

# AGRICULTURE

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## Contents

EU's food imports pose 'tricky balance' for hungry Africans' .....p.1  
Looming shortage of key crop nutrient pushes call for conservation .....p.3  
Farmers locked in food production vs. pollution trade-off .....p.5

Green farming agenda faces EU budget axe .....p.6  
Scientists eye nanotechnologies to boost crop yields .....p.7

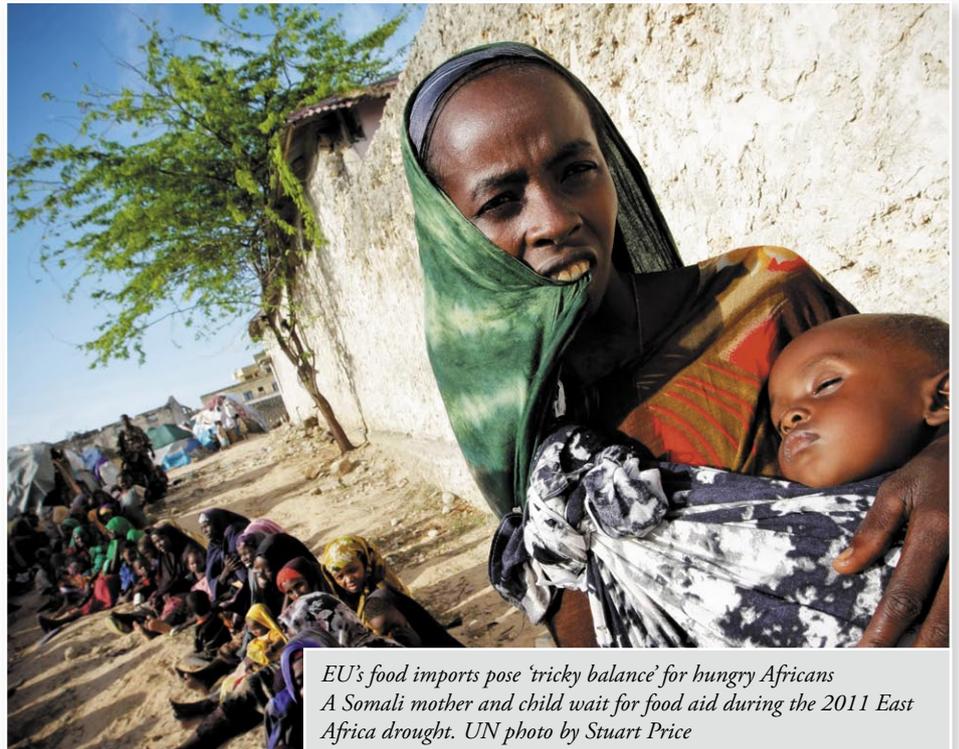
## EU's food imports pose 'tricky balance' for hungry Africans

East Africa was hit by its worst drought in half a century last year, leaving millions of people in Kenya, Ethiopia and Somalia hungry and triggering an outpouring of emergency aid from the European Union and other major donors.

Yet while relief workers fought to avert a drought-induced famine in Africa, packets of Kenyan green beans and avocados and buckets of decorative flowers from Ethiopia were available in European markets, the result of special EU trade treatment designed to help Sub-Saharan African countries grow out of poverty.

The 2011 scenario is repeated on nearly an annual basis in a region prone to climate calamities and famine and reflects an oddity in the fight against poverty and hunger in Sub-Saharan Africa, the world's poorest region and main recipient of EU development aid.

"It's easier to know the demands of the market in Europe than we do in our own neighbourhood," said Mohamed Ibn Chambas, who heads the African,



*EU's food imports pose 'tricky balance' for hungry Africans  
A Somali mother and child wait for food aid during the 2011 East Africa drought. UN photo by Stuart Price*

Caribbean and Pacific Group of States, known as the ACP, which works with the EU to coordinate trade and development assistance.

"In a particular [African] region you can have an acute shortage of goods, whereas next door you can have a bumper crop," Chambas said in Brussels.

The EU imports 40% of Sub-Saharan Africa's agricultural exports – including nuts, fresh-cut flowers, tea, coffee, citrus fruits and vegetables – Commission figures show. Trade has nearly doubled in the decade since Europe began forging closer economic ties with ACP states under EU commitments to boost trade and aid, with exports to the EU exceeding those between African nations.

## Pressure for economic development

The south-north food flow has created willing foreign markets for African farmers, while home-grown goods aren't getting to other Africans who are surviving on international relief aid flown in during food shortages.

Tim Benton, a University of Leeds professor of population ecology who serves as Britain's Champion for Global Food Security, says it's "a very tricky balance to negotiate."

"It is difficult to imagine the sense in the system, because when we import, say, green beans from Kenya, we're taking

**Continued on Page 2**

### Continued from Page 1

imbedded water from a drought-prone country, and then we're putting into our supermarkets, into our fridges and then we're throwing it away uneaten," Benton told EurActiv by telephone, saying his comments reflected his personal views.

"But equally, when you talk to governments down there they say, 'we need the money'. So in a sense, that's a very tricky balance to negotiate because by those trade deals you are helping them to develop economically, but at the same time in the long run it cannot be sustainable and that as population grows, and as climate change impacts increasingly happen, it can't continue in the way it is at the moment."

At the height of the 2011 East Africa drought, estimates of the number of people dependent on foreign aid ranged from 10 million to more than 13 million.

Development experts speaking last week at a conference organised by the Friends of Europe think-tank in Brussels said agriculture holds great potential for Africa's development. With nearly half of

the more than 800 million Sub-Saharan Africans living below the UN's poverty line of less than \$1.25 per day, farming is seen as a way to create jobs, feed a growing population, while also providing lucrative exports of food and biofuel crops.

### Promoting regional commerce

To do so, the conference experts said, the continent needs to improve land productivity through fertilisers and crop nutrition technology; irrigation and water storage practices; education and technical training; and financing opportunities for small farmers.

Yet while Europe turned towards building a common agricultural market out of the ruins of the Second World War, much of Sub-Saharan Africa is more focused exporting its agriculture and raw materials to non-Africans.

Poor transportation connections, high tariffs, security barriers and primitive information-sharing on market needs contribute to the problem, ACP's Chambas

told EurActiv, making it easier to ship goods to Europe by air or sea.

Leaders of the 53-nation African Union have approved an "action plan" to change this by promoting regional commerce and providing a more inviting manufacturing climate. The AU plan calls for the free movement of people and commerce, and multinational cooperation to address the sub-continent's pitiful infrastructure.

Regional trade blocs in the west, south and east have led to easier trade and infrastructure investments – though Chambas said central Africa remains largely outside the picture.

But poverty campaigners like ActionAid say African farmers face other challenges, including foreign governments buying or leasing land for farm export production and production of biofuels. Greenpeace, Oxfam and African-based rights groups have complained that these projects sap water and cultivatable land from needy Africans.

### Effect of climate change

Climate change is a big unknown when it comes to developing internal as well as foreign markets. While efforts have been made through the EU's 2008 Food Facility and the United Nations' Millennium Development Goals to reduce malnutrition and poverty in Africa, perverse weather events such as periods of severe drought and extreme flooding create uncertainty for the future of farming.

Lies Craeynest, Oxfam International's EU climate change policy advisor, acknowledges that EU aid and poverty-fighting efforts have led to gains in needy nations.

But, she said, climate change is likely to have major consequences for agriculture and food production. "What this will mean for many of the people living in rural areas, a large majority of them still being small-scale food producers, may actually mean a reversal of some of these achievements, particularly if you look at the longer time frame."



# Looming shortage of key crop nutrient pushes call for conservation

Stepped-up farm production to feed a growing world could lead to shortages of a vital crop nutrient, phosphorus, prompting European officials to consider conservation and recycling measures to protect supplies.

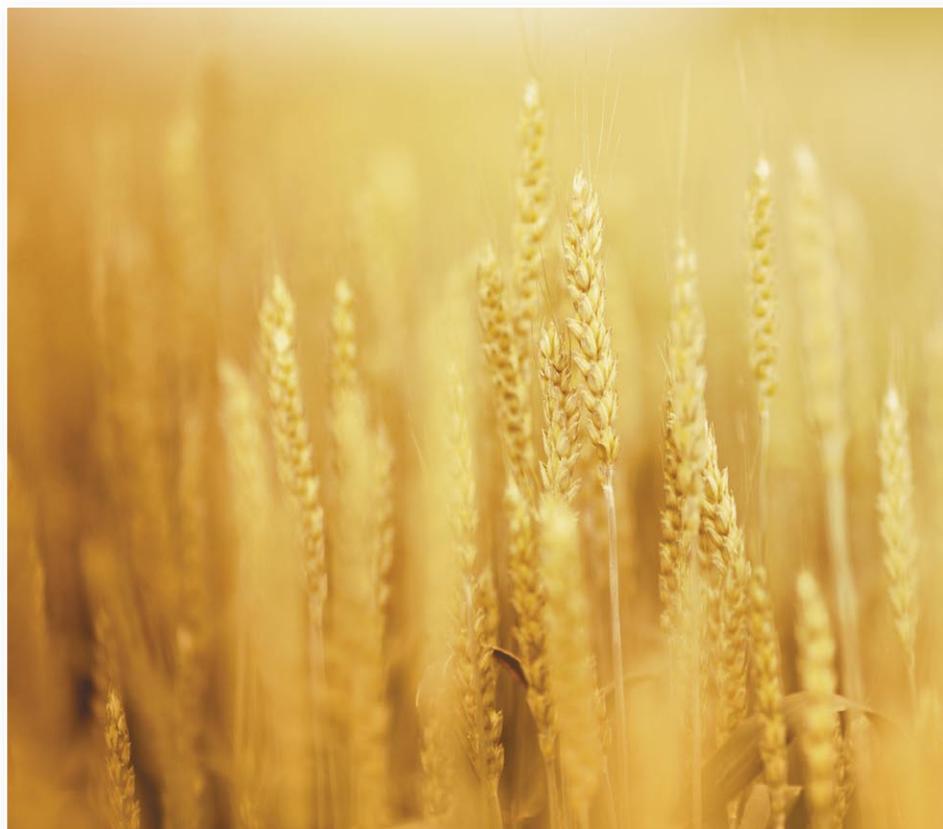
But it remains an open – and sometimes boisterous – debate how long reserves of the non-renewable nutrient will last, with projections ranging from a few decades to hundreds of years.

“Phosphorus is a major problem for Europe because it is only found in six or seven countries,” Gilberto Garuti of Neorurale, a rural development organisation in Milan, said at a recent European Parliament conference on farming. Garuti estimated that global demand will exceed supply by 2035, a figure that is in line with other assessments.

The EU is dependent on imports for nearly all its phosphorus and the European Commission’s environment directorate has cited supply security of phosphorus and the need to consider more efficient use of the resource.

European officials have raised concerns about the concentrations of supply in a handful of countries and food production pressures in developing countries that could crimp supplies in advanced nations.

Phosphorus is one of the most abundant earth elements and is mined from phosphate rock. Consumption grew fourfold between 1960 and 2008, a period



of rapid world food production, according to the International Fund for Agricultural Development.

Experts have called for expanding research and technology to recover phosphorus from non-mining sources like sewage sludge, or regulatory measures like taxing consumption to reduce waste.

Past estimates by the US Geological Survey put total global reserves at least 16 billion tonnes – one-third of it in Morocco. China, South Africa, Jordan, United States, Brazil, Russia, Israel and Syria also have significant reserves. Current production is more than 160 million tonnes per year.

## Supply concerns overstated

Yet there is an enormous gulf in forecasts for how long stable supplies will last with the planet expected to feed 2 billion more mouths, up from 7 billion today, by mid-century.

Researchers in the water and environmental studies research programme at Sweden’s Linköping University say phosphorous stocks will run out within 50 to 100 years. Earlier studies suggested supplies peaked more than 20 years ago,

but new discoveries and rapid growth in phosphorus output in China dampened concerns about looming shortages.

Other researchers say the projections are way off and point to new discoveries in countries including Iraq.

“There is no indication there is going to be a ‘peak phosphorus’ event within the next 20-25 years,” says a study by the International Fertilizer Development Center (IFDC) in the United States, adding that “phosphate rock reserves to produce fertiliser will be available for 300-400 years.”

Steven Van Kauwenbergh, a geologist who wrote the IFDC report, told EurActiv he estimates world reserves at 60 billion tonnes, a figure he contends is “very conservative” and doesn’t factor in known supplies that are more difficult to access.

“In the Western United States there is another Morocco in terms of resources, it’s just imbedded and folded in contorted mountains,” he said by telephone from the IFDC headquarters in Muscle Shoals, Alabama.

“If the price of rock gets up high

Continued on Page 4

Continued from Page 3

enough, people will go back under ground for it.”

### Rising demand – and need

What is certain is that prices for agricultural phosphorus and other crop fertilisers have risen and are likely to continue to do so – driven in part by production and shipping costs, but also growing food demand.

Phosphate rock prices hit their highest mark this century in 2008, more than \$400 per tonne, before plummeting to less than \$100 in 2009. Prices topped \$200 a year ago and stood at \$185 per tonne last month, the InfoMine news service reported.

Researchers at the Sydney University of Technology have also raised concerns about geopolitical consequences of supplies being concentrated in the hands of China, which has imposed steep tariffs on phosphorous exports, and in Morocco and the disputed

Western Sahara region.

“In 2008 China imposed a 135% export tariff to secure domestic supply for food production; a move which essentially halted exports from the region overnight,” says a study by the university’s Institute for Sustainable Futures.

“Morocco currently occupies Western Sahara and controls that region’s extensive reserves in defiance of UN resolutions,” it added, highlighting potential security concerns that could disrupt trade.

### Agreement on recovery

Despite the differing takes on future supplies, there is broad agreement that recycling and more judicious application are important to supply security and reducing environmental hazards.

The United Nations Environmental Programme contends that “major gains can be made through improving plant nutrient management and recycling phosphorus from waste streams,” including sewage

sludge.

The more efficient use of phosphorous fertilisers opens the door to better environmental stewardship, the UNEP also says.

While nitrates and other minerals used for plant nutrition work their way through plants quickly, phosphorus dissipates very slowly and excess use can lead to long-term contamination of soils. Scientists say Soviet agricultural planners’ over application of phosphorus and other fertilisers to turn arid Central Asian land into cotton and wheat fields contributed to one of the world’s worst environmental disasters – the near-death of the Aral Sea.

But European-led efforts to mine phosphorus from sewage sludge and farm waste also could have human health consequences. “There’s a lot of ins and outs to that,” Van Kauwenbergh said, noting that sewerage treatment systems in Europe often do not separate metals that could prove harmful if applied to crops.

## Farmers locked in food production vs. pollution trade-off

Agriculture remains a major threat to water quality in Europe, according to the latest report by the European Union’s environmental agency. But farmers and EU policymakers are also quick to highlight the trade-off between conservation objectives and pressure to increase food production.

At a time when other sources of pollution have cleaned up their act, the European Union’s environmental watchdog

reports that intensive farming practices are contributing to “significant loads of pollutants” in surface water.

The European Environment Agency, in a new assessment, reports that 48% of streams and lakes in the EU will fail to meet good ecological status by 2015 as required by the 2000 Water Framework Directive.

Excessive nutrients from fertilisers are a leading problem, the EEA report says, with one consequence being the growth algae that chokes off oxygen to fish and plant life in lakes, streams and bays.

“Agricultural production is becoming increasingly intensive, with high input of fertilisers and pesticides, in turn resulting in significant loads of pollutants to the water environment through diffuse pollution,” the EEA says in a new report on Europe’s water status.

The European Commission’s Water Blueprint, released a day later on 15 November, calls for better enforcement at the national level of EU laws designed to reduce pollution “from nutrients

and/or other chemicals from agriculture, households and industry.”

### Lifting food supplies

But the fight against pollution is destined to run head-on with concern about food security.

There is growing pressure, in Europe and internationally, for farmers to be more productive to address tighter food supplies, rising prices and a population forecast of 9 billion – from 7 billion today – by mid-century.

In recent years, severe droughts in the United States, Australia, Russia and East Africa fuelled commodity speculation and food price rises, but also exposed the vulnerability of supplies and the need for longer-term supply certainty.

In the European Parliament, these concerns have struck a chord with key policymakers.

Continued on Page 5

Continued from Page 4

“Unlike my green colleagues, I understand the value of nutrients,” British MEP George Lyon, a Scottish farmer and Liberal-Democrat member of the European Parliament’s agriculture committee, said at a recent round-table on fertilisers and food security. “If it hadn’t been for nutrients, agricultural production today would be below World War II levels.”

Farm, fertiliser and crop protection groups say the smart use of nutrients and pesticides can boost yields while minimising harm to the environment.

In October, the Fertilizers Europe industry association launched its ‘DAN’ campaign – directly available nitrogen fertilisers – to encourage the measured use of nitrate and ammonium forms of nitrogen, which the industry says can improve yields and reduce leaching of minerals into fresh water. Pesticide groups have launched similar campaigns for farmers.

The industry also says better use of fertilisers pays another environmental dividend – improved productivity reduces the need to clear forests and fallow land for farming, especially in rapidly growing developing countries.

Sub-Saharan Africa, for example, has among the world’s least productive farmland yet food demand forces farmers to clear forests or natural grasslands. Scientists say it’s not entirely a human-made problem – the continent has vast areas of desert and marshland that are unsuitable for crops or grazing, and in many other areas soils are high in salinity and acids.

A newly published United Nations Human Development Report on Africa, which focuses on food security, also cites crop failure and low productivity, scarce fertilisers and rudimentary irrigation practices as leading factors in food shortages in Sub-Saharan Africa. UN figures show that African farmers on average remove four times more nitrate nutrition during harvests than they return to the soil – a recipe for the gradual destruction of farmland’s productivity.



*Farmers locked in food production vs. pollution trade-off  
Photo: The New Partnership for Africa’s Development*

Environmentalists are wary of intensifying agriculture in both advanced and developing countries, arguing that reducing food waste is a better way to ensure sufficient supplies and that chemical nutrients not only have consequences for freshwater supplies, but also eventually harm the soil.

### Growing pains

Some experts say there has to be a mix of practices to both feed and protect a growing planet.

Ben Woodcock of the British National Environment Research Council advises farmers – and policymakers – to mix intensive farming with the development of buffer areas and natural habitats that can protect water bodies, improve soil quality and nurture wildlife work as pollinators and prey on pests.

“The problem is it can’t go both ways. If you keep damaging crop land, if you keep reducing the overall area of semi-natural habitats, these ecosystem services will actually decline,” he told EurActiv.

Woodcock, of the council’s Centre for Ecology and Hydrology, said that the post-second world war green revolution, the use of chemical fertilisers and pesticides brought about an initial increase in yields, “but what’s happening more and more now is that this is gradually levelling off.”

“If we are going to continue to increase crop yields over the future,” he said, “we’re going to have to make use of more than just conventional management practices – so pesticides, fertilisers, this kind of thing. We’re going to have to make increasing use of other ecosystem services, so that’s going to be natural pest control, pollination and all of these are ... likely to add notable increases in crop yields over the long term.”

Tim Benton, a University of Leeds professor of population ecology, sees environmental advantages to using fertiliser to boost farm output.

“The biggest environmental cost of agriculture is the conversion of new land, and that also has the biggest climate change consequences and the biggest biodiversity consequences,” said Benton, who serves as Britain’s Champion for Global Food Security.

He said getting more production out of land can work in advanced countries as well as in developing nations, which are squeezed by the double pressure of feeding more people and a rapidly rising middle class.

“It all comes down to being smart about things,” he told EurActiv. “We’re pushing in Europe for increased precision agriculture, resource-use efficiency, and so on, to limit [environmental] damages, and there is no reason why you can’t be sensible about it anywhere in the world, including small-holder agriculture.”

# Green farming agenda faces EU budget axe

Some EU national governments and lawmakers are pushing to weaken proposals intended to create natural defences against pesticides and fertilisers in crop fields. But they should reconsider their opposition to buffer strips and other natural areas, green advocates say.

The future of the CAP remains uncertain in part because the budget for 2014-2020 is still undecided.

EU leaders gathering this week in Brussels are to discuss financing for what has traditionally been Europe's largest single programme amid growing calls for putting the CAP on a diet. Meanwhile, the agricultural ministerial council is scheduled to consider CAP reform on 17-18 December.

It is almost certain that the CAP's 'greening' proposals will be weakened, with leading MEPs and national agricultural ministers holding out for greater flexibility.

With the economic crisis biting, there is more focus on boosting farm production to create jobs, and to address concerns about tighter food supplies and higher prices driven by recent droughts in southern Europe, the American breadbasket and Sub-Saharan Africa.

## Ecological focus area

But experts warn that weakening natural protections on the grounds that they take land out of cultivation are counter-productive.

EU farm Commissioner Dacian Cioloş's proposed reforms of the CAP,



*Green farming agenda faces EU budget axe  
Photo: Wolfgang Hoffmann / UWMadisonCALs*

issued a year ago, included linking 30% of farm support payments to a requirement that farmers maintain "ecological focus area" of at least 7% of farmland through buffer strips, hedges, fallow land and forested area.

Buffer and natural areas proposed in the Cioloş plan – though criticised as too timid by environmental groups – could actually nurture long-term productivity while reducing environmental side-effects of intensive farming, according to some experts.

## Bees worth billions

One expert encourages policies to create buffers rich in diversity that provide havens for bees, other important pollinators and insect-eating wildlife. Such buffers both reduce the need for pesticides and fertilizers and limit their impact on surface water.

"In the USA alone, it's estimated that natural pest control is worth something like \$4.5 billion [€3.5 billion] a year. You've got a world estimation of the contribution of pollination is about €153 billion a year, so these things have considerable high economic value," said Ben Woodcock of the British National Environment Research

Council.

The buffers prevent crop nutrients from leaching into waterways and provide a break – in effect a natural curtain – to reduce the amount of herbicides carried by the wind to surface water. Woodcock, of the council's Centre's for Ecology and Hydrology, testified at a European Parliament panel last month that such buffers areas are good for productivity.

"Field margins are highly compatible with high-intensity agriculture, so farmers tend to be very amenable to them," said Woodcock.

Woodcock sees the 7% focus area in the draft CAP as a potential important policy for fostering biodiversity. "Modest raises in biodiversity over very large areas would have undeniable benefit," he said in an interview.

Opposition to greening measures such as making direct farm payments conditional on greening is not universal amongst EU member states. Hans Brand of the Dutch agricultural ministry recently told a Parliamentary panel that linking CAP payments to farmers and ecological measures could achieve "real greening" with benefits for the climate, biodiversity, as well

**Continued on Page 7**

**Continued from Page 6**

as soil and water quality.

Europe's crop nutrition industry is also convinced that productivity can grow without ploughing up more land. "It is absolutely crucial from an environmental point of view to use the land under production," said Joachim Lammel, head of product and application research and development for the Norwegian-based Yara fertiliser company, told the panel on 17 October.

**'Unacceptable' demands on farmers**

Yet the European Commission proposals on land use have touched a nerve with agricultural trade groups and leading members of Parliament who see some 'greening' measures as incompatible with growth.

National ministers, testifying before Parliament last year, have been attacked the Ciołoş' draft greening measures as too cumbersome and could potentially force farmers to take land out of production despite anticipated surge in global food demand. (See background)

Copa-Cogeca, the agricultural trade organisation, has staunchly opposed linking 30% of payments to farmers to creating the ecological focus areas.

"Farmers not undertaking green growth measures should not receive the full direct payment but the penalty for mandatory greening proposed by the Commission of not only a 30% cut, but also a cut in the basic payment, is unacceptable," the organisation says.

In a setback for environmentalists, the Parliament and council of agricultural ministers sought to weaken some of the "greening measures" outlined by Ciołoş in

proposals released on 12 October 2011.

Farm ministers meeting on 16 July expressed doubts about proposals to reserve 30% of direct payments to farmers as an incentive to practice more sustainable farming. Meanwhile, a report presented the same day to the Parliament's agricultural committee raised concerns that the Commission's proposals were too complex.

But the National Environment Research Council's Woodcock says farmers need incentives to improve land stewardship.

"Most farmers tend to be not on the breadline but they are under considerable financial pressure. A lot of them have an active desire to enhance and maintain wildlife but from a financial perspective, they need a push to actually do it," he told EurActiv.com. "So you need this top-down driver to provide the kind of subsidies to allow them to implement this."

## Scientists eye nano-technologies to boost crop yields

Nanotechnologies that deliver fertilisers to plants offer promising ways of improving farm productivity while reducing the risk of water contamination. But the scientists behind a new Swiss-funded study caution that while the technology is still evolving, potential risks must be considered.

The European Union's Horizon 2020 research programme proposes heavy investment in developing materials and machines that are built from an atomic or molecular scale, with the European Commission proposing some €6 billion in financing for nano and other advanced technologies.



A UN Food and Agriculture Organization conference held earlier this year in Rome identified nanotechnology as potentially having "significant benefits" for food security in a world facing a population rise from 7 billion now to 9 billion in 2050.

Clemens Breisinger, a German

agricultural economist and senior researcher at the International Food Policy Research Institute (IFPRI), says the growth in consumption in the emerging world's middle class also creates pressure for more production.

**Continued on Page 8**

## Continued from Page 7

“As incomes grow, people tend to eat richer food, more meat,” Breisinger said.

“The only way to meet the demand is to significantly increase global food production,” Breisinger told EurActiv in a telephone interview. “The big question now is can this be done through productivity gains, or do we need more land.”

The Washington-based IFPRI has called for the Consultative Group on International Agricultural Research, administered by the World Bank, to support more research on ways nanotechnology can improve farm production and water safety, especially for the world’s most impoverished people.

## Urging caution

But the scientists behind a new Swiss-funded study caution that while the technology is still evolving, potential risks must be considered.

Researchers at Agroscope Reckenholz-Tänikon Research Station (ART) in Zurich and the Swiss Federal Office for Agriculture in Berne say that direct application of plant protection products and fertilisers containing nanosubstances may pose potential hazards to microorganisms that flourish beneath the Earth’s surface.

The scientists contend there is only limited research into the effects of man-made nanomaterials on soil health, and point out that “the potential improvement of plant protection products and fertilisers through nanomaterials is offset by their significantly higher flux into soils if nanomaterials are used.”

Fragile microorganisms like bacteria and fungi are natural suppliers of nitrogen, phosphorus and other nutrients to crops, and are paramount for soil fertility and plant health.

“We cannot afford to jeopardise these essential ecosystem services” explained Thomas D. Bucheli of the Agroscope ART, and an author of the report funded by the Swiss National Science Foundation. “These symbiotic communities are key for a sustainable agriculture and deserve our special attention.”

“With nanotechnology-related markets growing at an enormous speed, there is an urgent need to regulate products with nano content,” the researchers argue in their study published by the Journal of Agricultural and Food Chemistry.

“This need for regulation is, however, in general but also specifically for agriculture adversely accompanied by a lack of knowledge on the current state.”

The study points out that while Swiss companies are required to declare any nanomaterials contained in new pesticide products, international guidelines for nano risk assessment are still at the development stage.

## EFSA guidelines

Last year, the European Food Safety Authority published guidelines for the risk assessment of engineered nanomaterial in food and animal feed. Though it covers pesticides and food additives, the document does not deal with fertilisers.

Still, Bucheli said regulators have learned from past consequences of embracing technology without weighing the potential risks.

For instance, the pesticide DDT became a weapon of choice against malaria and typhus starting in the 1940s. Yet DDT, or dichloro-diphenyl-trichloroethane, was later linked to cancer and birth defects in humans, and to disappearing wildlife, leading to restrictions on its use.

“On a very general level, regulators in the EU and in Switzerland and worldwide are doing a pretty good job right now given that this [nanotechnology] is really an evolving field of development,” Bucheli told EurActiv. “I think we are pretty much on time with our activities, both as researchers and regulators.”

## Small is big

Both the advanced and emerging countries see enormous potential in nano developments.

German chemical company BASF and Syngenta have developed applications at the nano-level for crop protection. The United States is using nanosensors linked to global

position systems to monitor soil conditions.

Researchers in China used nanomaterials to detect contamination in dairy products in 2008, when the melamine contamination of milk caused thousands of people to become sick.

The Fraunhofer Institute in Germany is working on using nanotechnologies to improve water safety, purification and wastewater treatment, leading to reduced energy and chemical consumption.

Last year, European researchers led by Britain’s Cranfield University developed a sophisticated way of conducting field tests that can detect pathogens in water using strands of DNA to trigger warnings.

Such developments could have major health implications for global health. The World Health Organization estimates that 1.7 million people, most of them in developing countries, die every year from diseases related to contaminated water, inadequate sanitation and poor hygiene.

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