

Collaborative Research project
Agricultural Biotechnology for Development: socioeconomic issues and
institutional challenges of Genetically Modified (GM) Crops in developing countries

Introductory note

Sakiko Fukuda-Parr and Calestous Juma,
Harvard University

Objectives of the project

The objective of this collaborative research project is to identify the key institutional and socio-economic challenges for developing countries in taking up GM crops, based on a review of experiences in 8 countries. We aim to publish a volume putting together 6 country case studies in 2005.

While the introduction of genetically modified (GM) crops continue to be fiercely contested, the reality is that this is one of the fastest developing and diffusing technology – in research, development, production and market. To quote the January 15 issue of the Economist “Greens hate them, but farmers love them; that is the lesson of statistics out this week on the spread of genetically modified (GM) crops. The area sown worldwide last year was up by a startling 20% on 2003, to 81m hectares.” (The Economist, 15 January) Though still concentrated in the US, new trends show rapid rise in area under production in developing countries, notably China, India, Argentina, Brazil and South Africa. There are now 17 countries with significant areas under commercial production, and 14 countries with over 50,000 ha. (Clive James/ISAAA, 2004) Moreover, GM crops are becoming a major factor in global markets. For soy, GM crops account for 60% of total world production. GM crops account for more than 21% of world cotton acreage and 16% of maize. GM technology will therefore increasingly influence world markets and world prices of those commodities. Research and development is taking place in 63 countries of the world.

As this technology develops and becomes a powerful market force, the question for developing countries is how will they participate? Will they be able to develop the technology to address their productivity constraints, that would contribute to meeting their national priorities? Will they lose out in global markets as other countries become more competitive having adopted GM crops? Will they lose out if of ‘GM-free’ markets if they adopt GM crops? Will they be able to manage the necessary biosafety requirements? Will the new varieties be scale neutral and beneficial to small farms as well as to large commercial farms rather than turn into a source of rural social inequalities? Five years ago, the seminal report on prospects for GM crops in developing countries by the UK Nuffield Council on Bioethics warned *“As GM crop research is organized at present, the following worst-case scenario is all too likely; slow progress in those GM crops that enable poor countries to be self sufficient in food;*

advances directed at crop quality or management rather than drought tolerance or yield enhancement; emphasis on innovations that save labour costs (for example herbicide tolerance), rather than those that create employment; major yield-enhancing progress in developed countries to produce, or substitute for gm crops now imported in conventional (non-GM) form from poor countries'.

Many commentators consider that the developing countries will not be able to make use of this new technology to their advantage because of a capacity constraint - because of lack of technical capacity and financial resources as well as the administrative capacity for regulation. But this question has not been adequately tested empirically. And as documented in a recent study by IFPRI of 61 public research institutions in 15 countries public research institutions in developing countries have achieved considerable number of results. (Cohen, 2005) The study concludes them to be 'competent, though largely unproven player for GM crop production in developing countries'.

The institutional structure of GM crop research and development is radically different today in the era of gene technology and globalization. Unlike research and dissemination for the Green Revolution of the 1960s and 1970s that was public sector led and financed, it is two multinational corporations that lead and dominate the 'gene revolution'. In developing countries, it is public sector research institutions that are carrying out much of the work, but globally, it is the private sector, particularly large multinational corporations that dominate; expenditures were estimated at 1 to 1.5 billion while public sector research in developed countries was a mere \$900-100 million, and in developing countries, \$140-230 million, and the CGIAR centers spent \$25-30 million. (Fisher and Byerlee, 2000) The incentives built into this institutional structure is at odds with public priorities of developing countries. Private corporations aim to make a profit, and focus on crops where there is a large global market or on crops with high returns.

The key challenge is to develop the institutional capacities to be able to meet their own priorities for increasing their farm productivity. The public sector has a central role, but how they interact with the private sector will be critical. The case studies in this volume seek to document these challenges.

The volume aims to contribute to the policy debates about the adoption of agricultural biotechnology in developing countries by providing a realistic assessment of the social economic benefits, limitations, and risks of this new technology. It will not cover the environmental risks since these issues are amply covered in many other publications. However, there is a gap in the literature with respect to a coherent analysis of the socio-economic aspects.

Organization and timeline of the project

The project is a collaborative activity led and organized by Calestous Juma and Sakiko Fukuda-Parr. The project will involve two groups of researchers:

The first group working on policy themes who would participate in a workshop to be held in January at Harvard University. The papers presented will be published in a special issue of the *International Journal of Technology and Globalization*

The second group working on country case studies would present their papers at a workshop to be held at villa Bellagio in May. These country case studies will be part of a book to be published. The countries will include:

1. Case study: China (Jikun Huang)
2. Case study: India (Bharat Ramaswami)
3. Case study: Brazil (Jose Maria da Silveira)
4. Case study: Argentina (Daniel Chudnovsky)
5. Case study: South Africa (Marnus Gouse)
6. Case study: USA (Greg Traxler)
7. Case study: West Africa (Marcel Nwalozie)

