



Global Food Security Guide for Decision Makers

Report from the Aspen Institute Food Security Strategy Group

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The Food Security Strategy Group (FSSG) was a high-level, non-partisan, and international dialogue series exploring food security challenges with a group of prominent and influential leaders in business, government, non-profit organizations and academia. Taking place in 2013-2015, the FSSG was chaired by Madeleine K. Albright, Thomas A. Daschle, Tony Elumelu, and Dan Glickman, and focused on cross-sector solutions between four interlinked areas: population, health and poverty; science, technology and innovation; markets, trade and investment; and environmental sustainability. The FSSG was hosted by the Aspen Institute's Energy and Environment, Aspen Global Health and Development, and Middle East Programs.

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FOREWORD

Global food security in the coming decades is threatened by increasing levels of volatility in financial, energy, and agriculture markets, whether caused by political conflict, climate change, national level agriculture policies, or other intersecting variables. Given this reality, food security planning must be better understood both in terms of global trade and cross-sector convergences, and leaders should endeavor to contend with this volatility as the new context within which we must feed the world.

In one of the most recent examples of this volatility—the 2007-2008 food price crisis—intersecting factors not usually associated with food affordability and accessibility drove volatility in global food markets, exacerbating food insecurity. Volatile energy markets drove up the price of fertilizer and food distribution, financial markets shifted capital away from equities toward land speculation, and drought and heat in Australia and Eastern Europe affected commodity markets. This all impacted agriculture significantly. In reaction, some countries implemented export tariffs and other protectionist measures, further distorting markets.

Population change, urbanization and changing consumer demand also add to the level of volatility in global food markets. Food travels to nations where consumers are able to pay higher prices, and increasing food demand from a growing global middle class can negatively impact countries already facing internal food security issues.

The “new normal” of intersecting and volatile factors influencing food markets creates new challenges and questions for global leaders, such as: To what degree have the causal factors of volatility in agriculture markets been adequately addressed? Are we sufficiently equipped with existing institutional capacity and effective multi-stakeholder collaboration to manage unexpected political, climate-related, or food system volatility? These are the important questions for public and private sector leaders, and food security experts, to address in the coming years.

To better anticipate volatility and convergence between sectors and across the global food system, “shock absorbers” must be built into both agriculture value chains and national-level food planning. While we now feed more people more efficiently than at any point in human history, the downside of a globalized food system is that a shock in one corner of the global market can have outsized effects on food production and availability in another part of the world.

To address these challenges, and prepare for independent variables that are at times beyond the managing capacity of regulatory systems, **national leaders will need to invest in resilience-focused interventions that allow for ongoing shocks to the food system to be absorbed.** This will enable nations to meet both demands on the food system and emergency humanitarian crises into the long-term,

achieved by sustainably increasing agricultural productivity and food availability, while investing in critical safety nets.

It has been our honor to serve as co-chairs for the Aspen Institute’s Food Security Strategy Group over the past two years. Through these discussions, it has become clear that global food, energy, and financial markets can interact in times of crisis to worsen an already volatile political or food climate, and that the food security community should focus on this dynamic in particular going forward.

International coordination on food security must be heightened and national-level silos broken down, so that water, food, energy, and infrastructure can be addressed in tandem. In the face of permanent volatility, it is our moral imperative as a food security community to develop both sustainable and equitable frameworks for truly achieving food security in the coming decades.

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DECLARATION ON GLOBAL FOOD SECURITY PLANNING

Declaration on Global Food Security Planning

From the Aspen Institute's Food Security Strategy Group

The Food Security Strategy Group's **Declaration on Global Food Security Planning** articulates the linkages between national, security-related factors and recognized global food security priorities as a core strategy for communicating top level insights to leading policy- and decision-makers in both the public and private sectors who: **a) do not yet recognize** their own interests in food security and/or **b) have not yet assumed active leadership** on national and global food security. The goal of the FSSG Declaration is to help bring increasing focus to the security-related orientation of global food security planning priorities.

We, the members of the Aspen Institute Food Security Strategy Group, understand global food security to be governed by two levels of influence:

- ***Strategic security-related factors** that encompass political stability, national security, economic growth, and environmental security; and*
- ***Global food security planning priorities** relating to food production, financing, storage and distribution (including access and nutrition), which are necessary but not sufficient for meeting the growing demand for food.*

*The 1996 World Food Summit definition of food security provides a strong framework for understanding the various relevant factors on the ground: “**Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.**” This includes food availability on a consistent basis, physical and economic access to nutritiously adequate foods, and appropriate use of foods (including quality and safety, nutrition, water and sanitation aspects).*

*Increasingly, global food markets face volatility caused by changes in food markets across the globe; changes in financial, energy or other markets; and other types of shocks introduced to the system, from political instability to climate change. Given this new norm of volatility, the food security community and global leaders must focus on developing “**shock absorbers**” at the national and international levels that will build both food security and resilience over the long term. Beyond meeting the food and nutrition needs of populations around the world, food security strategies will meet other security priorities faced by global leaders, including political stability and national security, environmental security, and economic growth.*

We believe that reaching food security will require a closely coordinated effort at the highest levels of leadership in the public and private sectors, to develop and sustain the integration of these bottom-up food security priorities into the top-down architecture of strategic planning around trade, national security, economic development, and climate change.

We believe that global leaders and decision makers in the public and private sectors should now authoritatively endorse the critical role of strategic security-related factors influencing global food security priorities. Importantly, national governments can achieve significant tangible benefits from investment in food security, by unlocking opportunities for economic growth, climate resilience, and innovation. By linking strategic influences to known food security issues and emerging approaches (such as investing in smallholder farmers, developing storage and distribution capacity, and building gender equity), governments and the global food security community can better incorporate long-term food security planning into national security-related policy priorities.

We believe that these linkages should play a central role in the food security community's communications going forward, as a vehicle for articulating top level insights that encourage leading policy- and decision-makers to recognize their own interests in global and national food security and assume active leadership.

Recognition of the political, economic, and security risks posed by food insecurity is growing. This is evident in the inclusion of food security and nutrition principles in the G7 agenda and action plan, and the elevation of climate change by Pope Francis as a global policy issue to the highest levels of strategic and moral priority. It is also seen in the growing recognition of the need for a public-private sector approach to advance top-down and bottom-up solutions on food security and to translate the current language on feeding an expected 9 billion people into a clear action plan for high-level investment and political support. With the formal adoption of new sustainable development goals (SDGs) by 193 member states at the September 2015 UN General Assembly, we see this as a critical moment to elevate the issue of global food security by framing food security in contexts relevant to global decision makers.

We recognize that agriculture and food production are complex subjects. Farming operations differ in size from smallholder farmers—the majority being women farmers in the developing world—to larger more complex farming and agribusiness ventures. We also recognize that there is no single solution when it comes to issues challenging food security, agricultural self-sufficiency and the alleviation of hunger and malnutrition. Climate and weather patterns, soil types, plant and animal differences, governance, availability of modern infrastructure, availability of traditional and more modern technologies, and culture and regional considerations have much to do with the success of strategies aimed at these priorities. These variations must be taken into account at the national level throughout the implementation of recommended international food security planning priorities.

EXECUTIVE SUMMARY

The Aspen Institute’s Food Security Strategy Group (FSSG) was an expert strategy dialogue on long-term food security planning convened by the Aspen Institute in 2013 - 2015. This report presents a framework for global food security planning created by the FSSG members as a reference for decision-makers, including recommended actions to further international coordination, governance, market innovation, women’s health, sustainable intensification of agriculture, humanitarian aid, and supply chain financing. The following declaration and recommended action areas are the result of a two-year dialogue process, including 6 convenings at international locations with ~50 experts and thought leaders from business, government, academia and the NGO sector.

For public and private sector leaders to better understand food security priorities established by the expert community, the FSSG recommends that focus be placed on **seven recommended action areas linking security-related national priorities to global food security issues**. This report provides an overview of the action areas through which long-term threats to both national priorities and food security can be addressed in parallel. Ensuring that security-related priorities are achieved will support food security by creating stable environments for foreign investment, market development, and innovation.

Seven Action Areas Recommended by the Aspen Institute FSSG:



Recommended Action Areas:

1. INTERNATIONAL COORDINATION

Increased attention should be placed on a) strategic planning on trade agreements and national capacity building; b) deepening coordination between multilateral institutions and the private sector; and c) linking with existing initiatives. There is significant value in reducing and eliminating tariff barriers, national capacity building, and also shaping the processes and products of major international trade agreements.

2. FOOD SECURITY GOVERNANCE

To develop food security in regions with underdeveloped and undercapitalized agriculture systems, the FSSG strongly recommends that national governments prioritize agriculture and rural development policies that would enable greater investment opportunities and food system development as a matter of utmost moral responsibility.

3. MARKET INNOVATION

The private sector has the power to increase the sustainability and equity of global food systems by investing in and promoting smallholder farmer access to finance and markets, sustainable

supply chains, soil health, agriculture run-off prevention, erosion prevention, and efficient water use. It is also in a unique position to respond to the call for nutrient-rich and drought-resistant crops, and to aggregate producers and processors through cooperative structures.

4. WOMEN'S HEALTH

Global leaders and the food security community must go beyond acknowledging the role of women smallholder farmers as global food producers, to addressing the basic health issues that narrow their options, limit their productivity, and effect the nutrition and well-being of their children. Improved food security depends upon putting in place the conditions that will enable an organic slowing of population growth, based on both improved maternal and child health and voluntary family planning.

5. SUSTAINABLE INTENSIFICATION

Increasing agriculture yields without increasing agriculture's environmental footprint will be a priority risk mitigation opportunity for leaders globally in the next 50 years. Long-term food security requires action on sustainable agricultural intensification and climate change preparedness, with protections put into place that will allow vulnerable populations to maintain stability in the face of increasing natural disasters, weather variability, and shifting global food trade, including through social safety nets, regional trade growth and smart agriculture subsidies.

6. HUMANITARIAN AID

National instability and food insecurity are closely intertwined, as unfolding crises swell the numbers of migrants and other vulnerable groups globally. A strong call is needed for the creation of new systems for providing relief, and the public and private sectors should aim to secure new sources of support for humanitarian aid while also investing in transforming agriculture, building supply chains, and developing commodity markets.

7. SUPPLY CHAIN FINANCING

Agribusiness is essential for achieving global food security, and financing is a central component to the working of the entire value chain. From bringing land into sustainable production and improving productivity by transferring technologies and practices, to ensuring the best use of water and other natural resources, financing is a critical factor in supply chain development and overall food security.

BUILDING FOOD SECURITY FOR NATIONAL SECURITY & ECONOMIC GROWTH

Amidst the backdrop of developing trends like climate change, migration and urbanization, food insecurity can increase the risk of political conflict, prolong civil unrest, and threaten democratic governance. At the same time, inadequate governance and absence of the rule of law exacerbate issues surrounding the equitable distribution of resources—particularly for unstable, low-income countries in need of agriculture investment and financing—and fuel unrest. On the other hand, **investing in food security supports other national priorities like national security, political stability, and economic growth.**

The Economist Intelligence Unit (EIU)—based on data collected through the Global Food Security Index—**recommends building political stability to improve food security.** In an analysis conducted on behalf of the FSSG by the EIU (see [Insights from the Global Food Security Index for Long-Term Planning: Report for the Aspen Food Security Strategy Group](#) - June 2015), countries with the highest levels of political instability have the lowest levels of food security, government investment in agricultural infrastructure is a key indicator of food security, and food safety nets generally increase food affordability for those most in need. As detailed in the EIU’s report, high levels of political instability among certain countries in the Index is associated with declines in food security (generally caused by transportation blockages and waylaid food aid commitments).

Food security will be an increasingly critical security priority for global leaders in the coming decades. The following sections outline various action areas around food security identified by FSSG as they relate to national-level strategic priorities such as political stability, national security, economic growth, and environmental security.

I. **ADVANCING INTERNATIONAL COORDINATION & GOVERNANCE**

More than 7,000 children die each day around the world of causes related to malnutrition. It is the moral obligation of global leaders to set policies that help the majority to achieve food security, feed the poor, and allow for future generations to produce enough food. Food security requires not only new science, technology and markets, but also significant political commitment. The global effort to feed a growing population will be driven by increased market efficiency and a competent technocracy, but at a deeper level will be sustained by a global moral imperative to address hunger and underlying systemic inequalities.

There is significant value in reducing and eliminating tariff barriers, national capacity building, and also shaping the processes and products of major international trade agreements. In the past, trade barriers erected to protect domestic security have caused volatility in global food markets and distorted prices. Reducing these barriers will aid in stabilizing global food prices. However, we have seen significant increase in agriculture subsidies within the BRIC nations, distorting agriculture markets.

Given the important role of global trade in stabilizing food prices and distributing resources across food deficit and food surplus regions, greater transparency is needed in the multilateral trading system. Supply chain transparency focused on sustainable agriculture development would further food security, as well as consistency of rule of law supporting implementation of regional trade agreements in the developing world. While regional Free Trade Agreements will remain an important component of the food security equation, they must be matched by corresponding capacity-building at the national level to maximize their full potential. Governments should develop a transparent approach to foreign investment in land and natural resources, to make officials accountable for their actions, as they may influence their country's people.

To minimize investor risk, emphasis must be placed in the coming decades on rule of law, sanctity of contract, property rights and corruption prevention.

To minimize investor risk, emphasis must be placed in the coming decades on **rule of law, sanctity of contract, property rights and corruption prevention**, particularly for nations with significant food insecurity. Given that most food produced today is consumed by the nation in which it is produced (global food trade accounting for less than a fifth of global annual food consumption), government activities that prevent this trade—such as subsidies, protectionism, and importantly, lack of sanctity of contract—can directly threaten national food security. Maintaining contract sanctity is necessary for stable export and import of key commodities, and allows buyers and sellers to depend on their commercial commitments while reducing their exposure to financial risk. The rule of law must be enforced at all levels, and applicable to citizens at all levels of the value chain and government. In Africa, weak civil and criminal justice systems or arbitrary and corrupt governmental administration have tended in the past to discourage private investment.

One of the most important elements to launching new public-private partnerships (PPPs) brokered by the UN is the policy environment. Private investors, even with UN agency encouragement, are generally unwilling to invest in discouraging policy environments. Where governments have been interested in reducing obstacles to private investment—such as Rwanda, Uganda, and Burkina Faso—the International Fund for Agricultural Development (IFAD) has successfully stepped in to assess investor quality and finance parallel public sector development.

Maintaining land rights over time will particularly help to address the food security of at risk groups, and increase the implementation of environmentally sustainable practices, as farmers will more likely prioritize soil protection, etc. on their own land. Women are an especially important group on which national leaders should be focusing, as they comprise more than 60% of smallholder farmers, while often lacking access to key elements of success, such as legal rights, property rights, and financing. In these examples, the moral imperative extends to both negative rights (e.g. freedom from hunger) and positive rights (e.g. the right of current and future generations to food).

Farmers and agribusinesses in low- and middle-income countries are often asked to pay rates that exceed 25% per year or more.

Another aspect of food security governance is **reducing the cost of finance** in low- and middle-income countries—especially in the farming and agribusiness sectors—an essential condition for economic development. While high-income countries currently face very low interest rates, farmers and agribusinesses in low- and middle-income countries are often asked to pay rates that exceed 25% per year or more. At these rates, investments are risky, incentives to launch new farming operations or

agribusinesses that will take some time to mature are put to a severe test, and the potential for successful ventures is limited.

This issue could be addressed over time through the development of credit guarantee mechanisms by international institutions capable of assessing risks and benefits in the agricultural sector, facilities that provide local investors access to global capital and a stable investment environment for foreign direct investors, and approaches that promote the involvement of impact investors in the agriculture and agribusiness sectors. While the current rise of social impact investing and patient capital investment heralds a pivot in the right direction, there are a number of technical steps that could mitigate risk and increase the flow of agriculture capital, including sovereign guarantees for high-risk investments, improved country ratings, and creative agriculture insurance products.

Another issue requiring international coordination and national commitment is urban growth. In food-insecure sub-Saharan Africa, urban growth is increasing at unprecedented rates and in Asia, already-large cities are continuing to expand. There is no coherent strategy for ensuring that these large and growing urban populations will be food secure. **Building bridges between urban and rural environments** around food security is critical. Significant investment should be made to improve urban planning, including building food-oriented infrastructure in growing cities (e.g. stores and markets, warehousing, refrigeration, and transport hubs), ensuring that production zones are well-knitted into this infrastructure, and establishing strong safety net programs that meet the food security needs of vulnerable populations in both rural and urban areas.

Finally, to meet the nutritional needs of a growing population in the face of changing climate patterns in the coming decades, significant public investment must be made into **agriculture development and farmer education**. With rising temperatures and increasingly frequent extreme weather events, sustainably growing yields, increasing the nutritional profile of crops, and reducing food waste should all be a priority areas for research going forward. Extension services should also be bolstered to ensure that modern practices and information reaches smallholder farmers.

To enhance international coordination on these goals in the food security space, **existing food security initiatives should be better linked with each other**, rather than developing new solutions “from scratch” in each region. At a regional level, the African Union’s Comprehensive African Agricultural Development Program (CAADP) has driven collaborative and national efforts for more than a decade. Combined with African participation in the G-8’s New Alliance for Food Security and Nutrition and many countries’ participation in the Scaling Up Nutrition (SUN) Movement, there are new opportunities to improve the alignment of existing networks and institutional arrangements in Africa, which as a region still struggles with persistently low agricultural growth and poor nutrition.

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II. INCREASING FOOD SYSTEM RESILIENCE: MARKET INNOVATION & FINANCE

Global food security cannot be achieved without private sector investment. **The private sector has the power to increase the sustainability and equity of global food systems** by investing in and promoting

smallholder farmer access to finance and markets, sustainable supply chains, soil health, agriculture runoff prevention, erosion prevention, and efficient water use. It is also in a unique position to respond to the call for nutrient-rich and drought-resistant crops, and to aggregate producers and processors through cooperative structures.

From a private sector perspective, **supply chain volatility** is a central piece of the food security challenge. Private sector leaders should recognize that this volatility affects not only governments managing populations and sustaining effective political systems, but also the viability of the private sector and its ability to conduct business. As actors often larger than states, corporations should now make themselves available to collaborate in a global food system upon which they depend for stable, efficiently operating markets.

Given the significant risk that political and economic instability pose to companies' global supply chains, the private sector has an immediate interest in leveraging the potential for aggregation and greater economies of scale to increase access to markets comprised of smaller landholdings. **New models for aggregation and collaboration**—whether farmer associations, co-investments, or cooperatives—should also be explored, particularly those at the country level that allow for technology to disseminate knowledge and increase access to finance and inputs.

Public-private partnerships targeting various parts of the food system and value chain are slowly creating a new paradigm of cross-sector engagement, requiring deeper understanding and alignment between the sectors. Going forward, the global food security community should shift its partnership focus to addressing how **ongoing points of tension between the public and private sector can be better addressed**, to further the effectiveness of existing and new partnerships. National governments should also be encouraged to support partnership development by creating a level playing field for investment, developing transparent rules and regulations, funding public goods that catalyze innovation and allowing scalable partnerships that catalyze innovation.

Another aspect of private sector food security development is agricultural entrepreneurship, which should be supported as a model for economic success. In developing countries, agriculture already supports or employs the majority of the population; however, achieving global food security requires the creation and growth of enterprises—large and small—across the entire value chain. Africa in particular is ripe for entrepreneurial activity in the food sector, given its youthful population and large swaths of uncultivated, arable land. There is significant opportunity for entrepreneurs to create wealth and jobs by forming companies that improve and expand the provision of inputs to farmers, build modern processing facilities, and provide logistics, distribution, and consulting services. **Policymakers should lower the barriers to entrepreneurship in the food production space** by supporting training, mentoring, research and financing programs.

From bringing land into sustainable production and improving productivity by transferring technologies and practices, to ensuring the best use of water and other natural resources, financing is a critical factor in supply chain development and overall food security. Financing—whether through new instruments or farmer and supply chain financing programs—can support the development of environmentally sustainable and socially inclusive food supply chains that bring safe, affordable food from producers to end consumers.

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Climate change poses significant challenges to the stability of the global food system, including heightened production volatility driven by changes in weather patterns, changing profit margins for food companies due to increasing production costs and higher commodity prices, and stronger regulatory pressures to monitor and reduce carbon emissions. **The sustainability and resilience of the food system relies in part on farmers' ability to reduce carbon emissions and adapt to higher weather variability.** Yet, acting alone, they lack the finance, technology and capacity to achieve these necessary steps.

New supply chains should be designed to sustainably intensify food production by **aligning the interests of smallholder farmers, banks, insurance companies and regional-to-international commodity buyers.** To ensure the sustainability of product sourcing, the costs caused by extreme weather need to be minimized over time. Creating a financial and insurance value to risk reduction in agriculture can allow for the development of novel financial mechanisms that align the incentives of food supply chain actors (i.e. from smallholders to final buyers) that reduce the risk of agricultural production loss caused by environmental degradation and climate hazards. Importantly, expanding agricultural insurance in emerging markets requires proactive and enabling government policies, supportive infrastructure, innovative products, cost-effective business models, new distribution channels, and advanced technology.

There is an urgent need to develop commodity exchanges in emerging markets so that farmers protect themselves from declines in future crop prices.

The nature of the agricultural business cycle creates financing needs across different stages. Financing is needed to support research and commercialization of promising input technologies, acquire crops at harvest, transport them to storage locations, retain them for the period between acquisition and sale to the processor or end consumer, and during the period between processing into usable products and their final consumption by the end user. Financing is needed for special handling facilities at ports, warehouses, cold storage facilities, grain silos, greenhouses, local produce markets and commodity exchanges.

At the same time, **new farmer financing programs** are needed, alongside investment in overall operational capacity. Working capital finance is required by farmers to finance inventories, seeds, fertilizers and chemicals and pay for other pre-production costs, as incomes are available only post-harvest. Financing programs for farmers must be designed to accommodate the cash flow patterns of the agricultural business cycle of different crops.

Financing is also needed for investments in improving the climate footprint and, eventually, the overall sustainability of agricultural operations, including land rehabilitation and improving and managing watersheds. Financing of environmentally sustainable and more efficient irrigation systems and

equipment is an important tool for supporting the sustainability of global agriculture, which is threatened by climate change and a global decline in the supply of water.

There is an urgent need to **develop commodity exchanges in emerging markets** so that farmers can protect themselves from declines in future crop prices. In addition, mechanisms should be developed that enable farmers to benefit from instruments that are traded on commodity exchanges in other countries, to the extent that such exchanges offer contracts in the same crops which they produce and such crops are globally traded and command a unified global price. Financial education programs that can educate farmers about available alternatives are also critical as these instruments are relatively new to farmers in a large number of developing countries.

III. ADDRESSING THE HEALTH NEEDS OF WOMEN

Peace and security depend on food security and on just systems of governance, but rapid population growth in many of the world's most food insecure countries jeopardizes the ability of countries to sustainably produce enough food or to import enough food that is affordable and accessible to the poor. Good governance and improved food security therefore depend upon putting in place the conditions that will **enable an organic slowing of population growth, based on both improved health and voluntary family planning.**

A strong correlation between food affordability, food security and women's health suggests that in food insecure countries, **improving the delivery of women's health services and the effectiveness of food safety nets that increase food affordability** would propel development that is both more equitable and food secure. At the same time, in the absence of voluntary family planning and strong health systems, rapid population growth in many of the world's most food insecure countries is jeopardizing the ability of countries to either sustainably produce enough food or to import enough food that is affordable to the poor.

New data exploring correlations between the Economist Intelligence Unit's Global Food Security Index (GFSI) and other leading demographic and health data have yielded important new findings related to food security and women's health. Progress in food security is intimately intertwined with progress in investments in family health. The most food insecure countries are also those with the weakest investments in health, particularly in regards to affordability of food. These findings point to the critical

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need to link action in addressing national food security across the health and food sectors. As these new data suggest, the food security crisis will not be solved by focusing on food security and agriculture alone.

It follows from the Economist Intelligence Unit's findings that, for the world's most food insecure countries, lack of affordable food is a key factor driving hunger. But in countries where women, on average, have fewer children and better access to healthcare—including voluntary family planning, and better prenatal and antenatal care—maternal and infant mortality is lower, food is more affordable, and food security is stronger. Given the strong correlation of food security with maternal and infant mortality

rates, agricultural and food security programs need to put renewed emphasis on **providing for dietary diversity, nutritional fortification, and health services for women and children.**

The food security community must go beyond acknowledging the role of women smallholder farmers as global food producers, to actually addressing their health issues as women, as these fundamental issues restrict their exercise of human rights, their productivity as food producers, and their ability to adequately feed, care for and educate their children.

Population dynamics in the most food insecure countries require **investment in reproductive health for women, voluntary family planning, and meeting the unmet need for contraception.** The world's most food insecure countries are also the ones with the most unsustainable population growth, the lowest levels of public health expenditure, and the lowest levels of educational attainment, especially for girls. The common thread underlying these interrelated problems is poor healthcare for women and inadequate family planning services embedded in health systems that are easily accessible, and services that are widely understood and utilized, whether in the most remote rural areas or in rapidly expanding, underserved urban areas. Utilization of healthcare for women and family planning services is dependent on improved access to education, particularly for girls.

To close the gender gap in agricultural productivity, countries must systematically strengthen or put in place policies, laws, programs and practices that **address the underlying causes of the gender gap.** Given that women in many countries produce 20 - 30% less than men, and women make up half or more of smallholder farmers in many of the world's most food insecure countries, closing the gender gap will go a long way to improving food security. The gap is due both to unequal access to productive resources, and also to unequal benefits derived from those resources. The latter is explained in part by the women's divided time between the demands of farming and that of running a household, pregnancy and childbirth, and child rearing. At the same time, their access to education, health services, good land, agricultural training, finance, and farm inputs are more limited. Systematically and comprehensively addressing these issues facing rural women can close the gender gap in agriculture.

Improving the resilience and ability of millions of smallholder farmers to adapt to climate change means thinking outside the box of agriculture per se. It requires **thinking of farm families in a holistic way,** and making sure couples have access to the information and the services they need to adequately space the birth of their children; and to have families of the size they desire and can adequately provide for, especially given the minimal resources they typically have at their disposal.

IV. ENVIRONMENTALLY SUSTAINABLE INTENSIFICATION OF AGRICULTURE

A priority concern for global leaders planning ahead for long-term food security must be the environmentally sustainable intensification of agriculture yields—in other words, increasing agriculture yields without increasing agriculture's environmental footprint. While global agriculture yields will need to increase significantly to ensure food security, merely creating more food would be neither adequate nor desirable. Given the predicted population growth and increased aging and consumption, global agricultural producers will need to produce more using fewer inputs and less land.

Based on the need to double efficiency of production over the coming decades to enhance nutrition and scale production with population growth, it is particularly important that Sub-Saharan Africa sustainably intensifies its use of arable land, given that today Sub-Saharan Africa has the world's lowest grain yields and extensively degraded soils, and opportunities must also be sought for better connecting farmers to global markets. By implementing several priority strategies for sustainable intensification, country-level leaders can **build shock-absorbers into food systems that will create food security in the face of climate change, political changes, and other system stresses.**

Country-level leaders can build shock-absorbers into food systems that will create food security in the face of climate change, political changes, and other system stresses.

First, the worst agricultural performers must be helped to close the continuing yield gaps. The biggest reduction in environmental impacts will be achieved by **'moving the bottom.'** Sustainable agriculture methods can be promoted through public and private sector commitments to transfer best practices from top producers to bottom producers. To increase food supplies through sustainable intensification, while limiting the amount of new land brought into agricultural use, strong emissions policies for agriculture will also need to be established. This will ensure that habitats and overall biodiversity are protected even as food security is achieved.

As governments plan for long-term food security, two key indicators at the nexus of climate change and food production must be assessed and managed: **soil carbon and water resources.** Data on both of these resources must be improved in order to make decisions around agriculture practices like irrigation and cover crops. These resources will also be needed to restore lands degraded by agriculture, a strategy required to expand agriculture production without destroying wild lands. Intentional policies for natural resource conservation must be developed at the local and regional levels to ensure continued economic growth and food security, specifically focused on developing sustainable water use practices (for both rain-fed and irrigation agriculture) and soil conservation. New tools are in development that will empower leaders to better monitor, prevent, and mitigate the effects of natural resource impacts.

32% of the food produced by the world is lost or wasted ... 65% of that wasted food is estimated to be lost at the pre-consumer level.

There is broad consensus across food security agencies and NGOs that **addressing food waste** on the global level must also be a part of long-term food security planning. Each year, 32% of the food produced by the world is lost or wasted, equivalent to 28% of the world's agriculture land. 65% of that wasted food is estimated to be lost at the pre-consumer level. Specific approaches to addressing food loss should be promoted to increase both farmer income and food availability:

- Disseminating knowledge to farmers around improved harvest and storage facilities for crops;
- Reusing food no longer fit for human consumption as livestock feed;
- Increasing the use of pasteurization and other food preservation techniques; and
- Making public investments in improved infrastructure, particularly roads that connect smallholder farmers to high-demand markets, and other infrastructure needed to store and distribute food.

Finally, climate change is causing both increasing weather variability—creates unknowns in year-to-year yields—as well as shifting regional weather patterns that change the viability of certain crops in specific

regions. Food and beverage companies have already taken actions to diversify their suppliers in order to hedge their bets in the face of supply variability, and country leaders will increasingly need to use developments like broadband internet, cell phones, and remote sensors to understand these changes and expected trends. **This challenge requires that particular attention be given to those geographies where commodities grown today may not be viable in 2050.** To bolster food security, those without financial or knowledge resources will need to be supported in making needed weather-based transitions, including both low-tech and high-tech approaches to smart farming.

V. RETHINKING THE FINANCING AND IMPLEMENTATION OF HUMANITARIAN AID

Given the recent increases in political crises and rates of migration worldwide, **the food security community must now fully integrate humanitarian assistance and crisis management into its strategies and secure new sources of support for humanitarian aid.** The food security and development communities have for the most part left conflict-related strategies to security experts. However, given that 40% of the world's poorest people now live in unstable, low income countries, it is time for the food security community to take the issue head-on.

As a result of the food price crisis of 2007 - 2008, civil unrest unfolded in over 40 countries around the world, sometimes turning violent. Hunger further drove competition for land, with vicious cycles emerging around food insecurity, conflict, recurring crises and poverty, underemployment, and youth joining rebellions, criminal gangs, or extremist groups. Out of this volatile context, vulnerable groups have emerged: migrants in search of work, refugees and internally displaced persons (IDPs), women vulnerable to exploitation, children begging on the streets.

Conflict leads to crop destruction, missed planting seasons, lack of access to markets, farmers abandoning their land, and farmland sown with landmines. Conflict and human rights abuses have raised the number of forced migrants to the highest level since WWII—totaling 60 million refugees, IDPs, and asylum seekers. Cuts in UN World Food Programme benefits have further exacerbated migration.

To reframe food security approaches post-Arab Spring, in an environment where food prices have come down—but still remain above 2006 levels—the imperative of food security as a national and economic security lever must be emphasized. The scale of the global humanitarian crisis today is directly related to economic and political volatility, as so many people in so many varying contexts are driven away from their homes by conflict and climate change. Gaps in the global food system must be bridged, as both a matter of economic growth and political stability, given governments' responsibility to feed those vulnerable populations that cannot feed themselves.

Conflict leads to crop destruction, missed planting seasons, lack of access to markets, farmers abandoning their land, and farmland sown with landmines.

In response to recent developments in the number of parallel crises and migrants worldwide, the food security community must now fully integrate humanitarian assistance and crisis management into national strategic planning. As a long-term approach to food security under the new norm of volatility,

investment should be made into establishing new systems for providing relief, transforming agriculture, building supply chains, and developing commodity markets. Humanitarian approaches should be considered in tandem with issues of nutrition, welfare and social services, and cross-sector partnerships established that can provide additional support for developing effective humanitarian aid mechanisms.

Government contributions and donations from private sources (including foundations, corporations and individuals) have grown over the past few years in response to the rising demand. These international resources continue to play a critical role in supplementing the efforts of governments unable to fully meet the level of need of vulnerable populations. A combination of public and private funds must continue to be established to enable this ongoing effort.

As the United Nations Refugee Agency (UNHCR) struggles to support the current humanitarian aid needs relating to ongoing refugee crises, with contributions from governments, corporations and individuals proving inadequate to meet the current level of need, new sources of income must be identified and commitments made to enable the ongoing relief work of the UN agencies, including the United Nations Development Programme (UNDP), the United Nations Refugee Agency (UNHCR), the United Nations Children's Fund (UNICEF), the World Food Programme (WFP), and the Food and Agriculture Organization of the United Nations (FAO).

Historically, the food security response to global crises has been reactionary, basing funds on emergency appeals and voluntary contributions. This unsustainable architecture for long-term food security has resulted in declining support for an increasing need. Therefore, the public and private sectors should aim to **secure new sources of support for humanitarian aid** by establishing new mechanisms for ensuring predictable funding.

CONCLUSION

Ensuring food security is a matter of both economic growth and economic resilience, and at the national and global levels underpins the functioning of stable political and environmental systems. Food security can decrease the impacts of political conflict, reduce the likelihood of civil unrest, drive economic growth, and strengthen the ability of governments to meet their responsibility to feed the most vulnerable populations. A secure global food system will require stable regional and global food markets, strong connections between both farmers and markets and between rural and urban areas, and cross-sector collaboration on the priority areas outlined in this document.

Given expected population growth over the next century, alongside increasingly frequent shocks to the global food system, global leaders must now recognize and address food security as a paramount national, economic, human and environmental interest. By developing resilience in the face of increasing climate events, meeting the needs of the world's women smallholder farmers, bolstering national rule of law to attract private sector investment, and other strategies outlined in this document, global public and private sector decision makers have a significant opportunity to bolster food security in the coming decades, subsequently improving prospects of economic growth, political stability and national security.

APPENDIX I – ASPEN INSTITUTE FOOD SECURITY STRATEGY GROUP PARTICIPANTS

Note: Dialogue participants were invited as experts in their fields and not in their organizational capacities or affiliations. Individuals who participated in the roundtable are listed for identification purposes only; they are not responsible for, nor do they or their organizations endorse, this document's narrative, conjecture or any errors.

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APPENDIX II – CONVENINGS OF THE FOOD SECURITY STRATEGY GROUP

Note: The following list summarizes the dialogue meetings of the Food Security Strategy Group over the course of 2013 - 2015. Our sincere thanks to the following hosts and sponsors of the Food Security Strategy Group for underwriting these activities: Bunge Ltd., DuPont, Land O' Lakes Inc., Desjardins Group, The Coca-Cola Company, Aspen Institute Italia, and Vital Capital Fund.

Convenings of the Food Security Strategy Group

June 15-17, 2013	Marrakech, Morocco <i>Dialogue hosted by OCP Group at La Mamounia Hotel</i>
October 13-14, 2014	Des Moines, Iowa, USA <i>Dialogue hosted by DuPont Pioneer at the DuPont Pioneer Seed Headquarters</i>
February 5-7, 2014	Rome, Italy <i>Dialogue hosted by Aspen Italia at the Aspen Italia Offices</i>
June 18-19, 2014	Belgrade, Serbia <i>Workshop at the EastAgri Annual Network Meeting 2014</i>
May 20, 2015	Milan, Italy <i>Workshop with the Economist Intelligence Unit at Grand Hotel de la Minerve</i>
July 7 – 9, 2015	Milan, Italy <i>Dialogue hosted by Aspen Italia alongside the EXPO Milano</i>