

Role of biotechnology in agriculture and rural development



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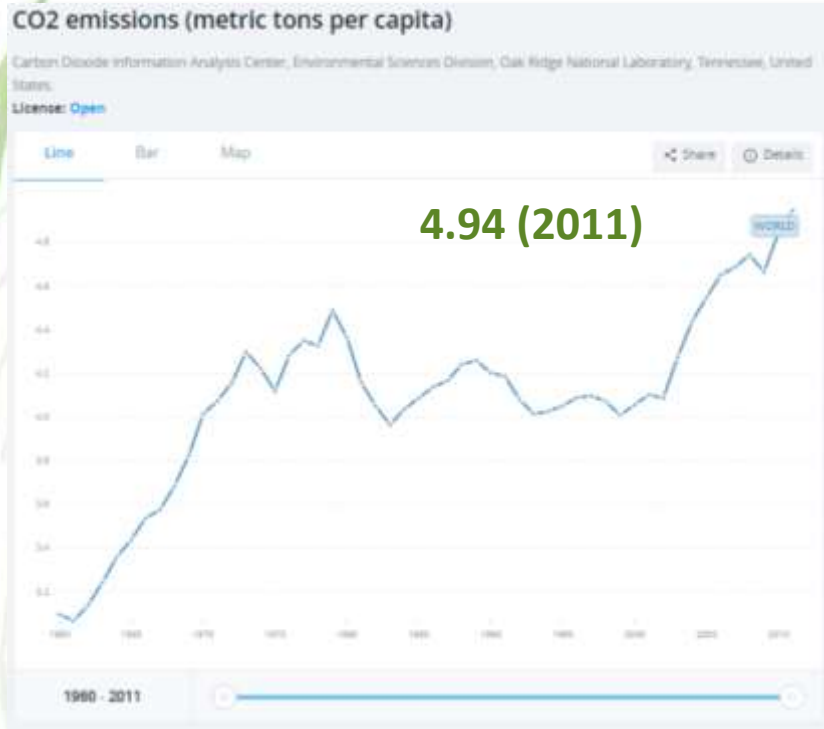
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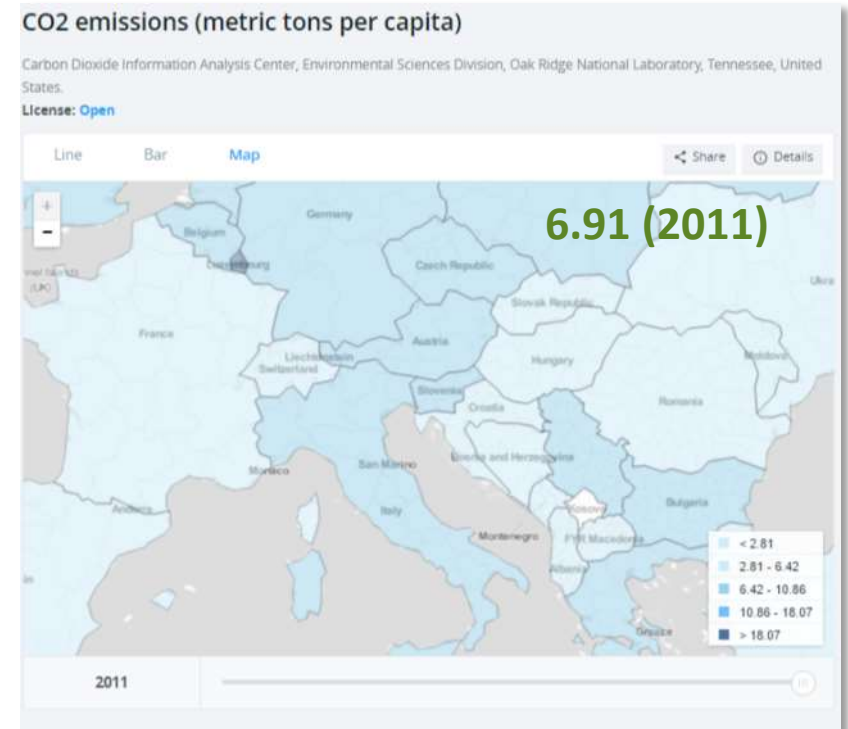
Pressing Needs of Agriculture

- **Reduce its environmental footprint** - the World needs to drastically reduce glasshouse gas (GHG) emissions from agriculture by 2050

World



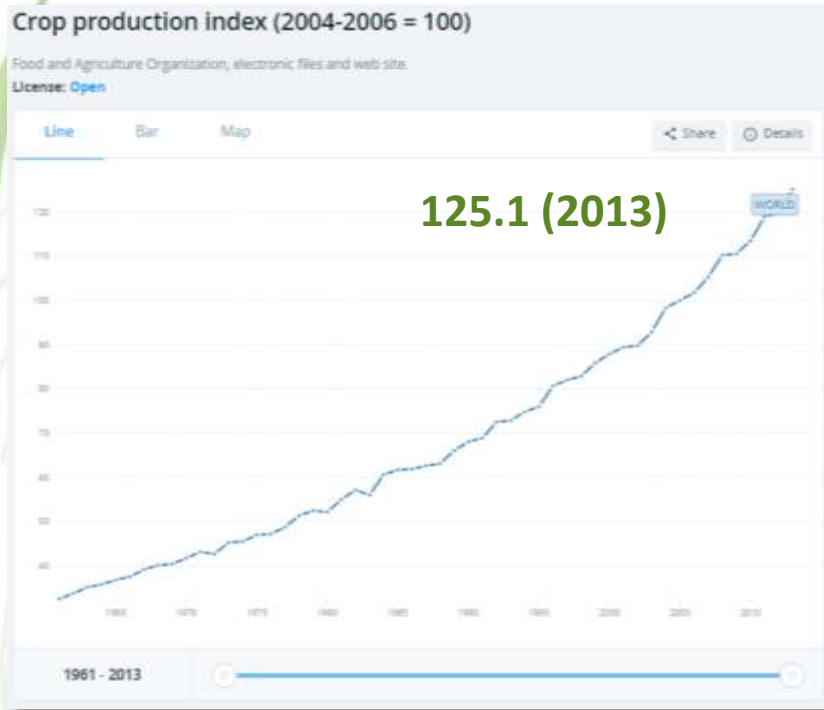
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Pressing Needs of Agriculture

- **Increase its productivity** - the World needs a 30-80 percent increase in global food production

World



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Biotechnologies provide and offer much promise in agribusiness



- **Development of genotypes with abiotic stress tolerance** (e.g., aluminium and manganese-tolerant crops which can grow in acidic soils, water-inundated soils, salt tolerance, drought tolerance)
- **Development of non-chemical alternative pest management technologies** (e.g. bacterial, viral and fungal disease resistance, insect resistance, vaccines against animal diseases)
- **Improving agronomic traits** (e.g. marker-assisted-selection to increase yield potential in both animals and plants)
- **Generation of higher nutrient levels** (e.g. pro-vitamin A, iron, essential amino acids) in nutrient-deficient staple crops, such as rice
- **Better crop digestibility** for animals and humans
- **Delayed over-ripening of fruits and vegetables** (e.g. to reduce post-harvest losses)
- **Generation of disease-free stock** (e.g. micro-propagation and plant tissue culture technology of vegetatively-propagated staple crops, such as cassava, potato, sweet potato, taro, bananas and plantains)
- **Improved fermentation technologies**
- **Improved technologies for generating biomass-derived energy**
- **Arable soil restoration** (e.g. clean-up of contaminated industrial land for agricultural use with GMMOs)

The role of biotechnologies in agribusiness

- **Science alone is unable to provide a complete solution to the problems of rural development**
- Biotechnological approaches to agricultural improvement can generate social, economic and environmental benefits
- **Current bias in agricultural biotechnology research towards commercial markets** - very few public-sector institutions or organisations are involved in the transfer of appropriate biotechnologies to the farming systems of rural groups
- **An array of agricultural biotechnologies currently being utilised** (e.g. plant tissue culture technology, marker-assisted-selection, genetic engineering, precision breeding, etc.)



Challenges faced by policy environment

- Specific biotech products are usually/expected to be regulated by governments
- Regulatory jurisdictions vary in the type of biotech product that will fall under regulation (e.g. GMO v Cisgenics v Precision Breeding)
- Producers need to be aware of not only their national (and potentially regional) policy environment, but also those of their export countries, if applicable.



Challenges faced by social reaction

- Many of the opportunities to produce new or novel products involve **genetic manipulation**
 - Current products are defined as “GM”; **how will products of precision breeding be defined and regulated?**
- Regulatory and approval processes cost of regulatory approval for GM crops – currently not risk proportional
- Activities of opposition groups
- Commercialisation, venture capital, and investment capital
- Consumer awareness and concern about GM crops



What is the ICGEB doing to help?

- Providing advisory services and technical assistance to governments of Member States in the area of biotechnology regulation (“biosafety”)
- Currently has two major programmes: 1 in sub-Saharan Africa, the other in Latin America & the Caribbean
- Involve:
 - Enhancing capacities of Project countries to develop their own biosafety legislation and administrative systems
 - Developing key elements for the elaboration of regional and country-tailored communication strategies and tools on the safe use of GMOs
 - Providing relevant regulatory exchanges and training in scientific and technical elements of biosafety regulation



ICGEB BG programme strengths



ICGEB - Trieste



ICGEB – Cape Town

- *“Bottom-up” approach to providing capacity enhancement assistance, focusing on locally-identified needs*
- *Dedicated staff serving needs of Member States and project beneficiaries in unbiased, transparent and professional manner*
- *Highly-regarded by international community for providing high quality scientific and technical training in biosafety*
- *Strong associations with established GMO regulatory offices and staff, forming the basis of training and consultancy resources*
- *Complementary and close collaborations with like-minded technical assistance providers around the world*
- *Effective technical and finance administration in ensuring successful project implementation*

Members of the Biosafety Group

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