A MONTPELLIER PANEL REPORT MARCH 2012

GROWTH WITH RESILIENCE:

OPPORTUNITIES IN AFRICAN AGRICULTURE

AGRICULTURE FOR IMPACT

GROWING OPPORTUNITIES FOR AFRICA'S DEVELOPMENT

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This report was authored by Agriculture for Impact, an advocacy initiative that convenes the Montpellier Panel to encourage better European donor support for the advancement of agricultural development in sub-Saharan Africa. The contributors to this report were Gordon Conway, Katy Wilson and Elizabeth Wilson with advice and inputs from members of the Montpellier Panel. The report was designed by Robb Whiteman and Hoevel & Associates.

OUR VISION

WE, THE MEMBERS OF THE MONTPELLIER PANEL, BELIEVE INVESTMENT IN RESILIENT AGRICULTURAL GROWTH IN SUB-SAHARAN AFRICA (SSA) CAN ACHIEVE SUSTAINABLE FOOD AND NUTRITION SECURITY FOR THE CONTINENT AND SIGNIFICANTLY CONTRIBUTE TO THE AFRICAN AND GLOBAL ECONOMY.

As we argued in our 2010 report:

- Food security underpins global security;
- Food trade is central to global trade; and
- Agricultural development is the best route to achieving economic growth that reaches the rural poor and most vulnerable in low income countries.

As is also evident from the experience of recent years, failure to ensure universal food security threatens political stability, social welfare and economic growth. Inclusive, resilient agricultural growth is thus a political imperative.

Resilient agricultural growth doesn't happen by itself - it needs pro-active policy design and investment.

The challenge is to generate agricultural growth that produces enough food, ensures it is accessible to all, is inclusive of the most vulnerable and is resilient, and hence able to withstand the increasing multiple stresses and shocks that afflict the world.

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To this end, we believe the priority should be supporting the creation of:

- Resilient markets that enable farmers to increase production and generate income through innovation and taking risks, while ensuring food is available at an affordable price.
- Resilient agriculture that creates agricultural growth out of knowledge and innovation, while simultaneously building the capacity of smallholder farmers to counter environmental degradation and climate change.
- Resilient people who are able to generate diverse livelihoods that provide stable incomes, adequate nutrition and good health in the face of recurrent stresses and shocks.

To achieve these goals we will also need political leadership that demonstrates the necessary vision and will.

SUMMARY OF RECOMMENDATIONS

THE RECOMMENDATIONS IN THIS REPORT ARE AIMED AT GOVERNMENTS, BOTH EUROPEAN DONORS AND AFRICAN GOVERNMENTS, WORKING IN PARTNERSHIP WITH LOCAL AND INTERNATIONAL PRIVATE SECTOR ACTORS, NGOS AND CIVIL SOCIETY ORGANISATIONS (CSOs).

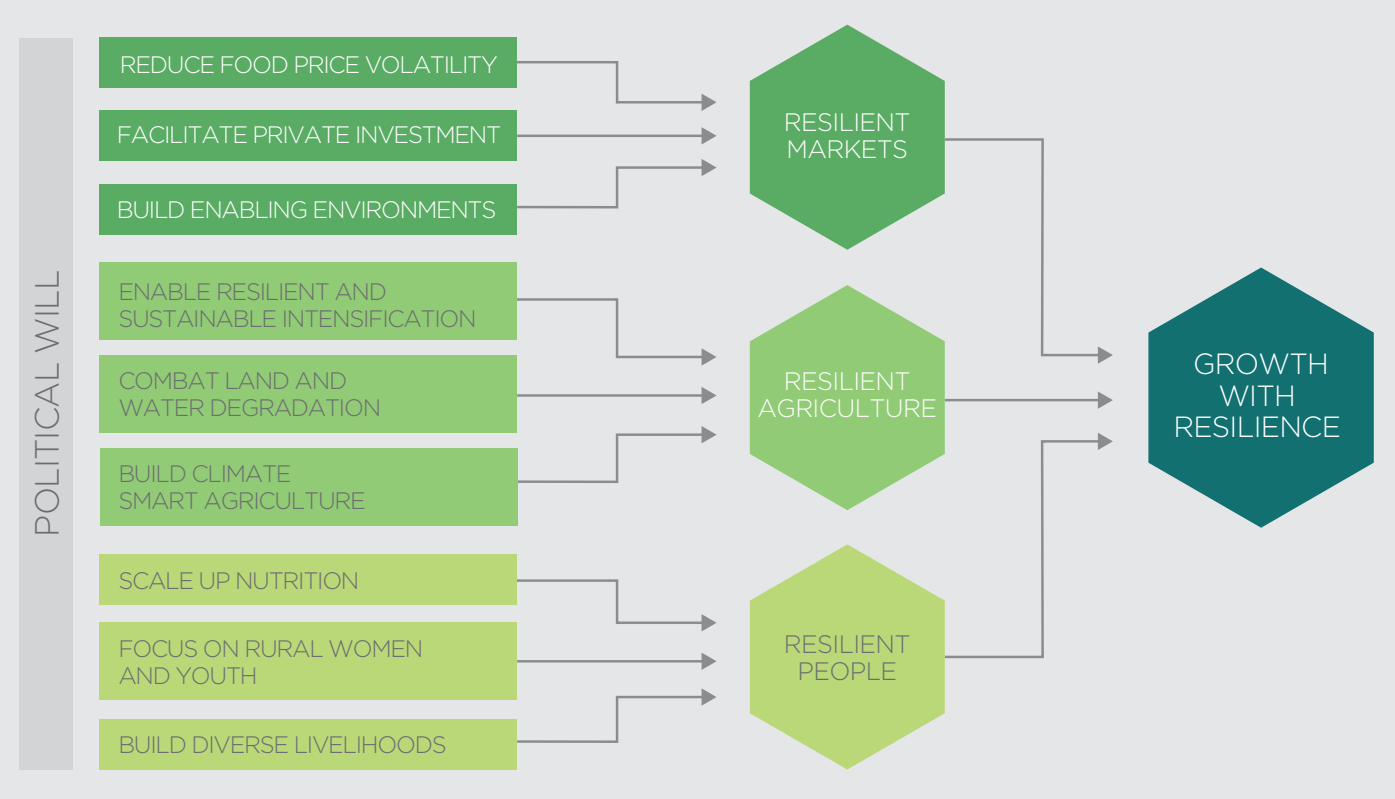


Figure 1: Flowchart of the Montpellier Panel recommendations on how to achieve agricultural growth with resilience

FOOD SECURITY AND AFRICA

WHY ACT NOW?

By acting now we have a unique opportunity to influence the global food security agenda in 2012 and beyond.

There will be a nexus of global level meetings in 2012 that could agree actions which will help achieve resilient agricultural growth in SSA:

- In May, G8 leaders, under the US presidency, will meet in Chicago. This also marks the end of the three-year L'Aquila Food Security Initiative (AFSI) commitment agreed by leaders in 2009. They will need to measure progress on fulfilling their US$22 billion AFSI pledge, to assess how their commitments have translated into action and to make further commitments.
- In June, Mexico leads the G20 meeting, building on the 2011 efforts to tackle food price volatility and food security within a framework of Green Growth.
- Also in June, at the Rio+20 meeting, twenty years after the first Earth Summit, world leaders will have a platform to debate how green economic tools and improved governance can deliver sustainable agricultural development, food security and poverty eradication.
- September will mark the two year anniversary of the unveiling of the Scaling Up Nutrition (SUN) initiative, a movement to reduce hunger and undernutrition, focusing on the critical window of opportunity for children between pregnancy and age two.
- In October, the second Global Conference on Agricultural Research for Development (GCARD) will gather farmers, civil society, the private sector and researchers in Uruguay to discuss agricultural foresight, partnerships and capacity building.

WHY SUB-SAHARAN AFRICA?

There are many reasons to believe that growth in SSA can generate greater food security and more resilient farming systems.

African GDP is growing at about 6% per year. Over the past decade, six of the world's 10 fastest growing countries were African. According to the African Development Bank (AfDB), a third of the population of Africa lives below the poverty line, another 20% lie just above in the band of US$2-$4 a day.

However 20% are 'middle class' with incomes of US$4-$20 per day and a further 20% have incomes of over US$20.

Including remittances from the diaspora, the AfDB estimates that over 300 million people, about a third of the population of Africa, is now middle class.

Nevertheless, the challenges are considerable. High growth rates are accompanied by increasing inequality. Growth is also more volatile in low-income countries. As a consequence, the sustainability of Africa's current growth is not guaranteed.

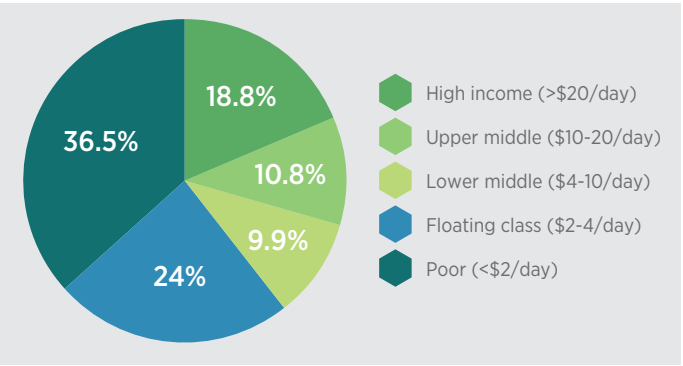


Figure 2: African population distribution by income in 2010
Source: African Development Bank

SSA FACES SEVEN MAJOR FOOD SECURITY CHALLENGES

- **Repeated food price spikes, creating persistent high food prices.** Several countries in SSA faced double-digit increases in maize prices during the first quarter of 2011. The World Bank estimates that globally 44 million people were pushed into poverty by rising food prices in 2010 to 2011.
- **In 2010, an estimated 239 million hungry people or 26% of the world's undernourished lived in SSA.** The food crisis in the Horn of Africa in 2011, which affected over 13 million people, and the growing food crisis in the Sahel of western and central Africa this year will add to these numbers.
- **Hunger disproportionately affects children and women.** In Africa, the number of stunted children is estimated to have increased from 45 million in 1990 to 60 million in 2010 . Nearly 70% of pre-school age children and 60% of pregnant women in SSA are anaemic, with 50% of all cases of anaemia being due to iron-deficiency.
- **The need to double food production if the growing population is to be fed by 2050.** FAO estimates we should increase food production globally by 70% above 2009 levels, but we will also have to create significant reserves to cope with extreme weather and other events.
- **Increasing environmental degradation and competition for land and water.** In 37 African countries, 22 kg of nitrogen (N), 2.5 kg of phosphorus (P), and 15 kg of potassium (K) per hectare of cultivated land has been lost each year over the past 30 years. This equates to an annual loss of US$4 billion in fertiliser.
- **High fossil fuel and fertiliser prices.** The price of diammonium phosphate (DAP), a commonly used source of nutrients in developing countries, rose six-fold at the time of the 2007/08 food price spike. After a significant fall, the price of DAP fertiliser has begun to rise again.
- **The increasing threats from global warming.** Increasing temperatures, declining rainfall, rising sea levels as well as devastating floods, droughts and cyclones, will significantly reduce yields, sometimes causing total crop or livestock loss. According to IFPRI, by 2050 average rice, wheat, and maize yields will have declined by up to 14%, 22%, and 5%, respectively, and food availability in the region will average 500 calories less per person, a 21% decline.

STRENGTHS AND WEAKNESSES

Agriculture in SSA is characterised by a range of interacting, socio-economic and biophysical strengths, weaknesses, opportunities and threats. These compound the challenge of achieving agricultural growth with resilience (Table 1).

Today the strengths and opportunities outweigh the weaknesses and threats. Appropriate solutions to the challenges exist and there are strong signs of a new, distinctively African, agricultural renaissance. As noted, much of the acceleration in GDP growth in SSA has been driven by faster agricultural growth and the potential for greater agricultural productivity is very high. In many respects Africa is the last agricultural frontier.

While only one country in SSA – Ghana – is on track to meet Millennium Development Goal (MDG) 1, 13 other countries in SSA are on track to halve poverty, and 10 countries are on track to halve hunger (Figure 3).

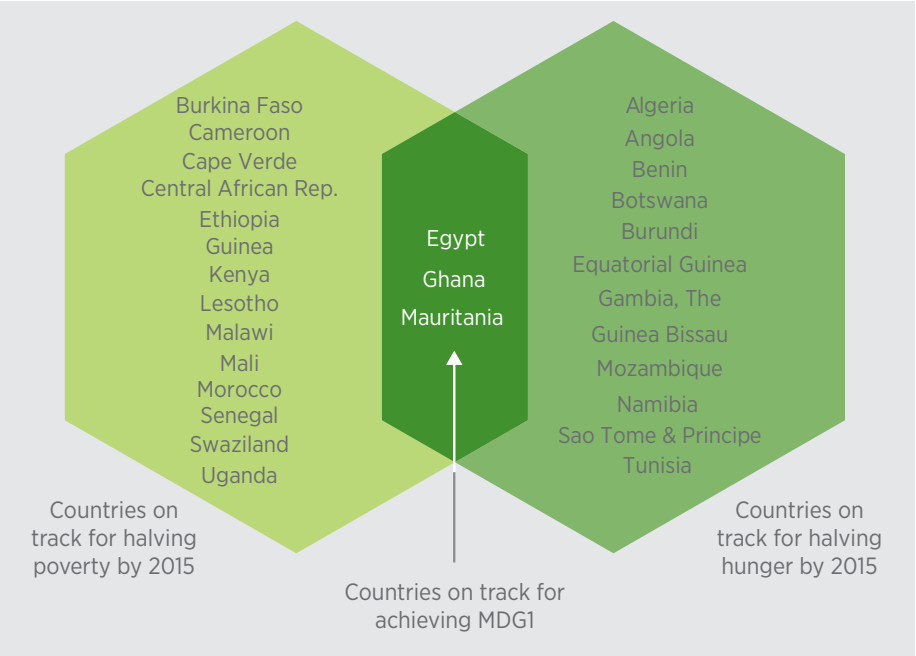


Figure 3: Countries on track for achieving MDG1 based on 'business as usual' projections. Source: ReSAKSS based on World Bank 2009, UN 2009.

LEADERSHIP FROM CAADP

As we recorded in our 2010 report, there has been a step change in the way African leaders, African regions and African governments approach agriculture. Since 2003, the African Union's Comprehensive Africa Agricultural Development Programme (CAADP), has provided an official channel for developing regional and national agricultural sector policies, strategies, and investment programs. Its momentum has been growing:

- **29 countries** have completed the CAADP Roundtable process and signed strategy documents, known as 'compacts'.
- **20 of the countries** have moved on to develop their agricultural investment plans and are receiving donor funds including five who have been awarded GAFSP (The Global Agriculture and Food Security Program) funding, totalling US$223.5 million.
- CAADP has set the goals of allocating **10% of national budgets** to the agricultural sector and achieving a 6% national agricultural growth rate.
- Seven countries are currently meeting the **10% agriculture spending target.** These countries met it both in the most recent single year measured, and on average over the most recent period (2003-09). Of the countries for which data was available, 17 countries met or surpassed the target of 6% agriculture growth in 2009.

STRENGTHS:

- The diversity of African agricultural agroecosystems furnishes resilience although this heterogeneity also requires sophisticated and nuanced management
- Smallholder agriculture can be highly efficient, producing five or more tons of grain per hectare with appropriate inputs and management
- Farm-level production costs in Africa are often relatively low
- There is a strong tradition of village-level farmer associations providing a basis for growth and innovation
- Acceleration in GDP growth in SSA has been, in part, driven by faster agricultural growth
- More organized and concerted African leadership through CAADP
- Foreign direct investment (FDI) in the continent increased from US$2.4 billion in 1985 to US$55 billion in 2010 although most of this was in the oil and gas sectors

WEAKNESSES:

- A lack of coherent, cross-ministerial policies and leadership on agriculture
- Poor incentives for small business investment
- Access to input and output markets is often weak
- Average cereal yields are only one ton per hectare
- The predominant rainfed agriculture is vulnerable to unreliable and unpredictable rainfall
- Total agricultural R&D spending in Africa grew at only 1.9% between 2000 and 2008, although there is wide variability between countries
- African soils are heavily degraded and depleted of nutrients
- Tenure over more than 90% of land remains outside the formal legal system in Africa and is therefore at risk of dispossession.
- Agricultural mechanisation is poorly developed

OPPORTUNITIES:

- There is a large agricultural workforce: 65% of Africa's population lives and works in rural areas
- The workforce will be predominantly young: by 2040, one in five of the world's young people will live in Africa
- Large opportunities to improve yields through increasing fertilizer application rates and irrigating more land
- Fertilisers are applied at average rates of about 11kg/ ha of arable land (compared to 154kg ha in India and 468kg/ha in China). There is a huge potential to use local African sources of rock phosphate fertilizer at affordable costs
- Only around 4% of cultivated land in SSA is irrigated. Potentially over 20 million hectares of land under irrigation
- Already in motion are agricultural growth corridor projects in areas with high agricultural potential that will stimulate investment and develop regional value chains
- Mobile and internet connectivity is growing rapidly: mobile phone subscribers have risen from less than two million in 1998 to over 400 million in 2009 and internet users in SSA between 2005 and 2010 grew by almost 430%

THREATS:

- 80% of all African farms (33 million farms) are less than two hectares in size, which can increase transaction costs
- The success of investments in agriculture depends on the engagement of women who make up 50% of the agricultural labour force and have relatively poor access to resources and services
- SSA has many pests, diseases and weeds such as Striga, Black Sigatoka, Banana wilt, Cassava mosaic virus, Maize leaf streak, Maruca beetles, stem borers, downy mildew and locusts that are capable of destroying harvests
- SSA farmers face the lowest agricultural incentives in the world
- Three quarters of African countries are net importers of agricultural products and African trade tariffs are on average 50% higher than comparable tariffs in Latin America and Asia
- Climate change is likely to reduce crop yields across much of SSA

Table 1 - SWOT analysis for African agriculture

BUILDING RESILIENCE

WHAT DO WE MEAN BY GROWTH WITH RESILIENCE?

Resilience, in the context of this report, is the capacity of agricultural development to withstand or recover from stresses and shocks and thus bounce back to the previous level of growth. As Figure 4 shows, a lack of resilience may be indicated by gradually declining agricultural productivity but, equally, collapse may come suddenly and without warning. Recovery may be fast, but more often is slow or incomplete.

A *stress* can be defined as a regular, sometimes continuous, relatively small and predictable disturbance, for example the effect of growing soil salinity or lack of rainfall or indebtedness. Such stresses or chronic crises are directly damaging but sometimes slowly culminate to cause a shock or acute crisis.

A *shock* is an irregular, relatively large and unpredictable disturbance, such as is caused by a rare drought or flood or a new pest outbreak, or when slow onset disasters pass their tipping points and become extreme events.

Many stresses and shocks are interlinked, for example, energy and input price volatility, extreme weather events and climate change, growing scarcity of natural resources and poverty and inequality. Because the planet is becoming more densely populated and increasingly urbanised, both physical and social interactions are becoming more complex and fast moving. As a consequence minor adverse events become amplified and the threats to agricultural growth are multiplying in frequency and scale.

STRENGTHENING RESILIENCE

Resilience can be strengthened in many different ways, through political, economic, sociological or technological interventions. For example drought can be countered by building irrigation systems, through improved water harvesting techniques, agro-ecological technologies such as conservation farming and by breeding new crops or livestock that are tolerant of or resistant to drought. Resilience can also be strengthened through more open trade policies to facilitate trans-border access to food. Some approaches are expensive, some more affordable.

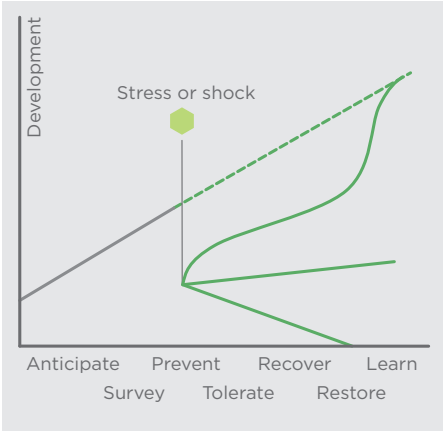


Figure 4 The range of responses to stresses and shocks

SOMETIMES, OF COURSE, DAMAGE IS UNAVOIDABLE AND THE ONLY RESPONSE IS TO REBUILD OR RESTORE THE BASIS FOR GROWTH.

The steps that need to be taken to build resilience (shown in Figure 4) include the anticipation of the likelihood and location of a stress or a shock, through some form of survey. In the case of extreme weather events such as droughts or floods, this may involve agro-climatic monitoring, such as informed the Famine Early Warning Systems network that in 2010 forecast the likelihood of the 2011 food crisis in the Horn of Africa.

The next steps – prevention and tolerance, recovery and restoration – involve defining objectives, identifying the various options and then appraising them in terms of their outcomes and the relevant costs and benefits. Preventative measures, such as building dams or sea walls, may allow agricultural growth to continue unhindered. But often, the best option is some form of tolerance that reduces the damage or allows rapid recovery. Frequently this will involve some form of trade-off, balancing agricultural productivity against reducing the risk exposure. Ideally, the answer will lie in seeking out and implementing win-win technologies and processes where they exist.

Sometimes, of course, damage is unavoidable and the only response is to rebuild or restore the basis for growth.

As a general rule, the more effort put into anticipating stresses and shocks and into designing preventative or tolerant responses the lower the likely damage and costs of action will be.

Finally, building resilience is about learning from past experience. How did a country, community or household cope with a severe stress or shock? How can it do better in the future? Almost everywhere in SSA local communities are experiencing the consequences of climate change and learning to cope (Box 1).

Some of the technologies and other interventions needed to build resilience are already available, but others, for example against devastating pests and diseases or to protect against drought, need further applied research. The G20 meeting in 2011 stressed 'the need to invest more and increase cooperation in research and development for climate change adaptation.' It also recognised the importance of the work of the Consultative Group on International Agricultural Research (CGIAR) and a subsequent first G20 conference on agricultural research for development was held in Montpellier in September 2011.

BOX 1 FARMER RESPONSES TO CLIMATE CHANGE IN MOZAMBIQUE

In the village of Nwadhajane in Southern Mozambique, villagers are experiencing the effects of climate change and are taking significant measures to counteract the worst impacts. Several farmer organisations have been created to reassign a portion of lowland and highland, which differ in their productivity to each farmer. On lowland the crops are very productive, but are washed out by periodic floods while the highlands produce good crops in the flood years but poor crops during the droughts. The farmer associations are also carrying out experiments with drought-resistant crops.

RESILIENT GROWTH

Resilience is not only about acute crises with one-off solutions. We cannot prevent the majority of acute crises unless we first address the underlying chronic crises. For example, increasing input prices, soil and water degradation, and global warming have to be tackled if sustainable food security and agricultural development is to be assured.

At first sight, the goal of resilience may seem at odds with growth. Indeed there is usually a trade-off. It is possible to have a highly resilient but stagnant growth, or a rapid growth that is destructive and highly volatile. The ideal is somewhere in between where appropriate resilience is built into growth at the outset in a way which exploits the synergies between growth and resilience. Moreover, growth is likely to be unpredictable unless resilience is built in. If growth is steady and assured it will encourage further investment, so creating a spiral of development.

GREEN GROWTH AND THE BIOECONOMY

Growth with resilience is at the heart of the theory and practice of Green Growth, presented by the Korean presidency at the G20 in 2010. Green Growth aims to achieve both a high level of growth and a high degree of resource efficiency. It advocates a strategic change to the economic system whereby the price of natural resources and services is internalized in market prices creating a Green Economy where economic wealth is linked to ecological sustainability. Korea is chairing the working group on Green Growth for the 2012 G20 meeting.

Building a green economy will be at the centre of deliberations at the UN's Rio+20 conference in June 2012. In the words of the zero draft for the conference, the member states and other stakeholders are urged to 'renew our commitment to sustainable development and express our determination to pursue the green economy in the context of sustainable development and poverty eradication. We further affirm our resolve to strengthen the institutional framework for sustainable development. Taken together our actions should fill the implementation gaps and achieve greater integration among the three pillars of sustainable development – the economic, the social and the environmental.' The challenge for the Rio+20 conference in this resolve is the integration of environmental and development priorities. Here the paradigm of pursuing resilience with growth can provide pointers for analysis and action.

TAKEN TOGETHER OUR ACTIONS SHOULD FILL THE IMPLEMENTATION GAPS AND ACHIEVE GREATER INTEGRATION AMONG THE THREE PILLARS OF SUSTAINABLE DEVELOPMENT – THE ECONOMIC, THE SOCIAL AND THE ENVIRONMENTAL.

More fundamentally we need, over the next few decades, to shift the planetary economy to one based on a Bioeconomy. Such an economy is focused on resource efficient technology, and ecologically sensitive products and services. The long term aim aim is that basic inputs for industry will be wholly plant or crop based, that is they will be intrinsically renewable. Germany has created a Bioeconomy Council with the aim of improving economic development, competitiveness, and thus value creation in using bio-based approaches. It is in this context that a new research program for food security in Africa has been initiated by the German Government in 2011.

In February 2012, the European Commission also adopted a strategy for a sustainable bioeconomy to ensure smart green growth in Europe. The goal is a more innovative and low emission economy, reconciling demands for sustainable agriculture and fisheries, food security, and the sustainable use of renewable biological resources for industrial purposes, while ensuring biodiversity and environmental protection.

The plan focuses on three aspects: developing new technologies and processes, developing markets and competitiveness, and encouraging policy makers and stakeholders to work more closely together.

RESILIENCE AT SCALE

'Development at scale' is a theme that crosscuts the growth with resilience agenda. Achieving resilient and transformational agricultural growth means going beyond small islands of success. Over 80% of African famers are smallholders, the majority of whom are women, cultivating less than two hectares of land. As a group they are critical to achieving widespread and inclusive food and nutrition security. But this depends on their links to markets – both markets that buy their produce and markets that supply inputs such as fertilisers and seeds and micro-credit and macro-insurance.

Development at scale is thus a function of the extent of engagement of farmers with markets. If these markets are accessible, efficient and fair - and hence resilient - smallholders will increasingly attain food and nutrition security and prosper. We thus begin our more detailed recommendations with the topic of resilient markets.

OUR RECOMMENDATIONS

RESILIENT MARKETS

RESILIENT MARKETS ENABLE FARMERS TO INCREASE PRODUCTION, TAKE RISKS AND GENERATE INCOME THROUGH INNOVATION, WHILE ENSURING FOOD IS AVAILABLE AT AN AFFORDABLE PRICE.

A resilient market minimises the effects of stresses and shocks, and is characterised by sound institutional arrangements, transparency of price formation and low transaction costs which bring about a degree of price stability, benefiting both producers and consumers. Underlying resilient markets are significant investments in agricultural growth and in the creation of appropriate enabling environments.

We recommend that governments work with the private sector to:

1. Reduce food price volatility
2. Facilitate private investments
3. Build better enabling environments

1. REDUCE FOOD PRICE VOLATILITY

Of the 20 highest increases in commodity prices over the last decade, 12 were for agricultural commodities. Most recent has been a food price spike in 2007 and 2008 followed by a spike in 2010 which has been prolonged to the present (Figure 5).

As the 2011 G20 meeting noted such 'excessive volatility not only has negative impacts on access to food for the poorest and on many producers, including livestock producers affected by the volatile cost of feed, but could hamper investments and an effective market response to a long-term increase in demand for food and may harm confidence in international markets.'

For farmers, price volatility reduces confidence and increases risks. Rapidly rising prices also mean increases in chronic hunger, accompanied by civil unrest and outmigration. In our 2010 report we addressed these challenges and made several recommendations, to:

- Explore the regulation of food markets in a manner similar to the banking and financial systems;
- Attempt to prevent the imposition of export bans; and
- Create modest physical grain reserves, for the World Food Program and for African regions and certain individual nations (especially those that are landlocked).

Public reserves can help during food crises in three ways: first, as domestic price stabilisation tools; second, as a source of emergency food for humanitarian aid during crises and third, as sources for food distribution programmes. These recommendations were initially regarded as somewhat controversial but are being implemented by a number of countries, at least at national level. Kenya has tripled its grain reserve in 2011 and Nigeria has adopted a policy that 15% of the total annual grain harvest should be held in reserve.

Food price volatility was a priority for the French government's presidency of the 2011 G20. Agriculture ministers and heads of states and governments agreed to support the establishment of the Agricultural Market Information System (AMIS) in the expectation that better information will help to dampen price volatility. AMIS seeks to improve agricultural market information, analyses and forecasts at both national and international levels; report on abnormal price activity; examine market conditions, including structural weaknesses, strengthening global early warning capacity; collect and analyse policy information, promote dialogue and responses, and international policy coordination; and build data collection capacity in participating countries.

As became evident during the G20 discussions, food price volatility has to be tackled from a variety of perspectives. For example, volatility may be moderated if the barriers to trade in grain are reduced or removed. In some cases tariffs are excessive while in others, countries have imposed protectionist trade policies. There is an urgent need to understand the nature and severity of such barriers in Africa and to devise ways of overcoming them, including the establishment of free trade communities.

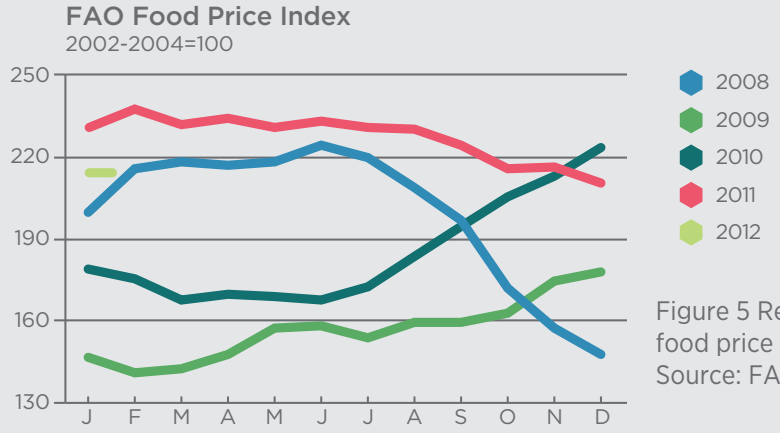


Figure 5 Recent food price spikes
Source: FAO

We recommend governments and other stakeholders:

a. Build on the G20 momentum and participate actively in AMIS

b. Measure progress and impact of actions taken by the G20 in 2011

c. Initiate a review of domestic and regional market barriers and protectionist policies within Africa

d. Explore the creation of free trade for key agricultural products, such as maize, within regional economic communities and all of Africa

2. FACILITATE PRIVATE INVESTMENT

A key factor increasing food price volatility has been actual or perceived shortfalls in food production relevant to actual or potential demand. Global consumption of grains and oilseeds exceeded production in seven of the eight years after 2000. By 2007, stocks were only 14 per cent of use. Thus increased food production, while it is not the sole solution to the problem, is a critical factor especially when combined with better access to markets for farmers.

Agriculture is, by its nature, a private sector activity. This is true of small as well as large farms and the majority of smallholders are, at one level or another, part of the private sector. The challenge for smallholders is that the transactions are usually small – a few grams of seed, a few kilos of fertiliser and 'micro' levels of credit and insurance. And when they have products to sell it is at most a few hundred kilos. However, the creation of local fertiliser and seed companies and small village agrodealers together with pilot experiments in micro-credit and micro-insurance are promising ways forward. Many of these involve major Africa-based commercial banks, often facilitated by guarantees to cover loans to small farmers.

The private sector has much to offer African agriculture. As crop value chains develop there are significant opportunities for wider scale private investments in such aspects as storage, processing, wholesaling and retailing. The private sector has the funds to operate at scale and can provide reserve and emergency funding to ensure such chains are resilient.

Foreign direct investment (FDI) in Africa increased from US$2.4 billion in 1985 to US$53 billion in 2008. But much more is needed, especially with an agricultural focus. In a key report to the November 2011 G20, Bill Gates explored a range of options for raising significant amounts of funds from the private sector for development. The options include interest on sovereign wealth funds (SWFs), diaspora bonds and various taxes, on tobacco, bunker fuel and financial transactions. Collectively these could raise some US$80 billion for a range of health and agriculture investments.

We recommend governments should work with the private sector, both nationally and internationally, to:

a. Build appropriate regulatory environments conducive to private investment

b. Facilitate the development of profitable and resilient value chains of significant benefit to small farmers, particularly women

c. Provide a forum for sharing lessons of success and failure in taking markets to scale

d. Explore innovative finance and access to finance: including sovereign funds, diaspora bonds and various forms of taxation

3. BUILD ENABLING ENVIRONMENTS

Food security is partly an economic problem, but its solution is dominated by political, technological, institutional and behavioural factors. The operation of market forces alone, whether within a country or on a global scale, will not create food security. Supply can meet increased demand but farmers in developing countries, especially smallholders, find it difficult to respond quickly to market signals. The benefits will only flow if there is an appropriate 'enabling environment.'

The G20 meeting in 2011 made a commitment to create 'an enabling environment to encourage and increase public and private investment in agriculture. In particular, we stress the need to support public-private partnership on investments, based on a value-chain approach, for services (such as access to financial services, agricultural education and extension services), and for infrastructure and equipment for production (such as irrigation), for agroprocessing, for access to markets (such as transport, storage, communication) andfor reducing pre and post-harvest losses. We commit to reinforcing capacity building in developing countries in these fields and call upon international organizations to assist. We also encourage efforts to establish proper investment environments, including through improvement of law and regulations.'

Much of this investment will have to come from the private sector, as outlined above, but at a minimum public action has to create the conditions that allow decentralised, private and collective initiatives to flourish. Moreover, markets never work perfectly so public sector and civil society organisations need to provide support to ensure that markets are accessible, equitable and efficient and that social safety nets are in place when markets do not work.

Experience suggests that many of the key elements of an enabling environment for agriculture can only be created through innovative public-private partnerships. The advantage of PPPs is that they can harness the entrepreneurialism and efficiency of the private sector to deliver better value for money, while at the same time utilising public engagement to ensure the benefits are widely shared both geographically and by social stratum. In this way private sector investment can benefit the many and not the few.

PPPs, which involve government and private sector with NGOs, are especially valuable in helping small farm enterprises and farmer associations become viable entities with profitable connections to input and output markets. Government input is often crucial to establishing the legal basis of such enterprises, while NGOs can help improve management expertise and fair linkages with markets.

PPPs also have a role in developing agricultural research partnerships where the technological expertise of public and private research organisations are combined with government oversight to ensure the benefits flow to smallholder farmers (Box 2).

A key component of an enabling environment for agriculture is access to markets. This depends, in part, on appropriate rural infrastructure. SSA has the lowest density of roads in the world: 204km per 1000km2 of land area, on average (the world average is 944km/1000km2). In many countries, transport costs and insurance take 50% of the value of exports. One of the biggest challenges is to help create regional trade networks in agricultural products, linking small farmers to supermarkets and exporters throughout their local region. The Trans-Africa Corridor developed by the United Nations Economic Commission for Africa (UNECA), the Africa Development Bank (AfDB) and African Union (AU), will comprise nine trans-continental roads equalling 56,683km that link, or closely pass most continental African states. It is estimated to generate $250 billion over 15 years in overland intra-African trade.

We recommend governments should collaborate with the private sector and NGOs, nationally and internationally, to develop public-private partnerships (PPPs) that;

a. Help to provide social safety nets for times of food crisis

b. Develop the legal basis and management expertise for small farm enterprises and farmer associations

c. Create agricultural research partnerships providing appropriate technologies for smallholder farmers

d. Provide unilateral and multilateral investments in the development of the Trans-Africa Corridor Network

BOX 2 WATER EFFICIENT MAIZE FOR AFRICA

A highly innovative public-private partnership has been created between the African Agricultural Technology Foundation (AATF), the International Maize and Wheat Improvement Center (CIMMYT), the seed company Monsanto and national agricultural research systems in the participating countries (Kenya, Tanzania, Uganda, Mozambique and South Africa) to deliver drought-tolerant and royalty-free maize varieties over the next decade.

The WEMA (Water Efficient Maize for Africa) project was initiated in 2008 and aims to increase yields by around 20 to 35% under moderate drought conditions. Maize hybrids are being developed through conventional breeding, marker-assisted selection and GM technology and are now undergoing trials in several SSA countries. The first varieties are expected to be commercialised four or five years from now. This could result in an estimated two million tons of additional food with benefits to 14 to 21 million people.

RESILIENT AGRICULTURE

RESILIENT AGRICULTURE CREATES AGRICULTURAL GROWTH OUT OF KNOWLEDGE AND INNOVATION, WHILE SIMULTANEOUSLY BUILDING THE CAPACITY OF SMALLHOLDER FARMERS TO COUNTER ENVIRONMENTAL DEGRADATION AND CLIMATE CHANGE.

Resilient agricultural technologies and practices build on agroecological knowledge to counter stresses and shocks in ways that maintain sustainable agricultural growth without contributing to significant environmental degradation.

We recommend that governments in partnership with the private sector & NGOs:

1. Enable resilient and sustainable intensification
2. Combat land and water degradation
3. Build climate smart agriculture

1. ENABLE RESILIENT AND SUSTAINABLE INTENSIFICATION

There is little likelihood of significantly more arable land becoming available for cultivation in SSA; yet we know that we have to approximately double food production by 2050. For the past fifty years the only significant increase in global arable land has been for crops such as oil palm and soybean, mostly on cleared rainforest or the Brazilian Cerrado. There may be land available for clearance in the rain forests of the Congo basin, but this will incur a major biodiversity loss and large Greenhouse Gas emissions.

For the future the solution to food security is to get more production out of the existing land (i.e. increasing land productivity), but to do it in a way that is resilient and sustainable. Such intensification is a significant challenge. It will depend on human ingenuity, in particular in harnessing the benefits of ecological processes and modern plant breeding.

In the 20th century, agricultural production relied on technologies developed by the industrialised countries. These "conventional technologies" typically deliver desired products in a ready-to-use 'packaged' form, e.g. a bag of synthetic fertiliser or a drum of synthetic pesticide or a tractor. Such technologies frequently 'work', but may be inappropriate or unaffordable for small farmers and have undesirable environmental side-effects.

One alternative is to draw on ecological principles to both increase production and make agriculture more resilient and sustainable. Examples include various forms of mixed cropping that enable more efficient use and cycling of soil nutrients (e.g. intercropping, rotations, agroforestry, sylvo-pasture, green manuring); integrated

and intensive crop-livestock systems, conservation farming systems that use minimum or no-tillage (Box 3), microdosing of fertilisers and herbicides and integrated pest management. These are now proven technologies, some of which build on traditional practices, with numerous examples working at least on a small scale. The imperative now is to find ways of scaling them up to reach a wider number of farmers.

Another solution is to increase the utilisation of modern plant and animal breeding methods (including biotechnology). There have been considerable successes in providing resistance to various pests of maize, sorghum, cowpeas, groundnuts and cotton, to diseases of maize and bananas, and to livestock diseases. These can provide relatively rapid gains in resilience. More pests and diseases have to be tackled but the continuing challenge is to combine these with biotechnology-based improvements in yield through improved photosynthesis, nitrogen uptake and resilience to climate change.

Fundamental to the success of modern breeding is the identification of natural genetic diversity in crop varieties and in close relatives. The International Treaty on Plant Genetic Resources for Food and Agriculture, adopted in 2001, facilitates sharing of plant genetic materials whilst ensuring the countries such resources originate in share in the benefits derived from their use.

The two approaches outlined above are not mutually exclusive. Building appropriate improved varieties into ecological agricultural systems can boost both productivity and resilience.

We recommend governments, the private sector and NGOs should:

a. Scale up proven successful programmes in conservation farming and integrated pest management

b. Develop agricultural systems that are efficient in terms of use of land, water and nutrients, including modern technologies of agro-ecology

c. Enable access to modern plant breeding technologies, including biotechnology, to develop crop varieties and livestock breeds that are more productive and resilient

d. Conserve and manage local germ plasm, in situ and ex situ, for future breeding programmes

e. Strengthen local rights over farm land and common natural resources

BOX 3 CONSERVATION FARMING IN ZAMBIA

A partnership between local government bodies and the NGO Concern Worldwide is investigating the use of conservation farming as a replacement for the traditional long fallow system in western Zambia. Currently the woodland is felled and burnt before being ploughed and sown to maize. Crops are grown for only a couple of years and the land then takes several decades to return to a state where it can be felled and burnt again. The conservation farming alternative is not to plough but sow the seed in small 'pockets' in the soil to which have been added two cupfuls of manure and a soda bottle top of fertiliser. After harvest, the soil is covered with the stems and leaves of the maize and next year's seed is sown several months later in the same holes. Despite the need to hoe weeds, the labour is much less than in the conventional systems. Yields are high – some four to five tons of maize growing new drought tolerant hybrids.

The system should allow tree or shrub cover to remain unburned more or less permanently, so increasing carbon sequestration and maintaining soil carbon levels, creating a more stable and sustainable farming system.

2. COMBAT LAND AND WATER DEGRADATION

Land and water for agriculture is in increasingly short supply, is subject to intense competition and affected by serious degradation. The causes are overuse, inefficient use, environmental change including global warming and pollution. Land is being degraded as a result of erosion, loss of fertility and desertification. According to FAO's Global Land Degradation Assessment (GLADA) almost a quarter of the global land area has been degraded between 1981 and 2003, with one of the most severely affected areas being Africa south of the equator. Globally, land degradation affects 1.5 billion people and over 40% of the poor depend on degraded lands for nutrition and income.

There is also now increasing information on the costs of degradation and its prevention. For example Niger loses about 8% of its GDP due to overgrazing, salinity in irrigated rice and soil nutrient depletion of sorghum and millet lands. It is estimated that an investment of US$20 million in microdosing of fertilizers in Niger in 2007 would have saved US$80 million of food aid. More generally there needs to be an assessment, by locality, of the costs and benefits of rehabilitation versus focusing on lands with the greatest potential. Appropriate investments will depend on financial or other incentives, such as improved land tenure or access to various inputs.

The use of water has always been subject to conflict, but this is intensifying as a result of rapid urbanisation and industrialisation, as well as global warming. Water is, of course, crucial to agricultural production and like land is similarly in short supply, and for similar reasons – overuse, inefficient use and degradation through pollution.

SSA has large untapped water resources for agriculture. Only around 4 to 5% of cultivated land is irrigated, two thirds of which is accounted for by Madagascar, South Africa, and Sudan. This compares to India's 66 million hectares in 2009. The potential exists to bring an additional 20mha or more of land under irrigation but, so far, technical, financial and socioeconomic constraints have slowed this expansion. At the same time, almost a quarter of the African population live in water-stressed countries, and the share is rising.

Over much of the continent however, environmental conditions are not suitable for large-scale irrigation systems, and the future lies in small-scale systems and in the drier regions in ingenious systems of water conservation based on a micro-catchment approach to water harvesting and the use of drip irrigation and related technologies. The general lesson from the experiences of the past thirty years is that small, community managed and designed irrigation systems are more likely to deliver sustainable water supplies.

We recommend governments, the private sector and NGOs should:

a. Target funding aimed at reducing land degradation, emphasizing the design of systems of financial and other incentives

b. Consider joining the international initiative on the Economics of Land Degradation (ELD) initiated by UN-CCD, Germany, and EC in 2011

c. Support development of major irrigation schemes as appropriate

d. Fund development of innovative micro-catchment water harvesting and conservation

3. BUILD CLIMATE SMART AGRICULTURE

Agriculture is both a victim and a culprit of climate change. In the longer term, climate change is likely to have a bigger effect on food supply than any other factor. Moreover, agriculture will probably be affected more than any other economic sector in the developing countries. Agriculture is particularly vulnerable because so many farmers rely directly on natural rainfall, which in SSA is highly unreliable and unpredictable. Large areas of agricultural land are already classified as "dryland", and climate change is likely to change rainfall patterns and bring a shorter growing season in the future, expanding drylands over a larger area. Irrigated lands will also suffer as river flows alter. Many parts of the developing world are already experiencing water shortages and these may increase in scope and severity.

Many crops are already grown close to their limits of thermal tolerance. Just a few days of high temperature near flowering can seriously affect yields of crops such as wheat, fruit trees, groundnut and soybean. Recent data from 20,000 field trials of maize conducted in Africa between 1999 and 2007 have revealed there is a yield loss of 1% under optimal rain-fed conditions and a loss of 1.7% under drought conditions for each degree day spent above 30°C. About three quarters of Africa's maize crop area would experience a 20% loss for a 1°C warming.

Although much progress has been made in developing adaptive farming systems through agroecological technologies and by breeding for drought or submergence tolerance, the applications are often small in scope and need scaling up.

Agriculture is also a major emitter of greenhouse gases (GHG): the agricultural sector accounts for some 10 to 12% of total global emissions, which rises to around 30% when emissions from agricultural fuel use, fertiliser production and land use change are included. The principle gases are nitrous oxide, originating from applications to the soil of manure, urine and nitrogen fertiliser, methane, which mainly originates in ruminant digestion, rice cultivation and anaerobic soils and carbon dioxide which comes from land clearing, burning of biomass and fossil fuels used to produce synthetic fertilisers and pesticides.

Some technologies for reducing emissions of GHG from agriculture are available although considerably more research needs to be done. There is a high potential for GHG abatement from agriculture with 70% coming from developing countries.

Ideally we need approaches that combine adaptation with mitigation and exploit potential synergies between them. However the big challenge is to find ways of going to scale.

Some progress was made at the Conference of the Parties (COP) 17 to the UNFCCC in December 2011 with agreement for the Ad Hoc Working Group on Long-term Cooperative Action (LCA) to make a decision on including agriculture at COP 18 in November 2012 in Qatar.

Governments, in partnership with the private sector and NGOs, should:

a. Support innovative adaptation programs being developed by local communities

b. Fund major efforts to take agricultural adaptation programmes to scale

c. Develop practical financial incentive programmes for famer engagement in mitigation at scale

d. Support a work programme for the agriculture sector under the Subsidiary Body for Scientific and Technological Advice at the UNFCCC COP 18

RESILIENT PEOPLE

RESILIENT PEOPLE ARE ABLE TO GENERATE FRUITFUL, DIVERSE LIVELIHOODS THAT PROVIDE STABLE INCOMES, ADEQUATE NUTRITION AND GOOD HEALTH IN THE FACE OF RECURRENT STRESSES AND SHOCKS.

We recommend that governments in partnership with the private sector, CSOs and NGOs:

1. Scale up nutrition
2. Focus on rural women and youth
3. Build diverse livelihoods

1. SCALE UP NUTRITION

195 million children are stunted; a third of all children in the world who are under five years old. In some African countries the proportion of children stunted is as high as 50%. Overall in SSA, the proportion of children under five stunted is 42% (roughly 50 million). Adequate nutrition not only prevents stunting it makes children resilient in the face of infectious diseases.

Sufficient nutrition is critically important during the first 1,000 days - (from pregnancy to two years old) - of a child's life. In our special briefing we proposed donors should support the Scaling Up Nutrition (SUN) initiative based on a series of well founded and costed interventions aimed at this window of opportunity. 26 countries have now signed up to the initiative, including Benin, Burkina Faso, Ethiopia, Gambia, Ghana, Malawi, Mali, Mozambique, Namibia, Niger, Nigeria, Senegal, Uganda, Tanzania, Zambia and Zimbabwe.

As noted by the UN Secretary General the need now is for 'the SUN countries to continue to receive coordinated and coherent support as they translate their commitments for scaling up nutrition into tangible results.'

Many of the staples on which poor people and their families depend, while usually rich in carbohydrates and protein, are often deficient in critical micronutrients that protect against infections. Ideally children should be fed a varied diet, including vegetable and animal products that contain the essential micronutrients (for example, iron, zinc and beta-carotene, a pre-cursor of vitamin A). However, these foods are often not available or are too costly for poor households, especially for the urban poor.

Part of the answer lies in improving the nutritional value of the foods derived from crops and livestock grown and husbanded by smallholders. More emphasis is needed on nutrition education and on the development of new crop varieties with increased micronutrient content, either by conventional breeding or genetic engineering (Box 4).

BOX 4 BIOFORTIFICATION

Biofortification seeks to produce crops with enhanced nutritional value. Most cereals and other staples are deficient in a number of proteins and other micronutrients. For instance, maize is deficient in the amino acids lysine and tryptophan which are essential for building proteins in the body. Often the capacity to produce these missing nutrients exists in the plant genome and only needs the right genetic background for expression.

HarvestPlus, a challenge programme of the CGIAR, is developing seven crops with enhanced levels of three critical micronutrients – zinc, iron and vitamin A. In most cases conventional breeding, with Marker Assisted Selection has been used. Vitamin A enriched sweet potato is now available in Uganda and Mozambique. Over the next couple of years HarvestPlus planned releases include vitamin A cassava and maize, iron bean and pearl millet and zinc wheat and rice.

Governments in partnership with the private sector and NGOs should:

a. Provide coordinated and coherent support to the SUN countries as they translate their commitments for scaling up nutrition into tangible results

b. Fund school feeding programs based on local produce and support widespread nutrition education

c. Support the scaling up of resilient and sustainable agroecological approaches to dietary variety, including home gardens

d. Fund both the development and scaling up of appropriate biofortified crop varieties

2. FOCUS ON RURAL WOMEN AND YOUTH

A large number of the poorest and most oppressed people in SSA are women and some of the poorest households are headed by women. They often shoulder a disproportionate share of the workload. Women in the hill districts of Nepal work around 16 hours a day, compared with the nine to 10 hours men work. Many women are hungry as well as overworked, so creating a vicious circle of discrimination, poverty and hunger.

If women had the same access to productive resources as men, they could increase yields on their farms by 20 to 30%. This could raise total agricultural output in developing countries by 2.5 to 4%, which could in turn reduce the number of hungry people in the world by 12 to 17%.

In practice, women farmers tend to have poor access to inputs (fertilisers, seeds and water), to extension (most extension agents are men) and to markets for their products. They often have poor access to land area and quality of land. Yet by force of circumstance or by culture, women are often highly resilient, able to turn their hands to many different tasks and to find ways of overcoming obstacles.

By 2040 one in five of the world's young people will live in Africa. While opportunities for semi-skilled low wage employment need to be developed in urban areas, there is an equal need for such employment in rural areas. Partly this can be met by encouraging the growth of larger, more enterprising farms and partly through development of semi-skilled rural business opportunities.

Governments in partnership with the private sector and NGOs should:

a. Launch a concerted Africa-wide initiative to ensure that the needs of rural women, their access to goods and services, to land and other resources are met

b. Build access to education and training for women in to all development projects from the outset

c. Support women's associations that will provide better bargaining power and access to credit, inputs and other services

d. Develop small rural businesses of various kinds suitable for young unskilled and semiskilled labour

3. BUILD DIVERSE LIVELIHOODS

Village level analyses in India and Africa have shown that the critical element in helping households to escape from poverty is diversification of income by establishing links with the urban economy. In one village, 73% of households who had escaped from poverty reported a member who had obtained a job, mostly in the private sector. In some cases they had established a craft or trade in a city, while a significant number (36%) had established a small business in the neighbourhood of the village. Examples of the latter included retail shops, butcheries, selling agricultural products, fish and paraffin, trading in timber, firewood and charcoal, making shoes and bricks, weaving baskets and brewing alcohol.

Of the households who escaped poverty, 57% diversified on-farm income through production of cash crops e.g. staple cereals, tea and sugar cane. Livestock acquisition also played a key role in the process.

Diversity is key to resilience. For example, income diversity reduces the vulnerability of livelihoods by providing alternative incomes. Thus, diversity of crops and livestock, and diversity of off-farm income play major roles in building livelihood resilience, ensuring that the livelihood expands and grows in a stable and sustainable manner irrespective of the various stresses and shocks it may experience. Diversification involves the development of value chains and the creation of small rural businesses that provide the key linkages between rural communities and urban economies.

Governments in partnership with the private sector and NGOs should:

a. Develop methods for measuring household diversity in relation to resilience

b. Support incipient small village level businesses through microfinance facilities that provide start up, micro credit and micro insurance funds

c. Facilitate the development of value chains that increase diversity of incomes

POLITICAL LEADERSHIP FOR RESILIENT GROWTH

To achieve resilient growth that takes forward our recommendations we will need to place agriculture at the heart of international development policy in Europe and at the heart of economic policy in SSA. Political leadership will be crucial to achieving this paradigm shift.

At national level in SSA, the challenge is for political leaders to create appropriate enabling environments for agriculture and to recognise and act upon the requisite investments in good governance, namely:

- Appropriate macroeconomic policies
- Significant investment in infrastructure, research, extension and education
- Security of tenure
- No corruption
- Efficient and fair markets
- Supportive environments for small and medium enterprises (SMEs)

The outstanding example of such leadership is in Ghana where agricultural GDP has risen at 5% per annum for the past 10 years and the country has already achieved the MDG of halving hunger by 2015.

In recognition of this achievement the World Food Prize was awarded to John Kufuor who was President of Ghana from 2001 to 2009. In his words 'my administration aimed to secure a more efficient and productive agricultural base that would become the engine for the economy by providing food security, ushering in industrialization, creating jobs, and increasing export revenues. The critical need was – and is – for an agricultural transformation'

In Europe, governments should have a clear strategic framework for embedding agriculture in their international development work, and agricultural policies and strategies need to be explicitly linked to other development plans such as health, nutrition, poverty, food security, climate change, to take advantage of win-wins.

By championing agricultural growth with resilience, European political leaders have an opportunity to help put solid foundations in place for improved food security in SSA, which in turn will benefit the wider global community. By leading on this agenda, and providing catalytic support to the private sector, they can mitigate shocks and stresses now, and plan for sustained growth in the future.

Figure 7 Ghana's food production between 2000 and 2010.
Source: FAO

At international level, European donors should continue to play an active role in support of the UN Committee on World Food Security (CFS). Established in 1974, it is the ideal candidate for the role of overarching strategic body that is needed to synchronize action in the world food system. It has recently been reformed with a wider remit beyond the UN organisations and could become more effective. At its last meeting in 2011 it focused on food price volatility, gender, investment in smallholders and land grabbing. In response to the latter it has drafted a set of guidelines on land tenure.

Of perhaps greater importance is the need for European donors to support the Global Agriculture and Food Security Program (GAFSP) which was set up as a multilateral donor trust fund at the World Bank to follow up on the G8 L'Aquila commitments. Its public sector window focuses on the delivery of additional funding in support of national and regional strategic plans designed and implemented by developing country governments usually as part of the CAADP process. GAFSP also has a private sector window designed to provide long and short-term loans, credit guarantees and equity to support private sector activities.

As part of the Second Call for Proposals for the Public Sector Window, GAFSP intends to allocate approximately US$180 million to five or six proposals. So far only three donors, Spain, Ireland and the Netherlands are European.

European governments should work together to strengthen European Union (EU) policy instruments on food security and agricultural development, such as the Food Security Thematic Programme and the European Development Fund. We acknowledge the delivery of the EU €1bn food facility in 2009-11, in response to rapidly rising food prices in developing countries, as an example of how European funding and support can have significant impact.

Finally, there is a need at international level to engage the private sector in agricultural growth with resilience. At the World Economic Forum in Davos in 2012, the implementation plan of a New Vision for Agriculture was published. This is aimed at all relevant stakeholders: those involved directly in the food value chain and in its broader environment, including government, industry, public and private-sector financiers, civil society, farmers and farmers' organizations. Emerging from the WEF engagement in this sector is also the Grow Africa Forum – a platform to promote private agricultural financing. Grow Africa in Addis in May 2012, in the margins of WEF Africa, will focus on pitching investment opportunities and attracting new private sector partners in to country initiatives.

We recommend that governments in partnership with the private sector:

a. Put resilient agricultural policies at the heart of government economic policy in SSA

b. Engage fully in the CAADP process ensuring it is more consistent with a resilience agenda

c. Support the UN Committee on Food Security

d. Provide funds to the Global Agricultural and Food Security Programme and strengthen EU policy instruments

e. Engage with initiatives emerging from the WEF such as the New Vision for Agriculture and the Grow Africa Forum

CONCLUSION

TODAY WE FACE A RANGE OF ACUTE AND CHRONIC CRISES OF GREAT MAGNITUDE. TO COPE, WE NEED TO INCREASE FOOD PRODUCTION, PERHAPS BY AS MUCH AS 100% IF WE ARE TO PROVIDE WIDESPREAD, INCLUSIVE FOOD SECURITY AND DELIVER AGRICULTURAL GROWTH.

The challenges we face on the demand side are not just rising populations, but rising per capita incomes and changing diets, and growing demand for biofuels. At the same time we have to cope with threats to supply caused by rising oil prices, shortages of good quality land and water, declining increases in the yields of some staples and, perhaps most alarming of all, the threats posed by global warming.

We also need agricultural growth not only to reduce poverty and hunger but to contribute to a balanced and vigorous pattern of economic development in Africa. There are good grounds for optimism. Many African countries are exhibiting high rates of economic growth and the CAADP process is encouraging donors to invest in agricultural development.

This year is a crucial year. The sequence of G8, G20 and Rio+20 summit meetings provides a ready platform for coordination of policies and intensification of investments that will promote an agenda based on growth with resilience.

As the following exemplifies, the key summits are aware of the challenges and the opportunities are there to be seized by European and African governments, the private sector, CSOs and NGOs working in partnership.

'With its diverse and dynamic membership, the G20 is in a phenomenal position to help us all think about development in new ways. Ultimately, the goal is to combine the world's total resources—public, private, rich, poor, and in between—in ways that drive development forward. We need to find better ways to bring private investment into poor countries. We need to help donors keep their promises by looking for new sources of aid money. We need to reinforce the dynamism of poor countries, so they can lead their own development. Finally, we need to tap the rich experience and capacity for innovation of rapidly growing countries that have recently travelled the development path so successfully.'

THE MONTPELLIER PANEL

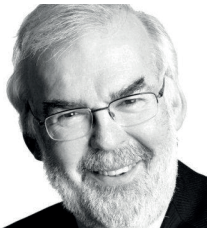
ALL PANEL MEMBERS SERVE IN A PERSONAL CAPACITY

Gordon Conway (Chair)

Professor of International Development, Agriculture for Impact, Imperial College London

Camilla Toulmin (Deputy Chair)

Director, International Institute for Environment and Development (IIED) (Moderator)



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Louise Fresco

Professor, University of Amsterdam

Peter Hazell

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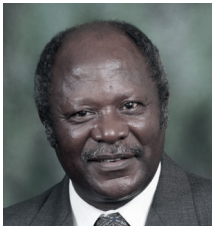

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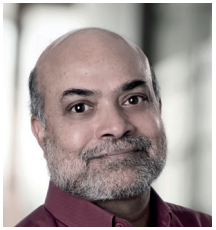

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KEY REFERENCES

AATF. 2011. Water efficient maize for Africa. Nairobi: African Agricultural Technology Foundation. http://www.aatf-africa.org/wema/en/.

AfDB and UN Economic Commission for Africa. 2003. Review of the implementation status of the Trans African Highways and the missing links – Volume 2: description of corridors. Stockholm: SWECO International AB, Nordic Consulting Group AB.

AfDB. 2011. The middle of the pyramid: dynamics of the middle class in Africa. Tunis: African Development Bank. http://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/The%20Middle%20of%20the%20Pyramid_The%20Middle%20of%20the%20Pyramid.pdf .

Arbache, J.S. and Page, J, 2009. How fragile is Africa's recent growth? Journal of African economies. 19: 1-24.

Badiane, O. 2008. Sustaining and accelerating Africa's growth recovery in the context of changing global food prices. IFPRI Policy Brief No 9, Washington, DC: International Food Policy Research Institute.

Bio-economy Council. 2011. Annual Report 2010. Berlin: Bio-economy Research and Technology Council (BöR).

Comprehensive Assessment of Water Management in Agriculture. 2007. Water for food, water for life: a comprehensive assessment of water management in agriculture. London: Earthscan, and Colombo: International Water Management Institute. http://www.iwmi.cgiar.org/assessment/.

Dar, W. 2007. What ICRISAT thinks.....: there is hope and prosperity in the drylands. Patancheru 502 324, Andhra Pradesh, India: International Crops Research Institute for the Semi-Arid Tropics.

Europa. 2012. Commission adopts its strategy for a sustainable bioeconomy to ensure smart green growth in Europe. Brussels: Europa. http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/12/97

FAO. 2010. FAOSTAT. Rome: FAO. http://faostat.fao.org/.

FAO. 2010. The state of food insecurity in the world: addressing food insecurity in protracted crises. Rome: United Nations Food and Agriculture Organisation and World Food Programme.

FAO. 2011. The state of food and agriculture: women in agriculture, Closing the gender gap for development. Rome: FAO.

FAO. 2012. FAO food price index. Rome: FAO. http://www.fao.org/worldfoodsituation/wfs-home/foodpricesindex/en/ .

FAO. No date. International Treaty on Plant Genetic Resources for Food and Agriculture: overview. Rome: FAO. http://www.planttreaty.org/content/overview.

Foresight. The Future of Food and Farming (2011) Final Project Report. The Government Office for Science, London.

Gates, B. 2011. Innovation with impact: financing 21st century development. http://www.thegatesnotes.com/Topics/Development/G20-Report-Innovation-with-Impact.

Ivanic, M., Martin, W. and Zaman, H. 2010. Estimating the short-run poverty impacts of the 2010-11 surge in food prices. Policy Research Working Paper 5633. Washington, DC: World Bank.

Krishna, A. 2010. One illness away: why people become poor and how they escape poverty. Oxford: Oxford University Press.

Lobell, D., Bänziger, M., Magorokosho, C. and Vivek, B. 2011. Nonlinear heat effects on African maize as evidenced by historical yield trials. Nature Climate Change. Doi: 10.1038/nclimate1043.

Nachtergaele, F. And Petri, M. 2008. Mapping land use systems at global and regional scales for land degradation assessment analysis. Version 1.0. Technical report n.8 of the LADA FAO/UNEP Project.

Nelson, G., Rosegrant, M., Koo, J., Robertson, R., Sulser, T., Zhu, T., Ringler, C., Msangi, S., Palazzo, A., Batka, M., Magalhaes, M., Valmonte-Santos, R., Ewing, M. and Lee, D. 2009. Climate change: impact on agriculture and costs of adaptation. Washington, DC: International Food Policy Research Institute.

Nin-Pratt, A. 2011. Agricultural R&D investment, poverty and economic growth in sub-Saharan Africa: prospects and needs to 2050. Conference Working Paper 9. Prepared for the ASTI/IFPRI-FARA conference, Accra, Ghana, 5-7 December 2011. Agricultural R&D: investing in Africa's future. Analyzing trends, challenges and opportunities.

Nkonya, E., Gerber, N., von Braun, J. and De Pinto, A. 2011. Economics of land degradation. The costs of action versus inaction. Washington, DC: IFPRI.

Omilola, B., M. Yade, J. Karugia, and P. Chilonda. Monitoring and Assessing Targets of the Comprehensive Africa Agriculture Development Programme (CAADP) and the First Millennium Development Goal (MDG) in Africa. ReSAKSS Working Paper No. 31. 2010.

Osbahr, H., Twyman, C., Adger, W. and Thomas, D. 2008. Effective livelihood adaptation to climate change disturbance: scale dimensions of practice in Mozambique. Geoforum 39: 1951–1964.

Pretty, J. 1995. Regenerating agriculture: policies and practice for sustainability and self-reliance. London: Earthscan.

Reij, C. 1991. Indigenous soil and water conservation in Africa. Gatekeeper Series SA 27. London: Sustainable Agriculture Programme, International Institute for Environment and Development.

Reij, C., Scoones, I. and Toulmin, C. (eds) 1996. Sustaining the soil: indigenous soil and water conservation in Africa. London: Earthscan.

Sanchez, P. 2002. Soil fertility and hunger in Africa. Science. 295: 2019-2020.

Skees, J., Hazell, P. and Miranda, M. 1999. New approaches to crop yield insurance in developing countries. Environment and Production Technology Division Discussion Paper No. 55. Washington, DC: IFPRI.

The Montpellier Panel. 2010. Africa and Europe: partnerships for agricultural development. London: Agriculture for Impact. http://www.imperial.ac.uk/africanagriculturaldevelopment/themontpellierpanel/panelreport.

UN. 2009. United Nations Millennium Development Goals Report. New York: United Nations.

UN. 2012. The future we want. New York: United Nations. http://www.uncsd2012.org/rio20/content/documents/370The%20Future%20We%20Want%2010Jan%20clean.pdf

UNICEF. 2010. Nutrition statistics. New York: UNICEF. http://www.unicef.org/rightsite/sowc/pdfs/statistics/SOWC_Spec_Ed_CRC_TABLE%202.%20NUTRITION_EN_111309.pdf.

Wheeler T., Craufurd P., Ellis R., Porter J. and Vara Prasad P. 2000. Temperature variability and the yield of annual crops. Agriculture, Ecosystems and Environment. 82: 159-167.

WHO. 2011. Millennium Development Goals: progress towards the health-related Millennium Development Goals. Geneva: WHO Media Centre. http://www.who.int/mediacentre/factsheets/fs290/en/ .

Winters, L.A., Lim, W., Hanmer, L. and Augustin, S. 2010. Economic growth in low income countries. How the G20 can help to raise and sustain it. Economics Department Working Paper No. 8-2010. Brighton: University of Sussex.

World Bank. 2007. Investment in agricultural water for poverty reduction and economic growth in Sub-Saharan Africa. A synthesis report. A collaborative program of AfDB, FAO, IFAD, IWMI and the World Bank. Washington, DC: World Bank.

World Bank. 2009. World Development Indicators. Washington, DC: World Bank.

World Bank. 2011. World Development Indicators: fertilizer consumption. Washington, DC: World Bank. http://data.worldbank.org/indicator/AG.CON.FERT.PT.ZS

You, L., Ringler, C., Nelson, G., Wiid-Sichra, U., Robertson, R., Woods, S., Guo, Z., Zhu, T. and Sun, Y. 2010. What is the irrigation potential for Africa? A combined biophysical and socioeconomic approach. IFPRI Discussion paper 00993. Washington, DC: International Food Policy Research Institute.

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