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OPINIONS

How to create resilient agriculture

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Durable food security and agricultural growth depend on development strategies with resilience built in from the start, says *Gordon Conway*.

Economic growth with resilience to environmental threats will be central to the agenda of the UN Conference on Sustainable Development (Rio+20) in June this year, which aims to map out a pathway of sustainable development for the planet.

The '[zero draft](#)', the document that will form the basis of conference negotiations, states a resolve to fight hunger, eradicate poverty and work towards just and economically stable societies.

Food security is critical to this mission. The threats are numerous: repeated food price spikes; shortages of good-quality land and [water](#); rising [energy](#) and fertiliser prices; and the [consequences of climate change](#).

Already, somewhere between 900 million and a billion people are chronically hungry, and by 2050 [agriculture](#) will have to cope with these threats while feeding a growing population with changing dietary demands. This will require doubling food production, especially if we are to build up reserves for climatic extremes.

To do this requires sustainable intensification — getting more from less — on a durable basis.

Combining traditional and technological

Farmers around the world will need to produce more food and other agricultural products on less land, with fewer pesticides and fertilisers, less water and lower outputs of greenhouse gases.

This must be done on a large scale, more cheaply than current farming methods allow. And it will have to be sustainable — that is, it must last. For this to happen, the intensification will have to be resilient.

The latest report of the expert Montpellier Panel [1], which I chair, lays out a vision of agricultural growth for [Sub-Saharan Africa](#) that is resilient — able to withstand or recover from stresses and shocks. The report makes specific recommendations around resilient agriculture, resilient people and resilient markets.



Ghana has reduced hunger and improved child health by making agriculture a priority
Flickr/Gates Foundation

Developing resilient agriculture will require technologies and practices that build on agro-ecological knowledge and enable smallholder farmers to counter environmental degradation and climate change in ways that maintain sustainable agricultural growth.

Examples include various forms of mixed cropping that enable more efficient use and cycling of soil nutrients, conservation farming, microdosing of fertilisers and herbicides, and integrated pest management.

These are proven technologies that draw on ecological principles. Some build on traditional practices, with numerous examples working on a small scale. In Zambia, conservation farming, a system of minimum or no-till agriculture with crop rotations, has reduced water requirements by up to 30 per cent and used new drought-tolerant hybrids to produce up to five tons of maize per hectare — five times the average yield for Sub-Saharan Africa.

The imperative now is scaling up such systems to reach more farmers.

Another solution is to increase the use of modern plant and animal breeding methods, including **biotechnology**. These have been successful in providing resistance to various pests of maize, sorghum, cowpeas, groundnuts and cotton; to diseases of maize and bananas; and to livestock diseases.

These methods can help build resilience rapidly. We need to combine them with biotechnology-based improvements in yield through improved photosynthesis, nitrogen uptake, resistance to drought and other impacts of climate change.

Agro-ecology and modern breeding methods are not mutually exclusive. Building appropriate, improved crop varieties into ecological agricultural systems can boost both productivity and resilience.

Enabling environments

The Montpellier Panel report recommends that governments, the private sector and nongovernmental organisations work together to help develop resilient and sustainable intensification; combat land and water degradation; and build climate-smart agriculture, such as conservation farming.

These partnerships can also build the resilience of people by increasing the reach of successful nutrition interventions and building diverse livelihoods, especially by focusing on rural women and young people. The report particularly recommends taking part in the Scaling Up Nutrition (SUN) framework that aims to greatly reduce the number of stunted children, which stands at roughly 50 million in Sub-Saharan Africa.

The report also describes how to achieve resilient markets that enable farmers to increase production, take risks and generate income through innovation while ensuring food is available at an affordable price.

Creating grain stores and opening up trade across Africa can reduce food price volatility. The continent also needs more private investments and public–private partnerships that will encourage increased production.

Developing agriculture with resilience depends on science, technology and innovation; but there are no magic bullets. We need strong political leadership.

An excellent example is Ghana, where agricultural gross domestic product has risen by five per cent each year for the past decade and the millennium development goal of halving hunger by 2015 has already been achieved. This was largely due to the leadership of former president John Kufuor who gave

agricultural development a high priority and created an enabling environment for the adoption of new technologies and other innovations.

This is a crucial year. The sequence of G8, G20 and Rio+20 summit meetings provides a ready platform for the international community to coordinate policies and intensify investments. I am optimistic that agricultural development and food security will be priorities, and an agenda based on agricultural growth with resilience will be a key outcome.

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REFERENCES

[1] The Montpellier Panel. 2012. [Growth with Resilience: Opportunities in African Agriculture](#). (Agriculture for Impact, 2012)

<http://www.scidev.net/en/agriculture-and-environment/opinions/how-to-create-resilient-agriculture-1.html>
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