



SUSTAINABLE DEVELOPMENT
SOLUTIONS NETWORK
A GLOBAL INITIATIVE FOR THE UNITED NATIONS

SDSN TG7 Issue Brief: Transformative Changes of Agriculture and Food Systems

Prepared by the Thematic Group 7

Sustainable Agriculture and Food Systems

It is hard to exaggerate the role that agriculture plays in human development. From providing basic sustenance and nutrition to employing farmers around the world, agriculture is a fundamental part of almost all societies and economies. Yet every year, more challenges arise that make agriculture's primary objective, feeding the world, more difficult. Agricultural systems must adapt, even transform, to meet these challenges while becoming more ecologically, economically and socially sustainable. This transformation is crucial for achieving many of the post-2015 Sustainable Development Goals (SDGs).

An agricultural transformation

One-third of Earth's land is devoted to agriculture, more than any other industry. Yet the agricultural sector struggles to keep up with a growing global population – a projected 9.3 billion by 2050 – and an expanding middle class who wants more food and greater dietary diversity. Demographic and socioeconomic trends suggest a need to increase global food production by at least 60-70% by 2050; many developing countries may even have to double their food production^{1,2}.

In addition to the challenge of increased demand, the future of agriculture must contend with another challenge: reversing the pressure that current agricultural practices place on the environment, leading to land degradation, water depletion, pollution, unbalanced nutrient cycles, increased greenhouse gas emissions, and threats to biodiversity. Climate variability and climate change are complicating factors that will likely exacerbate food insecurity and malnutrition in areas already suffering from poverty and hunger³.

Maximizing agriculture's potential to reduce rural poverty is another difficult challenge, particularly in

South Asia and Sub-Saharan Africa, where progress toward this goal has been limited. Farm sizes shrink as populations grow, and inequalities in land tenure and access to resources are pervasive. Efforts to increase farm productivity, improve access to markets, and subsidize inputs may even contribute to inequalities by favoring farmers with greater access to resources and capital. Reducing rural poverty requires long-term agricultural and economic growth that accounts for the needs of the poor, including creating new job opportunities for people in rural areas.

Societies must also leverage agriculture to meet health and nutrition goals, for example, through crop diversification and higher food quality. More than 840 million people are still chronically undernourished⁴. Two billion people face "hidden hunger," micronutrient deficiencies that inhibit mental and physical development. Stunting, an irreversible form of undernutrition, affects 165 million children. On the other hand, overweight and obesity are growing phenomena that take huge tolls on health and societies⁵.

Devising long-lasting solutions to these and many other challenges will require deep, "structural transformations" in the agriculture sector. In developing countries, the agricultural sector must adapt new technologies and business models to increase job opportunities, overcome resource constraints, enable greater market participation, and reduce inequalities, particularly for women. Agriculture in developed countries must also change to address urgent issues such as unhealthy diets, food waste, biofuel production, and policies that impact low- and middle-income countries. These countries must take the lead in implementing higher standards for productivity, resource efficiency, food safety, and environmental impacts.

	North America	Latin America & Caribbean	Europe	Middle East & North Africa	Sub-Saharan Africa	South & Central Asia	Southeast Asia & Pacific	East Asia
Food insecurity				H	H	H	M	M
Malnutrition					H	H	M	M
Obesity, health	H	H	H	H		M	M	M
Poverty				M	H	H	M	M
Poor rural infrastructure		M		M	H	H	M	M
Conversion of natural land		H			H	M	M	M
Soil and land degradation				M	H	H	M	H
Water shortage	M			H	H	H	M	M
Water and air pollution	M		M	M		H	H	H
Biodiversity loss	M	H	M	M	M	M	H	H

Figure 1. Regions likely to suffer moderate (M) and high (H) costs in a Business-As-Usual scenario of unsustainable agricultural development.

The alternative to these changes is a business-as-usual trajectory with severe global implications for food and nutrition security, public health, economic growth and prosperity, social wellbeing, natural resources, and biodiversity, in every region and in every country. Without new strategies, commitment, and coordination of the agriculture and food sector, many countries will also forgo opportunities for broad-based, self-sustaining development driven by governments and the private sector.

Rethinking smallholder agriculture

Each year an additional 10-15 million young people look for jobs in rural areas of South Asia and Sub-Saharan Africa. This presents a great opportunity for vibrant rural development: these young workers can ignite the structural transformation presented above so that smallholder farmers can see sustained and sustainable growth in productivity.

Smallholder farms are a crucial part of national food systems and economies, and they will play a large role in the sustainable food systems of the future. However, without a shift in how these farms work, many rural communities will continue to be left behind. Unlike farmers with large holdings, small-

holders may lack capital and other resources, legal rights that allow them to invest in new technologies, access to markets, and access to agricultural extension services⁶.

Female smallholder farmers face even greater barriers to success, despite the fact that they comprise half of smallholder farmers in East and Southeast Asia and Sub-Saharan Africa. Fortunately, women are a source of great potential for the future of agriculture: with access to the same inputs, women often produce yields 20-30 percent greater than men⁷. They must be empowered and encouraged.

Other shifts in smallholder agriculture can also improve productivity, profitability, and sustainability. Increasing the share of rural household income that comes from non-farm sources will act as an insurance policy against environmental and economic shocks by spreading risk and reducing reliance on one source of income, ultimately reducing poverty and increasing food security. One source of non-farm income is small-scale, rural food processing plants, which could also help reduce food loss and increase food quality, for both safety and nutrition.

Investments in rural infrastructure, especially roads, electrification, and telecommunications are essential to increase access to markets, reduce food loss, and improve storage and handling. Good governance is key to ensuring fair access to resources, markets, and new technologies. Strengthening farmers' entrepreneurial and management skills increases farm value and reduces threats to productivity and profitability.

As countries urbanize and fewer people are available to work on labor-intensive small farms, other options include consolidating farms or farm services and increasing mechanization to improve efficiency⁸. Ultimately, for many farmers and their families, the best way forward is to move out of farming as better opportunities arise.

Major elements of sustainable agriculture and food systems

A new global framework for the sustainable development of agriculture and food systems is essential to increase food availability and utilization, improve human health, create more prosperous rural communities, and mend and rejuvenate the environment. Solutions must address population

growth, food consumption, food production, and food loss.

One significant element of a sustainable food system is a change toward healthier diets and less food waste and loss. More people in rich and poor countries are eating greater amounts of energy-dense, processed and refined foods, which can be detrimental to health and require more resources to produce. While accounting for cultural considerations, dietary behaviors need to be reformed for both health and environmental sustainability.

Meanwhile, as much as one-third of all food grown may be lost or wasted along the way from farm to fork⁹. Unfortunately, it is unclear how much food loss and waste can realistically be reduced, and we do not know whether "recovered" food would reach those in need. More data on food loss and waste is urgently needed to guide future action.

Addressing the new challenges of food supply and demand will require a Sustainable Agricultural Intensification (SAI) in farms around the world¹⁰. This means producing sufficient nutritious food through higher yields rather than area expansion; ensuring food is accessible to all; preventing damage to

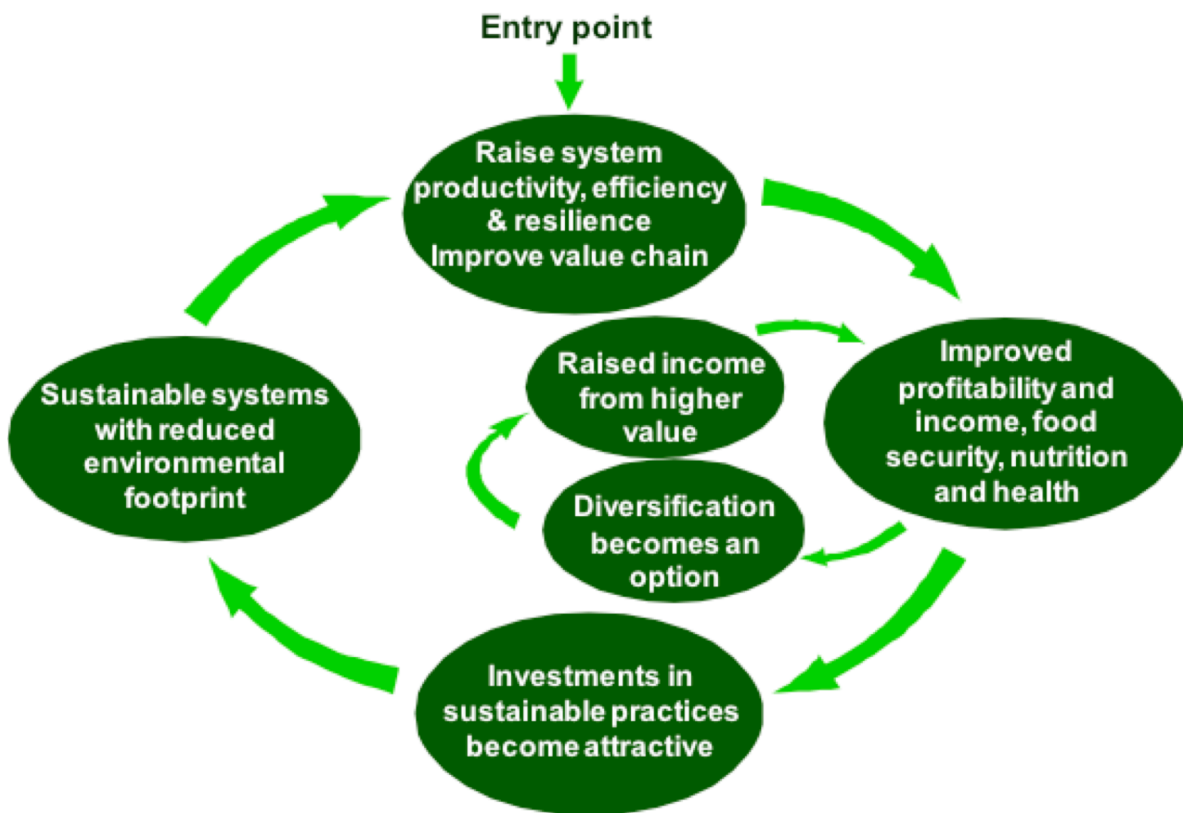


Figure 2. Enhancing system productivity and value is the entry point for enabling farmers to enter a virtuous circle of sustainable agricultural production and livelihood.

natural resources and biodiversity; respecting and protecting the health and wellbeing of people, animals, and the environment; and maintaining these principles now and in the future. Simply: SAI aims to reduce the environmental footprint of agriculture while meeting all its other social and economic goals. It requires tailored strategies and solutions that are integral components of accelerating economic and social development in rural areas.

SAI is also a core requirement for the broader implementation of a "climate-smart agriculture", which unites the goals of the agriculture, development, and climate change communities¹¹. The practical implications of climate-smart agriculture are still being debated, as difficult trade-offs undoubtedly exist between activities to intensify agricultural production, mitigate risks, and adapt to climate-induced shocks.

Diverse pathways to sustainable development

Transformative changes in agriculture and food systems are needed in all countries, but the priorities and timing of implementation will differ according to each local agricultural, economic, social, and cultural context. Every community will face different challenges and barriers to sustainable development, as well as different past successes. Simplistic, universal prescriptions or recommendations will not work; instead, successful models are built on flexibility and local knowledge.

Fortunately, the principles of SAI can be applied to any food production system. Sustainable agriculture can be achieved for farms of different sizes and degrees of market integration and will particularly benefit resource-limited, smallholder farms.

Without oversimplifying, action must focus on raising the diversity, productivity, resource efficiency, resilience to shocks, value, quality, and the overall profitability of farming. We need to provide farmers, agricultural professionals, agribusinesses, scientists, and local policy makers with the necessary information, resources, tools, and recognition, as well as the space to meaningfully cooperate.

In short, to achieve sustainable development we must accelerate the dynamic evolution of agriculture and entire food systems. This is the only way rural communities will move out of perpetual poverty toward long-term prosperity and the only

way we will see long-term, stable global food and nutrition security. It is also one of the few key pathways to rehabilitate the environment for a healthier planet. There is no practical alternative.

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Related SDSN Reports:

Solutions for sustainable agriculture and food systems. Technical report for the post-2015 development agenda. 2013.

An action agenda for sustainable development. Report for the UN Secretary General. 2013.

These reports and more at unsdsn.org/resources.

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