

For instance, the Water Efficient Maize for Africa (WEMA) partnership, led by the African Agriculture Technology Foundation (AATF) and supported by the Bill and Melinda Gates Foundation, is a five-year public-private partnership with the aim of developing new African drought-tolerant maize varieties. Modest yield gains could mean an additional two million tons of maize during drought years that could feed 14 to 21 million more people^{iv}.

How do EU policies on GMOs influence developing countries?

The EU's reluctance to biotechnology adoption and to the import of biotech crops already has major effects on developing countries, particularly in terms of exporting unfounded fears and its over cautious regulatory approach, evoking trade disruptions, and increasing demand and thus world food prices, which tend to hit consumers in the developing countries hardest.

Fast Facts

- More than half the world's population, 60% or about 4 billion people, live in the 28 countries planting biotech crops in 2012.
- In 2012, the growth rate for biotech crops was at least three times as fast and five times as large in developing countries, at 11% or 8.7 million hectares, versus 3% or 1.6 million hectares in industrial countries.
- Two new countries, Sudan (Bt cotton) and Cuba (Bt maize) planted biotech crops for the first time in 2012.
- In 2012, India cultivated a record 10.8 million hectares of Bt cotton with an adoption rate of 93%, whilst 7.2 million small resource poor farmers in China grew 4.0 million hectares of Bt cotton with an adoption rate of 80%, cultivating on average, 0.5 hectare per farmer.

What others say:

"In order to grow, agriculture must learn to save."^v
FAO director-general Jacques Diouf, 2011

"GMOs offer potential of increased agricultural productivity, improved nutritional values that can contribute directly to enhancing human health and development."^{vi}
World Health Organisation, 2005

"We support a range of crop breeding techniques so farmers have options and can choose what's right for them. These techniques include conventional breeding; an advanced breeding technique called marker-assisted breeding; and, in some of our grants... genetic modification."^{vii}

Bill & Melinda Gates Foundation, 2011

Want to know more?

- FAO hunger statistics: www.fao.org/hunger/en
- Communiqué from 80 ministers on food security, January 2013: www.bmelv.de/SharedDocs/Downloads/Ministerium/Veranstaltungen/GFFA2013/Abschlusskommunique_Agrarministertgipfel2013_EN.pdf?__blob=publicationFile
- Sustainable intensification in agriculture: www.fcrn.org.uk/sites/default/files/SI_report_final_0.pdf
- EFSA on GMOs with video: www.efsa.europa.eu/en/topics/topic/gmo.htm
- UK Foresight Report on Food and Farming: www.bis.gov.uk/assets/foresight/docs/food-and-farming/11-546-future-of-food-and-farming-report.pdf
- ISAAA, Global Status of Commercialised Biotech/GM Crops: 2012

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- i FAO 2010
 - ii Brookes G, Yu TH, Tokgoz S, Elobeid A. The production and price impact of biotech corn, canola and soybean crops. AgBioForum 2010; 13:25-52. www.agbioforum.org/v13n1/v13n1a03-brookes.pdf
 - iii ISAAA facts and trends – Burkina Faso
 - iv "Why the Foundation Funds Research in Crop Biotechnology", Bill & Melinda Gates Foundation, <http://docs.gatesfoundation.org/agriculturaldevelopment/Pages/why-we-fund-research-in-crop-biotechnology.aspx>
 - v <http://blogs.wsj.com/source/2011/06/13/fao-sustainable-farming-needed-to-feed-the-world/>
 - vi www.who.int/foodsafety/publications/biotech/biotech_en.pdf
 - vii <http://docs.gatesfoundation.org/agriculturaldevelopment/Pages/why-we-fund-research-in-crop-biotechnology.aspx>

GREEN BIOTECHNOLOGY FACTSHEET

FOOD SECURITY

How can GM crops contribute to development?



Innovation in plant breeding is essential to feed a growing world population and help reduce poverty by improving food security.

Farmers consider carefully which seeds to choose, based mainly on seed performance and price. Over 17 million farmers around the world have chosen to grow genetically modified (GM) crops on 170.3 million hectares of land. Over 90%, or over 15 million, farmers growing GM crops were small resource-poor farmers in developing countries.

From 1996 to 2011, GM crops generated globally economic gains at the farm level of US\$98.2 billion.

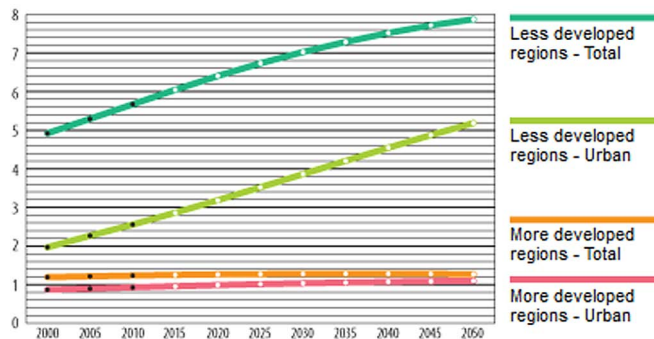
How many people are food insecure?

Close to one billion people are chronically hungry and up to two billion lack food security intermittently due to varying degrees of povertyⁱ. The latter do not always have enough money to buy sufficient quality and nutritious food, or if they are subsistence farmers, they may not harvest enough every year to feed their families adequately. Recent figures show that there is globally a reduction of people suffering from hunger and malnutrition; however, the challenge remains as more people leave the rural areas for the cities, where they then rely on surplus of farm production.

Why do we need to produce more and better?

There will be nine billion people on our planet in 2050. Consumption patterns are changing, with an increasing demand for meat. To meet this demand, we need to double food production in the developing world. We will need to produce the same amount of food in the next 40 years as we did in the past 8,000. At the same time, we need to avoid the over cultivation of agricultural land and protect our environment: 30% of global land is already degraded and climate change has made farmers lose anywhere from 10-25% of productivity in developing countries.

World population, 2000-2050 (billions)



Source: FAO's 'Save and Grow' report, 2011

The expansion of arable land on a large scale is not an option.

How can we address this challenge?

Less than 5% of the overall €100 billion in global development aid went to support agricultural production in 2011, according to the OECD. In parallel, the UN estimate shows that between 2015 and 2030, 80 per cent of the required food production increases will have to come from intensification in the form of yield increases and higher cropping intensities. In a communiqué signed in January 2013, 80 ministers emphasised that "agricultural production needs to be substantially increased with average annual net investment in agriculture in developing countries of at least USD 83 billion".

They also stressed the need for "sustainable agriculture, and its intensification". This means growing more with less: less input, less energy, less water. Contrary to what some say, agro-ecology and new technologies like biotechnology are not opposite concepts. Those who claim they are incommensurable mislead people and depict an inaccurate vision of how agricultural systems work and what role science and research play in improving the way we grow food in an environment that is continuously changing. In agriculture, increasing productivity can go very well hand in hand with decreasing the environmental impact. Making use of modern biotechnology is just one way to reduce pressure on land and other resources, and ensure sustainable agriculture.

How can GM crops help sustainable agriculture?

Firstly, by improving yields while using land more sustainably: yields can be increased by 6%-30% on the same amount of land, avoiding the need to plough up land that is currently a haven for biodiversity. Researchers estimate that 2.64 million hectares of land would probably be brought into grain and oilseed production if GM traits were no longer usedⁱⁱ.

Secondly, by using low- and no-till farming methods: fuel use and CO₂ emissions can be decreased and soil moisture conserved.

Third, by protecting crops from insect damage: this reduces the number of applications of pesticides, herbicides and fertilisers. Last but not least, agricultural biotech produces food containing fewer toxins such as mycotoxins, a toxic fungus that infects plants damaged by pests.



Source: www.motherjones.com/blue-marble/2013/02/gmo-farming-crops-more-popular-than-ever-world-charts3

GM uptake in various parts of the world

More and better adapted new traits can be developed more quickly to suit local farmers' needs. High performance seeds can be extremely easily deployed and are an efficient and quick way to enable farmers in developing countries to earn a better living. GM adoption is highest in the leading commodity exporting countries of North and South America, but parts of Asia and Africa as well as Australia are also investing heavily in the technology. 7.2 million smallholder farmers in China and 7.2 million in India cultivate Bt cotton. In Burkina Faso, national benefits to Bt cotton farmers in 2009 were estimated at US\$35 million. Extrapolating for 2010, when the adoption rate was 65%, compared with 29% in 2009, the national benefit from Bt cotton in 2010 was about US\$80 millionⁱⁱⁱ.

Biotech projects for development

The biotech industry and public research institutes are conducting research in promising areas to develop biotech varieties for staple crops such as cassava, (iron and vitamin enriched) bananas, sorghum and maize. The "Golden rice" is close to commercial approval in the Philippines and was developed to prevent diseases such as blindness, caused by lack of vitamin A. Some of the modifications are specifically targeted to address climate change and the uncertainty it gives to the farmers.