Isn’t there something cynical about the fact that nearly 800 million people do not have enough to eat and malnutrition is the main cause of death in children whilst, at the same time, over 600 million people are suffering from obesity? Isn’t it odd that 70 per cent of all undernourished and starving people live in countries where there is a food surplus? How can it be that smallholders produce more than 80 per cent of developing countries’ food supply and yet themselves make up the majority of the world’s poorest and most hungry people?

In this publication, German Development Minister Gerd Müller and six other thought leaders raise their “Voices Against Hunger”. There are voices from Germany and Africa, from government and civil society, from people working both on the ground and in science and research. The articles look at the key issues to be tackled if we are to conquer hunger and malnutrition by 2030: innovation, gender equality, the protection of natural resources, the role of the private sector and structural change to equip rural areas for the future.

However different the articles may be, the message conveyed by all the authors is the same: We can achieve a world without hunger! But only if we join forces. Let’s get to work!
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A World without Hunger is Possible
Hunger is the greatest scandal on our planet, because the Earth can feed everyone. We can overcome hunger and malnutrition, but we must possess the will to do so and we must make this the focus of our work. It is simply unacceptable that around 8,000 children die an unnecessary death every day. Would it not be cynical to accept that some 800 million people in the world do not get enough to eat every day, while some 600 million people suffer from obesity?

Dreadful though these facts may be, since 1990 the absolute number of people going hungry has been successfully reduced by 200 million people, which is an encouraging trend. This success story should be rated all the more highly given the growth in the world population, which is expanding by around 230,000 per day and around 80 million people per year. By 2050, as less and less land becomes available and water resources become increasingly scarce, feeding perhaps 10 billion people will be a formidable challenge. Climate change will also exacerbate the problem.

Hunger is a complex problem, but one thing is clear: Planet Earth does have the potential in terms of soil, water and plants. This is demonstrated by the fact that 70 per cent of all the world’s malnourished and hungry live in countries with a food surplus.

It is also clear that hunger and malnutrition are mainly the result of poverty. And three quarters of all those going hungry live in rural areas. Therefore, this is where we must focus our efforts. We need a new vision of modern rural development and sustainable agricultural production. The “Green Revolution” of the past focused too one-sidedly on increasing production – often at the expense of the natural environment and justice. We now need to place progress and innovation at the service of agriculture that is not only productive, but is also environmentally sound and conserves natural resources.
Rural development is the key to solving the problem of hunger. It is important that this development support “bottom-up harvesting”. Crucial factors for success will be political participation, land ownership for farmers, stakeholder ownership of the development process, and the establishment of local, off-grid structures in areas such as agricultural production, energy supply and trade. Other important elements will be full equality for women, and investments in education and infrastructure. Some 80 per cent of agriculture in developing countries is in the hands of smallholder families. This is where we need to focus our efforts with new forms of cooperation, cooperatives that perform, and the establishment of small and medium-sized enterprises. The path to sustainable results involves aiming not for size or monopolies, but for diversity and cooperation.

We need an agricultural transformation worldwide

Agriculture provides the foundation for human food and nutrition. There will be no life without crops, no future and no economic or social development without food and nutrition security. Nor will there be peace without food and nutrition security – what there will be is war, displacement and death. Building sustainable agricultural structures to safeguard these vital human needs will lay the foundations for more extensive development processes. This will include creating processing enterprises and jobs in the artisanal and manufacturing industries, as well as in distribution chains.

The developing countries can feed themselves. Just how much potential is lying dormant there becomes evident when we glance at the average yields of African agriculture. Today, they are between 0.3 and 1.5 tons of grain per hectare. In Germany, 5 to 8 tons are harvested on a comparable area.

Yields in the developing countries could be more than doubled rapidly through training, in conjunction with improved soil and crop management. For this to succeed, the countries concerned need appropriate
regional structures, local forms of management, and production and cropping methods that are environmentally sound and conserve natural resources. Agriculture must not become, as it has in some parts of the world, a driver of the problems of climate change, species loss, soil degradation, deforestation and water consumption. Agriculture must become a problem solver by adopting new production methods that are ecologically sound, climate friendly and animal friendly.

We cannot ignore the fact that the cultivation of palm oil and soya at the beginning of globalised value chains in some cases has devastating environmental impacts. As well as production methods, we also need to take a close look at the changes in our consumption habits. The rapid growth in global meat consumption, for instance, is having major effects on the global resource base, nutrient cycles and the climate. Each one of us bears responsibility, whether we are politicians, or whether we are involved in agriculture and the food industry, or food distribution chains. How we behave as consumers and shoppers also causes developments. The income of millions of small farmers who produce cocoa for our chocolate does not stretch far enough for a decent life,
for instance. Parents and millions of children work on plantations for a daily wage of one euro, with no chance of going to school and having a future to look forward to. As consumers, we are the ones pulling the strings. “Stinginess is cool” is the motto for consumers in the West, which means selling a bar of chocolate for 39 cents – too little for sustainable cultivation and distribution.

What we need is an effective global regulatory framework for the environment, agriculture and food. The progress made by individual countries, smallholders and enterprises must not be thwarted by unfettered, unregulated market forces and financial speculation. The goal of a just global agricultural trade system is still far from having been reached. Investment in land and agriculture must benefit the local population, rather than robbing them of their livelihoods by land grabbing. In the developing countries, rural areas need to be developed together with smallholders and producers rather than creating new dependencies on global corporations.

A world without hunger is possible. “Business as usual” is not an option. For a long time the fate of rural areas was ignored, and their huge potential for development went unrecognised. Food is a question of the survival of humankind, and the answer to it will be provided in rural areas of developing countries. It is time to make this needed change of approach in policymaking.

**Defeating hunger with the 2030 Agenda**

The international community has given sustainable global food and nutrition security a prominent place in the 2030 Agenda. For the first time, we have an agenda that seeks not only to reduce hunger, but to eradicate it entirely. As well as under-nutrition, it also sets out to eliminate malnutrition and over-nutrition. The Agenda 2030 goals with greatest relevance for sustainable global food security are:

**Goal 2:**

End hunger, achieve food security and improved nutrition and promote sustainable agriculture (by 2030).
In their Leaders’ Declaration at the Elmau Summit, the G7 also undertook to lift a total of 500 million people out of hunger and malnutrition by 2030. We now need to achieve these ambitious goals. Due to population growth, forecasts indicate that by 2050 as much agricultural produce will be required as was needed over the last 10,000 years put together, in other words, since agriculture began. An increase in production by approximately 60 per cent compared with 2005 levels is needed – and this even as water and soil resources are dwindling.

In 2016 there were 7.4 billion people living on our planet. By 2050 the figure is already expected to be approximately 10 billion. Moreover, dietary habits are changing, as are expectations with regard to production. Growing middle classes are demanding what was previously reserved for only a small stratum in the rich countries of the North. The consumption of meat and other animal products is rising, thus pushing up demand for animal feed to a very considerable extent. There is also a growing demand for biofuels, cotton for textiles and other agricultural commodities. In the field there is competition between food, feed, fuel and fibre.

This will further increase pressure on natural resources for agricultural production. In the past the Green Revolution made it possible to feed a continuously growing population, for example in India and China. However, this often went hand-in-hand with a loss of soil fertility, a falling groundwater level and the impacts of excessive pesticide use. Increasing production at any price is therefore not the solution, also because agriculture then often destroys the key resources on which it is based. Examples include the problems of deforestation, overgrazing, exploitation of water resources and the destruction of biological diversity. This can be seen in parts of South America as a result of soya cultivation, or in palm oil production in Indonesia. What agriculture needs to do instead

Goal 15:
Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss (by 2030).
is use existing resources more efficiently (such as water) and conserve them (such as soil). Yields per hectare can also be increased significantly through sustainable production. The vision for the future must be to produce more using fewer resources, on a sustainable, environmentally sound and animal-friendly basis.
What we need to do now – 10 points for a world without hunger

The goal of providing adequate food and healthy nutrition for all by 2030 can only be achieved if all stakeholders are actively involved. This includes not only individual countries, but also the international community, as well as politicians, the private sector, academia and civil society. The challenges are clear. Agriculture must become more productive, generate more nutritious produce, operate in ways that conserve resources, and become more resilient in the face of climate change.

To achieve this, the agricultural sector must receive support from many policy fields. The most important, alongside agricultural policy, are trade, education, health, research, infrastructure, environmental and legal policy. Development policy is also called upon to play its part. All these policy areas must be oriented towards a comprehensive strategy comprising the following ten core elements.

1. **Build an innovative agricultural sector**

Modernisation of the agricultural sector will be the key driver of progress in productivity and resource efficiency. Half a century ago, agricultural productivity was increased chiefly by using more land, water and fertilisers etc. Only about 10 per cent was attributable to innovation. Today, 50 per cent of productivity increases worldwide are due to innovations – improved knowledge, and new technical and organisational developments. These innovations are scaled up chiefly through improved training.

Many small farmers could easily increase their productivity. With access to knowledge, markets, capital and inputs such as seed, fertiliser, pesticides and agricultural machinery etc. they could make the leap from subsistence farming to modern market-oriented production. Yields per hectare can be achieved in small farm structures that equal those of larger farms. This is particularly true in Africa. As the African Union put it, the aim is to achieve an Africa where “modern agriculture for increased production, productivity and value addition contributes to farmer and
national prosperity and Africa’s collective food security”. To achieve this goal, various factors need to be harmonised.

Improved knowledge: Farmers need broad knowledge which they can apply. By closely linking agricultural research with agricultural training and extension, knowledge of sustainable farming methods must be transferred that incorporates agro­nomy, business management and veterinary medicine. The occupational profile of the farmer also needs to be modern­ised and professionalised.

Improved organisation: We will not succeed in making agriculture and the food industry innovative through mod­ern technology alone. It is at least as important to improve organisation among producers, processors and distributors. Forming cooperatives is one important way forward. But this must involve genuine “self”-organisation, meaning voluntary organisations that are owned by the stakeholders concerned and are beyond political influence.

Broader cooperation: If small producers are to operate pro­fessionally, innovatively and on a more market-oriented basis, they must cooperate. Contract farming and other forms of co­operation with the private sector can give them easier access to capital markets, thus making them more competitive.

Improved access to capital: Many farms obtain traditional bank loans only rarely. Conventional microloans that have short terms and are small in size usually do not cover their needs. Appropriate financial services are therefore needed – particularly for women – such as loans for agricultural inputs and capital goods such as machinery.
Improved infrastructure: Developing infrastructure improves market access. This will link rural areas with the expanding cities and their growing purchasing power, and enable more vigorous regional trade. Digitisation will create new opportunities here.

More energy: One factor that is often neglected is access to energy, which is imperative for more productive agriculture. Since renewable energy sources are highly suitable for off-grid solutions, they are ideal for agriculture.

Lower post-harvest losses: Worldwide almost 20 per cent of harvests are lost between the field and the plate. In developing countries the figure sometimes reaches 50 per cent. More energy would also help reduce post-harvest losses, for instance by improving the drying, refrigeration and processing of agricultural produce. Improved plant protection, good storage and transport can also reduce losses.

Today, modern information and communication technologies can generate key impetus for launching these urgently needed technical, organisational and institutional innovations. Radio and television, and especially mobile phones, tablets and PCs, now offer entirely new possibilities, particularly for the agricultural sector. Nowhere is the mobile phone market growing as rapidly as it is in Africa, where in 2000 just 16.5 million Africans owned a mobile phone. Today, over 700 million of them do. The potential applications include new forms of training and extension, market information, weather forecasts, inventory management, e-commerce, mobile financial services, the diagnosis of plant and animal diseases, and the tracing of product flows, for instance in connection with certification. The key challenge now is to further develop and combine the technological options, and adapt them to the specific needs of the rural population.
2. Develop rural areas comprehensively

Although agriculture is a crucial factor in rural development, there are at least three reasons why a support strategy should not focus exclusively on agricultural productivity.

If agriculture is to be productive and food security effective, then various other conditions must first be in place that can only be created by comprehensive rural development. This includes educational institutions, health posts, roads linking producers to markets, and electricity for refrigerating, drying and processing produce.

Increased agricultural productivity can increase the availability of labour. New jobs must then be created to cope with this structural transformation. These jobs can be created in the processing of agricultural produce, the crafts sector, small-scale industry and services. This can mobilise endogenous sustainable rural development. To achieve this we need fresh ideas, and strategies that are workable under practical conditions.

Without responsible rural development, global resource management is inconceivable. All natural resources must be managed sustainably in rural areas. The conservation and preservation of forests, biological diversity and freshwater resources are also major tasks for the future. And energy, which we will increasingly need to obtain from renewable sources due to climate change, has so far been produced largely outside of cities.

Each country needs to harness the specific potential of its rural areas, and significantly increase self-sufficiency within regional markets. Rural areas must offer people – particularly the younger generation – life prospects. At the same time, they must become core areas of sustainable development. The driving force behind this structural transformation will be higher productivity resulting from the use of knowledge, technology and capital.
The most appropriate way of achieving this will be to develop a self-reliant and capable agriculture and food sector. This should embrace all upstream and downstream areas of agricultural production, and form complex value chains networks. The stronger demand for a very wide range of products in cities offers a good opportunity for this.

The growing urban population can feed itself with products obtained either on the global market or from domestic production. Preference should be given to the latter, particularly when rural areas not only generate primary agricultural produce, but also store, process and distribute it. The structural transformation we need will only succeed if all the value added along agricultural value chains is generated in rural areas, and remains there. Once a capable agricultural and food sector is established, demand can increase for construction materials, repair services, trade and transport facilities, clothing, and ultimately education and health services. Sustainable rural development will then be set in motion. This systematic strengthening of rural areas can and must counterbalance migration to urban agglomerations and slums.

Ultimately, structural change will be driven through investment by millions upon millions of individuals: smallholders, input providers, food
processors, distributors, financial service providers, craftspersons and others besides. Investment by the private sector, however, will depend on numerous prior inputs by the public sector, technical infrastructure and social services. The state will also need to act in order to protect natural resources. It must create a comprehensive regulatory framework for rural areas in order to reconcile divergent claims on resource use.

3. Make agricultural markets fair and just
When production losses occur in a given locality, food prices also tend to rise there. When several upward pressures on prices coincide, the global price structure can even be destroyed. Between 2005 and 2008, weather-induced harvest losses occurred in a number of key agricultural export countries. At the same time stocks were already low, and demand for biofuels was increasing. This resulted in a perceptible shortfall in the global food supply. Prices then rose sharply. High energy costs drove them further upwards. Finally these effects were further exacerbated by the sudden imposition of export restrictions by a number of export countries, and by speculation in agricultural commodities – chiefly maize, wheat and soya. The outcome was that in 2008 grain prices doubled within twelve months. In 2011 prices moved upward once again. The number of people going hungry in the world rose in these years.

Moderate and steady price rises for agricultural commodities are a good thing. They create incentives for investment by small-scale producers in developing countries and provide market incentives against the wasteful use of resources. By contrast, when food prices rise suddenly or fluctuate widely, as they did in the years mentioned, almost everyone loses. These price movements plunge poor consumers into hunger, and jeopardise social peace. They also constrain investments, because they indicate increased risks for producers.

Measures to prevent and manage such economic shocks should be part of any comprehensive strategy for food and nutrition security. Agriculture is subject to fluctuations time and time again; this is in the nature of things. Yet the various risks can be reduced significantly.
The removal of permanent trade barriers does stabilise markets, for instance. The price crisis a few years ago also clearly showed how important it is that individual countries resist the temptation to impose sudden restrictions on trade. Farmers also need better access to markets and information on price trends across regions. Transparency and early warning mechanisms are also important for policymakers and aid organisations. They all need intact agricultural market price and early warning systems in order to deliver timely responses to food shortages.

Storage is also an important tool to counterbalance fluctuations in supply and prices. Unfortunately, many national storage systems have proved rather ineffective. Since private food stocks are often inadequate in situations of crisis, supranational food storage should be organised, perhaps by regional economic organisations.

**Correct existing bioenergy policy**

Energy obtained from biological raw materials, particularly wood, has traditionally played an important role in developing countries. These resources can be managed more sustainably and efficiently, however. During the price crisis, though, strong demand for biofuels in industrialised countries exacerbated the problem and drove prices upwards. Quotas and subsidies in many industrialised countries had led to the increasing use of agricultural commodities like maize as fuels. We should not reject biofuels outright. If biofuels are produced to high environmental and social standards, and primary raw materials are increasingly substituted by agricultural wastes and residues, then biofuels can be highly appropriate, and provide a source of income for rural areas. Food security always has priority, however. To avoid future price crises on the food market, we should therefore take a critical look at the aid policy of several industrialised countries. A more flexible policy would be advisable. When grain markets threaten to overheat, subsidies and quotas to promote bioenergy should be reduced or suspended. An approach of this kind would be more appropriate to the sensitive food markets than are rigid quota systems.
Prevent speculation in food

The price crisis of recent years has finally brought the issue of speculation in food onto the political agenda. Commodity futures markets are an important tool for determining prices and protecting against price risks. Recently, however, agricultural commodities have increasingly become part of the investment portfolio of financial investors. As a result, volatility on equity, real estate and energy markets is having a greater effect on prices for food and other agricultural commodities than could be explained by “real” agricultural factors. According to empirical studies, up to 30 per cent of the extreme spike in maize and wheat prices in 2008 was due to excessive speculation. There are various ways of tackling this.

// Greater market transparency is important in making actual availability and demand visible.

// To counteract the risks of high-frequency trading, during periods of crisis, position limits can be set and trading interrupted at short notice – as the EU has now decided to do. These decisions should be swiftly implemented and applied so that they can take effect during future price crises.

// Financial investors should be urged to forego speculating in food when there is a risk of a global food crisis. It is pleasing to note that several banks and investment companies have already declared themselves willing to do this.

// A financial transaction tax along the lines of the Tobin tax should be introduced that goes up when price fluctuations and price levels rise.
4. Allocate land fairly

Commercial investment in the agriculture and food sector can generate impetus for development and innovation. It can, for instance, accelerate technology transfer and access to markets and capital, thus supporting increased productivity. It can help diversify the livelihoods of the rural population, support the development of income and employment, and increase the availability of food.

However, negative examples of irresponsible agricultural investment across large areas, and purely speculative land grabbing, illustrate the limits and risks of large-scale investment by the private sector. Since the year 2,000, foreign investors have acquired some 27 million hectares of productive agricultural land and forests worldwide.

Land grabbing often targets land that is well supplied with water, is located in densely populated regions and is already used for agricultural purposes. This reinforces existing conflicts over land use. The poor, marginalised rural population in particular usually do not profit from such investment,
and in some cases are even robbed of their livelihoods in the process. Time and time again, land grabbing of this kind leads to people being evicted and natural resources being ruthlessly exploited. The local nutritional base then deteriorates, and the local population remain excluded from just participation in the benefits of private investment. Only when we succeed in ruling out such undesirable developments will large-scale agricultural investment make a credible contribution towards eradicating poverty, hunger, and underdevelopment.

Fair and secure land rights are an important prerequisite for “sustainable agriculture”, and a central issue of justice. The key yardstick here is the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests adopted in 2012, and the Principles for Responsible Investment in Agriculture and Food Systems adopted in 2014. These provide governments with guidance on legislation and land tenure, but are also designed for the private sector and civil society.

5. End discrimination against women
In many countries women suffer major discrimination. This is not confined to the agricultural sector, but it does have particularly severe consequences there. Women usually have poorer access than men to productive resources. They have fewer educational opportunities, often have no right to own land and barely any other rights to have their say; they find it more difficult to obtain loans, often have no way of purchasing seed, fertiliser or livestock, and have no access to modern technology or extension. By putting an end to this discrimination alone, agriculture in developing countries could produce 20 to 30 per cent more, and provide sufficient food for around 15 per cent of the hungry.

In developing countries women provide approximately 43 per cent of agricultural labour. In sub-Saharan Africa the figure is even around 50 per cent. As well as discrimination in agriculture, women also suffer discrimination through agriculture due to the multiple roles they perform. Women are also responsible for many other activities that are crucially important for food and nutrition security. They spend a great deal of time collecting firewood and fetching water. They also decide what meals will be prepared.
and how varied the diet is. Finally, they are the ones who play a key role in the healthy, balanced nourishment of infants through breastfeeding. Yet eating habits often mean that they receive less nutritious food than men.

Our goal must be to overcome this discrimination. Achieving this will not be easy, however, because the causes are usually of a cultural nature. Nonetheless, politicians and society at large must not ignore these grievances. Women and girls must be systematically supported in their social, political and economic participation. Many bear responsibility for this, above all men. However, religious communities can also play an important role in harmonising traditions with the right to food.

**Food and nutrition security for mothers and children**

Only individuals who are well nourished from birth onwards can fully develop their capabilities, work productively in later life and escape the vicious circle of poverty. Each dollar invested in combating malnutrition delivers a macroeconomic benefit of 16 dollars. The first 1,000 days of life are particularly critical. Those who do not receive sufficient and nutritious food during this period suffer irreversible impairment of their development. Nutrition is especially important for young women, pregnant women, nursing mothers and infants.

To prevent vitamin and mineral deficiencies, many countries need to work systematically towards diversifying agricultural production and the food available. Staple foods such as maize or rice alone are not sufficient. One effective and low-cost measure can be the enrichment of food (e.g., edible oil and flour) with micronutrients. Sometimes another option is the temporary administration of food supplements (e.g., vitamin A for babies and toddlers).

Infections caused by contaminated water or poor hygiene constrain the body’s ability to utilise food. Infectious diseases of this kind are the most common cause of malnutrition in children. In many regions the supply of safe water and sanitation therefore need to be improved. Functioning health systems, universal basic vaccination programmes,
deworming programmes and hygiene counselling for families are also of key importance.

Malnutrition often occurs because people lack adequate knowledge on breastfeeding, hygiene or a varied diet. This is why nutritional issues should be included not only in health programmes, but also in agricultural, water, sanitation and education programmes. Healthy nutrition campaigns, changes to curricula and more nutrition experts are also required. As the FAO points out, however, these measures will only be effective in conjunction with a minimal level of social protection. Good nutrition presupposes that people are not left without any protection at all against general life risks such as sickness, unemployment and old-age poverty, and that entire sections of the population are not marginalised.
6. Ensure food and nutrition security, also in times of crisis

Until the 1960s, famines claiming millions of human lives were a regular occurrence. These were caused chiefly by colonial exploitation, war and enforced collectivisation. Fortunately those times have gone. Only some 10 to 20 per cent of all people going hungry today suffer this fate as a result of economic crises, natural disasters or political conflicts. For all the others hunger is caused by structural poverty, mostly in rural areas.

Yet when crises, disasters or conflicts do occur in settings where people and societies are vulnerable and institutions are unable to act, the risk of hunger and malnutrition is particularly high. People then usually need humanitarian aid, usually in the form of food aid. Since poor nutritional status also weakens the population, this can lead to a fatal trend towards recurrent mutually reinforcing crises.

We must break this vicious circle, reduce vulnerability and strengthen the resilience of people and societies. Not an easy task, particularly since climate change and natural phenomena such as El Niño are constantly generating fresh challenges, and because a systematic approach is needed in very different areas. Important elements include:

- sustainable, climate-smart and more productive agriculture through applied agricultural research, drought-resistant seed, smart irrigation systems, terracing, agro-ecological methods;

- post-harvest protection through improved storage, processing and conservation of food;

- conservation of natural resources through soil rehabilitation, forest protection, afforestation and integrated water management;

- resilient institutions, e.g., early warning mechanisms and established crisis response plans, regional food reserves, improved data sharing and regional cooperation;
protection mechanisms, e.g., harvest loss insurance, social protection, creation of income generating opportunities outside of agriculture;

rural infrastructure: improved transport routes and trade links (procurement of food from neighbouring regions that are not affected), irrigation systems, establishment of water supply systems that are resilient to extreme weather events.

When a crisis does occur, a foresighted approach is required. This can include, for instance, linking emergency humanitarian aid with assistance that will deliver long-term results.

7. Tackle climate change with fresh approaches
Climate change is creating huge challenges for agriculture everywhere. Under strong pressure to adapt, agriculture must produce more for a growing world population. At the same time, agriculture is not only a victim of climate change, but also one of the factors causing it. Productivity, sustainable natural resource management, adaptation to climate change and the prevention of emissions are inextricably linked – and innovative strategies that combine them are available.

We need to rethink rural development at the global level in the context of climate change, and pursue it through a systemic approach. Breeding and propagating high-performance varieties will play an important role in this. These will need to deliver potentially higher yields, as well as better nutritional values, and at the same time be more resilient against drought, heat and pathogens. Publicly funded breeding research will be first in line for developing these varieties, chiefly for smallholders, who will then face less risk of becoming dependent on international seed corporations. At the same time the global gene pool – which provides the base for breeding new varieties – must be sustainably preserved and kept available.

Important though breeding research is, it will not in itself be sufficient, because individual varieties can only ever provide a solution to highly specific local situations. Often, however, we are unaware of these situ-
ations, because we cannot yet anticipate in detail what the impacts of climate change will be. We know roughly what increase in the global mean temperature to expect. Yet there is still a great deal of uncertainty as to where exactly temperatures and precipitation values will change, and how. And we certainly cannot predict how temperatures and precipitation will interact with soils, water availability and species diversity in specific regions. In other words, we are incapable of forecasting the specific conditions that will obtain for agriculture.

Consequently, agriculture – particularly in developing countries – will need to be able to respond flexibly to contingencies and mitigate risks. Ways of increasing resilience in crises, conflicts and disasters have already been described. Many of these approaches are indeed necessary and highly suitable for reducing vulnerability in times of climate change. Examples include: regional water management and the construction of efficient irrigation schemes; terrace construction, forest protection and afforestation; diversification of agricultural production; application of agro-ecological methods; measures for soil rehabilitation and agro-forestry. These can be supplemented by protection measures such as insurance against harvest losses. Since we are looking at a raft of needed measures, it would seem appropriate to speak not only of climate-smart agriculture, but also of climate-smart global rural development.
Partners for Change
Voices Against Hunger

Worldwide, agriculture causes approximately 10 to 12 per cent of global greenhouse gas emissions. Particularly worrying are the methane emissions given off by ruminants and those generated by rice cultivation and the fertiliser industry. This is compounded by the fact that the area of land used to cultivate animal feed crops, particularly soya, is growing by several million hectares a year. The separation of animal production from the local feed supply has opened the door to factory farming practices with a highly significant carbon footprint. Agriculture must therefore help reduce emissions, for instance, by changing livestock farming practices, using fertiliser efficiently or reducing post-harvest losses.

Changing land-use practices also offers major potential for reducing emissions. Agriculture is extending further and further into areas that were previously more or less untouched natural environments. Eighty per cent of global forest loss is attributable to this very trend. Marshlands and peat bogs are also having to make way, as in Indonesia due to the expansion of palm oil plantations. All this releases huge quantities of carbon that is bound in wood and soil. Such changes in land-use patterns mean that agriculture is indirectly responsible for a further 14 per cent of global greenhouse gas emissions. The sustainable intensification of production on existing farmland is perhaps the greatest contribution that agriculture can and must make towards climate change mitigation.

8. Make conserving natural resources a top priority
Without water, fertile soil and biological diversity, food cannot be produced. In the interests of subsequent generations, we must protect the natural resources on which agricultural production is based. This would be imperative even without climate change, though climate change makes it all the more important.

Conserving water
Many countries where agriculture offers major opportunities for development suffer from water scarcity. They usually consume more water than nature provides and, thus, gradually come to exploit groundwater and surface water. Even low investment in systems for irrigation and efficient water use could alleviate this problem and, at the same time, increase yields.
Water quality must be maintained, however. Inadequate sanitation means that many pathogens find their way into rivers and lakes, and then into the human food chain when fields are irrigated. Agriculture is not only affected by poor water quality, however. It is also part of the problem itself. The improper, careless and in some cases wasteful use of fertiliser and chemicals contaminates water with pollutants.

There are many technical options for managing water more efficiently and maintaining its quality. Yet any good approach will only succeed if it is embedded in a coherent “regulatory framework for water”. Here, good governance is called for on various levels. Drinking water use, irrigated agriculture and water resources protection for environmental purposes must be harmonised. Water must be allocated according to market principles while, at the same time, guaranteeing basic water supply for the poor.

**Conserving soil**

Every year, ten million hectares of fertile soil are lost worldwide, because the soil is managed either inappropriately or too intensively. Twenty million tons of grain could be cultivated on this land. More than one third of the world’s land is at risk of turning into bush or desert. Important habitats for species diversity are being lost. Productive land is becoming an increasingly scarce resource, competition for which is fierce. As with the conservation of water, simple methods for conserving soil are available. Building terraces or planting trees is often enough to protect sloping farmland against erosion, and thus sustainably maintain soil fertility and water retention capacity. Conservation agriculture – in which the soil is worked only minimally (or not at all), remains covered and crop rotation is maintained – offers many regions an appropriate alternative to the plough. Where soils have already lost their fertility, swift countermeasures should be taken.

**Conserving species diversity**

Human beings have been utilising the diversity of the natural environment for millennia. They have taken wild animals and wild plants, and systematically developed what they required in order to meet their needs. This has resulted in countless useful plant and animal species. But this
diversity has suffered considerably over the last 150 years. Around 1,500 livestock breeds are threatened by extinction. As regards cultivated plants, an estimated three quarters of these crops have disappeared. What remains of agro-biodiversity must be preserved and treasured. This precious resource forms the base for further breeding and is a prerequisite to productive and sustainable agriculture. Agro-biodiversity is a genetic reserve and a risk insurance policy for the future of humankind.

The “diversity principle” applies far beyond the realm of agricultural genetic diversity. The whole of nature’s diversity is the foundation for human nutrition, and is therefore indispensable for agriculture. Through its diversity, nature can sustain all the biological, chemical and biochemical conversion processes that are essential for life and the production of nutrients. Functioning ecosystems guarantee soil formation, filtration and water storage, crop pollination and, for instance, the nitrogen and phosphate cycles that affect nutrition.

9. Manage forests sustainably

Forests play a very special role in the interplay between ecology and food security. They provide livelihoods for more than 1.6 billion people. Forests provide food, which poor people in particular are often dependent on, especially as a reserve to fall back on in case of harvest losses. Forests also supply fuels, construction materials, animal feed and medicines. And they benefit agricultural production, because they help protect against erosion and improved degraded soils. Through efficient pasture management and agro-forestry, forest managers and farmers can increase yields sustainably.

Forests and wooded landscapes are among the most important elements for sustainable rural development. They provide a reliable source of food, generate income and employment, and preserve species diversity. Forests perform a crucial service for the global climate. They form oxygen and absorb the greenhouse gas carbon dioxide.

Tropical rainforests store up to 120 tons of carbon per hectare – far more than an average forest, which stores 75 tons per hectare. This stored car-
bon is released again when forests are chopped down and wood is burned. Global deforestation, particularly as a result of the expansion of soya and palm oil cultivation, as well as cattle breeding, currently affects primarily areas in the tropics and subtropics. In heavily forested tropical countries in particular, forests and forest products make a significant contribution towards livelihoods and economic output, as well as food and nutrition security. This is why investment in the preservation and restoration of forests, and in the creation of wooded landscapes, is very important.

10. Pursue marine conservation and sustainable fisheries
The outstanding importance of the oceans for human beings is still underestimated. Oceans are the world’s largest carbon sink, and supply 50 per cent of the world’s oxygen. They are also an important supplier of food. Protecting and managing them sustainably is therefore equally as important as preserving terrestrial ecosystems. This is why we need to drastically reduce marine pollution caused by litter, create more and better managed marine protected areas and prevent irreversible damage to marine ecosystems. Only then will the oceans be able to continue performing their ecosystem services in the future that are so important for human beings.

Nutrition is one example: Fish covers some 17 per cent of animal protein consumption worldwide. In developing countries, the figure is often even significantly higher. Thanks to the valuable fatty acids, vitamins and trace elements they contain, fish products can help prevent malnutrition.

Fisheries also provide many people with a secure income. Almost 60 million people work full-time in fisheries and aquaculture. For poor sections of the population, these industries often provide the only access to high-quality food and income. Fish is also outstandingly important as a commodity: 78 per cent of the fish and seafood produced worldwide ends up on international markets. Fish is the most important “agricultural” export product of developing countries, with a higher net export value than coffee, sugar, bananas, cocoa and tea combined.
Yet global fish stocks are under threat. The FAO estimates that approximately 31 per cent of all recorded stocks have been overfished, and over 58 per cent have been exploited to the limits of sustainability. Numerous fish species are threatened by extinction. Illegal, unregistered and unregulated fisheries, plus damaging fishery subsidies, are the main causes of overfishing. Illegal fisheries cost coastal states up to US$ 23.5 billion a year. Sustainable fisheries management is therefore needed. Where fishing takes place on a regulated and controlled basis, illegal overfishing can be contained, stocks can recover and small fishermen can continue to generate income. Sustainable aquaculture can also help alleviate the pressure on wild fish stocks, particularly if the industry succeeds in further reducing the amount of fishmeal and fish oil contained in aquaculture feed.

The ocean may also offer humans further opportunities to expand their base for healthy nutrition. Measured as dry matter, algae are richer in vitamins and minerals than any field crop. They also contain large quantities of protein and fibre. In developing countries in particular, algae can help combat protein, vitamins and mineral deficiencies, provided that cultivation is developed and the population incorporate algae into their diet.
Eradicating hunger and achieving long-term food and nutrition security are global objectives that all countries in the North and South, politicians and civil society, producers and consumers, and the international community, must include among their core responsibilities.

1. The responsibility of developing countries and emerging economies
The developing countries and emerging economies will play a key role here. Without their political will, consistent development orientation and purposeful initiative, any food and nutrition strategy will be doomed to failure. They need to create enabling frameworks for investment in rural areas. Sustainable jobs and income can only be generated by the private sector – from the smallholder family farm to the medium-sized enterprise. But it is the state, with its material outlays and regulatory framework, which will set the key incentives to investment. These will include stable financial systems, fair land tenure systems with certain land use and ownership rights for the rural population, a good vocational training system and the development of infrastructure. It is a proven fact that a consistent policy leads to success. Countries such as Ghana, Rwanda, Ethiopia, Cambodia and Brazil have made considerable progress in the fight against hunger.

Countries must also use all the trade policy options at their disposal to protect their markets during the initial phase of development, so that a competitive agricultural sector is able to emerge in the first place. Trade within and between countries in Africa is also important. Unfortunately, it is often quicker and less expensive for a country to import agricultural products from the world market rather than from a remote area within its own borders, or from neighbouring countries. Regional integration through improved roads and the removal of tariff and non-tariff barriers to trade between developing countries are important enabling factors for more trade within and between countries.
2. The responsibility of the food industry, distribution chains and consumers

Globalisation means that today, the conditions under which people live around the world are interlinked. How we produce and consume agricultural products ourselves has a significant effect on environmental and social conditions elsewhere. We can see this, for instance, in the land required by the industrialised countries. The land they need in order to meet European demand for agricultural goods is around one and a half times the size of the agricultural land actually available in Europe. Large swathes of the area used for this purpose outside of Europe serve chiefly to cultivate feed for meat production, in ways that all too often are unsustainable. This trend raises considerable problems.

The social impacts associated with the import of agricultural goods from tropical countries are also a matter of concern. For instance, most of the 40 to 50 million people employed in cocoa production worldwide live below the poverty line. For a conventional bar of chocolate, only 7 per cent of the retail price reaches the farmers. Almost 80 per cent goes to the manufacturers, distributors, wholesalers and retailers. In Ghana income is around 84 cents per day, while in Côte d’Ivoire the figure is about 50 cents per day. Furthermore, in West Africa alone 2.3 million children are employed on cocoa plantations, many of them without pay and with no opportunity to attend school. This state of affairs must change, and calls on all of us to act.

Food manufacturers and distributors bear responsibility for this, as does each and every consumer. We must ask ourselves where the products come from, and under what conditions they were manufactured. It should go without saying that we pay fair prices, because these enable sustainable production. Through their purchase decision, consumers can exert pressure and help improve the lives of smallholders and plantation workers. We also need to become more aware of the fact that with each piece of meat that lands in our bin instead of on our plate, the pressure on natural resources in the world continues to rise. To facilitate this change we need credible environmental and social labels in order to create the necessary transparency and guidance. Where an understanding of the
problems and the voluntary approach do not lead to the desired results, international rules and binding standards are necessary.

3. The responsibility of the international community
To achieve the goal of a world without hunger we need a robust global regulatory framework. The international community requires clear rules, regulations and approaches for international agricultural research, innovation promotion, agricultural trade, competition law, social and environmental standards, and the entire value chain.

The organisations that play a significant role in the fight against hunger will be key elements in an international architecture. As well as the WTO, FAO, IFAD and WFP, this will include the World Bank, the regional development banks and the global agricultural research partnership CGIAR. All of them still have a long way to go in exhausting the possibilities for helping build, within the framework of an appropriate division of labour, a sustainable global food and nutrition system.

The international community's responses to acute hunger crises remain wholly inadequate, for example. This is why the entire food aid system urgently needs to be further developed. The response time is too long, the early warning systems are in need of reform, and we need a strategic link between emergency humanitarian aid and long-term development programmes. The issue of resilience – crisis risk management and prevention rather than response – needs to play a greater overall role than has been the case so far.

A further major deficit that is not yet receiving sufficient attention internationally is the crucial importance of agriculture for mitigating climate change. Conversely, global food and nutrition security is threatened by climate change – which demands a clear commitment to joint action.

There are, however, also encouraging steps towards a global architecture for food and nutrition, such as the reforms of the Committee on World Food Security (CFS) and the global agricultural research partnership (CGIAR). Over the last few years, the G7 and G20 have also seized the
Partners for Change
Voices Against Hunger

Initiative and taken important first steps towards concerted international action, for example with the foundation of the Global Agricultural and Food Security Programme.

Stable prices worldwide are the best starting point for development. This is why the international community must do more to curb price fluctuations on agricultural commodity markets. A further important element of the global architecture will be a fair world trade system under the aegis of the WTO that prevents markets from being flooded with cheap products from the industrialised countries, and gives the developing countries an opportunity to protect their markets. This is the only way they will be able to establish a competitive agricultural sector and food industry. Although there have already been some positive movements towards a fair trade system, much remains to be done.

The developing countries must use the scope they have been given to develop their own markets within a protected environment, and attach priority to local production. They should be supported in this, for instance through development cooperation. This could include advisory services for trade policy, and a particular focus on the specific development of their own food processing industry.

At the same time, the affluent industrialised countries must make their contribution toward ensuring that this early phase of development really does succeed. They must undertake at the WTO level to reduce and reform their agricultural subsidies that distort trade. The time has also come for a worldwide agreement on duty- and quota-free access for all Least Developed Countries (LDCs), such as the EU has already established through the Everything But Arms (EBA) initiative. As well as exemption from duty, these countries also need comprehensive support in complying with rules and standards for access to the developed markets.

The international negotiations on mechanisms to protect against sharp increases in imports and on public storage must also be brought to completion. Moreover, the WTO must develop new rules to guarantee “fair” market relationships in supply chains. Binding environmental and social
standards must be made an integral part of trade agreements, and international enterprises must be required to comply with them.

4. The specific contribution of German development policy

Our policy now makes rural development and food security a priority task. In 2014, we launched the Special Initiative ONE WORLD – No Hunger. All activities in this thematic area were brought together within the initiative, strategically reoriented and given a considerable injection of additional funding. Currently, some 1.5 billion euros are being channelled into the initiative every year, which is almost 20 per cent of the entire budget of the Federal Ministry for Economic Cooperation and Development (BMZ) in this sector.

The Special Initiative pursues a broad overall approach designed to facilitate comprehensive rural development. Bilateral projects, which often include international partners, are aligned with our partner countries’ programmes and involve elements of their civil society. They cover a wide range of areas, foster innovation, help achieve food and nutrition security, strengthen resilience, improve soil protection and land rights, and much more besides. They serve to demonstrate progressive approaches, but also seek to prompt broad structural improvements in the countries concerned. Their effectiveness is measured in relation to ambitious quantitative targets. All large-scale projects are supplemented and accompanied by advanced research.

At the same time, the Special Initiative participates in numerous multilateral programmes, including the World Bank’s Global Agriculture and Food Security Programme (GAFSP), the IFAD’s Adaptation for Smallholder Agriculture Programme (ASAP) and the global agricultural research partnership CGIAR. The Special Initiative aspires towards greater international policy coherence, and is working to help design the global architecture.

Finally, in Germany, the Special Initiative ONE WORLD – No Hunger is an integral part of a comprehensive dialogue on development with the private sector, academia and civil society. As part of a so-called Charter
for the Future process, over the last few years we led a discussion of the vital issues affecting humankind under the slogan **One World – Our Responsibility**. At the level of many individual projects, we guarantee that civil society engagement is integrated and that expertise and experience is drawn from the private sector and universities in Germany. By establishing and participating in multi-stakeholder forums such as the German Initiative on Sustainable Cocoa, we are exploring new ways of making agricultural value chains sustainable and improving working and living conditions in partner countries.

Through the Special Initiative, the BMZ has been making major contributions towards eradicating hunger and malnutrition, towards rural development, and thus towards effectively preventing hopelessness, violence and displacement. In 17 priority partner countries, 14 of which are in Africa, we are contributing to efforts to guide 19 million people out of hunger and undernourishment. In the 14 “Green Innovation Centres”, training and extension for smallholder families and processing enterprises are now taking place in order to increase productivity, income and employment. More than five million people are benefiting from this. A further focus involves programmes in eleven countries to combat malnutrition, which are benefiting pregnant women, mothers and small children. In addition, more than 200,000 hectares of cropland and pasture are being rehabilitated so that they can once again be farmed productively by smallholders. Finally, the initiative is supporting people in six countries in securing land-use rights.
A World without Hunger is Possible

Müller
Conclusion

A world without hunger is possible! The planet has the potential to feed everyone. And we have the knowledge, the technology and the tools to do the job. All those who share responsibility must help:

- make agriculture more innovative and develop rural areas;
- make global agricultural markets fair and improve land rights;
- end discrimination against women and improve nutrition for mothers and children;
- increase resilience against crises, disasters and conflicts, and adaptability to climate change; and
- protect rural resources, including forests, and preserve the oceans and their abundance of fish.
In the globalised world, the fate of other regions is our fate too. How we produce, distribute and consume has a significant effect on people’s lives in other parts of the world. This is why everyone should ask themselves: How much am I willing to pay for fair trade and a fair purchase? What is a more just world ultimately worth to me? We are all responsible: the food industry, distribution chains, and each and every consumer.

To master this challenge we need the will and the readiness to take action. German development policy’s actions speak as loud as its words. With our projects and programmes, we show how it can be done. And we support our partners in reforming their policies for rural areas. Whether they involve “Green Innovation Centres”, sustainable supply chains, tackling malnutrition or soil protection – there are many ways to strengthen rural areas. And they work.

Now we need to scale up these approaches, and boost the modernisation of agriculture and food and nutrition policy across the board, in harmony with the natural environment. So that people no longer need to sit right next to the source (to be precise: the field) and go hungry.

We can and must overcome this paradox. Because hunger is murder, and a world without hunger is no pipe dream. There is now no greater task than swiftly translating these real possibilities into practice.
Figures

Figure 1: Number and percentage of malnourished people

Figure 2: Trends in food imports to and food exports from Africa

Source: Own representation with data from FAOSTAT 2011.
Figure 3: Trend in farmland

Hectares per person

Figure 4: Yields per hectare for wheat, maize and potato in various parts of the world

Figure 5: Various uses of farmland worldwide

- Animal-based food: 61%
- Plant-based food: 32%
- Renewable resources (energy): 3%
- Renewable resources (raw materials): 4%

Figure 6: Global greenhouse gas emissions by economic sector

- Electricity and heat production: 25%
- Agriculture, forestry and other land use: 24%
- Buildings: 6%
- Transportation: 14%
- Industry: 21%
- Other energy: 10%

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Global Eradication of Hunger and Malnutrition
Hunger and malnutrition have serious consequences; the costs are so great that economic development is also compromised. That means that ending hunger and malnutrition is not only a social but also an economic issue. Achieving that goal will take a structural transformation of African agriculture to make it more productive, efficient and competitive. A new generation of agribusiness entrepreneurs, the modernisation of agricultural value chains, strong partnerships and large-scale investment by both the public and the private sector will be required.
One in nine people are still undernourished

The targets for ending poverty, overcoming hunger and food insecurity by 2030 were adopted by the United Nations Member States in September 2015 as part of the Sustainable Development Goals (SDGs).

Poverty is both a cause and consequence of hunger and malnutrition. As a cause, poverty affects the availability of adequate amounts of nutritious food. Malnutrition, in turn, can perpetuate poverty by limiting the earnings potential of individuals. Hunger and malnutrition are fundamental obstacles to human health and well-being, from before birth to old age. Despite significant progress in recent years, 795 million people around the world were still undernourished in 2014–2016, or one in nine; resulting in a 10.9 per cent prevalence rate worldwide (FAO et al. 2015).

Africa still has the highest rates of chronic undernourishment globally, with an estimated prevalence rate of 20 per cent, or 232 million people (FAO et al. 2015). In sub-Saharan Africa, 220 million people are undernourished, which is equivalent to a 23 per cent prevalence rate. The highest prevalence rates are in Eastern and Central Africa, at 31.5 per cent and 41.3 per cent, respectively.

Increasing climate variability and weather shocks such as droughts or floods are expected to exacerbate food insecurity in Africa, especially in rural areas where subsistence agriculture is pre-dominantly rain-fed and therefore highly vulnerable to climate change. For instance, the El Niño climatic phenomenon that affected Southern and East Africa in 2015–2016 has compromised the food security of about 51 million people, including 26 million children. The number of people suffering from hunger is projected to increase between 10 to 20 per cent by 2050 due to climate change, with 65 per cent of those affected being located in sub-Saharan Africa (World Food Programme, 2012).

The consequences of hunger and malnutrition are too serious to be ignored. According to WHO (2016), 5.9 million children under the age of five died in 2015 and about 45 per cent of these deaths were linked to mal-
nutrition, making it the single largest cause of mortality among children. For those who survive, hunger and malnutrition can lead to stunting (too short for their age) or wasting (not enough weight for their height), with negative life-long consequences on cognitive and learning capabilities, such as a decreased intelligence quotient (Shekar, Heaver and Lee, 2006).

Africa accounts for 20 of the 24 countries with stunting rates of over 40 per cent. About 58 million children in Africa under the age of 5 years are stunted and about 14 million wasted, while 10 million are obese. Furthermore, 22 of the 34 countries that collectively account for 90 per cent of the world’s stunting are in Africa.

Today, millions of kids go blind, due to lack of a basic nutrient, vitamin A. They may not be able to attend school and have a productive life. Why must a child’s future, in this world, be mortgaged for lack of basic nutrients to live a healthy life? Similarly, millions of mothers die from complications during childbirth due to a lack of vitamin A and iron deficiency. Why should a mother die just for bringing a beautiful life to our world?

These facts are very disturbing and they must change. No child should ever go hungry – and no child should ever lose future economic opportunities or die early because of the lack of nutritious food. We must do all we can for the children, from conception to their second birthday – the first 1,000 days – and beyond! And we must support better nutrition for their mothers. A healthy mother, who is economically empowered, will nourish her children.

We must change how we look at the problem of malnutrition

We must refocus the debate around nutrition from one seen as a social development issue to one seen as an economic issue; as nutrition can shape the path of economic growth and development. In particular, by crippling children’s brainpower, hunger and malnutrition seriously undermine labour productivity and long-term economic growth pros-
pects. According to UNICEF, the economic cost of under-nutrition in sub-Saharan Africa is about US$ 25 billion annually.

The greatest contributor to economic growth is not physical infrastructure, but brainpower: what I refer to as “grey matter infrastructure”. While it is obvious that a road or port can add to improved trade and economic growth, it is often not recognised that stunting shrinks the size of the brain and therefore compromises the current and future economic growth of nations. Stunted children today leads to stunted economies tomorrow.

We must invest now in developing the grey matter infrastructure of Africa, by investing in better nutrition for its children, who are the future of the continent. Access to food, in the right quantity and quality, is a basic human right. There is absolutely no justification that Africa, which has over 65 per cent of all the arable land left in the world, continues to suffer the scourges of hunger and malnutrition.
Africa must invest in agriculture to unlock its great potential

Agriculture remains the mainstay of African countries, providing livelihoods and employment to over 60 per cent of the population, and contributing 35 per cent to Africa’s GDP. Despite the importance of agriculture to Africa’s economy, the sector has not been performing at full potential. For example, during the last 25 years, cereal yields increased by 164 per cent in Brazil, 81 per cent in Uruguay, 69 per cent in Chile and 43 per cent in Malaysia; but by less than 40 per cent in Africa. Figure 1 (p. 62) shows that there are still enormous unexploited growth opportunities in Africa’s agricultural sector.

Taking advantage of the growth opportunities will require removing obstacles related to the low adoption of modern inputs, erratic weather conditions, poor mechanisation, lack of access to credit, low farmers’ skills, inadequate land tenure systems and weak property rights, especially for women farmers and entrepreneurs. While significant progress has been made across the continent to improve the functioning of agricultural markets, transaction costs are still high due to poor infrastructure (World Bank, 2013).

Coupled with rapid population growth, the underperformance of the agricultural sector has worsened the trade balance in agricultural products. Since the late 1970s, Africa has turned into a net food importer. Figure 2 (p. 63) depicts the trends in the performance of African agricultural trade between 1995 and 2014 and shows that the total value of agricultural imports increased at a higher rate than exports.

Consequently, Africa’s food import bill increased to US$ 35 billion in 2015, and is expected to reach US$ 110 billion by 2030, if the current trends persist. Importantly, this deficit displaces public expenditures for other crucial economic sectors such as education, health and infrastructure; and puts an additional strain on the scarce foreign exchange reserves. It is now time for Africa to invest in its agricultural sector.
Africa can and must feed itself

The fight against world hunger and malnutrition requires a structural transformation of the African agriculture sector that increases agricultural productivity and creates vibrant agribusiness activities. Structural transformation will require significant public investments to: effect reforms to secure property rights in land ownership, especially for women farmers; facilitate access to land- and labour-improving technologies (e.g., new tools, improved seed varieties, water control, fertilisers); put in place appropriate pricing mechanisms; and establish linkages between producers, aggregators and buyers, and rural infrastructure.

Public investments will be key to encouraging private sector investment in agriculture to unlock the continent’s potential and for improved food security and nutrition. Unfortunately, the share of public expenditure currently allocated to agriculture in Africa barely exceeds 5 per cent, which is too low to end hunger and malnutrition. Greater political commitments will be needed. Under the Comprehensive Africa Agriculture Development Programme (CAADP) and the related Maputo and Malabo Declarations, African governments have committed to spend at least 10 per cent of their budgets on agriculture and achieve at least 6 per cent of annual growth of the agriculture sector. However, while there has been some progress across the continent, only a few countries are meeting or surpassing these targets.

Greater attention must be put to transforming rural areas. All across the continent, the rural areas have become zones of economic misery. High levels of poverty, high unemployment among the rural youths and devastating effects of climate change and environmental degradation, constitute what I call a “disaster triangle”. Together, they have turned many parts of Africa into fertile grounds for terrorists to recruit from. Therefore, massive investments will be needed in revamping rural areas and their economies.

We must transform these rural areas from zones of economic misery into zones of economic prosperity – and that can only be done through
Global Eradication of Hunger and Malnutrition  Adesina

a massive transformation of the agricultural sector. This will help to significantly reduce the current high levels of migration from rural to urban areas, and the rising waves of migration towards Europe. Investing in agriculture and rural economic transformation in Africa is key for securing the borders of Europe.

Attracting young people will be possible only if agriculture is viewed as a business, through agribusiness and agro-based industrialisation, rather than a way of life or “as a means to address poverty and food security” (African Development Bank, 2016a). With the food and agribusiness industry in Africa projected to be worth US$ 1 trillion by 2030, there is no doubt that young agribusiness entrepreneurs will need to feed an Africa of 2 billion people. Young “Agripreneurs” will form the new generation of commercial farmers and agribusiness people who will make agriculture in Africa more productive, efficient and competitive.

The entire food chain needs to be transformed

With the increasing population size and changing consumption habits, Africa’s agriculture needs to adapt and become more productive, competitive, and environment-friendly. The development of agricultural markets and trade is crucial to create income opportunities for farmers and boost productivity. This is particularly important in sub-Saharan Africa where around 80 per cent of smallholder farmers cultivate less than 2 hectares of land and need access to input and output markets to increase their income, food security and nutrition. A well-functioning agricultural market and a dynamic regional trade can also expand the size of Africa’s market for food staples, help transition from a subsistence to a business-oriented sector, and allow agricultural products to flow from surplus zones to deficit ones.

Massive amounts of food crops, fruits, vegetables or dairy products also go to waste in rural areas of Africa partly due to lack of markets while the continent depends on food imports and suffers the highest prevalence of malnutrition in the world. Besides increasing agricultural food
production, Africa should focus on developing food value chains – from field to the table – in order to produce and deliver healthy and nutritious foods. In this regard, significant investments, from both public and private sectors, will be required at every level of the food value chain, including planting, harvesting, storage, transport, processing and marketing.

Many poor households spend the bulk of their income on basic staples, unable to improve basic nutritious diets. One of the cheapest ways to provide them with nutritious food is through food fortification, such as adding iodine to salt, staple foods and cooking oil. Orange flesh sweet potato, iron fortified beans, golden rice with high levels of beta carotene and yellow cassava, high in beta carotene, all have great potential in addressing micronutrient deficiencies.

To boost access to micronutrients for healthy living, bio-fortification should be strongly promoted across the whole food chain; and not just for the poor. This will require addressing demand-side constraints and promoting policies that encourage the private sector to incorporate these nutritious crops in processed foods.

Africa must also reduce its substantial level of food losses. Massive amounts of food crops, fruits, vegetables and dairy products go to waste in rural areas of Africa while the continent depends on food imports and suffers the highest prevalence of malnutrition in the world. Post-harvest losses are estimated at US$ 310 billion in developing countries; with over 65 per cent of this occurring at the production and processing stages. Food losses alone per year in Africa can feed 300 million people, well over the 232 million that are currently malnourished.

To achieve improved nutrition, we must reduce losses all along the food chains and provide incentives to food-processing and manufacturing companies to locate in rural areas and source their raw materials locally. Such processing will increase preservation, thereby increasing food availability throughout the year. It will also ease transportation and distribution of otherwise perishable foods across regions. Special attention can be given to upstream industries engaged in initial processing such
as rice and flour milling, oil pressing, and fish canning. What is needed is
the development of large “Staple Crop Processing Zones” and “Agro-indus-
trial zones”, enabled with infrastructure such as roads, power, water etc. This will drive down the cost of doing business, as well as signifi-
cantly reduce the post-harvest losses in Africa. The African Development
Bank will invest in the development of these Staple Crop Processing and
Agro-industrial zones.

We must also address the major problem of food contamination. Con-
tamination of cereal, grains and other food materials by aflatoxins is a
major cause of post-harvest losses and food insecurity in Africa. FAO
estimates that a quarter of the world's food crops are affected by aflatox-
ins each year. Solving this problem requires a multi-sectoral approach,
linking agriculture, health and food safety. Significant progress is being
made in this area by the International Institute of Tropical Agriculture,
which produces aflasafe, which can reduce aflatoxin levels by nearly
100 per cent. These initiatives should be replicated all across Africa.

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access to markets to increase their incomes, food security and nutrition.
A well-functioning agricultural market and a dynamic regional trade can
help to expand the size of Africa's market for food staples, and assist the
sector to move from subsistence to market-oriented production.

In this regard, increased intra-African trade will be particularly important
given the heavy reliance of the continent on international trade and
the concentration of its exports on a handful of primary commodities.
Boosting agricultural regional trade will therefore not only help African
countries to weather the volatility of global primary commodity prices
and reduce their vulnerability to other external shocks, but also ensure
better access to agricultural products, which is a positive step in improv-
ing food security and nutrition.
Strong partnerships will be instrumental for success

The fight against hunger and malnutrition can only succeed through strong multi-level partnerships forged among governments, development partners, the private sector and civil society to unlock the enormous potential of the African agricultural and food sectors. Recently, the African Development Bank adopted its Feed Africa strategy, as part of its “High 5” priorities for Africa, to help accelerate support for Africa’s transformation. Feed Africa seeks to support African countries to achieve food self-sufficiency, add value to their agricultural commodities, end malnutrition and extreme poverty, and enhance Africa’s competitiveness in global food and agricultural value chains. To achieve these objectives, the African Development Bank plans to invest US$ 24 billion over the next 10 years in the agricultural sector.

The rollout of the Bank’s flagship programme, ENABLE Youth (Empowering Novel Agri-Business Led Employment for Youth) will also offer strong platforms to provide job opportunities for both urban and rural youths. This programme will support the emergence of a new generation of young commercial farmers and agribusinesses in Africa.

We will succeed in eradicating hunger and malnutrition only when we provide economic empowerment for women. This is why the African Development Bank established a US$ 300 million Affirmative Finance Action for Women in Africa (AFAWA) initiative to address the financing gap and access to finance challenges faced by women entrepreneurs, including those operating along commercial agricultural value chains.

Africa must turn agriculture into wealth and move out of exporting basic raw materials. Times are changing, as are the opportunities. For example, where global firms source for apparels is rapidly changing, due in part to rising industrial wages in China, as well as security and political uncertainties in leading suppliers such as Turkey and Bangladesh. This presents a unique opportunity for Africa to take its place in the global textile and apparel value chains. Because of cotton production in Africa,
it is possible to source cotton-textile garments from one area, which offers significant advantages over the Asian countries and excellent opportunities for vertical integration.

The future of an agricultural value added in Africa

Ethiopia has achieved remarkable success with industrial parks for cotton, textiles and garments. Today, some 20 global companies are engaged in developing its “cotton-textile-garment” sector. Ethiopia expects to export US$ 1 billion worth of textile and garments annually from just one industrial park (Hawasa Park)!

Africa should be exporting processed cocoa, not cocoa beans. It should be exporting specialised ground African coffee instead of generic coffee beans, and it should be exporting finished textile products, such as clothes, suits, dresses, shirts; not cotton lint. The remarkable progress of Kenya, Tanzania, Ghana, Ethiopia, Tunisia and Morocco in the global horticulture industry shows that with well-designed policies, financing and infrastructure support, Africa can climb to the top of the global food value chains.
Nigeria: Bank loans for the agricultural sector

We must also solve the challenge of access to finance, to expand access to finance to farmers and agribusinesses, with commercial financing. Risk sharing instruments will play a crucial role in this regard by sharing the risk of lending by commercial banks to the agriculture sector, thereby expanding lending to agriculture. Finance and farming have not always been easy partners in Africa. The agriculture sector receives less than 3 per cent of the overall financing provided by the banking sector. It’s a problem, and one where government can make a difference.

I know something about this, because I led the team that made that difference in Nigeria, as Nigeria’s Minister of Agriculture, prior to becoming President of the African Development Bank. With the Central Bank of Nigeria, we developed the *Nigeria Incentive-Based Risk Sharing for Agricultural Lending* (NIRSAL), a risk sharing facility designed to share with commercial banks the risks of lending to Nigerian agriculture value chains. And it worked, with impressive results. Lending by banks to the agriculture sector increased six fold, rising from 0.7 per cent of total bank lending to 5 per cent within four years. Together with the KFW of Germany, we also developed the Fund for Financing Agriculture in Nigeria (FAFIN), a private equity fund to provide much needed long tenor financing to grow small and medium sized agribusiness in Nigeria. Such initiatives should be scaled up across Africa. The lessons are clear: development finance institutions and multilateral development banks should be setting up national risk sharing facilities in every country to leverage agricultural finance.
Eradicating hunger and malnutrition in Africa will require a transformation of the agriculture sector for increased production and agro-allied industrialisation to add value along the entire food chain. Increased agricultural production will need to be combined with social policies and strategies such as bio-fortification to ensure that sufficient quantities of food with the right quality are made available on every table in Africa.

We need transformative partnerships to drive concrete results on massive reduction of malnutrition and stunting on the continent. That is why at the African Development Bank we have launched the African Leaders for Nutrition Initiative, together with the Global Panel on Agriculture and Food Systems for Nutrition, Bill and Melinda Gates Foundation, Dangote Foundation, the FAO, the Big Win Philanthropy and the African Union.

Together, we must end hunger and malnutrition on the continent. The G20 Presidency of Germany provides an excellent opportunity to drive this agenda – and the African Development Bank looks forward to working very closely on this with the government of Germany and the G20. At the African Development Bank, we look forward to ensuring that Africa feeds itself and ends food insecurity and malnutrition, through a more profitable, productive, efficient and competitive agriculture sector. By 2030, Africa must be feeding Africans with sufficient quantity and quality of food.
Figures

**Figure 1: Average yields in Africa compared to best practices**

![Graph showing average yields in Africa compared to best practices](image)

Best practices = average of top 10 countries in the world by yield in the commodity

Global Eradication of Hunger and Malnutrition

Figure 2: Trend in Africa’s agricultural trade, 1995–2014

References


Melinda Gates
Co-Founder of the Bill & Melinda Gates Foundation

Why Women Are Our Best Bet in the Fight against Malnutrition
Despite the progress made in many regions of the world, hunger and malnutrition are still far from having been eradicated. Yet there is real hope that they can be eradicated by 2030. And it is women who will be pivotal in achieving that – if they are trained, motivated and supported in their roles as caregivers, decision-makers in their families and communities and producers of food.
The way to combat hunger and malnutrition: safe, affordable, plentiful and nutritious foods

On Christmas Day, instead of staying home to celebrate with her family and friends, Patricia was out working on her half-acre parcel of rented land in rural Malawi. As she saw it, she didn’t have a choice. “That’s when the rains came,” she explained with a laugh “and when the rains come, you need to be out planting”. It’s particularly important that Patricia follows best growing practices to the letter because she is a seed multiplier. She grows a special variety of groundnut seed more resistant to drought, pests and diseases to sell to other farmers.

I got to know Patricia, an industrious and meticulous young farmer, a few weeks after she harvested that crop of groundnuts the following spring. As I listened to her talk about farming techniques and her hopes for her children, it reinforced my belief that women like her represent our best hope of achieving the world’s ambition to end hunger and malnutrition by 2030. Patricia is not only determined to break the cycle of hunger and poverty for her own family, she is also playing a critical role in getting nutritious food into the hands of her community.

Like any mother, Patricia’s first priority is as a caregiver. She knows that groundnuts, which are high in protein, healthy fats, vitamins and antioxidants, are an important part of a nutritious, balanced diet. Selling her seeds also means she can take even better care of her children by using the income to pay school fees, meet doctor’s bills, and buy everyday essentials, such as cooking pots and other nutritious food.

Patricia’s work on the farm has also empowered her as a decision-maker within the family. It’s not easy to cultivate these special seeds, but Patricia has benefited from lessons on how to increase her harvest from one of our foundation’s partners, CARE Pathways. By employing carefully thought-through practices and processes, she quadrupled her yield in just one season. This success and her expanding knowledge of farming have earned her greater respect and authority in her home. She openly shares her ideas about how to improve the family’s other crop yields with her
husband. And they now make decisions about the family budget together, so she has a say in what they do with their extra income.

Thanks to her role as a producer, Patricia can finally see herself on a pathway out of poverty. It is a cruel irony that the very households who are producing the bulk of food in Africa are also those most at risk of malnutrition. So by continually multiplying the amount of good seed available to fellow farmers, she’s also helping other women lift themselves and their families out of hunger and poverty.

The world’s come a long way in the fight against hunger, with 200 million fewer hungry people today than 20 years ago. Yet we know that while more food can stop people feeling hungry, it is not enough to address malnutrition. Still today, malnutrition is an underlying cause in nearly half the six million deaths of children under five every year. Progress against some of its most devastating impacts, such as stunting, has also been slow. Nearly one child in four under the age of five is stunted, meaning they don’t develop enough in mind or body to reach their full potential. It is harder for them to learn in school and subsequently earn a living as adults. At the same time, nearly two billion people globally suffer from deficiencies in essential vitamins and nutrients that prevent them from living healthy and productive lives.

There is still a long road ahead. What is beyond doubt, however, is that we cannot hope to make good on the promise captured by the second Sustainable Development Goal – “End hunger, achieve food security and improved nutrition, and promote sustainable agriculture” – without empowering women like Patricia as caregivers, decision-makers, and producers. And as women of reproductive age in developing countries are disproportionately affected by malnutrition compared to men, that starts with making sure they are themselves getting the right nutrients and enough good, healthy food to eat.
Women’s nutrition

Bill said last year that if he could wave a magic wand to solve any global health problem, he would use it to end malnutrition. It’s easy to understand why. Almost every challenge we face in global health and development is made harder by malnutrition. What is also true is that the burden of chronic malnutrition falls disproportionately on women and girls. It is estimated that 60 per cent of the world’s chronically hungry are women and girls, yet they make up less than half the global population. Yields for women farmers are typically 20-30 per cent lower because they have less access to seeds, fertiliser, equipment and credit. And when a crisis hits, women are generally the first to sacrifice their food. In some places, like the village where Patricia lives, tradition even dictates that women only eat after everyone else has been fed.

Women are especially vulnerable to so-called “hidden hunger” – where they get just enough food to eat, but not enough nutrient-rich food. In particular, they often miss out on vitamin A, zinc and iron, which are present in meat and vegetables. One particularly dangerous condition related to “hidden hunger” is anemia. Around half of all pregnant women in developing countries are anemic, which contributes to nearly 20 per cent of maternal deaths. The impact of anemia is also felt in economic terms. Women farmers who suffer from anemia, and the fatigue and weakness it causes, can see their productivity fall by as much as 17 per cent. Half of all anemia cases are caused by iron deficiency, which could be prevented through straightforward practices, such as food fortification and supplements. But the global community is not moving fast enough. Anemia cases are declining so slowly; we are more likely to reach our goals in 2130 than 2030.

On its own, the inequity that women and children suffer disproportionately from malnutrition should shame the world into action. But beyond the simple injustice, it brings a far bigger problem for all of us: it traps communities and countries in cycles of poverty. Good nutrition is critical to the health and well-being of women, which in turn is fundamental to them realising their full potential. By robbing them of that opportunity,
we prevent them from fully contributing to economic growth, and from investing in the building blocks of healthy, prosperous societies – their children’s health and education.

Women as caregivers

One of the most powerful ways women transform nutrition is through their roles as mothers, a process that starts well before birth. The 1,000-day window from conception until age two is critical in determining how children develop, grow and learn – not just during that golden period, but for their whole lives. It seems extraordinary that what happens in such a short time can have such a monumental bearing on a life that may last 60, 70 or 80 years. But, for example, an estimated 20 per cent of stunting takes place in the womb – the effects of which are irreversible.

Our understanding of the interconnected factors around maternal and child health is increasing all the time. A varied diet that provides adequate levels of iron and other essential nutrients, a women’s height and
stature, her age at first pregnancy, and the time between pregnancies are all significant factors in not only her own health and mortality, but also her child’s ability to survive and thrive.

Once a baby is born, mothers remain central to ensuring they get the right nutrients at the right time – as malnutrition inhibits children from fighting off preventable diseases such as pneumonia and diarrhea. Programmes that work directly with women to address malnutrition are the most effective, since women are usually responsible for buying, gathering, cooking and preparing food.

And one of the best things we can do to give babies a healthy start is to feed them breast milk immediately after birth, and exclusively for the first six months. As an advocate – but also as a woman and mother who knows from personal experience – I believe passionately in the benefits of breastfeeding. Of course, mothers have been breastfeeding throughout human history. But we have only recently begun fully to understand its vital role in ensuring children get the right nutrition from day one, and how that then helps them lead healthy, productive lives. An exclusively breastfed child is 14 times less likely to die in the first six months than a non-breastfed child, and breastfeeding drastically reduces deaths from pneumonia and diarrhea – two major child killers. In fact, universal exclusive breastfeeding could save the lives of up to 823,000 babies every year.

It’s not just good for children either. There is strong evidence that breastfeeding has significant health benefits for mothers too, particularly in reducing the risk of breast and ovarian cancers. Yet despite all this, women all around the world are today denied the support and resources they need to breastfeed effectively. There are many reasons for this, including a shortage of facilities and lack of, or limited, maternity leave, but often it’s just an absence of knowledge. On a visit to India, I met Babita Devi, whose daughter is five and a half and son three and a half. Since she became a village health worker, she’s learned a lot. “I didn’t really know about breastfeeding when I had my daughter. She was six months old when I took this job,” she said. “But since I learned more, when my son was born I made sure he was breastfed and nothing else.”
Women not only care for their own children, but often take on that role for others as community teachers, nurses and health workers. Go to many villages in rural India, for example, and you’ll see older women – known as anganwadis – making sure preschoolers get supplements and a good meal. Breaking the intergenerational cycle of malnutrition depends on expanding initiatives that promote and prioritize nutrition among women and adolescent girls. Above all, it is paramount that they are well-nourished before, during and after pregnancy.

Women as decision-makers

When I spoke with Patricia about her life as a farmer, she told me that one reason she was selected as a seed multiplier was because she has a supportive husband. But their marriage wasn’t always an equal relationship. Describing what it used to be like, Patricia does a funny imitation of him ordering her around. “Go and do this, go and do this, go and do this – all the time!” But once the couple took part in a gender dialogue, her husband could see the advantages of treating her as an equal partner and taking a more cooperative approach.

More couples need this chance to take on social norms that may be holding them and their families back. Giving women a voice is essential to a family’s health and well-being. The data tells us that women invest around 90 cents of every US$ 1 they earn back into their families, while men spend only about 30 or 40 cents. Women also prioritize paying things like their children’s school fees, making sure they are up-to-date with their immunisations, buying healthy, nutritious food – and guaranteeing that everyone has their fair share of it – in a way that many men simply don’t. A 2008 study revealed that a US$ 10 rise in women’s income in Côte d’Ivoire had the same effect on children’s health and nutrition as a US$ 110 increase in men’s income. Indeed, when a mother controls the household budget, her daughters and sons are 20 per cent more likely to survive childhood, and thrive into adulthood.
Education is key. One 25-year study of developing countries shows that women’s education contributed 43 per cent of the reduction in child malnutrition over time. It found that more than half the progress made in overcoming malnutrition was the result of improvements in women’s standing and situation within society. Recent national food and health surveys in Germany and the U.S. found similar trends. Wherever you look around the world, it’s women who are making healthier food choices for themselves and their families.

Community-based programmes that encourage mothers to feed their families a diverse diet can go a long way to improving health by ensuring an adequate and varied supply of nutrients on a regular basis. In Bangladesh, an initiative led by Helen Keller International is seeing a difference in women and children’s diets by engaging families in growing their own fruit and vegetables. Along with educating households – 90 per cent of which are headed by women – on the benefits of a nutritious diet, the home gardening project saw vitamin A intake rise by 87 per cent among women and 75 per cent among children under five in just one year.

Self-help groups, such as those run in India by Professional Assistance for Development Action (PRADAN), also bring women together to discuss ways to improve their livelihoods and increase their incomes. They learn about diversifying into new crops, setting up irrigation systems, and improving the productivity of their livestock. In the short term, women and their families gain tangible benefits, such as higher crop yields that put more food on the table and perhaps a surplus that can be sold at the local market. For many women, these community groups have also offered a stepping stone to stronger political participation and helped secure access to land entitlement programmes.

When women have an opportunity to earn a fair income for their family, and are empowered to then determine how that income is spent, they will make smart decisions for their family – including providing a varied, nutritious diet that helps their children grow and develop. That in turn leads to stronger workforces and more prosperous communities – extending the benefits of women as decision-makers well beyond the home.
Women as producers

Outside the first 1,000 days, one of the best ways to improve nutrition and health – and end poverty and hunger – is to make agriculture more productive, especially for women smallholder farmers. The village where I met Patricia is like thousands of others in rural Malawi. Each evening you’re likely to spot couples walking home together after a day spent working in their fields. The woman will be carrying a baby on her back, firewood on her head, and a hoe and maize stalks in her arms. It’s a reminder that not only is farming hard, it is particularly tough for women.

In many communities, women face gender-specific barriers that limit their productivity and make it more difficult for them to break out of poverty. The productivity gap is no small thing. The difference between men’s and women’s farm yields ranges from 23 per cent in Tanzania to 66 per cent in Niger, according to the World Bank. To unlock the enormous growth potential of agriculture – it generates up to four times greater poverty reduction than growth in other sectors – we need to get at the underlying gender gap.

Entrenched social norms marginalize women in many developing countries. They are far less likely to own land than men – in Nigeria, more than two-thirds of the rural workforce is female but men are five times more likely to own land. Even when they do have access to land, their plots are usually smaller and less fertile. Female farmers aren’t always aware of the latest innovations and technology as they only receive five per cent of all agricultural extension services. Women also have less time to farm: they typically spend around four and a half hours more than men on daily household chores, and perform the bulk of unpaid work in the home – collecting water and firewood, cleaning, cooking and caring. But hiring additional labour is harder for women farmers who often face difficulty in accessing agricultural loans. Addressing these kinds of challenges isn’t easy, but there are great examples of progress to draw lessons from.
Sorubali Singh, India

For many years, Sorubali Singh would take on odd jobs to make sure she could feed her family of six. Despite her best efforts, she only made US$ 75.20 a year, which was not enough to provide for her children. While some have benefited from booming cities, more than 90 per cent of rural Indians struggle to find a stable income. For a family like Sorubali’s, food alone could cost more than half their salary. But with training and support from a women’s self-help group run by PRADAN, Sorubali recently took the bold step to lease a small piece of land. Her courage is paying off, and – working with her husband – she made US$ 1,500 last year. Now, Sorubali has her own savings account and is able to provide healthier, more regular and diverse meals for her family, and meet their other needs.
Reaching women smallholders is essential to improve the quality and quantity of crops, and to increasing the availability and accessibility of nutritious food. Ensuring female farmers have access to enhanced seeds, better farming techniques and equipment, adequate finance, and markets can boost productivity by as much as 30 per cent. Progress on that scale would not only transform the fight against hunger and malnutrition, it would also create economic opportunities for millions of the world’s poorest people.

Gloria Uwizeyimana, Rwanda

Gloria Uwizeyimana, a mother of two from Rwanda, had a similar experience. Like Sorubali, she struggled to produce enough high quality food for her family. That was until she took part in a pioneering programme run by Harvest Plus. It allows farmers to exchange ordinary seeds for more nutritious ones – for free.

Gloria now farms high-yielding, iron-enriched beans that mean she can feed her family nutritious meals – and still have plenty left over to sell. This income helps pay her family’s annual health insurance bill, and allows her to contribute weekly to a women’s savings association in her village.
Conclusion

The word “nutrition” is one of those terms we use in global development that manages to squeeze the humanity out of an issue that is a matter of life or death for millions. What we are really talking about is this: Are people getting the food they need for their bodies and brains to develop properly? The good news is that this is something we can fix – and experience tells us that we can make substantial improvements, on a grand scale, in a short period of time. Countries such as Brazil, Peru and Vietnam that have made women’s and children’s health and nutrition a priority – and have invested in proven solutions – are achieving amazing results.

So we know progress is possible. What we also know is that it is not inevitable. In order to succeed, we have to expand initiatives and interventions that we know work, such as food fortification, breastfeeding, and providing supplements during pregnancy. We also have to be very deliberate about putting women and adolescent girls at the centre of our efforts. That means better understanding how to most effectively reach them with advice and information on good nutrition – and adopting gender-focused approaches to programmes that empower women farmers. Finally, we have to make sure that the agricultural systems produce safe, affordable, plentiful and nutritious foods all year round.

When women have access to nutritious food and are empowered as caregivers, decision-makers, and producers, they and their children have the best chance to survive and thrive. And by investing in women like Patricia, Sorubali and Gloria we are investing in the people who invest in everyone else. We have the means to end hunger, achieve food security and improve nutrition. Now, we need to work together to get the job done.
References


Innovations to Overcome the Increasingly Complex Problems of Hunger
Effective policies can be found to end hunger and malnutrition. But hunger has become more complex. Changes in rural structures and the productivity of small farms must be taken into account, as well as issues relating to health and education, climate change and, not least, wars and emergencies. Any solutions that hope to match the complexities of these causes and features must be based on innovation. There can be no progress without innovation, one of the fundamental drivers of human development.
Innovations to reduce hunger and undernutrition: an introduction

The challenge to end hunger is confronted with the fact that hunger has become more complex. Some characteristics of that increased complexity will be highlighted here at the outset. The majority of hungry people live in rural areas and on small farms of emerging economies, while urban hunger and undernutrition is of growing importance, too. Overcoming hunger relates closely to the transformation of rural areas and of small farms’ productivity, and to the quality of services reaching out to them, especially health and education services, and social safety nets. Hunger in emergencies and conflict situations is a growing political and social challenge. Micronutrient deficiencies have been only recently increasingly recognised as a large food and health problem, affecting cognitive capacities. Ending undernutrition in South Asia requires different actions than in Africa. Environmental causes of hunger such as climate change may be increasing. Overall, hunger is on the decline as accounted for by the Global Hunger Index (IFPRI et al. 2016), but the various features of hunger and undernutrition remain large global problems (Table 1). They are most prevalent in low and middle-income countries, but also exist partly unnoticed in industrialised countries, such as the USA and member states of the European Union. All this calls for equally complex policies and programmes, adjusted to regional and local circumstances.

This chapter aims to assess alternative pathways toward overcoming hunger with an emphasis on innovation. Innovation is the fundamental driver of human development, and food and agricultural innovations play essential roles to overcome hunger sustainably and effectively. Innovation is the accumulation and application of any new knowledge by a heterogeneous group of actors in social and economic contexts via complex interactions (Spielman 2005). However, innovation is not just a matter of technology and productivity. Hayami and Ruttan (1971) stress the importance of public institutions in the innovation process that is mainly driven by dynamic responses to the economic conditions and relative scarcity of resources in an economy. Innovations must tackle the problem of the complexity of hunger and find effective and cost-
efficient solutions to the problem. Transfers for short-term assistance are needed in emergencies and are a must to save lives. Aid that does not build local capacities or draws down nature capital will not sustainably reduce hunger. New thinking about policy, institutional and organisational innovations, and technical innovations, i.e., biological, mechanical and information technological innovations, must come together in order to end hunger by 2030, as called for by the Sustainable Development Goals. Fortunately, new large initiatives have been taken including by the German Government to achieve a “World without Hunger”. These initiatives must be sustained for the time until 2030 to actually reach the Sustainable Development Goal Number 2 to end hunger and achieve food security as well as improved nutrition while promoting sustainable agriculture.

Innovation in a conceptual framework of food and nutrition

In view of the matter’s complexities, an effective policy to end hunger needs a framework that helps in understanding causal relations of hunger determinants and in shaping priorities for action. Currently there are two conceptual frameworks that dominate the policy discourse about food and nutrition security, where agriculture and nutrition links are implicitly touched upon. In the framework provided by FAO, food and nutrition security depends on the availability of food through production and trade, on access to food due to purchasing power or self-production, on the utilisation of food for nutrition, and on the stability of the food system, especially of related markets and prices (FAO et al. 2014). The framework developed by UNICEF and applied in the Lancet nutrition series (Black et al. 2008) identifies the basic and immediate causes of maternal and child undernutrition. These frameworks do not capture political economy determinants of nutrition which require more attention (Pinstrup-Andersen 2013). Furthermore, structural issues such as discrimination, marginalisation, and conflicts require a broader framework of marginality to capture those complex causes of nutrition deficiencies (von Braun and Gatzweiler 2014). Such problems are deeply rooted in institutional and governance deficiencies. In certain contexts, it
seems hardly feasible to achieve improved nutrition without addressing these deficiencies. This concerns international arrangements as well as national and local level nutrition-sensitive inter-sectoral policies and their implementation (IFPRI 2016). Where relevant, these political dimensions need to be taken into account explicitly rather than treating them as distant framework conditions. Moreover, food and agriculture are becoming embraced by the larger bio-economy (von Braun 2015). An aggregate but comprehensive conceptual framework is put forward here (Figure 1, p. 107).

The concept takes a broad perspective on the food and agricultural sector, income and employment, markets and services, and hunger and malnutrition. Institutions, information and behaviour are cross-cutting issues that influence linkages in all of the domains that describe the framework. Even in a rather aggregate framework such as presented above, at least six critical linkages need consideration when addressing hunger and malnutrition (see arrows in Figure 1, p. 107). Actually, all linkages depict two-way relationships. Overarching and surrounding the Figure 1 (p. 107) are environmental as well as macroeconomic framework conditions. Related linkages exist at a large or even global scale, such as greenhouse gas emissions through land-use change, and at a local scale, such as water and sanitation in the context of irrigated agriculture. All the links operate with diverse dynamics under short- or long-term time lags which require attention in policies and programmes. Even the links between agricultural and food production and nutrition can be rather short-term, e.g., with acute food safety problems. Agriculture–income links may be more long-term, if agricultural resources such as soils are enhanced or degraded (Nkonya et al. 2016). The dimensions of the agriculture–food and nutrition linkages need to consider structural problems, such as access to markets and resources, including land. And there are risks that affect the resilience of poor people and low-income countries, often eroding societal cohesion. Furthermore, a multitude of drivers beyond agriculture shape food security in positive or risky ways. These include bio-energy systems, biomass based raw material uses in industries, financial markets integrated with food commodity markets, novel non land-based foods, and more. Generally, all four dimensions in Figure 1
Innovations to Overcome the Increasingly Complex Problems of Hunger
von Braun

(p. 107) and their interrelations can benefit from innovations making the food and nutrition system more effective, efficient and resilient. While agriculture remains a fundamental driver of food and nutrition in rural areas, income and employment is of growing importance as a driver in urban contexts. Three contextual changes are particularly significant now and may be even more so in the future: first, urbanisation and rural–urban change with extended value chains combined with retail industry expansion world-wide; second, the transformation of the small farm economy in emerging economies; and third, growing hunger in complex emergencies and political conflict situations. These changes also relate to migration and mobility of people. Rural and urban hunger need to be addressed simultaneously. Ever stronger linkages between urban
and rural areas represent a challenge for sustainable development and food security. Malnutrition in urban slums will need increased attention, especially with a focus on micronutrient-rich foods that the poor can afford to purchase as well as sanitation and clean water services. A sole focus on the quantities of food will not be adequate in these contexts.

Innovations in policy and food systems to fight hunger

Innovations that impact on the whole economic, social and food system context have huge positive effects for the reduction of hunger. At an aggregate global level, innovations have become more and more important for improved food security. This is clearly visible in one component of food security, i.e., the sources of growth of food availability for the global population. Innovation contributes now about three quarters of growth, and inputs and land and water resources have scaled back while overall growth was maintained (Figure 2, p. 108).

Not only has the essential productivity growth changed toward more sustainability. Other changes we can point to as historical and current examples include:

- the cooperative formations initially in the 1860s by Raiffeisen in Germany – then spreading to many countries around the world – which facilitated collective actions to deal with market malfunctioning in output, input, and credit markets and social innovation;

- the “Green Revolution” combining improved seeds of staple crops with irrigation and fertilisers pioneered by Norman Borlaug in South Asia and others in China prevented a food emergency threatening the lives of millions; its dependence on growing input and water intensity has been much reduced in the meantime (compare inputs and water shares in the 1960s and 70s with the 2000s in Figure 2, p. 108).
the Chinese economic policy reforms of 1979 and thereafter, giving farmers access to markets and management freedoms on their farms, which gave a boost to economic growth of the Chinese economy, drastically reduced hunger, and actually led into a changed world;

the Vietnamese rice market policy reform of the 1990s, which led the powerful incentives to reach the farm gates of small farmers who responded strongly and made Vietnam a major rice exporter, thereby improving the world food situation;

the innovation of microfinance by Mohammed Yunus in the 1980s that facilitated access to finance for women’s groups, thereby improving their livelihoods;

the innovation of conditional cash transfer schemes to improve nutrition and health, initially tested and scaled up in Mexico in the 1990s and spread thereafter around the world.
All these big innovation examples have two things in common: one, they focused on policy and institutional innovations, and two, they entailed years of research and experimentation before they were implemented and scaled up. An important lesson is that not only technological innovations but also institutional and policy innovations are quite research-intensive. Moreover, researchers’ and policymakers’ interaction in implementation-oriented research can be very effective for overcoming hunger. However, there is an additional lesson learned from each of these very successful examples: despite their great contributions to the reduction of hunger and food insecurity, none of them alone is a panacea to end hunger in every context.

Public policy has two possibilities: to either introduce policies that change behaviour of farmers, food processors and, in the end, consumers or implement nutrition-specific interventions which compensate for nutritional damage that is partly a consequence of food-system failures (Pinstrup-Andersen 2013). A broad set of public policies is required to address hunger and nutrition risks, including policies and programmes directly targeted at the undernourished with social transfers and nutrition programmes. Most of these actions are carried out by national governments, but international support for these investments is also needed, especially in the least developed countries. Policy actions in three priority areas are called for: (1) expand social protection and child nutrition action to protect the basic nutrition of the most vulnerable; (2) take protective actions to mitigate short-term risks (such actions would include cash transfers, pension systems and employment programmes); and (3) adopt preventive health and nutrition interventions to avoid long-term negative consequences. Social safety nets not only ease poverty in the short term, but also enable growth by allowing poor households to create assets, protect their assets, and allocate resources to more risky but highly remunerative production activities.

Since good nutrition is crucial for children’s physical and cognitive development as well as their productivity and earnings as adults (Hoddinott et al. 2008), early childhood nutrition and school feeding programmes should be strengthened and expanded to ensure universal coverage. Of
relevance are also employment-related transfer programmes, such as the Indian rural employment scheme, scaled up to the national level in the past decade. Cash transfer programmes are increasingly common. When well-implemented, these programmes – which transfer cash to households partly on the condition that they meet certain requirements such as sending children to school and using preventive health services – have proven successful in reducing poverty. In the short run, these programmes have improved nutrition and increased household income. In the long run, cash transfer programmes can have a beneficial impact by helping to build human capital. Still, these programmes also have deficits, as shown after many years of experience in Latin America, including potentially undermining the formation of formal labour markets and corrupting political processes at regional levels (Birner, von Braun 2015).

Innovations in markets and trade for reduction of hunger

Innovations for improved functioning of markets and trade are important for food security. Poor consumers and farmers’ lack of access to markets as well as excessive volatility of prices remain problems for many of the hungry. Risk and uncertainty are quintessential features of agriculture and food markets. In extreme cases, they can cause severe food crises as experienced multiple times in several parts of the world throughout history. Food shortages that have occurred in the 20th and 21st centuries, most notably the global food crises in the 1970s and more recently in 2008, 2011–12, have affected millions of poor people in food-importing regions. Before the crisis in 2007–08, it was widely propagated that only market-based approaches should be used to stabilise agricultural markets. However, this view has been revised in the aftermath of the crisis. Several important factors were found to have been underestimated, such as the level of price instability, the exposure of producers and consumers, and potential social unrest. Consequently, surging food prices and the associated extreme food price volatility have caused panic and protest in developing countries resulting in major challenges for policymakers. Yet, little protection against price shocks exists currently and the most vul-
Vulnerable people remain with a limited capacity to quickly adjust to abrupt price changes. Thus, the need to improve the resilience of agricultural markets remains as high as ever. The international community and many governments have yet to develop an effective risk management strategy to be well-prepared for future crises (Kalkuhl et al. 2016).

Innovations to deal with volatility aim to promote the integration of different markets for improved risk-sharing among them. This does not only apply to an international context but also within countries. Furthermore, integrating markets also helps to cope with seasonality as distant markets have different seasonal patterns. Integration also comprises connecting processes along the value chain, and eliminating non-tariff and political barriers to trade. Value chain analyses can help explain why in some cases low-income producers do not profit from market integration, e.g., because product standards exceed their capabilities. Thus, while promoting market integration, it is necessary to equip farmers with the necessary tools and training to enable them to participate and compete in markets. In addition, measures for prevention of excessive volatility include national and regional grain reserves and regulations that restrict excessive speculative engagement in food commodity markets (Tadesse et al. 2014). Food markets will remain volatile to a certain extent and therefore improved early-warning mechanisms and information sharing is needed at regional and global levels.

Innovations to address hunger in complex emergencies and wars

Abrupt and strong food price increases, as was the case in the 2007–08 and 2011–12 crises, can lead to social unrest, violent conflicts, political instability and reduced economic growth (Bellemare 2015). Because governments are held responsible to ensure that people have an acceptable level of food security, their legitimacy is challenged when the poor lack access to food following food price rises and spikes. From the beginning of 2007 to mid-2008, food-related protests including strikes, demonstrations, and riots occurred in more than 40 countries, with some countries
experiencing multiple occurrences and a high degree of violence (von
Braun 2008). Social unrest does not only harm human and physical cap-
ital, which ultimately affects the country’s economy, but it also hinders
domestic and international trade that is crucial for accessing food. Fur-
thermore, there is a strong correlation of food riots with the international
food price development (Kalkuhl et al. 2016).

Of increasing relevance at an international scale is hunger in complex
emergencies, i.e., when political conflicts, war, terrorism and environ-
mental emergencies interact. The list of countries and regions within
countries having to deal with hunger in complex emergency situations
is getting longer, including for instance Syria, Yemen, Afghanistan, parts
of Nigeria, South-Sudan, Burundi, and others. The human right to food is
often violated in some of these settings, and hunger is implicitly a weap-
on, when cities or localities are encircled, preventing food and other aid
from entering. In these settings, hunger reduction depends on innovative
cooperation between security policy, diplomacy and development pol-
icy. Even in these sometimes almost hopeless and depressing situations,
inventions in emergency relief operations can make a difference. Good
eamples would be inventions such as cash cards for local purchases
facilitating positive leakages of essential goods across borders or mobile
phone-based money transfers that can be locally used to buy food.

Protecting nutrition as much as possible during crises and rebuilding
thereafter must consider inequalities and discrimination that determine
resilience or the lack thereof. Typically, communities and groups of indi-
viduals that are marginalised and excluded lack such resilience and need
special attention in emergency operations. Resilience is the capacity to
withstand shocks and to recover quickly after a shock (Figure 3, p. 109).

Nevertheless, taking a combined short- and long-run view is needed
to overcome these protracted hunger problems by peacebuilding and
development. In terms of the proportions of hunger worldwide, it must
be kept in mind that structural, mostly poverty and marginality related
causes of hunger dominate and must be addressed by income and em-
ployment opportunities, as well as increased productivity on small farms.
Innovations to cope with the fast farm transformations

The small farm economies are undergoing structural change. In the cases of Asia and Africa, both continents are sooner or later approaching a turning point from a farm size decrease to increase, and demand for labour-saving mechanisation will rise. This structural change will impact the labour market, thus spilling over into other economic sectors. Yet, this transition towards larger farms, especially in regions where small farms are dominant, will take a long time. The world has about 570 million mostly small farms (Figure 4, p. 110).

These small farms are impacted by a rapidly changing context that affects the food situation – some yielding positive change, others yielding increased risk. Worth mentioning are:

1. Opportunities are increasingly seen outside agriculture labour markets and youth in many countries are leaving farming;
2. The market value of land is rising because of agricultural price changes and the increasing influence of non-agricultural demand for land use, and land speculation;
3. International dynamics resulting from consumption shifts as fundamental drivers;
4. The scale and pattern of investments in infrastructure and social policy change in the socio-economic context of farming.

It should be considered that a farm being small is not only a matter of land size, but a matter of assets and income (von Braun 2005). For example, one hectare of irrigated fertile land planted with high-value vegetables and fruits and located close to major urban markets could generate much higher total income than, say, 20 hectares of rain-fed area under subsistence crops in remote areas. The factors that put small farms at an advantage or disadvantage compared to large farms have been debated
by economists for years (Schultz 1964; von Braun and Kennedy 1994; Hazell et al. 2010). Hired labour is the main reason for the lower land productivity of larger farms (Binswanger and Rosenzweig 1986). This is because family workers are more efficient than hired workers. Since family members receive a share of the farm’s profit, they pay greater attention to the quality of their work compared to hired labour. Several studies corroborate these findings by showing that small farms have a higher land productivity than bigger farms due to higher incentives and productivity of family labour (Eastwood et al. 2010), especially in Asia where labour is more abundant than land (Hazell et al. 2010). Fan and Chan-Kang (2005) indicate that, in certain cases, once the varying degrees of soil fertility and land potential (irrigated vs. rain fed) are taken into account, the diseconomies of scale in land productivity between small and large farms may disappear. Wiggins et al. (2010) conclude that the distinct advantages of small farms are present in cases when the main agricultural input is family labour and there is very little use of external inputs, the production being chiefly for home consumption with whatever surpluses exist being sold to small-scale traders. Since most of the poor in the world reside on small farms (von Braun and Mirzabaev
what happens on these small farms will be decisive for reducing poverty and hunger. Therefore, if these farmers were better off, hunger and the sticky problem of child malnutrition would diminish. Hence, an appropriate focus on small farms’ prosperity is called for, but that priority should not be a dogma in view of urban–rural change and rural landlessness, as well as the need to provide low-cost safe, and healthy food for the rural and urban poor in the markets.

In view of the different characteristics of farms and people, different segments of marginalised smallholders must be kept in mind when considering innovation strategies. Strategies must match economic and human capability as well as agro-ecological potential (Figure 2, p. 108). Four broad people-and-land related segments within those two dimensions can be identified: 1) areas where rural populations have relatively high capabilities and land with relatively high agro-ecological potential (AEP); 2) areas where the level of human capabilities is relatively high but AEP is low; 3) areas where human capabilities are relatively low and AEP is high; and 4) where capabilities and AEP are both low. For each segment of the rural poor, strategic options can be identified: intensification, diversification, and coping strategies. Innovations to improve land productivity will be favored in segments 1 and 2, where agro-ecological potentials are relatively high. Innovations to improve labour productivity will be favored in segments 1 and 3, where human capabilities are relatively high. In segment 4, intensified efforts for improving both types of productivity need to be made. This segment is typically the domain of development aid organisations and needs to be embraced by national development and social safety net programmes. Value-chain-focused approaches are suitable for segments 1 and 2.

A strategy of sustainable agricultural intensification could involve improved access to production means, e.g., high yielding varieties, fertiliser, pesticides, and seeds to enhance productivity through intensification (The Montpellier Panel 2013). In this segment, technological and institutional innovations need to support the aim of increasing yields per area of land. Depending on the specific context in which innovations
are sought, strategies towards sustainable intensification will need to be more people and/or area-focused. These strategies include:

- intensifying crop production and minimising environmental impact by making use of improved varieties and technologies adjusted to changing environmental and climatic environments;

- diversifying agricultural crop production and production techniques to reduce external inputs and risks of failure and maintain agro-biodiversity;

- diversifying income opportunities and facilitating exit strategies, as well as enabling private business opportunities; and

- providing basic educational, food, and health services for the most deprived, including them in a social safety net, and connecting them to communication and transport infrastructure.

By investing more in farms, and by increasing efficiency of farming, a large portion of poverty and malnutrition could be reduced. Small farms play multifunctional roles in development, such as food and non-food production, contributing labour to local ecosystems services (soils and waters), and providing local social capita (HLPE 2013). Policy support should be aimed at promoting the dynamism within the family farm sector itself, but also enhancing the dynamic interactions and integration of the family farm sector into the rest of the economy. All three options for small farm transformation need public policy attention, not just a smallholder growth strategy. At the same time, land rights of small farmers must be protected by recording and by enforcing ownership against powerful international and domestic investors. Digitally supported ownership records can help with that, but rule of law is essential.
Innovations from the bottom up with farmers

We can distinguish between two interrelated components of innovation, i.e., institutional and technical innovations. They are driven by common forces, especially scarcity of resources and related prices of resources, mainly land, water and labour (Hayami and Ruttan 1984). When resources become scarce, opportunities for innovation arise. For instance, measures that enhance the land productivity are taken when land is the scarce factor. In contexts of water shortage, the efficiency of water use in irrigation may be increased or labour-saving technologies are implied when wages rise. Moreover, we need to include all actors of innovative change into the system, i.e., farmers themselves, the research communities, businesses along value chains, and policymakers.

Farmer innovation is as old as farming, when sedentary farming evolved and hunter-gatherers began to build permanent houses of stone and wood, and accelerated with inventions of agronomy, and plant and animal breeding. Human development and climate change were already exercising mutual impact on each other back then. Within just a few centuries, climates grew warmer which, in turn, facilitated the cultivation of wheat, barley and vegetables in steppe areas and other global regions, including forests. It is an irony that human development was triggered by climate change while today, food security is threatened by climate change. Nowadays, climate change puts pressure on agricultural production systems and food security, especially in regions where the population is already vulnerable to undernutrition (Wheeler and von Braun 2013). Adapting agricultural systems to these new challenges is the aim of innovations fostering climate-smart food systems. Weather index-based crop and livestock insurance systems are an innovative approach gaining increased attention.

Long before formal science institutions were established, innovation was changing and improving the productivity of farming and food systems. It must not be forgotten that this type of bottom-up initiative is still an important force of innovation in which farmers are investing. Gupta (2016), who pioneered the “Honey Bee Network” including thousands of farmers in India that makes grass roots innovations visible and accessible through...
sharing, points out that “minds on the margin are not marginal minds”. Wünscher and Tambo (2016) studied farmer innovations in Ghana. Farmer innovations include technologies or practices which can be applied along the value chain, are different from common or traditional practices, and are developed by a farmer or a group of farmers without external assistance. They stem from modifying existing technologies, inventing new practices or experimenting with new ideas. By means of a farmer innovation contest among smallholder farmers in Ghana, high-potential innovations were identified and encouraged. The researchers show that farmers can be a promising source for locally-adapted, site-appropriate innovations which may be suitable for rapid and cost-effective dissemination. They point to the fact that, despite poverty, a farmer’s innovative capacity remains part of their capabilities, which can be made use of by changing incentive systems for innovation. The provision of incentives in the form of a contest is a way to stimulate the farmers’ innovative behaviour and to facilitate the dissemination of successful technologies.
at a regional level. Farmers become creative, share their knowledge with institutions and other farmers, and engage in experimentation. Thereby, partnerships between farmers, extension officers, and scientists are strengthened, and the appreciation for farmer innovations among the involved stakeholders is increased. Furthermore, encouraging the innovativeness of farmers is a means of building resilience since their ability to autonomously adapt to changing conditions can be increased. Reducing a farmer's dependence on external inputs facilitates the application of this human resource of creativity and innovation. The approach of farmer innovation contests and farmer group formations is being rolled out in several more African countries.

Agriculture may be even responsible for shaping the mindsets of people. Talhelm et al. (2014) showed that there may be a two-way relationship between people’s behaviour and agriculture. Looking at China, they found that rice farming makes societies more interdependent, whereas farming wheat has the opposite effect, making societies more independently thinking. They found in rice-producing regions of China a comparatively higher degree of holistic thought; also, group goals were given a higher priority than individual goals (Cross et al. 2011). In wheat-producing regions, people tended to be more analytic and individualism was given a higher priority than the overall welfare of the group.

Other new research points at the important role aspirations or lack thereof play for innovation and technology adoption in agriculture. Mekonnen and Gerber (2016) find in Ethiopia that farmers with less aspiration adopt innovative practices less often, such as improved seeds and fertiliser. The upshot of this research is that innovation is endogenous to fundamental drivers, and not just a matter of transfer of knowledge and technology. Yet, transfer of innovation also plays important roles today. Relying just on bottom-up innovations would neglect opportunities offered by new research and applied scientific insights.
During the past 200 years, several major inventions for the agricultural sector could be observed that had a great influence on shaping societies (Fogel 1999). This accumulation of innovations took place simultaneously with the exponential population growth, actually facilitating population growth. Early scientific communities focused on agronomy and emerged in the late 1700s. Major contributors to agricultural economics included Johan von Thuenen (1810s) and Robert Malthus with his studies on population and hunger in the 1830s. Plant nutrition was dramatically changed by Justus von Liebig’s discovery of essential plant nutrients in the 1840s. The animal sciences already saw innovation in the 1800s regarding selective breeding. The increase in food safety measures was much improved by Louis Pasteur, who treated milk to stop bacterial contamination in the 1860s. Increasing awareness of food safety led to an amelioration of public health. It was Gregor Mendel in the 1850s who revolutionised plant breeding through genetic considerations. His innovative statistical studies had great influence on breeding. Norman Borlaug’s work on plant breeding in the 1970s had a huge impact on the food security situation in Latin America and Asia, increasing wheat and rice yields by planting high-yielding crop varieties (Gillis 2009). Since the 1990s, advanced biology has become important in agricultural science. Scientific innovations have made significant contributions to hunger reduction, and the Centers of the Consultative Group for International Agricultural Research (CGIAR) have played important roles in that respect together with national research systems of emerging economies. Still, a big gap exists between potential agricultural productivity and yields of crop and livestock between low and high-income countries. This gap must be further addressed by new ways of cooperation, and farmers’ vocational training and extension services must be strengthened.

Research increasingly focuses on the goal of achieving higher and more stable yields as well as on the plant-microbial relations, and advances in molecular and cellular processes. New forms of water-saving irrigation systems will become more important, as will innovations in pest and...
disease resistance in a post-antibiotics age, such as chemical control, biological control, sterile insects breeding, and breeding for resistance. In addition, meat substitutes made from pulses or algae have become prominent on research agendas to bridge protein gaps. Demand-side innovations will focus on consumption and behaviour change to overcome food-related health problems. Consumer preferences and the willingness of consumers to alter these will be one of the major determinants of the actually-adopted change of agricultural products in the next decades. Similarly, reducing wastes and losses will influence this trend as well.

Agriculture-related nutrition linkages influence farm families directly and indirectly through the availability of foods in the markets. Nutrition-sensitive agriculture aims at making nutritious foods available and accessible, thus focusing on an important cause of malnutrition (Jaenicke and Virchow 2013, Balz et al. 2015). An important evolution in the past 10 years is the increase of the nutrient content of staple foods, such as wheat, maize, rice, beans and sweet potatoes through plant breeding – an approach called bio-fortification (Bouis et al. 2013). Bio-fortification is seen as one major contributor to eliminating micronutrient deficiencies. At the same time, food fortification through mixing micronutrients into staple foods such as flour or cooking oil has become more widespread and more effective, too. These approaches need to be applied in optimal combinations rather than separately.

The bottom-up innovations discussed above and the science-based top-down innovations from research systems should be connected in new and more effective ways. A means for that are innovation platforms or innovation centers in which researchers and farming practitioners meet and jointly identify opportunities. The “Green Innovation Centers” initiated by the German Government in several African countries can be a basis for such synergies between bottom-up and top-down activities among farm actors and research communities on local or international levels (Husmann et al. 2015).
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Digital technologies for food security

The mobile phone has not only become the most important communication technology globally, but also offers numerous additional functions such as access to the internet, audio-visual recordings or financial transactions. Digital technology is a game changer for food and nutrition security. It potentially makes monitoring hunger risks more effective. Farmers can be better informed about market opportunities and become strong users of innovations that fit their circumstances. On the consumer side, digital technologies can facilitate the provision and dissemination of information related to malnutrition. Furthermore, costs for nutrition program experts to reach their target groups, especially mothers and children in need, decrease. Many of these opportunities have yet to materialise, but the potentials are large. In particular, the advent of smartphones has opened up a whole new range of services to their users. At the same time, the nature of the internet is changing towards a
network of diverse mobile devices which can collect, share and analyze huge amounts of data and connect users around the globe, including in Africa, through social networks. Several services are already being offered to farmers with the help of mobile technologies (referred to as m-services, Baumüller 2016). Using information and communications technologies (ICT) such as global positioning and information systems, remote sensing or sensors to monitor climatic conditions, soils or yield, farmers can detect temporal and spatial variability across their fields. They can then selectively treat their crop, either manually or through technologies that adjust their behaviour in response to the gathered data. Much of the focus has been on the variable rate application of inputs based on yield and soil monitoring (McBratney et al. 2005).

Many of the high-tech agricultural applications used in industrialised and a few developing countries are unlikely to be appropriate in development contexts given low levels of literacy, limited access to equipment, and small landholdings. However, the rapid spread of mobile phones and networks as well as advances in the Internet of Things (IoT) could lead to technological applications that are better adapted to the needs and capacities of small-scale producers. Farmers can use IoT services to assist with site-specific management of their fields, monitor the development of their crops, adjust their agricultural practices in response to the data, and track the sales of the produce. The information they gather is complemented by other information to help with planning, such as weather forecasts or price information for inputs and outputs. Baumüller (2016) reports that in Kenya, Virtual City’s Agrimanagr and Distributor systems use mobile phones to collect data when farmers deliver the produce, e.g., weight and location (through GPS) and track the produce throughout the chain to the processing plant. In Ghana, SAP uses barcodes linked to a farmer’s profile to record deliveries of shea and cashew and upload the information to a central system via mobile phones. IoT technologies are also being used to track the movement of cattle, for instance, in Kenya with GPS tracking devices attached to one cow in the herd (The Cattle Site, 2012). Insurance companies are deploying M2M technologies to manage micro-insurance schemes for crop and livestock producers. The
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company ACRE (formerly Kilimo Salama), for instance, uses data from weather stations to trigger insurance pay-outs in case of severe weather events via mobile phones. The inclusion of the next generation of millions of small farmers in ICT opportunities could also contribute to a reduced urban–rural divide.

Conclusions for innovations to end hunger and improve nutrition

At the outset of this chapter, we emphasised that hunger has become ever more complex. To conclude, efforts to sustainably eradicate hunger and malnutrition depend on policies and programmes that match these complexities of causes and features. Innovations are critical for progress. However, they require increased public and private investments as well. Key elements of inclusive policies and partnerships are:

Agricultural development in the hunger-affected rural areas and communities to improve productivity will remain a major part of solutions. Therefore, innovations are key to increasing productivity sustainably and ensuring food security while maintaining environmental quality and resources. The German “ONE WORLD – No Hunger” initiative with its innovation centres serves this purpose. It needs to be sustained for the long run, because agricultural development needs time.

Farmers’ own innovation capacities need strengthening. Bottom-up innovativeness of smallholder farmers and appreciation of their problem-solving potential is an opportunity. Vocational training can support that. Stimulating of farmers’ innovative behaviour by providing appropriate incentives and incorporation of local knowledge into more institutionalised research frameworks and extension services is called for. A strong focus of such actions on women farmers is fair and efficient.
Investment in food and agricultural research and development (R&D) is an important tool for broad-based innovation, for instance, with regard to improved seeds. In sub-Saharan African agriculture more investment in R&D is needed to raise production per head and total factor productivity (TFP). Although agriculture and food security have become clear priorities on the political agenda of many low-income regions, investments in R&D have not increased sufficiently. Stronger international food and agriculture science partnerships between science-rich countries and emerging economies can make important contributions.

Digital technology is a game changer for food and nutrition security. Many of the promising opportunities of the new digital technologies have yet to materialise, especially in contexts of developing countries, but the potentials are large and need international engagement and support. It can enhance farmer productivity and market access as well as nutrition actions, even in emergency relief.

Innovations for improved market functioning and avoidance of price shocks require information and early warning systems, as well as better preparedness with improved trade and food reserves policies.

The environmental and climate change aspects of agricultural, and land and water use change need attention for sustainable hunger reduction. An essential component of resilient agriculture is an end to land and soil degradation. The end hunger goal is not separable from related environmental sustainability goals.
More attention to innovative social protection and direct nutrition intervention programmes is needed, including addressing the micronutrient deficiencies in rural and urban areas. A focus on young children and mothers is required in these programmes. Fortification and bio-fortification of foods and nutrition-sensitive agriculture should be scaled up for overcoming the micronutrient deficiencies soon.

Hunger in complex emergencies needs to bring together development policy with diplomacy and security policy. Development and humanitarian actions can build on innovative emergency relief experiences. A combined short- and long-run view is needed to overcome these protracted hunger problems by peacebuilding and development. The structural and marginality-related causes of hunger caused by exclusion must be addressed by rights-based approaches, income and employment opportunities, as well as increased productivity on small farms.

Innovation initiatives, like any development investments, must follow principles of good governance, achieving investment at low transaction costs, sound financial practices, and avoidance of diversions of funds. Partnership principles and strict monitoring and evaluation systems must be established which measure the progress with regard to the mutually-set goals. Strong alliances among the private and public sectors and non-governmental organisations (NGOs) are needed to end hunger and undernutrition.
### Table 1: Hunger and nutrition problems

<table>
<thead>
<tr>
<th>Problems</th>
<th>Number of people</th>
<th>Consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hunger (undernutrition, calories)</td>
<td>Approx. 0.8 billion</td>
<td>Acute deficiency, political conflicts</td>
</tr>
<tr>
<td>Hunger in complex emergencies</td>
<td>No global estimates</td>
<td>Early childhood nutrition shocks, Mother’s health</td>
</tr>
<tr>
<td>Hidden hunger (deficiencies of micronutrients, such as vitamins, iron, etc.)</td>
<td>Approx. 2 billion</td>
<td>Diseases, reduces productivity</td>
</tr>
<tr>
<td>Children’s undernutrition (the first 1000 days)</td>
<td>Approx. 165 million</td>
<td>Stunting, reduced physical and cognitive development, 3.1 million deaths p.a.</td>
</tr>
<tr>
<td>Obesity and resulting chronic diseases</td>
<td>Approx. 1 billion</td>
<td>Obesity and resulting chronic diseases</td>
</tr>
</tbody>
</table>

Source: von Braun.
Innovations to Overcome the Increasingly Complex Problems of Hunger

Figure 1: Framework of relationships that determine nutrition and food security

Figure 2: Innovation feeds the world. Sources of productivity growth in world agriculture.

Contribution of:
- Innovation (TFP)
- Input intensification
- Irrigation
- Land expansion

Figure 3: Resilience of more vulnerable and less vulnerable groups

Figure 4: Where the world’s farms are (about 570 holdings)

Source: Based on data by Lowder et al. 2014. FAO datasets.
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Figure 5: Potential strategies, technological and institutional innovations considering human capabilities and agro-ecological potentials

Source: Gatzweiler and von Braun. 2016.

STRATEGY 1  
Agricultural intensification

STRATEGY 2  
Agricultural diversification

STRATEGY 3  
Income diversification

STRATEGY 4  
Coping strategies

High

Human capabilities

Low

Agro-ecological potential

High

Low
References


For more references, please contact the author.
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von Braun
Bärbel Dieckmann
President of the German NGO Welthungerhilfe

A Just World Is
One without Hunger
Even though great famines have been overcome and the Global Hunger Index shows that hunger is falling, it is still a problem affecting 800 million people worldwide. Poverty, crises and conflicts mean that there are 2 billion people suffering from grave malnutrition. Rural development – with an emphasis on social, environmental and economic sustainability – is a key component in the effort to overcome global hunger. However, just producing enough healthy food will not suffice; social justice and peace are vitally necessary as well. A world without hunger is possible – if the international community puts every effort into achieving the goals of its pact on the future, the 2030 Agenda.
Progress in fighting hunger

A world without hunger is not a dream or a vision. It is a human right. A right that we are coming closer to realising on a global scale. Since 2000, the developing countries have had a considerable degree of success in reducing hunger. The 2016 Global Hunger Index (GHI) shows that, overall, the level of hunger in developing countries has fallen by 29 per cent. It is pleasing to note that sub-Saharan Africa has achieved the greatest improvement in absolute terms: the GHI shows a drop of 32 per cent in the level of hunger for this region since 2000.

There is also one other extraordinary achievement that has been made: we are no longer seeing “huge” or even “calamitous” famines with over a million lives lost. Whereas millions died of hunger during the 20th century, with 15 million deaths in each one of five separate decades, since the start of the 21st century, the death toll has been just under 600,000 people (2015 Global Hunger Index). This is still a shockingly high number of deaths, but by historical standards, it is very low. The current humanitarian crises – due to wars, as in the case of Syria, or the weather phenomenon El Niño in the case of India or Ethiopia – are no longer causing massive famines. The system of emergency relief and assistance is working.

All in all, global efforts to combat hunger are making progress. However, this progress urgently needs to be accelerated in the worst affected regions, in South Asia and in sub-Saharan Africa. If these regions are able to improve their hunger levels between 2016 and 2030 at the same rate as they have been improving since 2000, then they will score somewhere between 20 and 22 on the Global Hunger Index. That is still “serious” or on the threshold between “moderate” and “serious” on the severity scale. With that kind of score, they would still be far from achieving the goal of a world without hunger by 2030. It is also true that the progress being made is not the same everywhere; there are considerable variations from region to region and from country to country, and also within individual countries. What is more, progress made in fighting hunger is not in itself enough to overcome global hunger: violent conflicts, poor governance, unfair terms of trade and climate-related harvest risks are
not only slowing the efforts to fight hunger in many places, they are also having a negative impact on the regional food situation.

It is not only crisis situations that make the task of overcoming hunger more difficult; inequality is also a major cause of hunger. India is a case in point: 22 per cent of India’s total population lives below the poverty line (Government of India 2013), yet the country also has 84 billionaires living within its borders (Forbes 2016). More than 50 per cent of the nation’s wealth is owned by just one per cent of the population. India is the second-biggest producer of food in the world and yet it has the second-biggest number of undernourished people worldwide (FAO 2015). India is ranked 97th out of 118 countries on the current Global Hunger Index – between North Korea and Tanzania. Mali (93rd), Rwanda (91st) and Malawi (89th) rank better than India.

Fighting hunger is and will remain a question of rural development and agricultural production – but sustainable success will only be achieved when overall conditions at the local, the national and the regional level are characterised by peace and social justice. That is why the work of civil society organisations in campaigning for good governance – at the local, the national and the international levels – is so important.

50 years of the social contract – social justice is still a long way off

The International Covenant on Economic, Social and Cultural Rights of the United Nations recently celebrated its 50th anniversary. The purpose of this UN social contract is to bring about binding commitments under international law to the rights laid down in the General Declaration of Human Rights. These rights cover a range of aspects, from gender equality to social protection, maternal benefits, health and education, decent wages, livelihoods, and good and varied nutrition. The Covenant was adopted by the UN General Assembly on 16 December 1966 and has meanwhile been ratified by 164 nations. These countries have given a binding undertaking to respect, protect and fulfil the human right to
adequate food (Article 11). Despite the commitment they have given, according to the Global Hunger Index, hunger is an issue in more than 100 countries. And many countries that are not themselves affected by hunger still do not act to protect the human right to food: their trade, agricultural and energy policies are designed solely with a view to protecting their own economic interests, without giving any consideration to the negative impact they may have on efforts to overcome hunger in other countries. The consequences of a particular policy are disregarded, political coherence is totally lacking – both within and between countries.

To find clear evidence that the implementation of the social contract has been and still is inadequate, you only need to consider the numerous other problems the world is currently facing in addition to hunger, such as crises, conflicts, migration and displacement, climate change, desertification and terrorism, to name but a few. Despite social rights, inequality has probably never been greater than it is today: 62 people own as much as the poorest half of the world’s population (Oxfam 2016). The measureless social divide within and between countries is not only manifested through hunger and poverty. The international community is further than ever before from reaching a position of social and environmental balance.

In order to tackle these problems at their roots, the international community agreed upon a pact for the future: the 2030 Agenda for Sustainable Development.

2030 Agenda – unity in a divided world

Hunger can be overcome. We know the causes. And we know the solutions. In numerous conferences and summits held during the last few decades, declarations have been drafted and signed in which more equitable global policies and measures to specifically target hunger have been called for and agreed. This is also the motivation for the 2030 Agenda adopted in 2015 by the United Nations: its 17 Sustainable Development Goals are aimed at realising “the human rights of all”, to quote from the Preamble. One of the goals to be realised is completely
eradicating hunger and malnutrition by 2030 – thus realising the human right to adequate food.

The 2030 Agenda is not binding. That is its greatest weakness. Its strength is that it was elaborated in a dialogue between policymakers, civil society, the private sector and academics – a dialogue involving participants from all over the world. However, the weakness of this dialogue is that, although the circle of participants was wide, they were mainly drawn from a global intellectual elite of like-minded players. Nevertheless, the 2030 Agenda is a widely recognised guideline that has the potential to contribute decisively to the realisation of social human rights. The knowledge that the international community is in a position to overcome hunger and poverty within the space of one generation lends weight to the Agenda – but this is counterbalanced by the knowledge that this is all the time we have left to address the fatal damage being done to the Earth’s soils, water and climate; damage that could change our human existence exponentially. The 2030 Agenda is very ambitious, but it appears doable, if the governments that have promoted and signed it also actually implement it. So far, however, there is little sign of that happening – economic interests continue to take precedence over social justice. That is also especially true in Germany.

Civil society is called upon more than ever: governments would like to see non-governmental organisations getting involved in the practical implementation of the 2030 Agenda, especially when it comes to fighting hunger. NGOs can indeed make a considerable contribution – especially in fragile states where political considerations mean that governmental organisations are unable to intervene. However, the 2030 Agenda is above all a political agenda that is concerned with striking a balance between economic and social interests. Especially when it comes to fighting hunger, civil society has a role to play in exposing poor governance using the goals of the 2030 Agenda and in demanding corrective action – both nationally and internationally. Civil society will need to do even more to show how governments often leave their citizens behind because, although the funds are available, they fail to foster access to education, health and nutritious food. Civil society activities are a key factor in mak-
ing economic and social development more just, in fighting corruption, and in smoothing the path for gender equality, sustainability, the rule of law and democracy. These activities are thus one of the pillars for the success of the 2030 Agenda.

If the weight and impact of the 2030 Agenda is to increase, then the signatories, i.e., the heads of government of 193 countries, have very little time left to show that they are serious about revising their policies. The Agenda has been in force since January 2016, yet there is still little sign of any obvious or tangible changes in policy. In order for such changes to take place, a new political partnership is needed, a partnership that gets broad swaths of civil society, the private sector and academia involved, not just symbolically but really and fairly. The only way this joint endeavour by the international community can succeed is if everyone works together. It is exactly that aspect which is the trickiest part when it comes to the
implementation of the 2030 Agenda. Governments are behaving in an increasingly autocratic way, civil society organisations are being pushed to the side, wars are being fought over territorial supremacy, there is a rise in separatism, extremism and nationalism, and battles are underway for economic advantage. All that is completely at odds with the goal of concerted global development.

Food security is a question of justice

Across the globe, enough food is produced to feed all the people living on the planet. Back in 1961, global food production was a mere 2,193 calories a day per person, but in 2011 – despite strong population growth – there were 2,868 calories available for each person each day (FAO 2014). The threshold for hunger is considered to be 1,800 calories a day per person, if the individual is moderately active. By comparison: there are on average more than 3,500 calories available each day for every German. In global terms: there is enough to go around. The only problem is that the physical availability of food alone is not enough to fight hunger. Only those who have enough money have access to food. This is true almost everywhere in the world.

Seen in that light, overcoming hunger is no longer exclusively a question of food production. Increasingly it is becoming a question of creating justice. This begins in the fields, with the small farmers: without just access to land and water, development is not possible. This is also a question of equitable regional development, where impoverished rural areas, instead of being left out, are targeted with support for health, education and transport infrastructure. It is also about national policies that contribute to the development of all citizens – without discrimination on the basis of ethnic origin, religion or skin colour. It is a question of national budgets being used in a socially equitable way. It is about international policies that must ensure the equitable use of environmental resources and regulate economic strategies driven by the desire to make a profit.
That is why, across the globe, civil society is campaigning more and more for justice – and over the last few decades these calls have increasingly been heard. For governments though, this has also made civil society an uncomfortable partner: instead of focusing on implementing social projects, as they did for decades in the past, civil society players are now starting to take a close look at unjust policies and are drawing them to public attention. They are condemning human rights violations. And they are showing how development can be made both socially equitable and environmentally compatible, and are demanding that the necessary steps be taken to achieve this. In many places, civil society is therefore a thorn in the side of national governments. Especially in countries like Ethiopia or Cambodia, where people are starving, but also in wealthier emerging economies such as India or Bolivia, we are increasingly seeing laws being passed that will allow the authorities to limit the scope for civil society to act. We are also seeing more and more people who are critical of the government being arrested. Repression does not create justice. And it certainly does not create food security.

The 193 heads of government who committed their countries to the 2030 Agenda have given an undertaking to “leave no one behind”. They have also made a commitment to empower all people to live self-determined lives by 2030, and to promote social, economic and political inclusion (Sustainable Development Goal 10). In many places, civil society plays a role in making people who are left behind visible, in fighting for their inclusion – making it possible for them to claim their rights. That is why fighting hunger increasingly means fighting for the realisation and observance of rights. In most countries, overcoming hunger is more about access to food than its physical availability. A just world is one without hunger.

Preventing hunger in the aftermath of displacement

With its first guidelines on the right to food, the United Nations called on all countries to “promote and safeguard a free, democratic and just society, in order to provide a peaceful, stable and enabling economic,
social, political and cultural environment in which individuals can feed
themselves and their families in freedom and dignity”. More and more
people are leaving their homes because their countries are not able to
provide such an environment and because there is no prospect of an
improvement in the situation.

About nine out of ten displaced people worldwide find refuge in their
home countries or in another developing country. A high proportion
of global refugee movements take place in Asia and Africa. Only a small,
but growing proportion of the world’s refugees end up in Europe. The
countries outside the European Union that have given shelter to many
refugees are often themselves struggling to achieve food security. In
order to make sure that displacement does not cause a food crisis, these
countries need additional support: humanitarian aid on the one hand,
and assistance so that countries faced with a tide of displaced people
have the possibilities and resources they need to welcome and provide
for them. Providing means not just giving them shelter and food, but
also arranging for other needs to be met, such as education and train-
ing, and access to labour markets. Especially in places where people are
obliged to eke out an existence living in refugee camps for months and
even years, every effort must be made to avoid the emergence of a lost
generation of refugees. For this, humanitarian assistance and develop-
ment cooperation urgently need to tread new paths, pursuing innova-
tive ideas in order to link the different approaches. It must be possible
for displaced people to return to normality in their temporary new
abode – even when they are far from home. Such approaches would seek,
wherever possible, to get the governments of the countries of origin to
shoulder a greater share of the responsibility, too, and would aim to
ensure that dictators and warlords do not benefit from any additional
support that may be forthcoming.

In order to tackle the root causes of displacement and support the ref-
ugees, considerably more funding should go into preventing conflicts
and crises. Without peace it will not be possible to realise the right to
food and thus achieve the second development goal, namely overcom-
ing hunger by 2030.
Humanitarian assistance should have a special focus on displaced persons who remain in their own countries or seek refuge in neighbouring states. Depending on the conflict situation, this scenario may require a high degree of political sensitivity and it may be dangerous for aid workers. Since displacement is, as a rule, a more long-term state of affairs, there is a need for both the development cooperation community and those engaged in humanitarian assistance to give much more attention to finding ways for displaced persons to help themselves. In Uganda, for example, refugees from neighbouring countries receive parcels of land that they can farm. They are allowed to work and earn money. This helps them access food independently and avoid becoming dependent on food aid.

A problem that urgently needs to be addressed by both German and European policy is how to achieve better links between humanitarian assistance and development cooperation. There is, furthermore, a great need to provide support and assistance in countries of origin for returning refugees, so that their return may be experienced as a new beginning and as the starting point for their reintegration.

Migration is not something to be fought; instead it should be properly regulated. Development cooperation can also play an important role in this. If implemented successfully, development cooperation activities can enhance prosperity in the regions where they are carried out. Since increased incomes make (expensive) migration easier to achieve, development cooperation can result in more migration in the short term. It is only when a higher level of prosperity has been reached that the trend towards migration can be expected to decline. Last but not least, the prospects for success are increased when development cooperation strategies are conceived in consultation with the countries of origin and when donor countries improve the mutual coordination of their activities.

Furthermore, development cooperation can create job opportunities in the countries from which migrants originate, for example through investments in infrastructure and rural development. Promoting local or regional value chains, especially in connection with the processing
of agricultural products, can produce a marked increase in employment opportunities in rural areas. This is especially true for African countries.

Malnutrition as a result of crises and conflicts

Mali in West Africa was on the right track: from 1992 to 2008, according to the 2016 Global Hunger Index, the country managed to improve its score from extremely alarming (GHI 50.2) to serious (GHI 34.4). The fastest progress was made between 2000 and 2008. During that period the country’s GHI score improved by a massive 9.5 points. However, following a political crisis in 2012, the food security of many Malians deteriorated – especially in the north of the country, but also in many other parts. Forced displacement and a lack of investment caused farmers to miss the moment for planting their fields in mid-2013. A total of 520,000 people left their homes in the north, with 32 per cent of them seeking refuge in the neighbouring states of Burkina Faso, Mauritania and Niger, whilst the remaining 68 per cent stayed in Mali and found temporary homes with friends or relations in Mopti, Ségou or Bamako. While they were living with host families or relations, people’s possibilities for feeding themselves and their children were limited. In the three northern regions there was a huge fall in the availability of staple foods. More than 90 per cent of the internally displaced persons and 75 per cent of those who fled to other countries lost their domestic animals. At the end of 2013 somewhere between 70 and 90 per cent of the population in the north were relying on food rations from international aid organisations. This unstable situation also had a knock-on impact on food security in other regions: trade in vegetables and fruit between the south and north was disrupted. As a result, malnutrition increased. In 2014, the food situation began to improve. People returned to their homes and began to cultivate their fields once more. Many humanitarian organisations resumed the work that the crisis had forced them to interrupt. In early 2015, however, before peace talks began in Algiers, the situation deteriorated once again. The repeated upheavals caused by drought and violence have gnawed away at the meagre resources which people had to live on before the conflict. Meanwhile, the situation has calmed down once more.
Fresh vegetables for families and for the market:  
460 Malian women on track for success

In 2013, supported by the German Federal Foreign Office, Welthungerhilfe and its partner organisation Association Malienne pour la Survie au Sahel (AMSS) rebuilt the Peace Garden on the edge of the city of Timbuctoo, which had been created in 1996. For the reconstruction, cash for work arrangements were made, women’s groups revived, cash transfers carried out and building materials provided.

“Today our families are once again able to eat vegetables. We share some of the vegetables with neighbours and sell some at the market in Timbuctoo. Our children are healthy again. With the money we earn we can send our children to school or buy medicine,” says Zarin Yattara, the president of the women’s group Alhamdoulaye, which runs the Peace Garden. The garden supplies markets in Timbuctoo with beans, salad, beetroots, carrots, tomatoes and potatoes.

Thankfully, the situation in Mali has improved once more, but overall the progress made on food security has suffered a clear set-back. Despite food aid, it is almost impossible to maintain a healthy standard of food during crises lasting many years. The lack of fresh fruit and vegetables, the basic ingredients of a balanced diet, is clearly reflected in the data for the period from 2008 to 2016: during that time, the fall in the GHI score was significantly slower – going down 6.3 points, to 28.1. This means that the food situation remains serious.

Crises and conflicts do not necessarily catapult people into hunger but they do usually lead to malnutrition. For children, the negative impact on their growth and development due to a lack of vitamins and minerals is often irreversible. As a result, whole generations of children can expect to experience poorer mental and physical health than would have been the case if they had been able to enjoy a good diet. Children who grow up in crisis regions will have to live with the burden of a traumatic childhood and stunted growth for the rest of their lives.
Restoring security and the rule of law should always be the highest priority, so that the vicious circle of hunger, malnutrition and armed conflicts can quickly be ended. Without justice and guaranteed human rights, national and cross-border reconciliation processes are scarcely conceivable. The combination of political strategies designed to achieve peace, initiatives aimed at promoting peace and development measures is a crucial step in that direction. However, far more is needed if the people in Afghanistan, Iraq, Mali and Syria are to be able to live their lives in peace and dignity, free from hunger and malnutrition. We have the Agenda for achieving that goal. However, even as they were being drawn up, the 17 Sustainable Development Goals were being trampled upon by many governments fighting wars of conquest and issuing increasingly autocratic decrees. It was those very same governments that jubilantly signed the 2030 Agenda in New York at the end of 2015.
Rural areas – still a hunger hotspot

The lives of poor people living in rural areas have changed very little in the last few decades. More than 70 per cent of the people who experience hunger live in poor, rural parts of developing countries. Most of them have no electricity and no access to clean drinking water. The few educational and health care facilities available are of a poor quality. Toilets, drains and solid waste disposal systems are unheard of amenities. The people living in these regions are small farmers or landless agricultural workers. They grow crops, keep domestic animals and many of them hunt and fish. It is incredible but true that most of the people affected by hunger are people working in the agricultural sector. Women and men do their best to feed their families on what they can grow themselves, and to earn some money selling their wares at local markets, since there is little work to be found other than in agriculture. Many children are obliged to help out in the fields and are not able to go to school. If the men move to the towns in search of a better income, then the women are often left behind with the children. The women are then solely responsible for the survival of their families – running the household and working the land by themselves. Pressed into this situation, it is hardly surprising that women and children are particularly affected by hunger. Rural life is hard; harvests are so small that it is not possible to build up savings. A relatively small problem, such as illness, can quickly turn into a disaster for the whole family. As a result, hunger is an ever present spectre, even when enough food is momentarily available.

Back on the political agenda for the time being – promoting rural areas

For many decades, rural areas were not on any political agenda; they were not given any priority by either the governments of the countries affected by hunger or the international community. For a long time, donor countries and international development and financial institutions in particular were firmly convinced that two main factors were the answer to overcoming hunger: free markets and adequate global agricultural
production. For years, therefore, governmental and international global food policies were based on a strong belief in the efficacy of open markets and increased productivity.

On a positive note, it can be said that, thanks to these policies, despite huge population growth, the world has managed to produce enough food to feed all people – in theory. In fact, in most of the regions affected by hunger, it is also possible to enjoy a healthy diet throughout the whole year, provided you can afford the expensive food available. However, for the one billion people living on less than US$ 1.90 a day, that food is scarcely affordable. As a result, according to the FAO, 793 million people are still suffering from hunger. Global (over) production of agricultural goods and globalised markets have been unable to solve the problem of hunger, because poverty still remains. It was not until 2009, when the number of people suffering from hunger briefly rose to more than one billion due to increased prices for food, that the people calling for rural development were heard. Non-governmental organisations in particular had not stopped carrying out development projects in rural regions and calling for more to be done. Academics had done the same. However, though the governments of countries suffering from hunger had also repeatedly highlighted the sorrowful state of affairs in rural areas, their focus had been on developing urban areas – to the benefit of an economic elite. As a result, the gap between town and country had continued to grow.

Now rural development is back on the development policy agenda. Promoting small farmers is firmly enshrined in the second of the Sustainable Development Goals of the 2030 Agenda. Rural development is not just the most important building block for overcoming global hunger, it is also extremely important for realising the human right to food. Supporting people by helping them to get access to sufficient supplies of suitable food is not about charity. It is more that both national governments and the international community have made a commitment to support people’s efforts to realise their right to food. The problem is, however, that it is difficult to achieve rapid results in places that have been neglected for decades. Development policy increasingly wants to be measured using
the yardstick of rapid successes. However, such successes are not compatible with sustainable rural development that also includes the poorest people. Quick successes are more likely to occur in economic corridors, where infrastructure at least functions partially, or in countries that are at least partly integrated into the global market. More and more official development assistance is being directed towards those very regions (cf. compass chart, Figure 2, p. 140), thus failing to reach the poorest people. This skewing of priorities is threatening to make local and regional disparities even greater. Favoured economic areas continue to be supported, whilst remote rural regions fall further and further behind. Expressed in figures: since 2010, the proportion of official development assistance (ODA) that Germany allocates for least developed countries (LDCs) has fallen from 28 to 23 per cent. This trend needs to be reversed if a world without hunger is to be achieved and the UN call to “leave no one behind” truly realised.

That is another reason why the 2030 Agenda calls for targeted support to be given to impoverished smallholder farms with a view to fighting hunger. Overcoming hunger and poverty in rural areas depends in the short and medium term on how successfully these small farmers can contribute towards food security and on whether their incomes increase. That is why rural development needs to revolve around supporting poor small farmers so that they are in a position to manage their farms as modern agricultural businesses, running them in ways that are ecologically, economically and socially sustainable. The aim is that their harvests will not just be enough to sustain them and their families but will yield a surplus, so that income and jobs can be created and secured. Because quick successes may be achieved above all by means of measures to increase productivity, for example via better seeds, artificial irrigation and mechanisation, crops are often a main focus of development projects. However, increased harvests must go hand in hand with diversification strategies and the further processing of the crops grown. This not only helps to reduce the risks from failed harvests and post-harvest losses, it also creates jobs.
There is another reason why it is very important that enough emphasis is given to diversification: there are two billion people suffering from malnutrition. It is poor people living in rural areas in particular who do not have enough money to buy in the extra fruit and vegetables, or meat and dairy products from other regions that they need for a healthy diet. Local crop diversification therefore represents an important contribution towards healthy, culturally appropriate and affordable food. During pregnancy and when children are very young, a healthy diet is especially important in order to avoid permanent developmental deficits. Development projects have shown that, particularly in remote areas, planting domestic gardens and communal village gardens can play a major role in reducing malnutrition. In the medium term, however, such activities are no substitute for the broad-based economic development of remote areas.
Opening markets to small farmers – with social standards

If the inequalities are not to become even greater, then it is absolutely vital that remote regions and impoverished small farmers are linked to markets via transport routes, and that energy supplies and other infrastructure are made available. These areas should benefit especially from being allocated official development assistance and should be included in projects to promote economic cycles. First of all, better access to local and regional markets will contribute to increased incomes. Regions severely affected by poverty and hunger that have fertile soils, water, sun and labour can improve their economic status by supplying biomass for food, animal feed, energy and as a source of raw material, for example. Debates about issues like “food before fuel” have helped ensure that the policy of securing the human right to food takes precedence both nationally and internationally in agricultural production. In practice, however, there are no mechanisms in place yet to check whether this human right is being upheld in food-insecure countries. If agricultural exports from
food-insecure regions are properly managed then they can help increase incomes without negative impacts on the right to food. It is, however, crucial that binding standards are introduced and monitored. This is also especially important when local governments are not so exacting in this regard. Large-scale importers of agricultural goods, like the EU, should introduce binding food security standards for all uses of biomass, not just for its use as fuel.

Since environmental conditions, development status and cultural norms place varying demands on the agricultural sector, there is no globally applicable development model for rural areas. Instead, strategies based on social, ecological and economic sustainability that are adjusted for each location need to be developed and implemented. Such adjustments also need to be made inside national borders. An innovative agricultural model can be beneficial in one region, but a short distance away where there is a different culture and landscape it may, for example, cause over-exploitation of soil and water resources. In order for agriculture to be able to contribute to successful rural development, it is important to simultaneously promote local economic cycles. This is above all about building up marketing structures and further processing of agricultural commodities. The palette of measures that can be used to support people living in rural areas is broad: it ranges from preserving techniques such as drying fruit and vegetables, to making juice or cheese, and fermenting cocoa beans. In order for products to reach the markets in good condition, transport routes, energy supply and warehouse facilities need to be developed and expanded in particular.

However, it is not just agriculture and its up- and down-stream aspects that are important for successful rural development. It is important that the people living in rural areas are able to determine their own development path. In order to be able to do that they need health and education, two sectors that have been very much neglected in poor rural areas in particular. Massive investments are necessary, not only in the construction of buildings but also and above all in training and so as to provide adequate salaries for health and teaching staff. In addition, the social environment must be shaped in such a way that girls and women
have equitable access to education and health. They are the ones producing more than half of all the food grown in Africa and Asia, although they rarely have equitable access to land or to means of production. The human rights of women need to be realised in all areas. Only then will women be able to participate in social decision-making processes, lobby for their interests, earn money and shape their living conditions themselves in accordance with their needs – thereby contributing to successful rural development.

2030 Agenda – Germany is called upon to act

Development policy and promoting sustainable, pro-poor rural development alone will not solve the hunger problem. The climate change triggered by the industrialised countries, for example, is making it more difficult to make progress in achieving food security. Furthermore, the political and economic choices made by the industrialised countries are directly at odds with the goal of fighting hunger. The massive subsidies available for our agricultural sector, for example, continue to hamper the development of smallholder farms in countries affected by hunger.

The 2030 Agenda makes it clear that all countries need to pursue a path that will be sustainable in the future. As far as sustainability goes, the industrialised countries in particular will need to make a huge effort. With regard to climate action we have, for example, a lot of catching up to do on energy saving, alternative energy and ending the use of coal. The 2030 Agenda also makes it clear that the responsibility for overcoming hunger in the world is in no way just a task for development policy; it is also a task for trade, agricultural, energy and financial policy. And ultimately it is a task for each and every one of us as well.
Throwing away food is just rubbish.
Our resources are too precious to be wasted.

In industrialised countries a good half of all food is not eaten. Instead, it is thrown away or filtered out in the production process. The food we waste reflects a way of life in our societies that is based on careless and unfair exploitation of natural and fossil resources. For the food security of future generations it is imperative that we keep our ecological footprint as small as possible. The only way we can do that is by being more careful and less wasteful overall in our consumption of food and agricultural commodities. However, it is not just quantity that matters when it comes to a food strategy that is viable for the future; production methods are also important. When consumers buy more and more products that have been grown using fair, environmentally sound farming methods, they are helping to ensure that sustainable farming methods gain ground in the North and in the South. Consumers who are aware and shop sustainably not only help protect the environment, they also contribute towards ensuring that producers in distant countries receive a fair income – and that also helps overcome poverty and hunger. Our consumption patterns today, however, are more likely to help entrench hunger and poverty in the world than overcome it. A clear change in course towards sustainable economies and lifestyles is a chance for us to mend our ways – if we really want to.

A world without hunger is possible. Policymakers, businesses, academia, society and civil society organisations must manage to work together better, shaping their strategies and activities in such a way that the goals of the 2030 Agenda are achieved. Nearly 800 million starving people have the right to expect that.
Figure 1: 2016 Global Hunger Index. The commitment to end hunger.

A Just World Is One without Hunger

Dieckmann

Extremely alarming 50.0 ≤
Alarming 35.0–49.9
Serious 20.0–34.9
Moderate 10.0–19.9
Low ≤ 9.9
Insufficient data, significant concern*
Insufficient data
Industrialised countries

* for more information, go to www.welthungerhilfe.de/en/globalhungerindex2016

The designations employed and the presentation of material in the maps do not imply the expression of any opinion whatsoever on the part of the BMZ concerning the legal or constitutional status of any country, territory or sea area, or concerning their frontiers or the delimitation of frontiers.
Figure 2: LDCs left behind
Net flows of German ODA in billions of dollars, by groups of countries, using constant prices.

Source: Kompass 2030. Die Wirklichkeit der Entwicklungspolitik 2016. Published by: Welthungerhilfe and terre des hommes Germany.
All 193 UN member countries face a serious malnutrition problem:

**UNDERNUTRITION**

- **795 million people** worldwide who suffer from hunger regularly.
- **2 billion people** who are micronutrient deficient.
- **1 in 4 children under five** is physically and mentally impaired due to chronic undernutrition.

**END HUNGER AND ENSURE ACCESS BY ALL PEOPLE TO SAFE, NUTRITIOUS AND SUFFICIENT FOOD**

World Health Assembly’s child stunting targets:

- **GOOD PROGRESS**
- **SOME PROGRESS**
- **NO PROGRESS**
- **NO DATA**

**GOVERNMENT RESPONSIBILITIES**

- Secure availability and access to diversified and nutritious food.
- Improve maternal health and nutrition.
- Promote recommended breastfeeding and complementary feeding practices.
- Eliminate causes of undernutrition, e.g., unequal access to resources, education, health.
All 193 UN member countries face a serious malnutrition problem:

**OBESITY**

1.9 billion adults who are overweight or obese.
1 in 12 adults has type 2 Diabetes.
41 million children under the age of 5 are overweight or obese.

**END ALL FORMS OF MALNUTRITION**

World Health Assembly’s obesity targets:

- 1.9 billion adults who are overweight or obese.
- 1 in 12 adults has type 2 Diabetes.
- 41 million children under the age of 5 are overweight or obese.

**GOVERNMENT RESPONSIBILITIES**

- Secure availability and access to diversified and nutritious food.
- Include nutrition in education schemes.
- Promote physical activity.
- Education, health.

References


Smallholder Farmers
Feeding the Continent and Driving Inclusive Growth
Smallholder farmers are the drivers of most African economies even though their potential is often not yet recognised. Empowering them will ultimately lead to inclusive economic growth, development and prosperity of the entire continent. The Alliance for a Green Revolution in Africa (AGRA) and other organisations provide practical examples of what needs to be done and also of the successes achieved in the last ten years.
Empowering smallholder farmers means empowering Africa

Margaret Lilwawala from Gulumba in southern Malawi diligently tills her piece of land to grow pigeon peas that she sells to the local market. The little money she gets is used to buy food for her family and pay school fees for her children, although it is hardly enough. She travels over 20 kilometers to sell her pigeon peas at the local market, often for a price that is below her cost of production. Margaret’s story is not unique to her or to Malawi. Cultivating over 80 per cent of agricultural land on the continent, usually in parcels of two hectares or less, smallholder farmers break their backs to produce 80 per cent of what we eat, yet they rarely get commensurate returns.

For Africa to prosper, it will need to be more inclusive of its largest segment of the population – smallholder farmers. While many leaders focus on the 15 – 20 per cent formal economy around services, manufacturing and commodities, it is agriculture that has unparalleled potential as the next engine of economic transformation for Africa. As the economies of many African countries continue to grow faster than anywhere else in the world, agriculture, which accounts for about 25 per cent of the continent’s GDP and provides employment to more than 60 per cent of the total labour force, will have to be the top priority of governments, the private sector and development partners (Jayne and Ameyaw, 2016).

Smallholder farmers are the drivers of most of these economies even though their potential is often not brought forward and is hardly understood. They make up 70 per cent of the sub-Saharan Africa population that is predominantly engaged in agriculture. Empowering them to achieve their aspirations will ultimately lead to inclusive economic growth, development and prosperity across the entire continent.

Ironically, agriculture has suffered historical neglect. Consequently, smallholder farmers are constantly faced with the challenge of low productivity due to the low adoption of high yielding seeds, fertiliser and other inputs, limited access to robust and functioning markets, weak
policy frameworks, post-harvest losses, lack of access to markets, credit, and technology, and climate-related vulnerabilities. However, the last decade has witnessed big changes to millions of smallholder farmers across the continent. This is best captured in the 2016 edition of the landmark Africa Agriculture Status Report (AASR), which found that a decade of intense domestic attention to farmers and food production has generated “the most successful development effort” in African history, with countries that made the biggest investments in smallholder agriculture rewarded with sizeable jumps in both farm productivity and overall economic performance.

Global happenings, local impacts

The architects of Africa’s agricultural transformation must remain alert to events happening elsewhere around the world that have a direct bearing on their work and, by extension, the well-being of smallholder farmers. The world continues to witness natural, political, social and economic events of magnitudes never seen before which constitute external shocks that have, largely, negative effects on agricultural production.

Climate change

Although Africa emits less than 3 per cent of the climate change-inducing greenhouse gases, it will suffer its effects disproportionately. Mean temperatures will rise faster than the global average, exceed 2°C and may reach as high as 3°C to 6°C by 2100. Rising temperatures in Africa often signal drought, reduced lengths and more erratic patterns of the rainy seasons, flooding and higher incidences of pest and diseases that put the lives and livelihoods of smallholder farmers at greater risk, increasing their vulnerability to famine.

The impact of climate change on farmers is beginning to be felt across most parts of Africa and will, most likely, get worse with time. This is leading to poor productivity that is exacerbating rural poverty and food insecurity. Its overall consequences are devastating. According to IFPRI, for maize in Africa, each “degree day” spent above 30°C reduces the final
yield by 1 per cent under optimal rain-fed conditions and by 1.7 per cent under drought conditions. With the increase of temperature, the yield of all major food staples in sub-Saharan Africa will fall. By 2050, it is estimated that the average yield of maize, sorghum and millet, groundnuts and cassava will drop 22 per cent, 17 per cent, 18 per cent and 8 per cent, respectively. It should be noted that climate change affects not only yields, but also food quality and safety, the reliability of its delivery to consumers, human health and water availability (Montpellier Panel report). The year 2050 is not a whole lot of generations away; it’s only 34 years from today and only one generation away. Therefore, some of today’s farmers will experience these shortfalls and worse- if nothing is done to curb climate change and its impact.

Longer-term, it is projected that hunger and child malnutrition could increase by as much as 20 per cent as a result of climate change by 2050. Economies are likely to take a hit with the recent estimates showing that climate change will lead to agricultural losses in Africa equivalent to 2–7 per cent of continental GDP by 2100.

As stated by Paul Pollman, Unilever CEO in a joint opinion piece with Sunny Verghese, Olam Co-Founder and Group CEO, if climate change isn’t tackled, Africa will simply never begin to fulfil its potential. It will only make things harder for the continent’s millions of smallholder farmers who rely on farming for their income or livelihood. Ironically, agriculture continues to receive insufficient support to deal with the effects of climate change. Africa receives under 5 per cent of funds available to tackle climate change. This is despite evidence showing that it will take on the order of US$ 7–15 billion per year until 2020 and US$ 35–50 billion annually thereafter to 2050 for Africa to adequately respond to the challenges climate change brings (UNEP, AMCEN and Climate Analytics, 2013).

Overall, to achieve food security under climate change, the resilience of communities and individual farmers needs to be strengthened through pro-active and longer-term adaptation actions. It is, however, not all doom and gloom. Although a lot more is yet to be accomplished, the
continent has invested in the development and adoption of many new agricultural innovations and technologies which should be scaled up.

Many climate-smart agricultural practices are taking root on the continent. As President of the International Fund for Agricultural Development (IFAD) Dr. Kanayo F. Nwanze has pointed out, these practices often build on traditional knowledge that’s been enhanced by agricultural research and innovation. Indeed, the work of AGRA and our partners has shown that African farmers are not powerless in the face of climate change. There are many ways in which they can survive and even thrive, despite the dramatic shifts in growing conditions they are likely to endure.

Deglobalisation: Is global integration over?
Recent global political, economic and social developments promise to have an impact on the continent’s development trajectory and especially in the agricultural sector. As a senior economic commentator recently wrote in the Wall Street Journal, the risk now is that politics, economics and finance are combining in a way that threatens to throw globalisation in reverse, hanging a sword of Damocles over the world economy. Years of sluggish growth, stagnant wages and rising inequality are fuelling a growing political backlash against perceived unfair competition from foreign firms and foreign workers across developed countries.

As asserted by Foreign Policy, history shows that the biggest losers of deglobalisation are among the world’s poorest nations, which are deprived of trade as a way to improve their lot. Studies by the International Monetary Fund show that global trade growth has decelerated significantly in recent years; it has grown by just over 3 per cent a year since 2012, less than half the average rate of expansion during the previous three decades. The waning pace of trade liberalisation and the recent rise in protectionism have been cited as some reasons that are holding back trade growth.

The imperative is on African countries to make deliberate efforts to chart development paths that take advantage of the continent’s richness. As asserted by Dr. Nwanze, change begins from within; there is no developing country in existence that transformed itself from a developing
to emerging country through development assistance. All developed countries and emerging economies underwent agriculture and rural transformation to get where they are.

Focus should now be on supporting smallholder farmers to transform into thriving businesses. The recent gains made in the agricultural sector should be cemented and technologies that have been developed over the years taken to scale. For instance, agribusinesses that will take advantage of the continent’s US$ 300 billion food market, projected to be worth US$ 1 trillion by 2030, should be supported with smallholder farmers at the centre. Indeed, Africa has the potential to feed Africa. But, at present, for example, only 5 per cent of Africa’s imported cereals come from other African countries. Generally, the level of intra-African trade, though fluctuating, has consistently remained at around 15 per cent of Africa’s total trade over the past decade, which is amongst the lowest intra-regional trades in the world (UNECA).

Transformation of the agricultural sector should also aim to address the challenge of youth unemployment in Africa. About 65 per cent of the total population of Africa is below the age of 35 years and 10 million youth enter the labour market annually (AASR, 2015). (AASR, 2015). According to Bloomberg news, these young people can evolve into a workforce that helps drive Africa’s growth or turn into dissatisfied and disaffected potential recruits for extremists. A World Bank survey in 2011 showed that about 40 per cent of those who join rebel movements say they are motivated by a lack of jobs.

It stands to reason, then, that finding gainful employment for the youth, which agriculture has a huge potential for, delivers multiple benefits for the continent. It not only guarantees inclusive growth but will also ensure peace and stability as well as turn the tide of international migrants. As outlined by the UN Population Fund, if countries in sub-Saharan Africa make the right human capital investments for the youth, the combined demographic dividends could be at least US$ 500 billion per year (equal to one-third of the region’s current GDP) for up to 30 years.
Against the backdrop of the African Heads of State summit in Maputo 2003 that put in place the African Union’s Comprehensive African Agriculture Development Programme (CAADP) – which called to an end decades of stagnation and lack of investment in agriculture – many African governments have put agriculture back at the top of the development agenda. This is well-captured in the AASR 2016 report stating that “after decades of stagnation, much of Africa has enjoyed sustained agriculture productivity growth since 2005, and as a result, poverty rates have declined in places like Ghana, Rwanda, Ethiopia and Burkina Faso”. The report notes that agriculture has had its biggest impact in countries that moved quickly to embrace the CAADP.

The attendant agricultural growth has expanded livelihood opportunities for millions of people now engaged in the growing off-farm aspects of the food system like storage, processing for value addition and supporting technologies. Offering a glimpse of future success, these advances have helped inspire a new vision for Africa, one in which farming realises its potential to help make the continent sustainable and hunger-free. Private companies have also invested heavily in Africa’s agriculture value chains in recent years.

As a result, farmers like Margaret in Malawi are now able to fetch better incomes for their produce. For instance, through support by AGRA and partners, about 4,500 soya bean farmers in Malawi organised themselves and negotiated fairer prices with contract buyers leading to higher incomes. In 2015, Margaret made over 50,000 Malawian Kwacha (US$ 75) from selling her three bags of pigeon pea. “The additional money helped me buy food and iron sheets for my house,” she said.

Overall, increasingly smallholder farmers across the continent have more options in the seeds they plant, the fertilisers they use, the markets they can tap into, and the information services available to help them manage their farms. New agri-businesses are springing up, finance and markets
are growing thanks to government and development community efforts as well as the efforts of others such as AGRA that target investments to grow businesses that serve farmers in their environment. There is need, however, to build the resilience of smallholder agriculture to climate change and variability and to continue growing the commercial attractiveness of the sector to all, especially women and youth.

Some countries have already realised the vast potential of smallholder farming and have begun investing and transferring technology and skills to the population, and are leading champions of the transformation. Ethiopia, for instance, exemplifies a sustained political commitment to agriculture and a bold recognition of the sector’s centrality to promoting inclusive growth. While previous decades of famine and drought have ravaged the country, recent investments in extension workers, rural roads and modern market-building have enabled cereal production to increase and have helped improve nutrition outcomes by increasing the number of calories that rural people consume by roughly 50 per cent. As a result of investments into smallholder-focused agriculture, Ethiopia’s poverty reduction is happening at a rate of 4 per cent per annum (ONE.org, 2014).

Burkina Faso, a landlocked country, has made remarkable progress in poverty reduction and food security with government investment in the sector averaging 17 per cent of the total expenditure in the past 10 years (ONE.org, 2014). Ghana’s agricultural transformation agenda has remained a top priority of successive governments that have led a number of reforms and strategic public investments that spurred agricultural development. This includes the gradual liberalisation of the agricultural sector, as well as heavy investment in infrastructure, research and development.

Rwanda’s agricultural transformation, which was triggered by the need to end chronic hunger and improve nutrition status for a majority of its people, has invested in programmes including land reforms, land consolidation, better input access for smallholder farmers and better access to expansion. As a result, these programmes have increased food availability by 150 per cent, reduced chronic malnutrition and stunting significantly and reduced poverty by 20 per cent in the last 10 years.
Despite this progress, and that there are lessons and inspiration to the region, much more needs to be done. With the world’s biggest remaining agricultural potential on the continent, Africa imports food worth US$ 43 billion per year, a figure that is projected to be at US$ 110 billion per year by 2025. This, combined with the fact that the continent has a fast-growing food market driven by urbanisation and estimated by the World Bank to be worth US$ 1 trillion by 2030, imply that African agriculture and African smallholder farmers have the potential to be part of a huge economic engine. If well facilitated and with proper investment, this economic engine can feed the continent and transform Africa into a net food exporter, create employment opportunities for its youth and generate revenue for investment in other sectors of the economy.

A call to action: seizing the moment for a comprehensive inclusive agriculture transformation

At the African Green Revolution Forum (AGRF) held in Nairobi in September 2016, public and private leaders delivered a massive infusion of financial, political and policy commitments to African farmers and agriculture businesses. More than US$ 30 billion in investments over the next 10 years to increase production, income and employment for smallholder farmers and local African agriculture businesses were pledged. This is one of the largest single packages of financial commitments ever delivered to African agriculture. It is backed by the broadest coalition ever assembled to support a transition to inclusive agriculture that focuses on moving millions of smallholder farmers from subsistence to income-earning agriculture and bears huge potential for overall economic growth.

The pledges were in response to a call for sustained and consistent support to African Agriculture to build on the gains of the last decade. The call was also made in recognition that African agriculture will happen in the next 10 years against a number of increasing challenges especially from climate change. The call also recognised that lack of opportunities for African youth has long fuelled migration to the north, creating a
significant challenge to Africa’s northern neighbours. With this call, the AGRF firmly put commitment to inclusive agricultural growth front and centre of development programmes. The forum committed to focusing on smallholder farmers in the next 10 years in order to achieve significant growth in agriculture productivity in at least 20 countries while unleashing US$ 200 billion in investments in the agriculture sector across the continent. Other specific commitments included unlocking 10 per cent of public expenditures for agriculture, as many countries agreed to do when they first joined the CAADP partnership. The private sector committed to the launch of innovative approaches to providing finance for smallholder farmers and agribusinesses in order to bring in at least US$ 20 billion in private investment that focus on smallholder farmers. The two most significant calls to action coming from the forum and the over 2,000 people present involved, first, the heads of state calling for all partners to focus on implementation and getting results to communities in farming. The second involved the heads of state calling for mechanisms to be put in place that track progress as provided for in the Malabo Declaration, recommitting as they did in 2014 in Malabo to being held accountable for progress in their countries.

Lessons from the field: What can we learn from where we have seen progress?

Agricultural growth is the best poverty fighter there is. This has been true throughout history, going all the way back to Europe in the eighteenth century and all the way up to China just a generation ago. It is established that, globally, economic growth that comes from the agricultural sector is at least twice as effective as other kinds of economic growth at driving down poverty rates, while in sub-Saharan Africa, it is more than eleven times as effective.

In Africa, investment in smallholder farming can lead to a faster rate of poverty alleviation, by raising the incomes of rural cultivators and reducing food expenditure, and thus reducing income inequality. For this to happen, smallholder farmers need regular and affordable access to
productive resources such as land, quality inputs such as locally-adapted seeds and soil-specific fertiliser, mechanisation, investments, access to innovative finance, market access, and information and training. Unfortunately, these factors have, in the past, been delivered in a disjointed way with the farmer as a natural point of division. An integrated approach should consider gender dynamics, especially the contribution of women in the value chain. In general, women tend to have less access to land, inputs, markets, technologies, credit and training. Failure to address the specific barriers that women face means limiting the potential for agriculture transformation. Figure 2 (p. 170) shows the key components of an integrated value chain approach.

Land: a critical factor of production

Currently, 183 million hectares of land are under cultivation in sub-Saharan Africa, mostly by smallholder farmers. Another approximately 452 million hectares of additional suitable land are not being cultivated, which amounts to roughly 60 per cent of the global total (Mwaura and Place, 2013). Constraints related to the tenure system, such as insecurity of land tenure, unequal access to land, lack of a mechanism to transfer rights and consolidate plots, have resulted in under-developed agriculture, high landlessness, food insecurity and degraded natural resources. Women and youth, who are the majority of smallholder farmers, are worst affected.

For the smallholder farmers to achieve maximum production, secure access to productive land is critical. Ownership of land, with titles, will encourage people to invest and improve the land through likely investment in long-lasting infrastructure and better land management and cash-generating agriculture. Probably nowhere in Africa is this better seen than Rwanda, where even though the average land holding is about 0.5 hectares, all land parcels (over 10 million), are titled and owned individually. Measures such as these give farmers the confidence they need to invest, protect land and think through income-generating activities. In the past few decades, most African countries have witnessed a wave of land policy formulation and reforms, mainly due to complex and per-
sistent land problems. Land liberalisation in Japan and later land consolidation in China were critical policies to inclusive transformation in these countries that ensured that the smallest of landowners had an opportunity to experience an agricultural-based transformation. These type of lessons may be critical to policies for land reforms in Africa.

Access to inputs

The amount and quality of yields a smallholder farmer expects to get is largely dependent on the quality of seeds available to them. Indeed, the genetic potential of a crop inherently contributes about 40 per cent of the total crop yield. The rest is apportioned to proper agronomy, and use of other inputs like seed and fertilisers. In light of the on-going climate-related disruptions and fast degrading soils, farmers should have access to high-yielding seeds that are adapted to their agro-ecological zones.

Since its inception, AGRA has made significant investments to grow African seed systems with a focus on adapting high yielding crop varieties to local environments and on improving yields of existing and well-adopted local varieties. This was backed up by creating a system of “mom and pop” shops and seed companies that together reduced the distance a farmer needed to move to acquire inputs from over 50 kms to 5–10 kms depending on the country. From less than 10 seed companies across the continent selling less than 2000 MT, AGRA has grown the African seed business to over 100 local private seed companies and over 35,000 local agro-dealerships. These have moved over 400,000 metric tons of certified seeds to smallholder farmers in sub-Saharan Africa.

In addition to poor access to good quality seeds, many smallholder farmers in Africa rarely use fertiliser, which is mainly due to its high cost, with an average farm gate price of US$ 500–800 per ton (Kiwia et al. 2016) compared to US$ 200 per ton in southeast Asia, limited knowledge on the benefits of using inorganic fertilisers, and lack of appropriate recommendations and balanced fertilisers among African smallholder farmers. Consequently, fertiliser use in Africa is still very low compared to other
parts of the world. Over the last 10 years, AGRA has worked with partners to deliver close to a million metric tons of fertilisers to smallholder farmers through agro-dealers, farmers’ cooperatives and other channels that enhance the opportunity of delivering fertiliser closer to farmers. The Africa fertiliser Agribusiness Partnership (AFAP) was born out of the need to strengthen fertiliser supply systems to smallholder farmers. AFAP is enhancing the supply of fertiliser to farmers as illustrated in case study 1.

### Improving productivity and labour efficiency

The entrenched image of a smallholder farmer is that of an ageing person, mostly a woman, tilling their land using a hand hoe and, occasionally, using animals. Sadly, this image is a reflection of the smallholder farmers’ reality across Africa. Many of them have limited access to any form of mechanisation which, invariably, leads to low levels of productivity. It follows then that the adoption and use of appropriate farming tools and machines is a critical agricultural input and has the potential to transform rural families’ economies by facilitating increased output of higher value products, expanding the area under cultivation, increasing productivity and reducing costs. At the same time, it eliminates the hard farm labour associated with agricultural production and creates an opportunity for youth engagement.

The policies of the 1980s that looked at farm mechanisation as owning a tractor do not work for smallholder farmers and have resulted in many dysfunctional pieces of equipment scattered around the African Agricultural landscape. Today, through models like land consolidation, it is possible to build private sector business services that focus on getting smallholder farmers the equipment they need for the purpose at hand from tilling to post-harvest shelling and other functions. This will require government to invest in two things simultaneously: supporting the private sector to build business in mechanisation and training a bulk of young people to form the skills base necessary for mechanisation to take off as a business in technical services, repair and others. Setting up such services in rural areas may be difficult for the private sector to do on their own without deliberate government intervention.
Case study 1: The Limpopo Valley Agricultural Society (SAVAL) in Mozambique

In 2013, SAVAL was procuring only 20 metric tons of fertiliser. That year, AFAP provided a supplier guarantee of US$ 85,000 to kick-start the flow of fertiliser. In 2014 SAVAL acquired 1,500 metric tons from a supplier, which it sold to about 10,000 smallholder farmers growing rice, maize and vegetables. By the end of 2015, SAVAL was supplying fertiliser to over 20,000 farmers who grow rice on 25,000 hectares of irrigated land, and who produced a crop valued at over US$ 2 million. The supplier payment guarantee not only allowed increased fertiliser supply capacity and lower prices, but also resulted in the establishment of commercial relations that include the production and supply of fertiliser packages in small bags for smallholder farmers (5kg, 10kg, 25kg and 50 kg) and the provision of technical assistance through soil sampling, appropriate fertiliser recommendations, and the production of balanced blends. SAVAL increased its storage capacity to also provide output storage for farmers. Source: Diallo et al. (2016)
Financing agriculture and leverage

A major handicap to developing inclusive agriculture in Africa is access to finance for communities and businesses looking to invest. Several institutions have worked to bridge the gap between risk-averse financiers on the one hand and farmers, their organisation and SMEs that are perceived as risky users of financial services on the other hand. There is growing experience on how to catalyse innovative finance mechanisms for rural communities. In the past, AGRA has provided risk-bearing capital (credit lines or guarantees) to financial services providers that are willing to develop risky assets (loans to smallholder farmers and agri-preneurs) at scale. AGRA also supports the capacity building for financial services providers and borrowers to engage responsibly. Case study 2 on Nigeria, offers a good example of the incentive-based risk sharing for agriculture lending, a tool that AGRA is helping grow to other countries to enhance lending to agriculture.

Case study 2: The Nigerian Incentive-Based Risk Sharing System for Agricultural Lending (NIRSAL)

Objectives. NIRSAL aims to increase the productivity of the Nigerian agricultural sector by mobilising financing for Nigerian agribusinesses. The aim is to generate an additional US$ 3 billion in agricultural financing over ten years by incentivising banks to increase the availability of capital in the market.

Operations. NIRSAL was designed by AGRA on behalf of the Central Bank of Nigeria. It was capitalised at US$ 500 million and has five pillars; (1) a Risk Sharing Facility (US$ 300 million to leverage US$ 3 billion in loans to the agricultural sector), (2) a Technical Assistance Facility (US$ 60 million) to support both borrowers and lenders, (3) an Insurance Facility (US$ 30 million) to develop innovative and affordable insurance prod-
ucts, (4) a Bank Incentive Mechanism (US$ 100 million) to further incentivise banks to demonstrate effective and significant lending to the agricultural sector, and (5) Bank Rating Mechanism (US$ 10 million) to rate banks and determine which ones should be further incentivised. NIRSAL provides guarantees in the form of Credit Risk Guarantees (CRG) as a comfort for banks to lend and also incentivise farmers through a provision of Interest Drawback Program (IDP) to be paid quarterly, based on the agricultural project.

**Target:** NIRSAL targets all actors in the agricultural value chain.

**Outcomes.** From inception in 2012 to date, 454 projects valued at US$ 306 million have been guaranteed by NIRSAL and enabled three private insurance companies to expand their portfolios to include agricultural finance. Furthermore, the sum of US$ 3.36 million was paid out as an interest rebate to borrowers who repaid promptly to encourage good repayment behaviour and thereby minimise default. This model has been expanded to Ghana (GIRSAL) and Kenya with an expected growth to lending for smallholders and SMEs in these two countries.  

*Source: AGRA*
There is an emerging opportunity to leverage digital delivery channels and data-driven (financial) services provision to de-risk financial services for SMEs and smallholder farmers. The new business models and cases that are emerging from the fast-developing digital financial services sector need to be probed, tested and scaled through a well-managed acceleration process that includes capacity building and financial instruments development. The use of alternative data (mostly transaction-based data such as who has sold, how much, at what price, to whom, and at what frequency) and alternative delivery channels (mobile phones, agents and point-of-sale (POS) terminals) to de-risk financial services delivery to smallholders and agri-SMEs has immense potential as case study 3 illustrates.

**Case study 3: M-Kulima – A mobile-based savings and credit product for smallholder farmers**

AGRA with the support of the MasterCard Foundation has funded Kenya Commercial Bank (KCB) to develop a digital platform called M-Kulima, which farmers can access through their mobile phones.

**Operation:** When farmers are being paid for their produce by buyers like the National Cereal and Produce Board, Cargill and various dairy cooperatives, they can, on the basis of the produce delivery history captured by KCB as the long-time banker of these buyers, access a credit facility or saving plan in their mobile wallet to purchase inputs or for other uses. M-Kulima will be a scalable solution with all credit decisions and transactions done digitally.

*Source: AGRA*
Most smallholder farmers have no incentive to produce more than their families can eat unless they can sell the surplus, and many are unable to. A majority of them, especially the most isolated, simply do not have any access to markets. Even farmers who can get their produce to market are rarely able to do so efficiently. By necessity, many hire a series of middlemen to handle the transport who take a big cut. Since smallholder farmers do not usually have access to post-harvest storage, and since they almost always need money as soon as harvest comes, they usually sell everything they have immediately. This leads to annual price crashes that cut into their already meager profits.

There is growing recognition of this handicap to the agriculture sector and a number of investments are currently targeting this segment. In many cases, farmer organisations are used as an entry point for the transfer of knowledge and skills in good production and post-harvest practices to farmers. This expands extension advisory services and enhances the organisational and technical capacities of the farmer groups. Farmers maximise benefits of collective action by consolidating their input requirements, reducing transport cost and marketing collectively at favourable prices. This also presents an opportunity to link farmer groups to large commodity buyers using structured trading systems, such as Warehouse Receipt Systems and Forward Contracts Instruments that help increase bankability and access to financial services. The farmers are trained in contract negotiations and obligations, collective marketing, aggregation, storage and post-harvest management. Through the use of these instruments, AGRA has supported African farmers to supply over 550,000 metric tons worth US$ 164 million to commodity markets through structured trading systems via 686 aggregations centres in 11 countries.
Enabling policy framework

The policy implication for enabling smallholder farmers to increase their productivity, profitability, incomes and welfare is that African countries need to concentrate on the prime movers of agricultural development (Eicher, 1990). These prime movers include: (1) enabling private sector business environment; (2) structured agricultural output marketing systems and price policies; (3) agricultural research and technology development system; (4) agricultural extension programmes; (5) seed multiplication and distribution systems; (6) fertiliser supply, manufacturing and distribution networks; (7) rural financial markets and credit institutions; (8) small scale industry and processing; (9) land tenure and land reform; (10) labour markets, human capital development and women in development; and (11) irrigation and infrastructure. For smallholder farmers to fully realise their potential and improve their productivity, income and general well-being, the right policy framework is essential. An enabling policy environment not only ensures sustainability but also facilitates the replication of the tried and tested interventions across the continent.

African governments need to streamline their agriculture policies through two approaches. The first being strengthening of relevant national policy systems with a focus on input and output markets and associated trade and regulatory environment; the second involves land access and environmental and climate change resilience. From AGRA’s experience there is a strong case to make for micro reforms of the Policy and Regulatory Framework to fast track agribusiness and other investments in the sector. Governments need to identify, prioritise and reform “problem” agricultural policies, laws, regulations and administrative practices that constrain expanded investments by the private sector in local agribusinesses engaged in agricultural input supply and output marketing in staple food value chains serving smallholder farmers. These reforms are yielding results and increased investments in Burkina Faso, Ethiopia, Ghana and a few other countries where doing business reforms are being prioritised.
Making African agriculture fit for youth

Africa is struggling under a heavy youth bulge: according to FAO, 60 percent of the continent’s population is under 24, with 10 million youth entering the labour market annually with increasing unemployment. This is a huge potential input into the agriculture sector given that Africa is currently short of feeding itself with an import bill of US$ 43 billion despite the world’s largest unused arable land resource. This has led many to conclude that the future of African agriculture is in the hands of the youth.

Efforts to accelerate agricultural growth and improve food security have been, unfortunately, separated conceptually from efforts to create jobs for young people. And yet agriculture is the largest employer and is still the most immediate means of catalysing economic growth and employment for young people. The continent’s youth will continue shunning agriculture if the focus is on getting them to till the farm. Most are children of smallholder farmers and the only memory they have of farming and agriculture for them is a poverty trap.

It is unlikely that present day smallholder subsistence agriculture will create employment interest and therefore opportunities for youth. To attract youth, agriculture would have to be structured as a business and the youth as agri-preneurs that make it work. There are opportunities for youth to provide goods and services to the agricultural sectors in input services such as seed and fertiliser companies, agro-dealers, value addition and processing as well as marketing. The youth are also more likely to engage directly should agriculture be modernised through mechanisation, better access to new technologies and financing, and opportunities to acquire relevant skills set. The case study 4 below illustrates how youth have created jobs for themselves using ICT to provide services to farming communities.
Case study 4: Agritech Solutions – Kenya

Founded in 2013 by a group of young ICT4Ag entrepreneurs, Agritech Solutions is a youth-led agricultural software solution company based in Kenya. It provides ICT solutions for crop and livestock production, bringing together information all the way from planting dates of crops or birthdates of livestock, to the selling date. It then makes this information available to agricultural value chain players, including financiers, input companies, regulators, processors/marketers, and contracting companies (among others), to help guide their decisions. For crop farmers, Agritech provides such ICT4Ag products as eInputs, which helps farmers to manage input orders and supplies and link them directly to input dealers, and also eGrowers, a software solution that enables them to manage their farming activities and calendar, including post-harvest traceability. For livestock farmers, it provides the ePig System and eDairy Solution. The ePig system helps pig farmers to manage their operations, plug into a network that gives them access to veterinary services and information, and to quality feeds, drugs and new markets. Its eDairy solution also enables dairy farmers to better plan production and more effectively access veterinary services and manage operations. Source: AASR 2015
Conclusion and recommendations

Africa is a region of unrivalled smallholder farmer resilience whose entrepreneurial drive has continued to feed the continent and the world. Up to 80 per cent of the food we eat in the region is produced by smallholder farmers who are the main investors in their own agriculture. The reality is that the real output from smallholder farmers remains far below their potential. This means that empowering them with access to finance, better seeds and fertile soil, effective extension services, reliable markets and supportive policies can fuel the region’s agricultural development. All stakeholders should demonstrate commitment to promoting programmes that enhance farmers’ resilience and adaptive capacity to cope with climate change impacts. Through the work of AGRA but also others across the continent, practical examples of what needs to be done and real success has been demonstrated with significant progress made in the last 10 years.

The progress seen in a few countries across the continent and the associated impact on poverty and economic growth demonstrates that investing in inclusive agriculture and Africa’s smallholder farmers is an imperative if Africa is to experience sustainable economic growth. The momentum that led to the strong commitments made by African leaders at Maputo in 2003 when CAADP was formulated and subsequent recommitment captured in the Malabo Declaration and the AU Vision 2063, show that what needs to be done is known but rather that national governments, development partners and the private sector must at the national level internalise and unfold these commitments to action.

Through the “Seize the Moment” campaign, there is need to recognise that African agriculture and smallholder farmers can help fuel Africa’s economies if well-invested. The development community and African governments need to recognise that smallholder farmers have not failed to make agriculture a viable business for themselves; they have mostly suffered from inconsistent policies and a lack of investment to make the sector work. The renewed commitment to agriculture in national, regional and global agendas is not an opportunity to be missed. We must
all work to ensure that conviction and enthusiasm are similarly invested in forging strong partnerships that enable smallholder farmers to increase their productivity, access markets, receive a fair reward for their work and, more importantly, ensure that food and nutrition security are achieved and sustained.
Figures

Figure 1: Agricultural contribution to GDP for selected countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Agriculture, value added (% of GDP)</th>
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<tbody>
<tr>
<td>Ethiopia</td>
<td>41%</td>
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<tr>
<td>Burkina Faso</td>
<td>33%</td>
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<tr>
<td>Kenya</td>
<td>33%</td>
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<tr>
<td>Rwanda</td>
<td>33%</td>
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<tr>
<td>Tanzania</td>
<td>30%</td>
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<tr>
<td>Malawi</td>
<td>29%</td>
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<tr>
<td>Mozambique</td>
<td>26%</td>
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<tr>
<td>Uganda</td>
<td>25%</td>
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<tr>
<td>Ghana</td>
<td>21%</td>
</tr>
<tr>
<td>Nigeria</td>
<td>21%</td>
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Source: World Bank Development Indicators. 2015.
Countries that have implemented the CAADP have posted higher agriculture productivity and stronger GDP growth as well as sharper declines in malnutrition compared to countries that have not adopted the programme by signing CAADP compacts. The differences are especially stark when comparing countries that signed up early, between 2007 and 2009, to those that have not yet signed. The early adopters are: Benin, Burundi, Cape Verde, Ethiopia, Gambia, Ghana, Liberia, Mali, Niger, Nigeria, Rwanda, Sierra Leone and Togo.

Figure 2: Agricultural transformation across the value chain

1. Increased productivity
2. Improved incomes
3. Better produce quality

- Quality inputs: Adapted business models to increase the availability of quality inputs at a fair price
- Access to innovative finance: The introduction of innovative financing models to support investment in smallholder agriculture
- Mechanisation: The introduction and adoption of appropriate technologies
- Market access: Ensuring easy access to markets by smallholder farmers
- Investment: Promote Public Private Partnerships to support agricultural transformation
- Information and training: Farmer training and market-related education

References


Striking Hunger and Poverty at the Roots by Investing in Rural Communities
Ending hunger and eradicating poverty are at the heart of Agenda 2030 – the world’s new vision for sustainable development that leaves no one behind. In order to strike hunger and poverty at their roots, we must invest in rural areas to drive not only growth in agricultural productivity, but the broader and deeper economic and social growth that is defined as inclusive rural transformation.
Millions of people’s lives across the world are overshadowed by hunger and undernourishment

Uneven progress in fighting hunger has left about 795 million people – more than the entire population of Europe – suffering from undernourishment around the globe. As a proportion of total population, the hungry are estimated to make up 12.9 per cent today, a significant decrease over 23.3 per cent in 1990-92. However, progress has slowed in recent years and there are sharp regional differences. Indeed, in some regions, although rates of hunger have fallen, the actual number of hungry people has risen, a trend driven by population growth.

In sub-Saharan Africa, more than half of the adult population faced moderate-to-severe food insecurity in 2015. The picture for children in the region is even bleaker: the number of children under the age of five who are stunted continued to rise, with 58 million children affected in 2014, up 23 per cent from 1990.

In Central Africa and Western Asia in particular, the numbers of hungry people are rising rather than falling, and there is a higher proportion of undernourished in the population today than in 1990-92. This is the result of protracted crises caused by natural and human-induced disasters and political instability.

Hunger and poverty feed off one another

Hunger can be defined in scientific terms, but essentially hunger is present when people lack the food they need for an active and healthy life. Hunger and extreme poverty go hand in hand, forming a vicious circle.

Hunger and chronic undernourishment undermine people’s health, happiness and life chances. They deprive unborn children of nutrients vital to their development. They stop girls and boys from attending school, and impair learning when they do attend. They prevent adults from managing physically or mentally demanding work that would increase
their families’ food production or their incomes. They keep generations trapped in poverty. Indeed, numerous studies have shown that where food and nutrition insecurity is deep and widespread, poverty and economic stagnation are also entrenched.

On the other hand, food and nutrition security is both a sign and a driver of broad social and economic welfare and dynamism – of inclusive economic growth.

This is why ending poverty and eliminating hunger have been enshrined as the first and second Sustainable Development Goals (SDGs) and primary building blocks of Agenda 2030 – the new global development agenda that sets out a vision of inclusive growth, social justice and environmental sustainability. Agenda 2030 aims higher than the MDGs it succeeds: poverty and hunger are to be eradicated, not just cut by half. And most importantly, the end goal is holistic development, taking into account economic, social and environmental dimensions.

Progress has been made in reducing poverty – though once again, this has been uneven. In the decade from 2002 to 2012, the proportion of the global population living on less than US$ 1.90 a day dropped by half, from 26 to 13 per cent. Yet in sub-Saharan Africa more than 40 per cent of people were still living in poverty in 2012. Young people across the globe are disproportionately affected, with 16 per cent of working people between the ages of 15 and 24 living below the poverty line in 2015, compared with 9 per cent of working adults.

The numbers of poor people have been falling faster than the numbers of hungry people, and this is because the hungry are the poorest of the poor. Their multiple deprivations – food, finance, education, health, voice and influence – mean that they are disempowered and effectively excluded from the opportunities offered by economic growth.
Poverty is rural

Digging deeper into the big numbers on global poverty, we find that poor women and men in all regions live largely in rural areas. Indeed, three quarters of the world’s poor people live outside the cities. We also know that women and men in rural areas rely predominantly on agriculture for their income and food, with 2.5 billion people depending on the world’s 500 million smallholder farms.

Consider this cruel contradiction at the heart of the world’s food systems: although small farms are estimated to provide more than 80 per cent of our food in terms of value, they are home to a large proportion of the world’s poorest and hungriest people. Significantly – and in contradiction of a popular notion that people living in food-producing areas don’t go hungry – cross-country evidence confirms that on average, adults and children in urban areas are better nourished than those in rural areas. In a further confirmation that the rural space is home to disadvantage and deprivation, evidence also shows that in most developing regions, the risk of working poverty is highest for people earning an income from agriculture: about 80 per cent of the working poor are engaged in vulnerable employment in the informal economy, particularly in agriculture.

A recent landmark report issued by the International Fund for Agricultural Development (IFAD) – the organisation that I lead – looks in depth at the nexus between rural transformation and overall structural transformation and inclusive development in 60 countries. The Rural Development Report 2016 conclusively demonstrates that measurable equitable change in rural areas is fundamental to social and economic growth and poverty reduction at a national level.

Crucially, the evidence presented in the report shows that inclusive rural transformation does not happen automatically as a result of broader economic growth. It must be made to happen if the rural areas – and the poorest sectors of society that call them home – are to share in the benefits of structural transformation and increased prosperity.
What is rural transformation?

Rural transformation is driven by a series of significant changes in the rural space:

- Enabling small farmers to increase their productivity so that they can harvest greater quantities and produce a greater variety of foodstuffs;
- Strengthening poor producers’ connections to functioning markets so they can increase sales and raise their incomes;
- Empowering rural families to diversify their incomes so that they can manage risk and earn extra money by moving into processing and off-farm activities;
- Building human and social capital through education and training;
- Investing in infrastructure, including roads, water supply, energy and telecommunications;
- Making financial services available and accessible in rural areas;
- Boosting the rural non-farm economy and building robust rural-urban connections.

Many of these changes put rural people centre stage, and indeed they must be enabled to play the leading roles in rural transformation. As I have said many times to audiences around the world, it’s important to remember that development is not something that aid agencies and organisations do for people, it’s something that they do for themselves. To make this shift from beneficiary to agent of change, rural people must be empowered – and this empowerment is a vital strand of inclusive rural transformation. With our unique focus on the rural areas of
the developing world, one of IFAD's fundamental tasks is to empower rural women and men, individually and through the organisations that represent them.

// Putting the puzzle together

If we compare the elements of rural transformation to the pieces of a jigsaw puzzle, increasing smallholder farmers’ productivity and incomes must be at the centre of the picture. Agricultural growth in low-income countries has been shown to be three times more effective than growth in other sectors in reducing extreme poverty. This is particularly evident in sub-Saharan Africa, where agricultural growth can be as much as 11 times more effective in this regard.

When farmers are enabled to increase their production of staple grains, through gains in productivity, this boosts their incomes and reduces prices to consumers, thus benefiting buyers and sellers. When they are also able to increase the variety of crops they produce – to include vegetables, fruits, legumes and animal products – this improves the diversity and nutritional value of food available, once again boosting farmers’ incomes but also making a healthier diet available to farming families themselves and to the broader community.

Productivity rises, diversification and higher incomes for farmers in turn boost the rural non-farm economy, which is a key step in the broader structural transformation process. The role that women farmers play in the process of diversification is often particularly important in determining positive nutritional impact both at the household level and beyond.

Improved infrastructure in rural areas helps create incentives and reduce risks for smallholders to invest in their businesses and raise productivity. Better facilities, particularly for food storage, processing and transportation, are critical to reducing losses and waste, and preserving the nutritional value of perishable foods. They strengthen farmers’ capacity to provide year-round supplies of important food stuffs and to access
finance and markets. Clean water supplies and proper sanitation also play a vital role in improving food hygiene and reducing the incidence of food-borne diseases. In addition, they enable producers to meet the quality and safety requirements of market consumers.

Reducing hunger and malnutrition – by increasing incomes, raising awareness of the importance of nutrition, and making a diverse range of healthy food available and affordable all year round – could be described as a sea change. That’s a hugely significant shift, and in this case it forms the foundations on which inclusive rural transformation can be built.

Food and nutrition security for every child, woman and man is essential to making economic growth inclusive and sustainable; it sends ripple effects that reach across generations, vulnerable population groups and ethnic and racial divides.

The nutrition transition: a challenge to good nutrition

Media coverage around the world draws our attention to the fact that structural transformation and poverty reduction can have unintended consequences and negative impacts on diets and nutritional status. There is clear evidence that rates of overweight and obesity – which are also forms of malnutrition – surge at high levels of transformation, and can be present even at lower levels. At the same time, micronutrient deficiencies can continue to pose significant problems. This is because people with higher incomes and more urbanised lifestyles tend to shift to diets that include more processed food, more sugar and more fat, not necessarily ones that are more nutritious overall. To deal with this challenge, which comes as part and parcel of the transformation in rural areas, we must focus on ensuring that consumers use increased incomes to make informed food choices that improve nutrition and health, rather than worsening them.
Women’s influence

Women are particularly important when it comes to influencing family eating patterns and they therefore play a key role in meeting the challenges of the nutrition transition. Research has shown that women spend a far larger part of their income than men on household expenses, including food, education and healthcare. Even where their decision-making power within the family is limited by cultural norms, women are largely responsible for growing, buying and preparing family food, and therefore their ability to grow or buy nutritionally-rich food and their level of knowledge about nutrition makes a significant difference. In addition, a woman’s own nutritional status affects not only her ability to care for her children and other family members, and her productivity as a food producer or worker, it also crucially affects the health of children yet to be born. Nutrition education and nutrition-sensitive interventions are critical to support women in playing this vital role.

An IFAD-supported project in Bangladesh, where an estimated 20 million people suffer from micronutrient deficiencies, has focused on improving maternal and child nutrition. IFAD partnered with WorldFish, an international research organisation, to increase breeding and consumption of the mola. This is a small nutrient-rich fish kept in local ponds, but previously not considered worth eating. Women were taught how to prepare the fish, with the main objective of improving nutrition for children between the ages of six months and two years. The children like the mild flavour of the fish, which is fed to them as a powder developed by the project, mixed with rice, orange sweet potato and oil. Over the lifetime of the project, stunting in the project area dropped from 56 per cent to 41 per cent. A fish chutney was developed specially for pregnant and breast-feeding women. One spoonful of dried fish, lightly fried in oil and spices, adds key nutrients to their main daily meal.

In addition to the nutritional benefits, families in the project area reported higher incomes as they were able to sell the fish that they didn’t eat themselves. With this incentive, production of the mola more than doubled. In recognition of the success of the project, the Government of Bangladesh is scaling up the Small Fish and Nutrition Project to other parts of the country.
Meeting women’s needs

Empowering women to be agents of change is a hugely important part of inclusive rural transformation. Women already represent a significant part of the agricultural labour force and this is being exacerbated by male out-migration. This leaves women with responsibility for crop and livestock production, and household and farm management, in addition to their domestic duties and child and elder care. About a quarter of households in Africa – a sizeable minority – are headed by women and their number is increasing. Despite their labour and their many responsibilities, women and girls worldwide are disproportionately affected by hunger and poverty.

Discriminatory norms and practices and women’s lack of status affect their daily lives, health and opportunities in countless ways – limiting their movement outside the home, their legal right to own property or start a business, their influence over how household income is spent and their access to education and healthcare.

Women are also poor in non-monetary terms. In particular, they are
time-poor. In some regions, rural women typically work 12 hours a week more than men. Many of the tasks traditionally allocated to women and girls in rural areas – such as fetching water or firewood – are necessary because of inadequate infrastructure and poor services. And these tasks are becoming more onerous as a result of climate change and degradation of the natural resource base. The resulting burden of labour leaves women chronically short of time for other essential activities, including making an income or getting an education – as well as having some leisure time.

Although gender equality is a complex undertaking and an elusive goal – with no country having yet attained it – economic empowerment for women is recognised as one effective tool. Economic empowerment means enabling women to acquire assets, start businesses, access financial services and be fairly paid for their labour.

Economic empowerment for women has significant ripple effects on individuals, families, communities and countries. Research has shown, for example, that women who own property are less likely to be the victims of domestic violence. It has also been established that income earned and managed by women is more likely to be spent on family welfare, including food, education and healthcare, and improving a household’s food and nutrition security.

More food must be grown locally – especially in Africa

Worldwide, structural transformation and rising incomes are driving burgeoning demand for greater and more diverse food supplies. For the many countries where agriculture is a mainstay of the economy and of the livelihoods of millions of rural women and men, it is imperative that a large share of this demand is met locally. This must be done by boosting productivity and production, and by strengthening local and
domestic food systems. Better management of crop loss and waste is also essential – because it makes no sense to produce more if you cannot sell it or store it.

Nowhere is this more true than in Africa, which is increasingly becoming a chronic net importer of food. Over the last few decades, economic growth, population growth and urbanisation across the continent have combined to drive a strong, sustained increase in demand for food. Domestic food production has not been able to keep up with this demand and the gap has been filled by sharply rising imports. At the same time, 20 to 50 per cent of produce is lost to rodents, insect pests and poor storage.

The food trade balance in Africa has been negative since 1980, with a deficit that increased from US$ 3.7 billion to US$ 38.9 billion in 2015. Low-income countries, which include most of sub-Saharan Africa, typically produce less and buy more, therefore experiencing higher food trade deficits. Imports of basic foodstuffs, such as dairy products, edible oils and fats, meat and meat products, sugar and cereals have all risen markedly since the mid-1970s.

IFAD-supported projects boost local food production, consumption, processing and marketing to meet demand, improve nutrition and raise incomes. For example, in Senegal the Agricultural Value Chains Support Project encourages people to grow, eat and sell local crops rather than consuming imported grains such as rice. As part of the project, 9,000 farmers took training in improved agricultural practices that produce higher yields and better quality harvests. They reported that yields of millet – a nutritious local grain – doubled and tripled in some cases as a result.

The hungry season has been shortened from 6 months to 1 month in the project area and 5,000 previously unemployed people now have jobs. Women and local chefs have learned new recipes with the locally grown crops – which include sesame, cowpeas, maize and millet. Women are also starting businesses, packaging products like baby porridge. And many restaurants in the area now offer only locally grown food.
Where are the farmers of the future?

If rural communities in developing countries are to grow more food and countries are to cut their food imports, young farmers are urgently needed. Yet we know that young women and men are abandoning agriculture and moving out of rural areas at rates that warrant the use of the word “exodus”. The average age of farmers worldwide is 60, a shocking statistic that signals an immediate need to attract innovative motivated young people into the agricultural sector.

Growth in agriculture is needed today to strike at the roots of poverty and hunger and deliver on Agenda 2030. Continued growth will also be needed over the coming decades to feed a global population projected to reach 9.7 billion in 2050, just 34 years from now. FAO estimates that, with no reduction of food losses and waste, and no shift to more sustainable diets, food production will have to increase by 60 per cent to meet demand. And this demand will continue to be driven not just by increasing numbers of people, but also by rising incomes.

It is also true that the agricultural sector must contribute to providing decent work for youth in rural areas, because even under the most optimistic projections, urban sectors will not provide jobs for all the young people entering the labour markets in the coming decades, particularly in some regions and countries. Indeed, the regions set to experience the largest increase in young labour market entrants are those where hunger and poverty levels are also the highest – sub-Saharan Africa and South Asia. This means that the agricultural sectors in the poorest countries and regions are going to have to be a major creator of jobs in the decades ahead.

IFAD proposes action on several fronts to encourage youth re-engagement with agriculture:

- investing in agriculture to integrate technology, innovation and entrepreneurship into smallholder farming and make the sector more attractive to young people;
IFAD supports young rural people

The projects we support are increasingly reaching out directly to young rural people, as a specific target group with a huge potential to contribute to rural transformation. In the Caribbean we’re funding a three-year programme to improve the business skills of young women and men in Belize, Cuba, the Dominican Republic, Grenada, Guyana and Haiti.

In Moldova, we’ve made credit lines available specifically for young farmers. Nineteen-year-old Anastasia Gilca is one of over 700 young women to take out a loan and she now runs her own profitable blackberry farm on 3 hectares of land. Gilca owns her own tractor, cultivator and cutter and her next step will be to plant up an additional 6 hectares and to design her own brand name, logo and packaging.
tailoring rural financial services to fit young farmers’ needs;
improving training and education services in rural areas;
empowering young women and men to take part in policy and planning processes concerning food and agriculture and rural development.

The projects we support are increasingly reaching out directly to young rural people, as a specific target group with a huge potential to contribute to rural transformation. In the Caribbean we’re funding a three-year programme to improve the business skills of young women and men in Belize, Cuba, the Dominican Republic, Grenada, Guyana and Haiti. In Moldova, we’ve made credit lines available specifically for young farmers. Nineteen-year-old Anastasia Gilca is one of over 700 young women to take out a loan and she now runs her own profitable blackberry farm on 3 hectares of land. Gilca owns her own tractor, cultivator and cutter and her next step will be to plant up an additional 6 hectares and to design her own brand name, logo and packaging.

Our biggest challenge: climate change

There is little dispute that one of the greatest and most intractable challenges that the world faces today is climate change. The headlines have become repetitive: year on year and even month on month temperature records are broken, sea levels rise, polar ice caps shrink. According to the SDG report 2016, climate change presents the single biggest threat to sustainable development. Its widespread, unprecedented effects disproportionately burden the poorest and most vulnerable people – erasing their livelihoods and destroying their homes. Climate change is also a major threat to food and nutrition security, shifting the areas where food can be grown and creating devastating weather conditions and events that wither food crops or wash valuable harvests out of the ground.
While the international community edges closer to binding agreements to bring emissions and temperature rises under control, far from the air-conditioned conference rooms, smallholder farmers fight daily battles to protect their livelihoods and food security. They must find ways to adapt their farming techniques to hotter temperatures, less water and increased salinity. They must learn to defend themselves, their crops and their livestock from devastating storms and pest invasions. They urgently need finance, information and training so they can take the right decisions about what to plant, how, where and when.

Climate finance for small farmers

IFAD manages the Adaptation for Smallholder Agriculture Programme (ASAP), which channels climate financing to the world’s poorest producers. ASAP was launched in 2012 and has become the world’s largest financing source supporting family farmers in their struggle to adapt. It is now working in more than 30 developing countries.

In Mozambique, ASAP is funding the installation of weather stations to improve climate risk information and forecasting for farmers.

In Kyrgyzstan, six climate models were used to generate climate scenarios for the design of an IFAD-supported livestock and market development programme. Findings were analysed by season and altitude to help identify risks, vulnerabilities and future opportunities for new pasture areas.

It is also introducing small-scale infrastructure such as low-cost greenhouses to help farmers grow crops with fewer agro-chemicals during the increasingly hot season.
Indigenous people and sustainable rural transformation

In many countries, indigenous people suffer more marginalisation and discrimination – more disempowerment – than any other population group on earth. They make up 5 per cent of the global population, but account for 15 per cent of those living in poverty. Although considerable progress has been made in some countries, indigenous people fare worse than any other population group on all development indicators. Indigenous women are further marginalised, even within their own communities.

Despite histories marked by colonisation, violent oppression and armed conflict, indigenous people have fought to maintain their identities and their cultures. Today there are 370 million indigenous children, women and men, and their numbers are rising. Living largely in isolated, disadvantaged and remote rural areas, their needs must be fully taken into account if rural transformation is to be inclusive. When this happens, along with other rural inhabitants, they reap the benefits of economic growth, improved infrastructure, education and healthcare. They gain better access to markets, are enabled to take advantage of income-generating opportunities, and empowered to increase their participation in community decision-making.

When they are empowered, indigenous people can also contribute significantly to making rural transformation sustainable. Indigenous knowledge and traditions can be of great value to rural communities aiming to increase agricultural production in ways that protect natural resources and respect the environment. Indigenous people have centuries of experience of interacting with the natural world – and today their territories are home to 80 per cent of the world’s biodiversity.

However, there is another side to the coin: rural transformation that is not inclusive or sustainable can put traditional indigenous livelihoods at risk and increase poverty, marginalisation and environmental degradation.
IFAD works with indigenous peoples to enable them to adapt to changing circumstances and strengthen their livelihoods and resilience, while maintaining their way of life and traditions. In Laos, an IFAD-supported project has enabled the Pacoh people to make a stable income harvesting the bark of the bong tree for processing into incense sticks in neighbouring Viet Nam. This has served the dual purpose of conserving a neglected species while boosting incomes. The Pacoh cultivate the bong trees alongside rice, which is their staple food. A second phase of the project will train the people to process the bong bark, rather than selling it in an unprocessed state, thus further increasing their earnings.

Agenda 2030: roles and responsibilities

To return to the new global vision for holistic development – it’s important to understand that Agenda 2030 is not just the 17 SDGs; it includes the goals, the targets, the indicators, and their means of implementation. On top of that is a multi-layered follow-up and review mechanism which is vital to measuring progress – shining a light on successes and failures – and ensuring flexibility where necessary. Also closely interlinked with this Agenda are the Paris Agreement on climate change and the Addis Ababa Action Agenda on financing for development.

National governments are primarily responsible for delivering on Agenda 2030, which was unanimously adopted by the 193 member states of the United Nations in September 2015. However, realising this agenda will require “all hands on deck”. The actions of all stakeholders must be aligned, including the private sector, research institutions, civil society organisations, and individual citizens. The international community is responsible for giving sustained support to national governments and enabling them to deliver. International development actors and agencies are also responsible for ensuring that they work together harmoniously and coherently to maximise the impact of their work for those who need it most.
IFAD is a specialised United Nations agency and an international financial institution. We have a particularly close working relationship with the other Rome-based agencies, the Food and Agriculture Organisation of the United Nations (FAO) and the World Food Programme (WFP). The three agencies share common goals and have complementary mandates. We share professional and material resources and work together at field level. We also cooperate closely with the Committee on World Food Security (CFS) – the foremost inclusive stakeholder platform working towards global food and nutrition security.

New approaches to financing for rural transformation

To implement Agenda 2030, very large resources must be mobilised – financial and otherwise. And those resources must be used efficiently and effectively. Indeed, the Addis Ababa Action Agenda on financing for development is an integral part of the Agenda 2030 roadmap.

Financing for sustainable development is only in part about traditional development assistance, or aid. It is also about mobilising domestic resources and climate finance, and leveraging private sector finance through public instruments for catalytic impact on the SDGs. In addition, the international community must help build government and national capacity to mobilise and leverage private sector investments and align them with inclusive and sustainable development.

As a financial institution, IFAD plays an important role in mobilising resources and leveraging finance for investment in rural transformation. Under our original business model, we did this primarily through replenishments conducted every three years with our member states. But increasingly, our aim is also to leverage finance from other sources, in order to achieve scale and have a catalytic effect that goes beyond our direct target groups.
IFAD is committed to identifying new and alternative sources and modalities of finance to drive inclusive rural transformation. We already have concrete experience in creating new financing tools. In 2014 we reached an agreement with Germany’s KfW Development Bank that transformed our business model and gave us access to sovereign borrowing. Although grant contributions remain the core, sovereign borrowing gives us flexibility and, most importantly, it increases our ability to invest in rural transformation.

The transformative power of small loans

At IFAD we know that it’s not just big money that makes a difference to people’s lives. In line with our work to empower poor rural women and men, we also focus on microfinance and on bringing the benefits of financial inclusion to the world’s poorest people. Smallholder farmers and small business owners are themselves major investors in the agricultural and agrifood sectors and their investments can be multiplied when they are enabled to manage their money.

It is currently estimated that less than 10 per cent of poor rural households have access to the basic financial services that people in developed countries take for granted. And around 2 billion poor adults remain excluded from the financial system. A big majority (72 per cent) of these people come from South and East Asia and the Pacific, and sub-Saharan Africa.

Together with our partners, we are working to change this. IFAD is one of the world’s largest lenders in rural and agricultural microfinance for poverty reduction and we have invested over US$ 3 billion in rural finance initiatives worldwide since we started work in 1978.
How an unemployed woman became a successful businesswoman and driving force for rural transformation

In my visits to rural communities on every continent, I have met scores of women and men who have changed their own lives and those of many others because they’ve been able to join a savings group or take a loan. Zhang Danying, whom I recently met in Shaanxi province, China, was an outstanding example and I would like to end this piece by telling you her story.

Today Zhang is a powerful businesswoman who owns two multi-million dollar companies. Eighteen years ago, having lost her job, she set up a sewing group with seven other women in her village, taking a loan from relatives to rent seven sewing machines. In 2004, the group obtained a loan through an IFAD-supported project with which they bought 30 sewing machines and hired 80 people.
With two more loans over the next few years, they further expanded production.

Today, Zhang’s clothing company employs more than 200 people and earns more than 10 million Yuan (US$ 1.5 million) annually. But that’s not all. With a bank loan, Zhang started a meat-processing company that has poverty reduction at the heart of its business plan. The company sources livestock from 10,000 small farmers and employs more than 1,000 workers. In 2003, Zhang also set up a vocational school which has trained more than 50,000 people in entrepreneurship, literacy, sewing and livestock-raising.

Zhang was an inspiration to me. Her rise to riches has changed the lives of thousands of women and men, increasing their incomes and giving them the skills and tools to build their own businesses and futures. She is a striking reminder that empowerment lies at the heart of rural growth. Inclusive rural transformation takes root when people have the services, the finance, the infrastructure and the confidence that enable them to share their successes and become agents of a bigger wave of change.
References


AUTHORS
Dr. Gerd Müller

Dr. Gerd Müller has been Germany’s Federal Minister for Economic Cooperation and Development since December 2013. As Minister, he has been an avid champion of Africa as the continent of opportunity. His proposal for a Marshall Plan with Africa has kicked off a broad-based consultation process. He was responsible for launching the process to frame a Charter for the Future, the Partnership for Sustainable Textiles and the ONE WORLD – No Hunger initiative.

As Parliamentary State Secretary to the Federal Minister of Food, Agriculture and Consumer Protection from 2005 to 2013, Dr. Müller’s responsibilities included overseeing the Ministry’s activities regarding international food security. He has been a member of the German Bundestag since 1994 and served through 2005 as CSU spokesman for European and foreign policy.

Dr. Akinwumi A. Adesina

Dr. Akinwumi Ayodeji Adesina has been President of the African Development Bank Group since September, 2015. He is celebrated as one of Africa’s leading development entrepreneurs thanks to his ability to develop and successfully execute bold initiatives that transform the lives of millions of people.

Before becoming President of the Bank, he was Minister of Agriculture in Nigeria, a position he has held since 2011. A bold reformer, as Minister, he turned the agriculture sector of Nigeria around within four years. Under his leadership, Nigeria’s food production expanded by 21 million metric tonnes, surpassing the 20 million metric tons target set out at the start of his tenure.

A consummate and highly effective builder of strategic partnerships, Dr. Adesina has worked effectively across several sectors of the African economy to lift millions of people out of poverty. He was Vice President
(policy and partnerships) of the Alliance for a Green Revolution in Africa (AGRA) and served as Associate Director and Regional Director for the Southern Africa Office at the Rockefeller Foundation, for over a decade.

A prolific writer, Dr. Adesina has written over 70 scholarly publications on policy, agricultural development and African development issues. He also served as President of the African Association of Agricultural Economists and on editorial boards of several academic journals. He is the recipient of prestigious awards for outstanding achievements, including the YARA Prize and Forbes Africa Person of the Year Award in 2013.

Melinda Gates

Melinda Gates is co-chair of the Bill & Melinda Gates Foundation.

Along with Bill, she shapes and approves the foundation’s strategies, reviews results, and sets the overall direction of the organisation. Together, they meet with grantees and partners to further the foundation’s goal of improving equity in the United States and around the world.

Through her work at the foundation over the last fifteen years, Melinda has seen first-hand that empowering women and girls can bring transformational improvements in the health and prosperity of families, communities and societies. In 2012, Melinda spearheaded the London Summit on Family Planning, which adopted the goal of delivering contraceptives to an additional 120 million women in developing countries by 2020. Her work has led her to increasingly focus on gender equity as a path to meaningful change.

The second of four children, Melinda grew up in Dallas, Texas. She received a bachelor’s degree in computer science and economics from Duke University in 1986 and a master’s in business administration from the Fuqua School of Business in 1987.
After joining Microsoft Corp. that year, she distinguished herself as a leader in the development of multimedia products and was later appointed Microsoft’s General Manager of Information Products. In 1996, Melinda left Microsoft to focus on her philanthropic work and family.


Prof. Joachim von Braun

Joachim von Braun is Director of the Center for Development Research (ZEF), Bonn University, and Professor for economic and technological change.

He is chair of the Bioeconomy Council of the Federal German Government. von Braun is a member of the German Academy of Science and Engineering (acatech), the Pontifical Academy of Sciences of the Vatican, and a fellow of the African Academy of Science and of American Association for the Advancement of Sciences.

He was Director General of the International Food Policy Research Institute (IFPRI) based in Washington, DC, USA from 2002 to 2009, and President of the International Association of Agricultural Economists (IAAE).

Bärbel Dieckmann

Bärbel Dieckmann is President of the German NGO Welt hungerhilfe.

From 1994 to 2009, she was mayor of the city of Bonn. She has been a member of the Social Democratic Party of Germany (SPD) since 1972. From 2003 to 2009, she was a member of the SPD presidium and from 1999 to 2009, a member of the executive committee. The focus of her political work has been on environmental and development policy, youth and family policy, and education policy.
She is on the board of trustees of the Development and Peace Foundation (sef:) and the National German Sustainability Award Foundation, is a member of the advisory board of the Arnold Bergstraesser Institute and a member of the Presidium of the United Nations Association of Germany (DGVN). Other positions that she has held include Chairperson of the World Mayors’ Council on Climate Change (founded on the occasion of the 11th Conference of the Parties on Climate Change), Executive President of the Council of European Municipalities and Regions (Brussels) and member of the Executive Committee of the Association of German Cities.

Bärbel Dieckmann studied philosophy, history and social sciences at the University of Bonn; from 1974 to 1995, she was a teacher, ultimately working as a senior faculty member at various secondary schools. Since 2008, she has held the honorary post of President of the German NGO Welthungerhilfe.

Dr. Agnes M. Kalibata

Dr. Agnes M. Kalibata, president of AGRA, leads AGRA’s efforts with the participation of public and private partners towards ensuring a food secure Africa through rapid, sustainable agricultural growth and improved productivity by empowering millions of smallholder farmers.

She is a former Minister of Agriculture and Animal Resources in Rwanda and is widely considered to be one of the most successful Agriculture Ministers in sub-Saharan Africa. Dr. Kalibata has held several other leadership positions, including Permanent Secretary of Ministry of Agriculture and Deputy Vice Chancellor of University of Rwanda. She has also worked for the International Institute of Tropical Agriculture (IITA) in Uganda, and various other agricultural development organisations. She currently sits on various boards including the International Fertiliser Development Corporation (IFDC), the Sustainable Trade Initiative, the Africa Risk Capacity, and the Global Agenda Council of the WEF.
In 2012 Dr. Kalibata received the Yara Prize, now the Africa Food Prize, for her contribution to transforming Rwanda’s Agriculture in a relatively short period of time. She is a distinguished agricultural scientist, policy-maker and thought leader and holds a PhD in Entomology from the University of Massachusetts, Amherst.

Dr. Kanayo F. Nwanze

Dr. Kanayo F. Nwanze was President of the International Fund for Agricultural Development (IFAD) from 2009 to 2017. IFAD is dedicated to ensuring that agriculture is a central part of the international development agenda, and that governments recognise the concerns of smallholder farmers and other poor rural people.

Nwanze has been a member of the World Economic Forum’s Global Agenda Council on Food Security since 2010. He was previously Director-General of the Consultative Group on International Agricultural Research (CGIAR) Africa Rice Center for a decade, where he was instrumental in introducing and promoting New Rice for Africa, or NERICA, a high-yield, drought- and pest-resistant variety developed specifically for the African landscape.

Nwanze graduated with a Bachelor of Science in Agricultural Science from the University of Ibadan, Nigeria, and has a Doctorate in Agricultural Entomology from Kansas State University. He was awarded the inaugural Africa Food Prize in September 2016 for his leadership of IFAD and his advocacy in putting Africa’s smallholder farmers at the centre of the global agricultural agenda. He has also received honorary degrees from McGill University, Canada, and the University of Warwick, United Kingdom, as well as numerous honours and awards from governments, and national and international institutions. He has published extensively, is a member of several scientific associations and has served on various executive boards.
The German Federal Ministry for Economic Cooperation and Development (BMZ) is committed to sustainability. This publication has been awarded the “Blue Angel for Printed Matter” for being produced in line with the criteria specified by RAL-UZ 195.
Isn’t there something cynical about the fact that nearly 800 million people do not have enough to eat and malnutrition is the main cause of death in children whilst, at the same time, over 600 million people are suffering from obesity? Isn’t it odd that 70 per cent of all undernourished and starving people live in countries where there is a food surplus? How can it be that smallholders produce more than 80 per cent of developing countries’ food supply and yet themselves make up the majority of the world’s poorest and most hungry people?

In this publication, German Development Minister Gerd Müller and six other thought leaders raise their “Voices Against Hunger”. There are voices from Germany and Africa, from government and civil society, from people working both on the ground and in science and research. The articles look at the key issues to be tackled if we are to conquer hunger and malnutrition by 2030: innovation, gender equality, the protection of natural resources, the role of the private sector and structural change to equip rural areas for the future.

However different the articles may be, the message conveyed by all the authors is the same: We can achieve a world without hunger! But only if we join forces. Let’s get to work!