

Sustainable Agriculture, Food Security and Nutrition in the Post-2015 Framework

Discussion Paper

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Executive Summary

This discussion brief presents the rationale for a comprehensive approach to the inclusion of sustainable agriculture, food security, and nutrition issues in the Post-2015/Sustainable Development Goals (SDG) Framework. It builds on a range of recently completed and ongoing processes which highlight the importance of a coordinated and comprehensive approach to these issues in the Post-2015 Framework. These processes include the Secretary General's High Level Panel on Post-2015 Framework (HLP), the Sustainable Development Solutions Network (SDSN), the Zero Hunger Challenge, and the thematic discussions of the Committee on World Food Security (CFS) and Open Working Group (OWG).¹

The Post-2015 process provides a unique opportunity to recognize and leverage linkages across sectors to achieve equitable development outcomes. Agriculture, food systems, and nutrition outcomes are not only intricately linked to one another, but also to the ambitious goals of eradicating hunger and poverty. Specifically, the purpose of this brief is to promote and inform continued discussion by illustrating what a Sustainable Agriculture, Food Security, and Nutrition goal – and a set of measurable, achievable targets and indicators – could encompass.

Background: Sustainable Agriculture, Food Security, and Nutrition in the MDGs and the Changing Development Context

The Millennium Development Goals (MDGs) have become a central framework to guide global development efforts.² Endorsed by every UN member state, they have helped align donor, government and other stakeholder actions on priority issue areas crucial to improving the lives of the world's poorest people. The deadline associated with the goals, the specific targets and indicators attached to each goal to measure progress, and the coordinated roles of both rich and poor nations in achieving the MDGs have led to an unprecedented degree of public awareness and support for global poverty reduction.

Despite significant progress, extreme poverty, hunger, and malnutrition remain persistent challenges, particularly among women and girls in Sub-Saharan Africa and South Asia. The global development context, however, has evolved since the original goals were adopted in 2000. Donors and other stakeholders are increasingly recognizing the linkages between poverty, hunger, agriculture, and nutrition, and the enormous potential for cross-sector development approaches.³ Furthermore, our growing analytical understanding of entrenched inequality suggests that key populations – smallholder farmers and women broadly – are at the nexus of agriculture, nutrition, and health, and thus, critical drivers of inclusive growth. Conversely, they are challenged by the structural roots of poverty, hunger and malnutrition and likely to slow the realization of sustainable development if their critical role is un-addressed.

Other issues have risen to greater prominence since the endorsement of the MDGs, most notably, environmental sustainability. Resource constraints and environmental threats have emerged as worldwide concerns as global environmental negotiations have stalled, failing to catalyze significant changes in production and consumption patterns. Linking sustainability and human development priorities based on the principles of equality and inclusivity is one of the key innovations in the emerging Post-2015/SDG Framework and has particular relevance for food and agricultural systems.

The Path Forward: Sustainable Agriculture, Food Security, and Nutrition within the Post-2015/SDG Framework

Key stakeholders and processes – including the CFS, the Secretary General’s HLP, the SDSN, and the Zero Hunger Challenge – overwhelmingly support a strong focus on food and nutrition security in the next set of global development goals, and believe a comprehensive approach is necessary to eliminate extreme hunger and poverty.⁴ Consequently, a goal must address the various dimensions of food security, including agricultural productivity, diet quality, and market functionality. Why is a comprehensive approach necessary?

- **Increasing agricultural productivity and promoting good nutrition are interrelated aspects of addressing hunger and poverty.** Malnutrition plagues more than one in three children in most of the developing world⁵ and negatively affects not only an individual’s ability to learn and grow, but also countries’ workforces and economies. Furthermore, most of the world’s poor live in rural areas and depend on agriculture for their livelihoods.⁶ Given women’s preponderance in agricultural production, and that increasing women’s incomes has disproportionate benefits for alleviating malnutrition, investing in women smallholder farmers is critical. When both men and women farmers grow more food and earn more income, they are better able to nourish their families, send their children to school, invest in their farms, and buffer themselves against negative shocks and global changes. Historical evidence shows that agricultural productivity is a primary driver of inclusive economic transformation, the type of growth that most rapidly reduces poverty.⁷
- **Increasing agricultural productivity must be achieved in a sustainable manner** – in both developed and developing countries.⁸ Deforestation and the inefficient use of fertilizer, pesticides, water, and other inputs will likely compound mounting environmental pressures, including climate change, land degradation, and water pollution, which in turn can endanger human health and jeopardize economic growth.
- **Successfully eliminating hunger is contingent upon increasing food production, while simultaneously reducing waste and post-harvest loss.** Most of the world’s hungry are – tragically and ironically – farmers. Increasing smallholder farmers’ productivity can help meet household food security as well as the projected increase in food demand – up to 60% by 2050 by some estimates⁹ – and thereby resolve one of the necessary conditions for food security: food availability. Productivity increases, however, must be pursued in conjunction with reductions in post-harvest losses and food waste to create a sustainable food system.¹⁰ Given the predominant role of women in post-harvest processing across the world, strategies and technologies in this regard must be developed in a gender-responsive manner.
- **Food availability is just one component of good nutrition.** Reducing malnutrition requires the availability and consumption of a variety of nutritious foods. There are settings in which agricultural productivity has increased, but child stunting has remained unchanged – or even increased – due to poor diet quality, inadequate nutritional knowledge among household caregivers, or persistent poor health. It is also important to recognize and address the growing problem of overconsumption, as the number of overweight or obese adults living in the developing world more than tripled from 250 million in 1980 to 904 million in 2008.¹¹ Nutrition-sensitive agriculture programs have enormous potential, yet to be unleashed, to enhance the scale, coverage, and effectiveness needed to generate improved nutrition outcomes.¹²

Collectively, this evidence strongly suggests that food security and nutrition must be tackled together, with a special focus on smallholder farmers and women, to sustainably address extreme poverty and hunger in an era of environmental vulnerability.

Possible Targets and Indicators for a Sustainable Agriculture, Food and Nutrition Security Goal

A comprehensive goal must acknowledge and address various aspects of food security and nutrition, and include a select number of targets and indicators to measure quantifiable progress. Given the complexity of this challenge, it is important to establish clear principles to guide further discussion and the development of a goal. Specifically, the targets and related indicators should be:

- Geared toward solving critical global issues, including hunger, poverty, malnutrition, environmental degradation, and gender inequality
- Supportive of inclusive economic growth
- Understandable and resonate with the general population
- Ambitious, but technically feasible and measurable
- Applicable to both developed and developing countries, small and large farms, enabling some level of cross-national comparison to evaluate relative progress, while still allowing for varying contexts
- Applicable to a wide range of stakeholders – not only public agencies, but also civil society and private sector actors and farmers groups, which should be intimately involved in holding governments to account for tracking of targets and indicators

Based on these principles, and building on the work of the HLP, CFS, SDSN, and the Zero Hunger Challenge, the following targets and indicators illustrate potential ways to effectively measure progress against a goal within the Post-2015/SDG Framework. Specifically, targets and related indicators under a goal should:

- (1) Measure progress on eradicating hunger, in line with MDG1;
- (2) Measure sustainable food production, productivity, consumption, and systems, focusing on smallholder farmers, including women; and
- (3) Measure improved nutrition outcomes.

Each target should include a set of indicators that are appropriately disaggregated by region and, where relevant, by sex and age, and that serve as key measures to indicate progress (or lack thereof) on the target and the broader food and nutrition security goal.

The illustrative goal framework is meant to be taken as a comprehensive proposal (e.g., all elements would need to be included for it to be coherent – you could not only take the productivity target without also including a smallholder and sustainability target as well.)

TABLE 1: Illustrative SDG on Hunger/Food Security and Nutrition – Goal, Targets, and Indicators

GOAL: Eliminate hunger and ensure food security and good nutrition by 2030			
Note: Indicators should be disaggregated by region and nation when possible.			
Target 1- Hunger	Eliminate Hunger by 2030		Data availability
	Indicators	1.i Decrease the proportion of people below minimum dietary energy consumption.	FAO/SOFI
		1.ii Reduce childhood wasting and maintain at less than 5%.	WHO
Target 2- Agricultural Productivity	Increase sustainable agricultural productivity by 2% per year from 2015 to 2030.		
	Indicators ¹³	2.i Increase TFP growth by 2% annually globally	USDA/ERS
		2.ii Increase agricultural labor productivity by 3% per year	USDA/ERS
		2.iii Increase agricultural land productivity by 2%	USDA/ERS
		2.iv Increase on-farm yields for key staple food crops by 2.5% per year.	FAO
Target 3- Environmental Sustainability of Agriculture	A significant improvement in environmental sustainability of agricultural production is achieved by 2030.		
	Indicators ¹⁴	3.i Improve soil fertility, including organic carbon content in soil (% of carbon content in soil), nutrient retention capacity, and related soil physical and chemical properties.	Remote sensing can now be calibrated to estimate some properties of healthy soils
		3.ii Increase agricultural production per unit of agricultural water withdrawal.	FAO/National survey data
		3.iii Reduce rate of expansion of agricultural land (e.g. overall cropland expansion, or expansion into valued ecosystems such as forests, wetlands, and conservation areas).	FAO/WRI/Ramsar

Target 4- Opportunities for Smallholder Farmers	Steadily increase economic opportunities for smallholder farmers, with attention to gender equity, through 2030.		
	Indicators ¹⁵	4.i Increase real wages, disaggregated by gender and rural in comparison to urban.	National survey data
		4.ii Increase number of extension workers per 1000 farmers.	FAO
		4.iii Ensure access to market information systems and finance through the adoption of cell phones, approaching 90% coverage by 2030.	ITU
Target 5- Sustainable Food Systems	Achieve 50% reduction in food loss by 2030 through the development of a more sustainable food system.		
	Indicator ¹⁶	5.i Reduce the level of food loss by 50% by 2030 through better technology across the food value chain and improved incentives to avoid losses.	FAO/GFLI ¹⁷
Target 6- Nutrition	Promote nutrition security and reduce stunting by 50% by 2030.		
	Indicators	6.i Reduce childhood stunting by 50% from 2010 to 2030.	WHO
		6.ii Ensure no increase in overweight children over 2010 levels.	WHO
		6.iii Dietary diversity: Reduce percentage of women 15-49 years of age who are consuming less than the recommended number of food groups.	TBD
		6.iv Increase year-round household access to adequate, affordable micro-nutrient-rich food groups such as legumes, fruits and vegetables, and animal-source foods.	TBD

Target 1: Hunger Elimination

The first proposed target would measure impact against hunger elimination, building off of MDG 1, but would replace the original underweight indicator with an indicator on wasting, which is now the more accepted measure of extreme hunger.¹⁸ The remaining targets would measure progress against outcomes necessary to eliminate hunger, malnutrition, and poverty, including food quantity and quality, while addressing other dimensions of food security¹⁹ – access, utility, stability – and agriculture-nutrition linkages.

Targets 2-5: Measuring agricultural productivity, environmental sustainability of farming, opportunities available to smallholder farmers, and sustainability of entire food systems

While eradicating extreme hunger and poverty topped the list of MDGs, agricultural productivity – one of the clearest pathways to reduce both hunger and poverty – was not an explicit target within the original framework. To achieve substantial and inclusive growth, sustainable growth in agricultural productivity will be essential and much of this growth will need to come from smallholder farmers, especially women. But agricultural productivity alone will not be sufficient to ensure sustainability and smallholder opportunity, which is why we propose four specific targets to measure progress on this broad objective—agricultural productivity, environmental sustainability of farming, enhanced opportunities for smallholder farmers (especially women), and sustainability of entire food systems. The four suggested targets focus on achieving:

- Significant growth in agricultural productivity, measured by indicators that capture growth in land and labor productivity, as well as the efficiency with which all inputs are used (Total Factor Productivity, or TFP²⁰). We are proposing to use four different, complementary, measures of agricultural productivity detailed in Table 1 under this target. Overall growth in agricultural production can be decomposed (“accounted for”) into growth in harvested area and in crop yield. In turn, improvements in crop yields can be accounted for by more intensive use of traditional inputs and by growth in the efficiency with which these inputs are used. We propose to use this method of growth accounting to create a target for improving agricultural productivity that first tracks increases in output per worker (labor productivity) and output per unit of area (yields). Many inputs beyond land and labor contribute to agricultural productivity. The best measure of these other inputs is Total Factor Productivity, or TFP. An alternative way to think of this measure is in terms of the efficiency with which all inputs are used. The four measures can be used together to understand the factors that account for changes in agricultural productivity over time and across countries. For growth in agricultural output to be sustainable over long periods of time, most of the increases need to come from gains in the efficiency of input use, not from greater use of inputs. Both output per hectare and output per worker need to increase significantly if agricultural productivity growth is to be sustainable and still generate higher standards of living, and less poverty, among farm households. Only increases in the efficiency of input use—higher TFP growth—can lead to this outcome. Achieving this will rest on increasing access to productive resources, inputs and services in an equitable manner, so that both men and women smallholders will be able to use these efficiently and reap productivity gains.
- Significant improvements in the environmental sustainability of agricultural production in settings of both high inputs and low inputs. These improvements will be reflected in higher soil fertility, including organic carbon content, nutrient retention capacity, and related chemical and physical soil properties, as well as in improved water quality through reduced agricultural pollution. Other potential environmental sustainability indicators include: the contribution of agriculture-related land use and land use change to GHG emissions (especially from deforestation stemming from agricultural expansion), and nutrient use efficiency, of relevance both as more nutrients are used more broadly on food crops in SSA and as pressures rise to limit nutrient overuse and consequent water pollution in OECD and East Asian countries.
- Significant improvements in the opportunities available to smallholder farmers, especially as measured by their access to markets for productive inputs and profitable outlets for their surplus production. Enhanced access to markets will raise farm productivity and incomes, as will opportunities for productive work off the farm. Key indicators of change in this area are the disparities between real urban wages and those in the local rural, non-farm economy. Gender-based wage differences will also have to be bridged in order to

ensure equity in this target. Another important measure of this could be reflected in the percentage of smallholder farmers, especially women, with access to current market information and finance via cell phones—coverage should approach 90% by 2030. Finally, farmers with better access to extension workers have greater opportunity to acquire the knowledge needed to best use limited resources and maximize their returns through stronger market integration into efficient value chains supported by mobile technology.

- Significant improvements in the sustainability of the entire food system, from inputs to farm production to marketing and processing to household consumption. Greater efficiency of energy and water use will be important in improving sustainability of the food system. The most visible contribution to food system sustainability will be sharply reduced food loss. Since this is a bigger concern in developing countries, smallholder producers, especially women, will need access to technologies, services and information on ways to reduce losses in the post-harvest process from handling to marketing; and losses to pests, diseases and weed infestation during the cultivation cycle.²¹

Target 6: Measuring improved nutrition outcomes

Adequate nutritional status is a function of multiple factors, requiring the consumption of sufficient food and nutrients for healthy growth, cognitive development, and physical activity; a clean environment; and access to preventive and curative healthcare.²² Given these cross-sector linkages, nutrition could be addressed in multiple ways within the Post-2015/SDG Framework. While this brief proposes including a nutrition target and related indicators under a food and nutrition security goal, this does not preclude the inclusion of additional nutrition-related indicators within a separate health goal.²³

Under a food and nutrition security goal, the following indicators (tracking to the WHA 2025 nutrition targets) could monitor progress against improved nutrition outcomes:

- Stunting in children under the age of five, based on its power to capture inequity and chronic conditions of poor health, diet, and caring practices, particularly during the crucial 1,000 days from pregnancy through a child's second year of life. In 2012, the World Health Assembly (WHA) endorsed global targets for six key nutrition indicators, including of a 40% reduction in the number of stunted children globally by 2025 (100 million children) over a 2010 baseline (171 million children). Achieving this target would require a nearly 4% reduction in stunting annually, a rate that has already been achieved in countries making significant investments in agriculture, health, sanitation, and nutrition. Countries have already begun devising country-specific strategies and annual rates of reduction through the Scaling up Nutrition (SUN) movement. A 50% global reduction in child stunting by 2030 is a more ambitious, but still realistic target and would imply a reduction in the prevalence rate of stunting from the current 25% to 13%.
- Numbers of overweight or obese children. The WHA also endorsed an overweight indicator in 2012 (0% increase over 2010 levels), seeking to address rapidly increasing rates of overconsumption and obesity, particularly in the developing world. Disaggregating the data for this indicator by rural and urban communities would also be helpful. Putting this issue on the global development agenda could also draw attention to rapidly changing food systems, which are contributing to this phenomenon.
- Dietary diversity in adolescent girls and women of child-bearing age, as measured by the percentage of women consuming more than a certain number (to be validated) of food groups. Studies show that these measures correlate with adequate intake of essential micronutrients. Further work may be needed to refine this indicator and create appropriate cut-offs and targets, as it was not included in the 6 WHA nutrition targets.
- Year-round access to adequate, nutritious foods. Access to healthy food, especially for mothers and their babies, is critical to ensure good nutrition, given the inter-generational impact of maternal malnutrition. This indicator would look at a national level increase in access to nutrient-rich food. National and sub-national level estimates could be derived from aggregate production figures; to measure this at the household level would require additional investment in data sources.

Conclusion

Developing and delivering on a sustainable agriculture, food security and nutrition goal is a complex, but critical task. A credible set of bold targets and specific indicators could, once again, focus the world's attention and collective action toward addressing some of the most appalling contributions to and manifestations of extreme poverty.

Endnotes

- ¹ UN Secretary General's High Level Panel of Experts (2013), 'A New Global Partnership: Eradicate Poverty and Transform Economies through Sustainable Development.' The report calls for a separate goal on food security and nutrition, 'Goal 5: Ensure Food Security and Good Nutrition.' Other mechanisms calling for a separate food security and nutrition goal include the Sustainable Development Solutions Network.
- ² Bill & Melinda Gates Foundation (2013), "Statement to the High Level Consultation on Hunger, Food Security and Nutrition," available at: <http://www.gatesfoundation.org/Media-Center/Speeches/2013/04/Hunger-Food-Security-and-Nutrition-in-the-Post-2015-Development-Agenda-Mark-Suzman>
- ³ For example, the Lancet 2013 *Maternal and Child Nutrition Series* available at <http://www.thelancet.com/series/maternal-and-child-nutrition> finds that "targeted agricultural programs play a key role in mitigating negative effects of shocks and global changes, supporting livelihoods, food security, diet quality, and women's empowerment, and reaching nutritionally at-risk populations."
- ⁴ Refer to endnote (1) for citations.
- ⁵ According to the Lancet 2013 *Maternal and Child Nutrition Series*, 45% of under-5 child deaths globally are attributable to undernutrition.
- ⁶ GDP growth originating in agriculture can be more effective at reducing poverty than growth in other sectors. Source: World Bank (2008), *World Development Report: Agricultural For Development*, available at: <http://go.worldbank.org/2DNNMCBGIO>
- ⁷ Op cit. Also refer: IFPRI (2007, 2010), 'The Asian Green Revolution' for *IFPRI: Vision 2020 and Millions Fed: Proven Successes in Agricultural Development*, and Peter Timmer (1988), 'Chapter 8: The Agricultural Transformation' in *The Handbook of Development Economics: Vol 1*; and Peter Timmer (2009), *A World Without Agriculture*.
- ⁸ World Resources Institute (2013), *World Resources Report: Creating a Sustainable Food Future*, available at: <http://www.wri.org/our-work/project/world-resources-report/world-resources-report-2013-2014-creating-sustainable-food>
- ⁹ FAO, *Global Agriculture Towards 2050*, available at: www.fao.org/fileadmin/templates/.../HLEF2050_Global_Agriculture.pdf
- ¹⁰ FAO (2013), *Food Wastage Footprint*, available at: <http://www.fao.org/docrep/018/i3347e/i3347e.pdf>
- ¹¹ Overseas Development Institute (2014), "Future Diets: Implications for Agriculture and Good Prices," available at: <http://www.odi.org.uk/sites/odi.org.uk/files/odi-assets/publications-opinion-files/8773.pdf>
- ¹² Lancet (2013), *Maternal and Child Nutrition Series*, available at <http://www.thelancet.com/series/maternal-and-child-nutrition>
- ¹³ Other indicators could include: (1) Reduced yield gap among smallholder producers; (2) Increased access by male and female smallholder producers to agricultural resources, services, and inputs; (3) Improvements in input use efficiency, particularly efficient use of nutrients.
- ¹⁴ Other indicators could include: (1) Nutrient efficiency increases significantly. (More nutrients used on food crops in SSA, with improved efficiency. Fewer nutrients used in OECD/East Asia, with less downstream pollution/improved efficiency); (2) Increased adoption by male and female smallholder producers of farming practices and technologies that promote environmentally sustainable intensification and regeneration; (3) Increased access by male and female smallholder producers to public and private extension, knowledge, and climate-smart farming practices and technologies that will enable farmers to be resilient to climate change and related potential yield losses.
- ¹⁵ Other indicators could include: (1) median farm size stabilizes and begins to increase.
- ¹⁶ Other indicators could include: (1) The share of animal products in total food consumption increases in poorer countries and decreases in richer countries. Sub-indicators could include: (1) male and female smallholder producers have access to improved technology/systems for post-harvest handling, storage, packing, transporting and marketing; and (2) male and female smallholder producers have access to knowledge and means to use IPM, virus eradication and weed reduction strategies that would reduce losses to pests, diseases, and weed infestation.
- ¹⁷ The Global Food Loss Index is under development at the FAO and an initial version is expected by the end of this year.
- ¹⁸ These targets closely track the recommendations of various reports, including the HLP (ref: endnote (1)) and the UN Secretary General's Zero Hunger Challenge: <http://www.un.org/en/zerohunger/index.shtml#&panel1-1>
- ¹⁹ FAO, "Definition: Food Security," available at: www.fao.org/docrep/013/al936e/al936e00.pdf
- ²⁰ Total Factor Productivity (TFP) is a concept often used in the economics literature to capture gains in productivity that are beyond what would be expected from a simple growth in inputs. TFP is sometimes used to identify long term change, especially of the kind driven by increased innovation and technology. A discussion on productivity growth in agriculture can be found in: Fuglie, Keith O., Sun Ling Wang, and Eldon Ball, eds. *Productivity in Agriculture: An international perspective*. Cambridge, MA: C.A.B. International, 2012.
- ²¹ Other drivers of demand for food commodities will need to be controlled if the food system is to be sustainable. For example, biofuel policies, should be revisited so that they provide for and do not hinder food security. Finally, food price volatility beyond levels seen in the 1990s and early 2000s should be cause for concern. No country has managed to sustain gains in agricultural productivity, in poverty reduction, and in overall increases in per capita incomes, in the face of highly volatile food prices for extended periods of time.
- ²² Robert E Black, Cesar G Victora, Susan P Walker, Zulfiqar A Bhutta, Parul Christian, Mercedes de Onis, Majid Ezzati, Sally Grantham-McGregor, Joanne Katz, Reynaldo Martorell, and Ricardo Uauy, "Maternal and child undernutrition and overweight in low-income and middle-income countries," *The Lancet*, 3 August 2013 (Volume 382 Issue 9890 Pages 427-451 DOI: 10.1016/S0140-6736(13)60937-X).
- ²³ The WHA endorsed 4 other indicators related to anemia in women of reproductive age, low birth weight, exclusive breastfeeding, and wasting in children. We suggest that these indicators be considered for inclusion in a future health goal since addressing these conditions falls primarily within the health sector.

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