

“We do not necessarily need *more* partnerships, but rather *stronger* partnerships, with global initiatives underpinned by partnerships at the country, sub-regional, or regional level.”

Figure 7.5. **New forums for collective action**

- Initiatives launched between 2000-2007
- Initiatives launched between 2008-2015



Source: Initiative websites and analyses

CHAPTER 8

Concluding remarks

CHAPTER 8

Concluding remarks

One of the central messages of this report is that no single policy or action will be enough to end rural hunger. It will require a country-by-country mix of clear strategies, strong policies, and adequate resources targeted to support populations in greatest need. With a level-headed and evidence-based approach, the challenge of ending rural hunger can shift from aspirational to achievable.

What would a world without rural hunger look like? How might humanity look if the international community rises to the challenge and meets the new global goals for FNS?

The interwoven deprivations of rural poverty and a lack of access to food for rural households will end; instead households will have enough income to ensure that no one in their families goes to bed hungry. Maternal and child malnutrition will no longer hold back the development aspirations of the next generation; instead all men, women, and children will have healthy diets that allow them to achieve their full potential. Smallholder farmers will no longer struggle to produce enough food for their own consumption; instead, they will thrive as entrepreneurs in competitive, connected markets. Farming practices will no longer degrade the environment and contribute to the warming of the planet; instead, agriculture will lead the way in abating carbon emissions and farmers will adopt ecological practices that boost both resilience and agricultural production.

A world free of rural hunger will be more just, more productive, and more sustainable. While it is ambitious to believe humanity can end rural hunger by 2030, it is by no means a purely aspirational goal. Today the broad policy approaches and political commitments, in both developed and developing countries, are making preliminary steps in the right direction. More substantial progress is feasible. This includes the further decline in distortions in agricultural markets, the development and adoption of new technologies, a focus on the particular needs of small-scale farmers and the political commitments to ensure that no one—including women, children, and marginalized groups—is left behind in the drive to end hunger. Moreover, greater investments—from domestic governments and donors as well as multilateral institutions, private domestic and foreign investors, and the development assistance from emerging economies—are creating new opportunities for agricultural transformations.

The challenge now is to translate this moment of opportunity into a historic global achievement. The increased attention to the challenges of FNS is welcome, but what is crucial is that these new efforts—money, time, and advocacy for reforms—are channeled to their most productive uses and sustained over time. An evidence-based strategy is needed to prioritize among competing needs, efficiently allocate resources, track progress in outputs and outcomes, and enable review and follow-up. Such strategies will come to life only when paired with adequate forms of leadership.

In this project, we have made a first attempt at building the evidence-base to shape such a strategy. We have sought to produce a database that is not just informative but also actionable, one that will be useful for the wide range of actors—governments,

“A world free of rural hunger will be more just, more productive, and more sustainable. While it is ambitious to believe humanity can end rural hunger by 2030, it is by no means a purely aspirational goal. Today the broad policy approaches and political commitments, in both developed and developing countries, are making preliminary steps in the right direction.”

scientists, educators, private investors, multilateral institutions, NGOs, and advocacy organizations—engaged in the noble drive to end rural hunger. This report has distilled the key lessons and recommendations that emerge from the data; far more data, graphs, and analysis are available at endingrural-hunger.org.

Our research underscores the importance of three key action areas for developing country governments and introduces disaggregated measures to help establish priorities on each. First, the data allow developing country governments to identify and rigorously measure priority FNS needs, distinguishing among access to food, malnutrition, smallholder yields, and vulnerability. While all are important, the scale and nature of the challenge is distinct in each country. Second, governments can assess where they must strengthen FNS policies and political commitment, especially for smallholders, women, climate change, and research and extension by reviewing how they compare to their peers and to the best-practice frontier. Third, governments can act to mobilize resources for public investment while promoting private investment, whether from domestic sources or mobilized from abroad, and scaled according to their populations, needs, and policies.

Developed countries, meanwhile, have their own three key contributions to make. First, they can reduce distortions in domestic agricultural and biofuel policies and in their agricultural trade policies. Second, they can raise the quantity of FNS aid and improve its quality. Third, they can better target aid to countries with high needs and strong policies but limited resources. Within those countries, the areas of greatest need can be prioritized, and governments can help ensure that cross-cutting issues of gender and climate change are fully incorporated in FNS investments.

Ending rural hunger is within reach. It depends on strong and committed leadership among governments, international organizations, policymakers, analysts, businesses, civil society organizers, and local communities around the world. All stakeholders need to base their strategies on evidence, ensuring that contributions toward global FNS goals are of appropriate scale and coherence. To that end, we hope the *Ending Rural Hunger* project provides useful tools for helping to kick-start progress where humanity needs it most.

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List of Abbreviations

ADB	Asian Development Bank	IPCC	Intergovernmental Panel on Climate Change
AfDB	African Development Bank	MDG	Millennium Development Goal
AFESD	Arab Fund for Economic and Social Development	MESA	Ministry for Food Security and Fight Against Hunger
AGRA	Alliance for a Green Revolution in Africa	MMT	Million Metric Tonnes
AIIB	Asian Infrastructure Investment Bank	ND-GAIN	Notre Dame Global Adaptation Index
ASTI	Agricultural Science and Technology Indicators	NEPAD	New Partnership for Africa's Economic Development
BRICS	Brazil, Russia, India, China, and South Africa	NGO	Non-Governmental Organization
CAADP	Comprehensive Africa Agriculture Development Programme	ODA	Official Development Assistance
CAF	Development Bank of Latin America	OECD	Organization for Economic Cooperation and Development
CFS	Committee on World Food Security	OFID	OPEC Fund for International Development
CGIAR	Consultative Group for International Agricultural Research	OOF	Other Official Flows
CSO	Community Support Organization	OPEC	Organization of the Petroleum Exporting Countries
DAC	Development Assistance Committee	PAA Africa	Purchase from Africans for Africa
DOTS	Directly Observed Treatment, Short-Course	PAA Brazil	Programa de Aquisição de Alimentos
DRC	Democratic Republic of Congo	PPP	Purchasing Power Parity
EC	European Commission	QWIDS	Query Wizard for International Development Statistics
EU	European Union	R&D	Research and Development
FAO	Food and Agriculture Organization	SDG	Sustainable Development Goal
FDI	Foreign Direct Investment	SSC	South-South Cooperation
FNS	Food and Nutrition Security	SUN	Scaling Up Nutrition
GAFFSP	Global Agriculture and Food Security Program	t	Tonnes
GDP	Gross Domestic Product	UN	United Nations
GHG	Greenhouse Gas	UNU-WIDER	United Nations University World Institute for Development Economics Research
GODAN	Global Open Data for Agriculture and Nutrition Program	WEF	World Economic Forum
ha	Hectare	WFP	World Food Programme
IEG	Independent Evaluation Group (World Bank)	WHO	World Health Organization
IFAD	International Fund for Agricultural Development	WTO	World Trade Organization
IFC	International Finance Corporation		
IFPRI	International Food Policy Research Institute		

Appendices

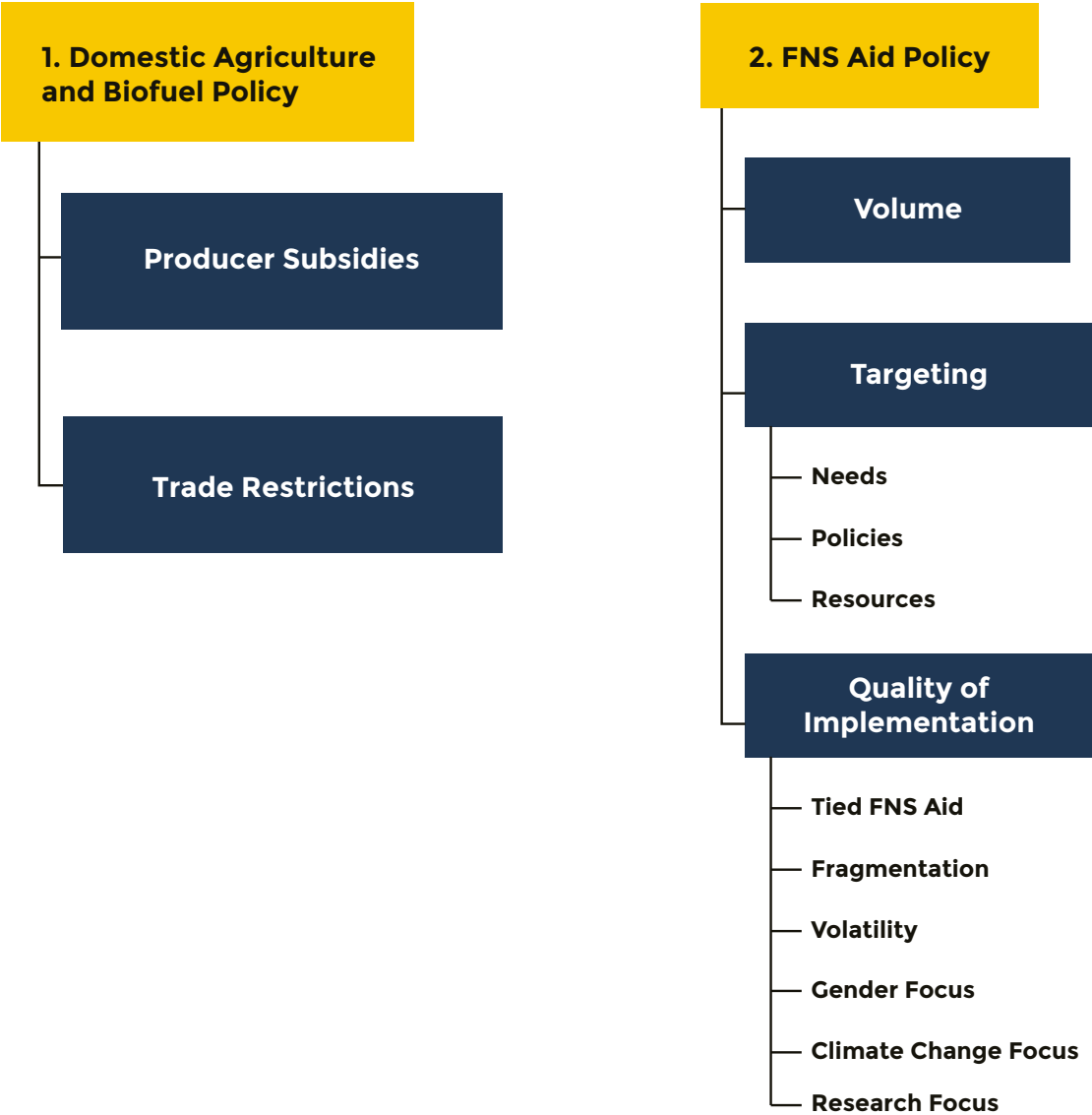
Appendix 1:

SDG 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture

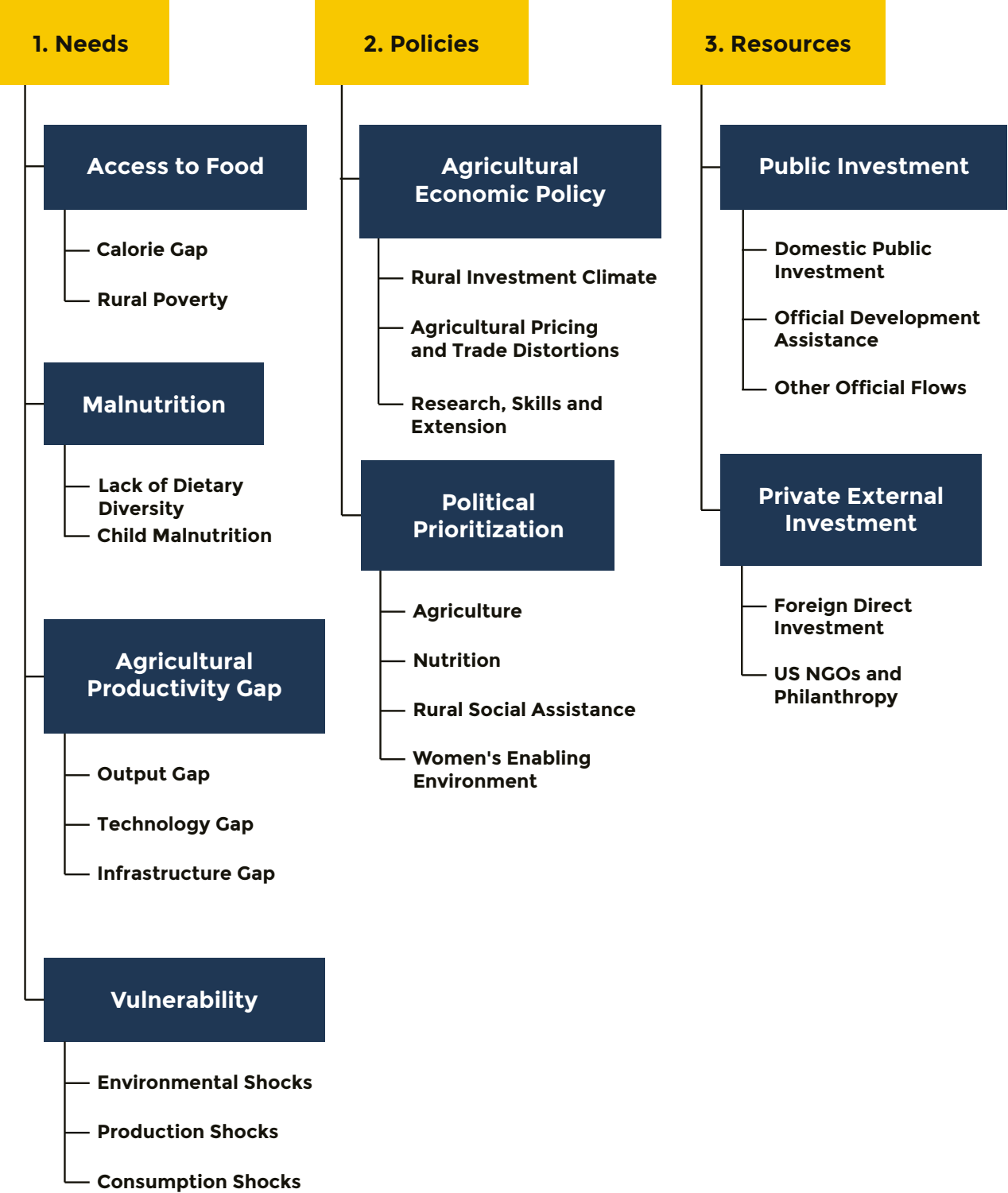
- 2.1** By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round
- 2.2** By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons
- 2.3** By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, 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
- 2.4** By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality
- 2.5** By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed
- 2.a** Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries
- 2.b** Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round
- 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

Appendix 2: ERH index structure

Index Structure:
Developed Countries



Index Structure:
Developing Countries



Appendix 3.a: Developing country list of indicators

Developing Country Context: Indicators by Category					
		Indicator	Source	Country Coverage	Units, calculations used & descriptions
1. Needs					
Access to Food					
Calorie Gap					
1	1	Lack of enough money to buy food	Gallup World Poll http://www.gallup.com/services/170945/world-poll.aspx	110	Percent. This indicator is based off the following survey question: "Have there been times in the past 12 months when you did not have enough money to buy food that you or your family needed?" National level.
1	2	Undernourishment	FAO Food Security Indicators http://faostat3.fao.org/home/E	97	Percent. The prevalence of undernourishment expresses the probability that a randomly selected individual from the population consumes an amount of calories that is insufficient to cover her/his energy requirement for an active and healthy life.
1	3	Average dietary energy supply adequacy	FAO Food Security Indicators http://faostat3.fao.org/home/E	108	Percent. This indicator expresses the dietary energy supply (the national average energy supply, calories/capita/day) as a percentage of the average dietary energy requirement (a reference for adequate nutrition in the population, calories/capita/day).
Rural Poverty					
1	4	Rural multi-dimensional poverty headcount	Oxford Poverty & Human Development Initiative http://www.ophi.org.uk/multidimensional-poverty-index/mpi-2015/	91	Percent. This indicator identifies multiple deprivations at the household and individual level in health, education and standard of living. This analysis uses data from the USAID Demographic and Health Surveys (DHS), UNICEF Multiple Indicator Cluster Surveys (MICS), WHO World Health Surveys and national household surveys.
1	5	Rural poverty rate	World Bank World Development Indicators and own calculations http://data.worldbank.org/data-catalog/world-development-indicators	78	Percent. This indicator is the rural poverty headcount ratio at \$1.25 per day (PPP), as a percentage of rural population. Calculated by using share of rural headcount in poverty at national poverty lines to approximate share of rural headcount in poverty at \$1.25/day. Original sources include United Nations, Census reports of national offices, Eurostat, US Census Bureau.
Malnutrition					
Lack of Dietary Diversity					
1	6	Food consumption score (FCS)	World Food Programme	31	Percent. This indicator measures the percentage of the national population that falls into a 'poor' FCS score category, and 'borderline' category. Double weight is given to the result in the 'poor' category. The FCS score system is a measure of the frequency of consumption of different food groups consumed by a household during the 7 days before the survey.
1	7	Average protein supply	FAO Food Security Indicators http://faostat3.fao.org/home/E	109	Grams/capita/day. This indicator provides information on the quality of the diet. The indicator is calculated in three year averages to reduce the impact of possible errors in estimated DES (see above), due to the difficulties in properly accounting of stock variations in major food.
1	8	Percent of calories from staples	FAO Food Security Indicators http://faostat3.fao.org/home/E	109	Percent. This indicator expresses the energy supply (kcal/caput/day) provided by cereals, roots and tubers as a percentage of the total dietary energy supply (kcal/caput/day, see above indicator) calculated from the corresponding countries in the FAOSTAT food balance sheets.
Child Malnutrition					
1	9	Under 5 wasting	FAO Food Security Indicators http://faostat3.fao.org/home/E	110	Percent. This indicator measures the percentage of children under five whose weight for height is more than two standard deviations below the median for the international reference population for ages 0–59. Original source: WHO.
1	10	Under 5 stunting	FAO Food Security Indicators http://faostat3.fao.org/home/E	110	Percent. This indicator measures the percentage of stunting (height-for-age less than 2 standard deviations of the WHO Child Growth Standards median) among children aged 0–5 years. Original Source: WHO.
1	11	Anemia in children	World Bank World Development Indicators http://data.worldbank.org/data-catalog/world-development-indicators	111	Percent. This indicator measures the percentage of children under 5 with hemoglobin levels of less than 110 grams per liter at sea level. Original Source: WHO.
Agricultural Productivity Gap					
Output Gap					
1	12	Cereal yield (kg per hectare)	World Bank World Development Indicators http://data.worldbank.org/data-catalog/world-development-indicators	115	Kg/ha. This indicator measures the total yield per country for wheat, rice, maize, barley, oats, rye, millet, sorghum, buckwheat, and mixed grains. Cereal crops harvested for hay or harvested green for food, feed, or silage and those used for grazing are excluded. Qatar, Oman, Kuwait and UAE values are excluded due to extreme outliers. Original Source: FAO.
1	13	Agricultural value added per worker	World Bank World Development Indicators http://data.worldbank.org/data-catalog/world-development-indicators	116	Constant 2005 USD, logged. This indicator measures the output of the agricultural sector (ISIC divisions 1–5), less the value of intermediate inputs. Original Source: WB National Accounts & FAO.
1	14	Cold storage	Global Cold Chain Alliance	26	Cubic meters/agricultural value added. This indicator measures refrigerated warehouse capacity.
1	15	Family farm prevalence	FAO (Benjamin Graub) http://www.sciencedirect.com/science/article/pii/S0305750X15001217	47	Percent. This indicator measures the area of family farms (farms < 10ha, though based on individual criteria in certain cases, ha) as a percentage of total agricultural area (ha).

Developing Country Context: Indicators by Category					
		Indicator	Source	Country Coverage	Units, calculations used & descriptions
Technology Gap					
1	16	Percent of area devoted to modern varieties	CGIAR DIIVA (Diffusion and Impact of Improved Varieties in Africa database) http://www.asti.cgiar.org/diiva	33	Percent. This indicator measures the percentage of agricultural area for crops that is devoted to improved varieties: bananas, barley, beans, cassava, chickpeas, cowpeas, durum wheat, faba beans, field pea, groundnuts, lentils, maize, pearl millet, pigeon-peas, potatoes, rice, sorghum, soybeans, spring bread wheat, sweet potatoes, yams.
1	17	Agricultural TFP growth	US Department of Agriculture (Keith Fuglie) http://www.ers.usda.gov/data-products/international-agricultural-productivity.aspx	112	Percent. This indicator measures the rate of growth of total factor productivity in agriculture between 1961 and 2010. Original Source: FAO.
Infrastructure Gap					
1	18	Account at a formal financial institution, rural	World Bank FINDEX http://datatopics.worldbank.org/financialinclusion/	101	Percent. This indicator denotes the percentage of rural respondents (age 15+) with an account (self or together with someone else) at a bank, credit union, another financial institution (e.g., cooperative, microfinance institution), or the post office (if applicable). Includes respondents who reported having a debit card. Original Source: Demircuc-Kunt and Klapper, 2012.
1	19	Access to financing for farmers	EIU Global Food Security Index http://foodsecurityindex.eiu.com/	81	Discrete 0-4. This is a qualitative indicator that measures the availability of financing to farmers from the government, multilateral, and private sectors. Score of 4 is the best value.
1	20	Access to agricultural input markets	IFAD Rural Sector Performance Assessments http://info.worldbank.org/governance/wgi/index.aspx#-doc-sources	103	Discrete 1-6. 6: Good for three years 5: Government has substantially liberalized markets and removed rural market distorting policies and practices. 4: Government has made significant efforts to liberalize markets and reduce rural market distorting policies and practices. 3: Government has made efforts to commercialise agricultural inputs and produce markets and trading systems, but to a limited extent. 2: Government has not made efforts to liberalize agricultural markets and remove rural market distorting policies and practices. 1: Unsatisfactory for three years
1	21	Arable land equipped for irrigation	FAO Food Security Indicators http://faostat3.fao.org/home/E	118	Percent. This indicator is a three year average of the area of land equipped for irrigation as a share of total arable land.
1	22	Distance to fertilizer index	McArthur & McCord, 2014 http://www.brookings.edu/research/papers/2014/09/fertilizing-growth-economic-development-mcarthur-mccord	107	Index. This indicator is an indexed measure of transport costs to the nearest nitrogen fertilizer plant by measuring the average distance between the country's agricultural centroid to the closest fertilizer plant.
1	23	Road density	World Bank World Development Indicators http://data.worldbank.org/data-catalog/world-development-indicators	116	Km of road per 100 sq km of land area, logged. This indicator is the ratio of the length of the country's total road network to the country's land area. The road network includes all roads in the country: motorways, highways, main or national roads, secondary or regional roads, and other urban and rural roads. Original Source: IRF Geneva.
Vulnerability					
Environmental Shocks					
1	24	Total renewable water resources per capita	FAO Aquastat http://www.fao.org/nr/water/aquastat/sets/index.stm	115	Cubic meters/year/capita. This indicator is the annual total of actual renewable water resources per inhabitant expressed as the sum of internal renewable water resources and external actual renewable water resources, divided by the rural population. It corresponds to the maximum theoretical annual amount of water actually available for a country at a given moment.
1	25	Projected change in runoff	ND-GAIN Index - University of Notre Dame and Global Adaptation Index http://index.gain.org/	116	Percent. This indicator is a proxy for what climate change implies for surface water resources. The projected change is the percent change of annual runoff from the baseline projection (1980-2009) to the future projection (2040-2069) using a specific emission scenario (RCP4.5).
1	26	Projected change in agricultural yield	ND-GAIN Index - University of Notre Dame and Global Adaptation Index http://index.gain.org/	116	Percent. This indicator is a proxy for what climate change implies for agricultural yield. The projected change is the percent change of annual yield from the baseline projection (1980-2009) to the future projection (2040-2069)
1	27	Land degradation risk	World Agroforestry Centre (ICRAF), CGIAR	104	Percent. This indicator measures the percent area for each country where soil organic content (SOC) is low (<15 g kg ⁻¹) and soil erosion is higher than 50%. SOC shows the percentage of area area with < 15 g C kg ⁻¹ , while soil erosion shows the percentage of area with >50% erosion prevalence.
Production Shocks					
1	28	Volatility of agricultural production	USDA (Keith Fuglie) and own calculations http://www.ers.usda.gov/data-products/international-agricultural-productivity.aspx	111	Tonnes. This indicator is the coefficient of variation of agricultural production over the period 2000-2013 on detrended series per country (using 1970-2013 series). Original Source: FAO gross agricultural output.
1	29	Variation in cereal crop yields	World Bank World Development Indicators and own calculations http://data.worldbank.org/data-catalog/world-development-indicators	116	Tonnes/ha. This indicator is the coefficient of variation of cereal crop yields over the period 2000-2013 on detrended series per country (using 1970-2013 series). Original Source: FAO.
1	30	Food production variability	FAO Food Security Indicators and own calculations http://faostat3.fao.org/home/E	110	USD/person. This indicator is the coefficient of variation of food production over the period 2000-2013 on detrended series per country (using 1970-2013 series).

Developing Country Context: Indicators by Category					
		Indicator	Source	Country Coverage	Units, calculations used & descriptions
Consumption Shocks					
1	31	Household exposure to food price shocks	EIU Global Food Security Index, FAO Food Security Indicators, and own calculations http://faostat3.fao.org/home/E	69	Index. This indicator is the product of the percentage of household expenditure that is spent on food at a national level (from EIU) and the Domestic food price volatility index (from FAO). Original Data for Percentage of Household Expenditure on Food: FAO, UN Original data for Volatility Index: FAO, ILO, World Bank ICP
1	32	Country in receipt of emergency food aid for 8–10 years	OECD Creditor Reporting System https://stats.oecd.org/Index.aspx?DataSetCode=CRS1	100	Binary 0/1. This indicator counts whether a country has been receiving food aid for at least 8 years during the 10-year period of 2004–2013 based on Creditor Reporting System (CRS) info and thereby highlights chronic food aid recipients.
2. Policies					
Agricultural Economic Policy					
Rural Investment Climate					
2	1	Investment climate for rural businesses	IFAD Rural Sector Performance Assessments http://info.worldbank.org/governance/wgi/index.aspx#-doc-sources	103	Discrete 1–6. 6: Good for three years 5: Government has made major efforts to encourage private traders to open a business 4: Government is making efforts to encourage private traders to open a business 3: Government efforts to encourage private traders to open a business are weak 2: The policy and institutional framework effectively discourages the emergence of rural private businesses with legal status. 1: Unsatisfactory for three years
2	2	Policy framework for rural organizations	IFAD Rural Sector Performance Assessments http://info.worldbank.org/governance/wgi/index.aspx#-doc-sources	103	Discrete 1–6. 6: Good for three years 5: Government is pro-active in its political and legal support for the establishment of conditions conducive to the development of organizations of the rural poor. 4: Government may make efforts to create the conditions conducive to the establishment of organizations of rural poor people 3: While the government may not be officially opposed to the existence of organizations of the rural poor, it makes no effort to create the conditions that facilitate their development. 2: The government opposes efforts of the rural poor to organize or to strengthen their representation. 1: Unsatisfactory for three years
2	3	Accountability in rural areas	IFAD Rural Sector Performance Assessments http://info.worldbank.org/governance/wgi/index.aspx#-doc-sources	103	Discrete 1–6. 6: Good for three years 5: Government has fully decentralized administrative and fiscal authority to the local level 4: Government has done much to decentralize administrative and fiscal authority to the local level 3: Government has a policy of decentralizing limited administrative authority to the local level, but this is not accompanied by fiscal decentralization or the institutional reforms and safeguards necessary to enhance transparency and accountability and to eliminate local corruption. 2: Government has no effective policy for decentralizing administrative or fiscal authority. 1: Unsatisfactory for three years
2	4	Access to land	IFAD Rural Sector Performance Assessments http://info.worldbank.org/governance/wgi/index.aspx#-doc-sources	103	Discrete 1–6. 6: Good for three years 5: A range of land access mechanisms is available to rural poor households, including women, indigenous populations and other vulnerable groups, and their land access is generally secure. 4: A majority of rural poor households, including women, indigenous populations and other vulnerable groups, have access to land. 3: A majority of rural poor households have access to some land, though this access is often insecure. 2: Rural poor households typically have either no access, or at best insecure access, to land. 1: Unsatisfactory for three years
2	5	Access to water for agriculture	IFAD Rural Sector Performance Assessments http://info.worldbank.org/governance/wgi/index.aspx#-doc-sources	103	Discrete 1–6. 6: Good for three years 5: Government is actively pursuing a clear and equitable strategy for water resources management that recognizes the imperatives of agricultural water use 4: Government has a water resources management strategy that provides an integrated framework for equitable water resources allocation 3: Government may have a water resources management strategy, but does not use it effectively to manage the allocation of water resources. 2: Government policy (or PRSP where it exists) does not highlight the need for an equitable allocation of water resources for agriculture. 1: Unsatisfactory for three years
2	6	Enabling conditions for rural financial services	IFAD Rural Sector Performance Assessments http://info.worldbank.org/governance/wgi/index.aspx#-doc-sources	103	Discrete 1–6. 6: Good for three years 5: Government development plans (including PRSPs) fully recognize the importance of a well-functioning rural finance subsector 4: Development plans recognize the important role of financial services in the rural development process 3: Government development plans make general supportive comments on the importance of rural finance and access for the rural poor 2: The role of rural finance (including but not restricted to credit) and access for the rural poor is not adequately recognized in government policies 1: Unsatisfactory for three years

Developing Country Context: Indicators by Category					
		Indicator	Source	Country Coverage	Units, calculations used & descriptions
2	7	Dialogue with rural organizations	IFAD Rural Sector Performance Assessments http://info.worldbank.org/governance/wgi/index.aspx#doc-sources	103	Discrete 1–6. 6: Good for three years 5: There are well-established political processes for rural organizations to enter into dialogue with government at all levels 4: There is a process for rural organizations to enter into dialogue with government or to lobby government 3: There is no direct or transparent process for rural organizations to enter into dialogue with government 2: There is no process or opportunity for rural organizations to enter into dialogue with government. 1: Unsatisfactory for three years
2	8	Corruption	Worldwide Governance Indicators http://info.worldbank.org/governance/wgi/index.aspx#home	117	Index. This indicator captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as “capture” of the state by elites and private interests. Original Source: 22 individual sources.
2	9	Political stability	Worldwide Governance Indicators http://info.worldbank.org/governance/wgi/index.aspx#home	117	Index. This indicator captures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. Original Source: 9 individual sources.
2	10	Rule of law	Worldwide Governance Indicators http://info.worldbank.org/governance/wgi/index.aspx#home	117	Index. This indicator captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular, the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Original Source: 23 individual sources.
2	11	Doing business index	World Bank http://www.doingbusiness.org/data	114	Index. This indicator uses a similar distance-to-frontier methodology in order to rank countries based on their ease of doing business. Higher rankings (a low numerical value) indicate better, usually simpler, regulations for businesses and stronger protections of property rights. Original Source: Mailed questionnaires to business and other stakeholders.
Agricultural Pricing and Trade Distortions					
2	12	Nominal rate of assistance	World Bank (Anderson et. al.) www.worldbank.org/agdistortions	46	Percent. This indicator measures to what extent the domestic producer prices exceeds the border price. This domestic-to-border-price-ratio is set up to be negative if farmers receive less than the price at the country's border for a similar product and positive if the opposite is the case. Original Source: OECD, FAO, World Bank. We have taken the absolute value of these values in order to be able to capture market distortions in either direction of support.
2	13	Relative rate of assistance	World Bank (Anderson et. al.) www.worldbank.org/agdistortions	41	Percent. This indicator is the ratio of protection of agricultural tradables in comparison to non-agricultural tradables. We have taken the absolute value of these values in order to be able to capture market distortions in either direction of support. Original Source: OECD, FAO, World Bank.
2	14	Consumer tax equivalent of farmer support	World Bank (Anderson et. al.) www.worldbank.org/agdistortions	47	Percent. This indicator measures consumer protection similar to NRA above. It differs from the NRA if there are government interventions in place other than border interventions, i.e. domestic taxes and subsidies, exchange rate interventions. Original Source: OECD, FAO, World Bank. We have taken the absolute value of these values in order to be able to capture market distortions in either direction of support.
2	15	Welfare reduction index	World Bank (Anderson et. al.) www.worldbank.org/agdistortions	47	Percent. This indicator measures the global welfare effects of government interventions in the markets for traded products, by taking into account the fact that the welfare cost of a price distortion is proportional to the square of the tax or subsidy rate: the larger the variance in assistance levels within a sector, the greater the potential for resources to be used in activities which do not maximize economic welfare. Original Source: OECD, FAO, World Bank.
2	16	Non-tariff barriers, agriculture	WTO https://www.wto.org/english/res_e/statis_e/itip_e.htm	71	Percent. This indicator measures the total number of non-tariff measures (Anti dumping, Countervailing, Safeguards, Sanitary and Phytosanitary [Regular], Special Safeguards, and Technical Barriers to Trade) initiated by a country between 01/01/2009 to 31/12/2013 on agricultural products as a percentage of total measures initiated by all countries on agricultural products for this time period.
2	17	Average applied MFN tariff, agriculture	WTO https://www.wto.org/english/res_e/statis_e/itip_e.htm	104	Percent. This indicator represents the simple, average applied most-favored-nation (MFN) tariff for agricultural products.
2	18	Trade bias index	World Bank (Anderson et. al.) www.worldbank.org/agdistortions	44	Percent. This indicator measures the support to the importing-competing agricultural sector compared to the exporting agricultural sector. Original Source: OECD, FAO, World Bank. We have taken the absolute value of these values in order to be able to capture market distortions in either direction of support.
2	19	Trade reduction index	World Bank (Anderson et. al.) www.worldbank.org/agdistortions	47	Percent. This indicator captures the aggregate trade- and welfare-reducing effects of all policies that affect consumer and producer prices of farm products from all price-distorting policy measures in place. The trade reduction index (TRI) offers an indication of the world trade effects of government interventions in the markets for traded products, by properly accommodating trade subsidies alongside trade taxes. Original Source: OECD, FAO, World Bank.
2	20	Time to export	World Bank World Development Indicators http://data.worldbank.org/data-catalog/world-development-indicators	114	Days. This indicator measures the length of time needed to export a given good. The time calculation for a procedure starts from the moment it is initiated and runs until it is completed. Original Source: Doing Business.
2	21	Logistics performance index, transport	World Bank World Development Indicators http://data.worldbank.org/data-catalog/world-development-indicators	112	Index. This indicator is logistics professionals' perceptions of a country's quality of trade and transport related infrastructure (e.g. ports, railroads, roads, information technology). Scores are averaged across all respondents
2	22	Peak tariffs	WTO and own calculations https://www.wto.org/english/res_e/statis_e/itip_e.htm	100	Percent. This indicator measures the share of agricultural tariff lines (at the 6 digit Harmonized System code level) which have an average ad valorem duty for MFN applied tariffs of >15%.

Developing Country Context: Indicators by Category					
		Indicator	Source	Country Coverage	Units, calculations used & descriptions
Research, Skills, Extension					
2	23	Agricultural R&D as percent of agricultural GDP	Agricultural Science and Technology Indicators (ASTI) – IFPRI http://www.asti.cgiar.org/globaloverview	54	Percent. This indicator measures public (government, higher education and non-profit) spending on agricultural research and development as a share of agricultural GDP.
2	24	Access to agricultural extension services	Institute of Development Studies (IDS) Hunger And Nutrition Commitment Index http://www.hancindex.org/the-index/	45	Discrete 1–6. 6: Good for three years 5: Government encourages the development of complementary pluralistic research and extension services... 4: Public agricultural research and extension have made major efforts to improve the participation of poor farmers in setting priorities 3: The agricultural research and extension system is weak and does not address the needs of poor farmers. 2: Extension services are the exclusive preserve of government, and poor farmers have no say in setting priorities or in controlling funds for agricultural research and extension 1: Unsatisfactory for three years Original Source: IFAD Rural Sector Performance Assessments.
2	25	Share of researchers with PhD	ASTI, IFPRI http://www.asti.cgiar.org/globaloverview	53	Number/rural capita. This indicator measures the number of PhD-qualified agricultural researchers per rural capita in a given country.
2	26	Share of female researchers	ASTI, IFPRI http://www.asti.cgiar.org/globaloverview	53	Number/rural capita. This indicator represents the number of female agricultural researchers per rural capita in a given country.
Political Prioritization					
Agriculture					
2	27	Agricultural spending intensity	IFPRI Statistics of Public Expenditure for Economic Development (SPEED) http://hdl.handle.net/1902.1/19525	83	Percent. This indicator is government national agriculture expenditure as a percentage of agricultural GDP. Original Source: IMF, World Bank, national accounts.
2	28	Degree to which FNS features in citizen priorities	MyWorld http://peoplesvoiceschallenge.org/data/	117	Percent. This indicator measures the share of a country's total responses that listed priority 109 = "Affordable and nutritious food" as one of the six priorities in the MyWorld survey for a given year.
2	29	Allocation and management of resources for rural development	IFAD Rural Sector Performance Assessments http://info.worldbank.org/governance/wgi/index.aspx#-doc-sources	103	Discrete 1–6. 6: Good for three years 5: The national development plan (or PRSP) and budget document emphasize the important role that the agricultural and rural development sector must play in poverty reduction and economic growth; sector policy/policies are consistent with that analysis and advocate an appropriate approach for reducing rural poverty and promoting broad-based growth. 4: The national development plan (or PRSP) and budget document emphasizes the important role that the agricultural and rural development sector must play in poverty reduction and economic growth. 3: The national development plan (or PRSP) and budget document give some emphasis to agriculture and rural development; but the sectoral policy/policies do not provide a strong basis for reducing rural poverty and promoting broad-based growth. 2: The national development plan (or PRSP, where there is one) and budget document give little emphasis to agriculture and rural development; and the sector policy/policies are not appropriate as a basis for reducing rural poverty and promoting broad-based growth. 1: Unsatisfactory for three years
Nutrition					
2	30	National dietary guidelines	EIU Global Food Security Index http://foodsecurityindex.eiu.com/	81	Binary 0/1. This indicator measures whether the government has established guidelines for a balanced and nutritious diet. Original Source: qualitative scoring by EIU analysts based on WHO, FAO, and national health ministry documents.
2	31	Time bound nutrition targets	IDS Hunger And Nutrition Commitment Index http://www.hancindex.org/the-index/	45	Binary 0/1. This indicator measures whether governments identify time bound nutrition targets in public policy documents. Original source: Save the Children.
2	32	Governments promote complementary feeding	IDS Hunger And Nutrition Commitment Index http://www.hancindex.org/the-index/	45	Binary 0/1. This indicator measures whether governments promote complementary feeding practices of children aged 6–9 months and continued breastfeeding of children at ages 12–15 and 20–23 months. Original source: Sun Reports/World Breast Feeding Trends Initiative.
2	33	Food safety score	World Health Organisation http://apps.who.int/gho/data/node.imr.IHR11?lang=en	99	Percent. This indicator measures the percentage of the WHO's recommended International Health Regulations related to food safety that have been attained.
Rural Social Assistance					
2	34	Food safety net programs	EIU Global Food Security Index http://foodsecurityindex.eiu.com/	81	Score. This qualitative indicator (scoring by EIU analysts) measures the variety of public incentives to protect the poor from food-related shocks. This indicator considers food safety net programmes, which include in-kind food transfers (ie food vouchers), and the existence of school feeding programmes by the government, NGOs, or multilateral sector.
2	35	Social safety net Coverage	World Bank ASPIRE http://datatopics.worldbank.org/aspire/home	78	Percent. This indicator measures the percentage of the poorest 20% of rural population participating in social assistance programs (includes direct and indirect beneficiaries). Original Source: Household Surveys.
2	36	Social safety net benefit incidence	World Bank ASPIRE http://datatopics.worldbank.org/aspire/home	78	Percent. This indicator measures the percentage of benefits going to the poorest quintile(rural) of the post-transfer (or pre-transfer) welfare distribution relative to the total benefits going to the population, for social assistance programs. Original Source: Household Surveys.
2	37	Social safety net adequacy	World Bank ASPIRE http://datatopics.worldbank.org/aspire/home	65	Percent. This indicator measures the percentage of the total transfer amount received by all beneficiaries in poorest quintile (rural) as a share of the total welfare of beneficiaries in that quintile, for social assistance programs. Original Source: Household Surveys.

Developing Country Context: Indicators by Category					
		Indicator	Source	Country Coverage	Units, calculations used & descriptions
Women's Enabling Environment					
2	38	Secure access to land	OECD Social Institutions and Gender Index http://genderindex.org/	109	Index 0–1. This indicator measures whether women and men have equal and secure access to land use, control and ownership. 0: The law guarantees the same rights to own, use and control land to both women and men 0.5: The law guarantees the same rights to own, use and control land to women and men, but there are some customary, traditional or religious practices that discriminate against women 1: The law does not guarantee the same rights to own, use and control land to women and men, or women have no legal rights to own, use and control land. Original Source: Reports, surveys from specific country or region.
2	39	Access to financial services	OECD Social Institutions and Gender Index http://genderindex.org/	109	Index 0–1. This indicator measures whether women and men have equal access to financial services. 0: The law guarantees the same rights to access formal financial services (e.g. credit, bank account and bank loans) to both women and men 0.5: The law guarantees the same rights to access formal financial services to both women and men, but there are some customary, traditional or religious practices that discriminate against women 1: The law does not guarantee the same rights to access formal financial services to women and men, or women have no legal rights to access financial services. Original Source: Reports, surveys from specific country or region.
3. Resources					
Public Investment					
Domestic Public Investment					
3	1	Government spending on agriculture	IFPRI SPEED, World Bank World Development Indicators, World Bank BOOST database and World Bank Public Expenditure Reviews http://wbi.worldbank.org/boost/	118	Constant 2013 USD/rural capita. This indicator measures government national agriculture expenditure (disbursements). Qatar and Kuwait values are excluded due to extreme outliers in public spending. Original Source: IMF, World Bank, national accounts
Official Development Assistance					
3	2	ODA to FNS	OECD Creditor Reporting System https://stats.oecd.org/Index.aspx?DataSetCode=CRS1	118	Constant 2013 USD/rural capita. This indicator measures official development assistance received by developing countries via all channels minus Other Official Flows. Qatar and Kuwait values are excluded due to extreme outliers in public spending. Values are from gross disbursements, for purposecodes identified as being agriculture and food security relevant.
3	3	ODA to FNS – China	AidData http://china.aiddata.org/	118	Constant 2013 USD/rural capita. This indicator measures the estimated Chinese aid to the agriculture sector by country, based on a JICA–RI paper, China MOFCOM 2009 and 2011 foreign assistance White Papers, and AidData China–Africa dataset. Qatar and Kuwait values are excluded due to extreme outliers in public spending. The values represent disbursements for all projects in the database whose status is either completed or in implementation.
Other Official Flows					
3	4	Official flows to FNS – India	AidData http://aiddata.org/	118	Constant 2013 USD/rural capita. This indicator represents the sum of amounts committed for purposecodes identified as being agriculture and food security relevant in AidData's main dataset for India. This indicator is expressed as a three-year moving average of the original data, to correct for the lumpiness of the data. Qatar and Kuwait values are excluded due to extreme outliers in public spending. Original Source: Ministry of External Affairs, India and Exim Bank of India.
3	5	Official flows to FNS – Brazil	AidData http://aiddata.org/	118	Constant 2013 USD/rural capita. This indicator measures the sum of amounts committed for purposecodes identified as being agriculture and food security relevant in AidData main dataset for Brazil. This indicator is expressed as a three-year moving average of the original data, to correct for the lumpiness of the data. Qatar and Kuwait values are excluded due to extreme outliers in public spending. Original Source: Agência Brasileira de Cooperação (ABC) of Brazil.
3	6	Other official flows (DAC)	AidData http://aiddata.org/	118	Constant 2013 USD/rural capita. Qatar and Kuwait values are excluded due to extreme outliers in public spending. This indicator captures the transactions by the official sector with aid recipient countries which do not meet the conditions for eligibility as Official Development Assistance or Official Aid, either because they are not primarily aimed at development, or because they have a Grant Element of less than 25 per cent.
Private External Investment					
Foreign Direct Investment					
3	7	FDI to agriculture	Financial Times FDI Markets http://www.fdimarkets.com/	118	Constant 2013 USD/rural capita. This indicator measures the FDI inflows (commitments) to the following subsectors from all source countries in the Financial Times database: all other food, animal food, animal production, animal slaughtering and processing, coffee and tea, crop production, dairy products, fishing hunting and trapping, food and vegetables and specialist foods, grains and oilseed, sugar and confectionary products. Qatar and Kuwait values are excluded due to extreme outliers in public spending. This indicator is expressed as a three-year moving average of the original data, to correct for the lumpiness of the data.
US NGOs and Philanthropy					
3	8	Philanthropy	AidData http://aiddata.org/	118	Constant 2013 USD/rural capita. This indicator measures the sum of amounts committed to ag/forestry/fishing and dev aid/food security in AidData aggregate search. Qatar and Kuwait values are excluded due to extreme outliers in public spending. Original Source: US Foundations.
3	9	NGO	InterAction http://ngoaidmap.org/	118	Constant 2013 USD/rural capita. This indicator measures the sum of incoming project budgets (commitments) in the InterAction Food Security database. Qatar and Kuwait values are excluded due to extreme outliers in public spending. This indicator is expressed as a three-year moving average of the original data, to correct for the lumpiness of the data.

Appendix 3.b: Developed country list of indicators

Developed Country: Indicators by Category			
Indicator	Source	Country Coverage	Units, calculations used & descriptions
1. Domestic Agriculture and Biofuel Policy			
Producer Subsidies†			
1.1 Producer Support Estimate (PSE)	OECD Producer and Consumer Support Estimates database; European Commission; and own calculations http://www.oecd.org/tad/agricultural-policies/producerandconsumersupportestimatesdatabase.htm	29	Percent. This indicator measures the annual monetary value of gross transfers from consumers and taxpayers to support agricultural producers, measured at farm gate level, arising from policy measures, regardless of their nature, objectives or impacts on farm production or income. Expressed as a percentage of agricultural GDP.
1.2 General Services Support Estimate (GSSE)	OECD Producer and Consumer Support Estimates database; European Commission; and own calculations http://www.oecd.org/tad/agricultural-policies/producerandconsumersupportestimatesdatabase.htm	29	Percent. This indicator measures the annual monetary value of gross transfers to services provided collectively to agriculture and arising from policy measures which support agriculture, regardless of their nature, objectives and impacts on farm production, income, or consumption of farm products. Expressed as a percentage of agricultural GDP.
1.3 Support* to the marine sector	OECD Agriculture Statistics database and own calculations http://stats.oecd.org/BrandedView.aspx?oecd_bv_id=agr-data-en&doi=-data-00220-en	22	Percent. This indicator measures government financial transfers (GFTs) to the marine sector, contribution from direct payments, cost reducing transfers, general services, and cost recovery charges. Expressed as a percentage of agricultural GDP.
1.4 Support* to the aquaculture sector	OECD Agriculture Statistics database and own calculations http://stats.oecd.org/BrandedView.aspx?oecd_bv_id=agr-data-en&doi=-data-00220-en	20	Percent. This indicator measures government financial transfers (GFTs) to the aquaculture sector, contribution from direct payments, cost reducing transfers, general services, and cost recovery charges. Expressed as a percentage of agricultural GDP.
1.5 Support* to the marine marketing and processing sector	OECD Agriculture Statistics database and own calculations http://stats.oecd.org/BrandedView.aspx?oecd_bv_id=agr-data-en&doi=-data-00220-en	20	Percent. This indicator measures the government financial transfers (GFTs) to the marine marketing and processing sector, contribution from direct payments, cost reducing transfers, general services, and cost recovery charges. Expressed as a percentage of agricultural GDP.
1.6 Support to the production of biofuels	OECD Fertiliser and biofuels support policies database; World Bank Commodity Price Data; FAOStat and own calculations http://www.oecd.org/tad/agricultural-policies/support-policies-fertilisers-biofuels.htm	20	Percent. This indicator measures the sum of dollar amounts for: measures in place to support the production of biofuel stocks and livelihood of biofuel producers. Expressed as a percentage of agricultural GDP.
Trade Restrictions			
1.7 Simple Average Applied MFN tariff, agricultural products	WTO https://www.wto.org/english/res_e/statistics_e/itip_e.htm	28	Percent. This indicator represents the simple Average Applied Most Favored Nations (MFN) tariff for agricultural products.
1.8 Peak Tariffs	WTO and own calculations http://tariffdata.wto.org/default.aspx	29	Percent. This indicator represents the share of agricultural tariff lines (at the 6 digit Harmonized System (HS) code level) which have an average ad valorem duty for MFN applied tariffs of >15%.
1.9 MFN applied tariff for biofuel feedstocks	OECD Fertiliser and biofuels support policies database; World Bank Commodity Price Data (The Pink Sheet) and own calculations http://www.oecd.org/tad/agricultural-policies/support-policies-fertilisers-biofuels.htm	20	Percent. This indicator represents the simple average of MFN applied tariffs for biofuel feedstocks (specific, ad-valorem, ad-valorem equivalent).
1.10 Non-tariff barriers, agriculture	WTO and own calculations https://www.wto.org/english/res_e/statistics_e/itip_e.htm	16	Percent. This indicator measures the total number of non-tariff measures (Anti dumping [ADP], Countervailing [CV], Safeguards [SG], Sanitary and Phytosanitary [SPS] [Regular], Special Safeguards [SSG], Technical Barriers to Trade [TBT]) initiated by a country between 01/01/2009 to 31/12/2013, on agricultural products; as a share of total measures initiated by all countries on agricultural products for this time period.
2. FNS Aid Policy			
Volume			
2.1 Share of food security aid in GNI	OECD Creditor Reporting System, World Bank GNI and own calculations https://stats.oecd.org/Index.aspx?DataSetCode=CRS1	29	Percent. This indicator measures ODA to FNS (excluding nutrition and AR4D) as a percentage of GNI.
2.2 Share of Nutrition aid in GNI	OECD Creditor Reporting System, World Bank GNI and own calculations https://stats.oecd.org/Index.aspx?DataSetCode=CRS1	25	Percent. This indicator measures ODA to nutrition as a percentage of GNI.
2.3 Share of Agricultural Research aid in GNI	OECD Creditor Reporting System, World Bank GNI and own calculations https://stats.oecd.org/Index.aspx?DataSetCode=CRS1	27	Percent. This indicator measures ODA to AR4D as a percentage of GNI.

Developed Country: Indicators by Category			
Indicator	Source	Country Coverage	Units, calculations used & descriptions
Targeting			
Needs			
2.4 Extent of FNS aid to food insecure	OECD Creditor Reporting System and own calculations https://stats.oecd.org/Index.aspx?DataSetCode=CRS1	29	Percent. This indicator is a measure of the extent to which ODA to FNS is disbursed in recipient countries with high FNS needs. ODA to FNS is weighted using the overall Needs Scores from the developing country index.
Policies			
2.5 Extent of FNS aid to countries with strong FNS policies and commitments	OECD Creditor Reporting System and own calculations https://stats.oecd.org/Index.aspx?DataSetCode=CRS1	29	Percent. This indicator is a measure of the extent to which ODA to FNS is disbursed in recipient countries with strong FNS policies. ODA to FNS is weighted using the overall Policies Scores from the developing country index.
Resources			
2.6 Extent of FNS aid to low resources	OECD Creditor Reporting System and own calculations https://stats.oecd.org/Index.aspx?DataSetCode=CRS1	29	Percent. This indicator is a measure of the extent to which ODA to FNS is disbursed in recipient countries with limited resources available for FNS. ODA to FNS is weighted using the Total Resources per capita data (standardized to a 0–1 scale) from the developing country index.
Quality of Implementation			
Tied FNS aid			
2.7 Share of food aid that is untied	OECD Creditor Reporting System and own calculations https://stats.oecd.org/Index.aspx?DataSetCode=CRS1	28	Percent. This indicator measures the share of ODA to FNS that is classified as untied according to CRS.
Fragmentation			
2.8 FNS Median project size	OECD Creditor Reporting System and own calculations https://stats.oecd.org/Index.aspx?DataSetCode=CRS1	28	Logged, constant 2013 USD. This indicator measures the median project size for each donor.
2.9 Significance of aid relationship, FNS	OECD Creditor Reporting System and own calculations https://stats.oecd.org/Index.aspx?DataSetCode=CRS1	29	Rank. This indicator ranks donors by ODA size in a country for FNS and gives them a score based on their average per-country FNS rank.
2.10 Revealed Comparative Advantage in FNS	OECD Creditor Reporting System and own calculations https://stats.oecd.org/Index.aspx?DataSetCode=CRS1	29	Binary 0/1. This indicator measures the share of donor's ODA to agriculture that is disbursed in countries where the donor has a revealed comparative advantage (RCA>1). The RCA compares the ratios of the donor's aid to a partner country relative to global aid to that partner and the donor's total aid flows to all its partner countries relative to its total global aid.
2.11 Support to global FNS multilaterals	OECD Creditor Reporting System and own calculations https://stats.oecd.org/Index.aspx?DataSetCode=CRS1	26	Percent. This indicator measures the core contributions extended to multilaterals in the FNS sector (CGIAR, FAO, IFAD, WFP) and contributions received by GAFSP (both public and private sector windows), divided by donor's total ODA to FNS.
Volatility			
2.12 Volatility of aid to FNS	OECD Creditor Reporting System and own calculations https://stats.oecd.org/Index.aspx?DataSetCode=CRS1	27	Constant 2013 USD. This indicator represents the coefficient of ODA variation over the period 2000–2013 on detrended series per recipient country (using 2000–2013 series).
Gender Focus			
2.13 Gender focus of aid to FNS	OECD Creditor Reporting System and own calculations https://stats.oecd.org/Index.aspx?DataSetCode=CRS1	29	Percent. This indicator measures the share of gender marked projects that are either marked significant or principal. Significant is weighted 0.5, Principal is weighted as 1.
Climate Change Focus			
2.14 Climate Change mitigation focus of aid to FNS	OECD Creditor Reporting System and own calculations https://stats.oecd.org/Index.aspx?DataSetCode=CRS1	29	Percent. This indicator measures the share of climate change mitigation marked projects that are either marked significant or principal. Significant is weighted 0.5, Principal is weighted as 1.
2.15 Climate Change adaptation focus of aid to FNS	OECD Creditor Reporting System and own calculations https://stats.oecd.org/Index.aspx?DataSetCode=CRS1	29	Percent. This indicator measures the share of climate change mitigation marked projects that are either marked significant or principal. Significant is weighted 0.5, Principal is weighted as 1.
Research Focus			
2.16 Share of FNS aid to agricultural research	OECD Creditor Reporting System and own calculations https://stats.oecd.org/Index.aspx?DataSetCode=CRS1	27	Percent. This indicator measures the share of ODA to FNS going to Agricultural Research
*Sum of direct Payments, cost reducing transfers, general services and cost recovery charges to each sector			
†Raw sum of the follow six indicators, then rescaled and inverted			

Appendix 4.a: Full list of scores, developing countries

ERH Index Score: 0–100

Grey = Missing data

Needs

Higher Scores = Greater Needs

Ranked from Lowest to Greatest Needs

Policies

Higher Scores = Stronger Policies

Ranked from Strongest to Weakest Policies

Resources

\$ per rural capita

Ranked from Most to Fewest Resources

Country	Needs					Policies			Resources		
	OVERALL SCORE (RANK)	Access to Food	Malnutrition	Agricultural Productivity Gap	Vulnerability	OVERALL SCORE (RANK)	Agricultural Economic Policy	Political Prioritization	\$ per rural capita (RANK)*	Public Investment	Private External Investment
Afghanistan	70 (106)	69	76	79	57	35 (102)	28	42	39 (67)	39	0
Albania	20 (5)	17	19	20	23	59 (37)	67	50	85 (37)	83	2
Algeria	37 (49)	3	32	45	68	30 (110)	36	24	176 (22)	175	0
Angola	66 (97)	63	73	69	57	36 (99)	38	33	177 (21)	163	13
Argentina	19 (3)	7	2	47	21	66 (20)	58	73	579 (3)	337	242
Armenia	27 (20)	20	20	29	37	68 (12)	73	64	142 (28)	142	0
Azerbaijan	32 (35)	23	41	39	24	52 (56)	54	50	35 (75)	33	1
Bahrain	25 (17)	6	16	16	63	61 (29)	60	62	206 (16)	118	88
Bangladesh	51 (69)	51	69	35	47	42 (86)	38	46	15 (104)	15	1
Belarus	19 (2)	9	8	31	28	66 (18)	55	77	564 (4)	554	10
Benin	64 (94)	60	72	68	59	55 (46)	76	34	28 (86)	28	0
Bolivia	50 (67)	44	50	69	38	60 (32)	59	61	80 (41)	63	17
Bosnia	22 (10)	10	19	27	34	54 (52)	62	47	38 (70)	29	8
Botswana	50 (68)	49	49	63	41	56 (45)	66	45	258 (11)	258	
Brazil	17 (1)	6	5	38	21	73 (8)	83	63	258 (10)	221	38
Bulgaria	38 (52)	44	19	42	47	71 (10)	67	75	116 (31)	85	32
Burkina Faso	70 (105)	67	68	86	59	46 (72)	49	43	39 (68)	37	2
Burundi	71 (108)	90	52	89	54	36 (100)	31	40	16 (103)	13	3
C. African Rep.	75 (113)	92	68	85	54	23 (116)	22	25	18 (100)	9	8
Cambodia	54 (75)	48	76	43	51	46 (73)	42	49	20 (98)	16	4
Cameroon	54 (72)	57	50	63	45	42 (87)	60	24	86 (36)	25	61
Chad	76 (115)	81	84	84	56	28 (113)	31	25	14 (107)	12	3
Chile	21 (7)	10	14	32	28	80 (2)	82	78	301 (9)	260	41
China	22 (8)	14	20	32	22	75 (5)	63	86	153 (25)	150	3
Colombia	32 (36)	23	24	48	32	62 (24)	54	70	65 (50)	63	2
Congo	70 (103)	78	67	78	55	44 (80)	36	53	72 (46)	36	36
Congo DRC	73 (110)	86	71	89	45	26 (115)	29	23	8 (113)	7	1
Costa Rica	22 (9)	15	15	39	21	73 (9)	70	75	187 (19)	159	28
Cuba	37 (51)	8	20	61	60	75 (6)	62	88	186 (20)	186	0
Cyprus	34 (42)	43	10	39	46	83 (1)	73	92	617 (2)	617	
Côte d'Ivoire	55 (78)	48	62	69	40	32 (105)	33	31	33 (78)	20	13
Dominican Rep.	25 (16)	32	26	19	24	50 (59)	38	63	88 (35)	81	7
Ecuador	30 (30)	29	31	40	20	61 (31)	54	68	54 (55)	52	2
Egypt	28 (26)	7	40	30	36	55 (50)	60	49	35 (72)	32	4
El Salvador	36 (45)	26	32	47	38	55 (49)	61	48	40 (65)	39	1
Eritrea	89 (116)		85	90	92	36 (98)	26	46	11 (109)	11	
Ethiopia	65 (96)	73	70	68	50	43 (84)	45	41	29 (84)	27	2
Gabon	41 (58)	36	38	66	25	40 (92)	42	37	345 (7)	198	147
Gambia	55 (77)	53	52	79	34	44 (81)	44	45	45 (62)	45	
Georgia	40 (56)	31	31	61	36	65 (21)	72	57	58 (54)	24	34
Ghana	54 (74)	36	61	67	53	45 (77)	54	36	35 (74)	31	3
Guatemala	43 (61)	34	49	45	45	56 (44)	45	67	34 (76)	27	8
Guinea	62 (88)	72	67	71	38	29 (111)	28	30	8 (112)	8	0
Guinea-Bissau	64 (95)	74	64	62	58	31 (107)	28	35	28 (88)	28	
Haiti	58 (82)	81	54	55	42	48 (66)	50	46	46 (59)	41	5
Honduras	37 (50)	35	37	51	26	46 (74)	40	51	39 (66)	35	5
Hungary	30 (28)	41	12	36	30	78 (3)	71	85	240 (14)	214	25
India	51 (71)	47	80	35	42	53 (55)	62	43	22 (94)	22	1
Indonesia	43 (62)	25	70	41	37	58 (41)	54	61	26 (91)	21	5

Country	Needs					Policies			Resources		
	OVERALL SCORE (RANK)	Access to Food	Malnutrition	Agricultural Productivity Gap	Vulnerability	OVERALL SCORE (RANK)	Agricultural Economic Policy	Political Prioritization	\$ per rural capita (RANK)*	Public Investment	Private External Investment
Iran	33 (40)	30	26	52	24	51 (58)	49	52	46 (60)	45	1
Iraq	54 (73)	28	54	57	77	34 (103)	27	41	24 (93)	22	2
Jordan	27 (21)	3	22	34	49	54 (53)	65	42	81 (40)	67	14
Kazakhstan	24 (14)	4	12	58	22	57 (42)	56	58	127 (29)	125	2
Kenya	59 (84)	64	51	68	54	44 (82)	54	34	22 (95)	20	2
Kuwait	26 (19)	4	8	34	60	64 (22)	67	62			
Kyrgyzstan	31 (33)	16	31	65	11	48 (65)	54	43	28 (89)	23	5
Lao PDR	55 (79)	55	57	50	58	53 (54)	46	60	28 (87)	26	3
Lebanon	33 (39)	12	22	35	62	56 (43)	71	42	77 (44)	77	0
Lesotho	61 (86)	56	61	64	65	54 (51)	50	59	35 (71)	35	0
Liberia	75 (114)	90	77	85	49	40 (91)	38	43	156 (23)	37	119
Libya	30 (32)	24	27	46	26	41 (88)	41	41	188 (18)	187	1
Macedonia	24 (13)	17	12	23	41	68 (14)	66	70	107 (32)	103	5
Madagascar	71 (109)	87	88	72	38	49 (63)	46	51	14 (106)	13	2
Malawi	74 (111)	75	66	68	85	51 (57)	47	55	41 (64)	40	1
Malaysia	20 (4)	7	28	26	17	68 (13)	67	70	512 (5)	491	20
Mali	64 (93)	50	75	66	66	45 (76)	49	42	45 (61)	42	3
Mauritania	57 (81)	42	54	69	63	44 (83)	47	40	62 (52)	62	
Mexico	23 (11)	12	18	48	15	67 (17)	68	65	245 (12)	224	21
Moldova	40 (57)	31	25	40	65	59 (39)	63	54	54 (56)	47	7
Mongolia	39 (53)	37	23	64	31	59 (38)	62	56	70 (48)	70	0
Morocco	34 (43)	14	28	35	61	40 (90)	39	42	65 (51)	62	2
Mozambique	69 (102)	73	74	72	57	48 (68)	46	51	48 (58)	45	4
Myanmar	43 (63)	49	45	29	51	30 (108)	27	33	7 (114)	5	1
Namibia	56 (80)	65	55	72	33	49 (62)	57	41	147 (26)	126	21
Nepal	48 (65)	34	61	49	50	42 (85)	38	46	15 (105)	14	1
Nicaragua	39 (54)	38	34	45	38	50 (60)	44	56	76 (45)	50	25
Niger	71 (107)	65	75	85	58	45 (78)	50	40	27 (90)	25	2
Nigeria	58 (83)	59	78	65	31	37 (97)	38	36	16 (102)	15	1
Oman	32 (38)	14	21	35	59	63 (23)	80	46	302 (8)	125	177
Pakistan	55 (76)	52	65	52	49	55 (47)	62	48	9 (110)	9	0
Palestine	39 (55)	18	13	51	74	48 (67)	67	29	78 (43)	78	
Panama	28 (27)	22	27	46	17	66 (19)	55	77	92 (34)	85	7
Paraguay	37 (48)	21	28	67	31	62 (25)	62	62	79 (42)	63	16
Peru	35 (44)	28	38	37	37	61 (30)	61	61	71 (47)	65	6
Philippines	42 (60)	34	61	42	30	60 (33)	65	55	38 (69)	33	5
Qatar	34 (41)	0	5	71	62	60 (34)	68	51			
Romania	31 (34)	30	14	45	35	74 (7)	70	78	241 (13)	219	22
Rwanda	68 (98)	77	49	71	76	41 (89)	50	32	29 (85)	28	1
Saudi Arabia	24 (15)	8	34	21	35	68 (15)	61	75			
Senegal	62 (87)	62	60	68	58	48 (70)	53	42	84 (39)	83	2
Serbia	26 (18)	22	17	32	34	49 (61)	52	46	124 (30)	80	44
Sierra Leone	70 (104)	82	78	66	53	32 (104)	38	27	32 (81)	22	10
Somalia	68 (99)	64	72	69	67	26 (114)	32	20	9 (111)	9	0
South Africa	37 (47)	24	43	35	45	62 (28)	63	60	33 (79)	28	5
Sri Lanka	41 (59)	32	58	40	36	55 (48)	52	58	44 (63)	41	2
Sudan	60 (85)	55	41	78	64	38 (95)	42	35	31 (83)	26	5
Swaziland	48 (64)	54	54	59	25	48 (69)	58	38	154 (24)	98	56
Syria	49 (66)	19	45	58	74	39 (93)	51	28	61 (53)	60	0
Tajikistan	51 (70)	41	58	50	55	44 (79)	41	48	20 (96)	20	0
Tanzania	64 (91)	72	58	69	55	49 (64)	54	44	26 (92)	25	1
Thailand	32 (37)	14	42	38	34	59 (35)	63	56	99 (33)	97	2
Timor-Leste	63 (90)	71	85	68	28	46 (75)	49	42	69 (49)	59	10
Togo	69 (101)	70	75	74	56	30 (109)	35	24	19 (99)	19	
Trinidad and Tobago	30 (31)	19	23	56	25	76 (4)	58	93	143 (27)	103	40
Tunisia	28 (25)	2	18	53	37	59 (36)	61	56	198 (17)	186	12

Country	Needs					Policies			Resources		
	OVERALL SCORE (RANK)	Access to Food	Malnutrition	Agricultural Productivity Gap	Vulnerability	OVERALL SCORE (RANK)	Agricultural Economic Policy	Political Prioritization	\$ per rural capita (RANK)*	Public Investment	Private External Investment
Turkey	20 (6)	6	13	39	23	62 (27)	51	72	428 (6)	404	24
Turkmenistan	36 (46)	13	37	65	30	35 (101)	32	38	34 (77)	33	1
Uganda	64 (92)	66	57	81	53	46 (71)	48	45	14 (108)	13	1
Ukraine	27 (23)	14	19	30	46	62 (26)	54	70	85 (38)	56	29
Uruguay	23 (12)	9	16	39	28	70 (11)	74	66	683 (1)	457	227
Uzbekistan	30 (29)	15	40	40	24	29 (112)	30	27	31 (82)	31	0
Venezuela	27 (22)	23	21	40	25	68 (16)	49	86	235 (15)	217	18
Vietnam	27 (24)	18	41	32	19	58 (40)	51	66	35 (73)	28	7
Yemen	63 (89)	53	82	58	59	37 (96)	48	26	20 (97)	14	6
Zambia	75 (112)	91	81	61	65	38 (94)	38	39	50 (57)	43	7
Zimbabwe	69 (100)	61	64	79	70	32 (106)	31	33	17 (101)	14	3

Appendix 4.b: Full list of scores, developed countries

Domestic Agriculture and Biofuel Policy
High score = least distorting to global FNS markets

FNS Aid Policy
High score = Best FNS Aid policies

Country	Domestic Agriculture and Biofuel Policy			FNS Aid Policy			
	OVERALL SCORE (RANK)	Producer Subsidies	Trade Restrictions	OVERALL SCORE (RANK)	Volume	Targeting	Quality of Implementation
Australia	96 (2)	100	91	46 (10)	34	59	45
Austria	71 (18)	75	67	35 (19)	8	48	48
Belgium	58 (25)	40	75	53 (7)	50	54	56
Canada	62 (23)	82	41	54 (6)	49	57	56
Czech Republic	78 (10)	81	75	25 (27)	2	31	41
Denmark	70 (20)	65	75	63 (2)	85	57	48
European Union	72 (16)	79	66	30 (20)	12	41	37
Finland	81 (5)	87	75	41 (16)	27	55	43
France	75 (15)	75	75	39 (18)	26	46	45
Germany	65 (22)	54	75	43 (13)	24	56	49
Greece	79 (8)	91	67	28 (24)	0	36	48
Iceland	76 (14)	100	52	62 (3)	36	84	64
Ireland	71 (19)	74	67	61 (4)	79	64	42
Italy	78 (9)	83	74	27 (26)	4	54	23
Japan	47 (27)	44	50	41 (17)	32	59	33
Luxembourg	34 (29)	2	67	66 (1)	100	51	47
Netherlands	83 (4)	90	75	48 (9)	40	60	43
New Zealand	96 (1)	100	92	42 (15)	23	59	44
Norway	60 (24)	62	58	56 (5)	64	56	49
Poland	77 (13)	90	63	28 (25)	0	40	44
Portugal	72 (17)	83	61	29 (22)	1	41	44
Republic of Korea	47 (26)	66	29	24 (29)	10	35	28
Slovakia	84 (3)	93	75	25 (28)	0	51	22
Slovenia	78 (11)	81	75	28 (23)	0	51	34
Spain	81 (6)	86	75	43 (14)	40	51	37
Sweden	77 (12)	80	74	51 (8)	40	55	58
Switzerland	43 (28)	10	77	44 (12)	27	63	41
UK	69 (21)	62	75	45 (11)	33	57	46
USA	79 (7)	95	64	30 (21)	20	42	26

ENDING RURAL HUNGER: MAPPING NEEDS AND ACTIONS FOR FOOD AND NUTRITION SECURITY

The end of rural hunger is within reach. Getting there, however, will require substantial changes to how the international community supports Food and Nutrition Security around the globe. With the launch of the Sustainable Development Goals, now is the time to take a serious look at the scale of the challenge and to debate how we will organize ourselves to meet it. This report is our effort to kick start such a conversation.

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