Can Agricultural Biotechnology be Pro-poor?

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DEMOCRATISING BIOTECHNOLOGY

The argument for agricultural biotechnology appears, at face value, simple. Well-harnessed new technologies can solve the problems of famine and hunger in the developing world, by increasing yields and overcoming challenges of disease, pests, drought and nutrient deficiencies. The reality, of course, is that things are not so simple. A more sceptical look at the assumptions of the 'feeding a hungry world' storyline suggests some important questions.

A food security crisis?

Growing populations and declines in yield growth of basic food crops in the post-Green Revolution era are, for many, *the* big contemporary problems. Biotechnological applications, and in particular transgenics, are an important part of the solution, it is argued. Production is the key, and redistribution/access issues, while important, are infeasible to implement. A focused biotech 'Gene Revolution' is the only realistic answer.

This 'feeding a hungry world' storyline is reflected in the justifications for the policy positions of most international organisations (and in much biotechnology industry PR material besides). How are these positions justified? Recent work by organisations such as the International Food Policy Research Institute and others, have rekindled a policy focus on food security issues, with scenario models, production gap predictions and Malthusian overtones surprisingly reminiscent of the debates in the 1970s. Debates about the implication of new trade regimes under the WTO have added fuel to the fire (see Briefing 6). These discussions have firmly re-established the centrality of global food security issues in international policy discourse. Biotechnology is seen as a potentially neat, science-based and apparently apolitical solution to this unfolding scenario.

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Is biotechnology the answer?

But what is the likelihood that agricultural biotechnology will respond to the needs of poor farmers in the developing world? Will technological solutions really eliminate hunger and famine? Is the science up to it? Are the political and economic conditions right? Are there enough public resources available? Will the private sector play ball? Are there other solutions that might deliver similar – or even better – returns to the undeniably important issue of raising agricultural production? The Nuffield Council On Bioethics sounded a helpful note of caution:

> *As GM crop research is organised 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 which create productive 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.*

So what are the advocates of a pro-poor biotechnology assuming when they argue for the importance of seeing agricultural biotechnology as the solution to global food security problems? The box (see over) identifies ten key assumptions.

Critics sceptical about the future of agricultural biotechnologies regard meeting all (or even some) of these assumptions as highly unlikely. They question the likelihood of biotechnology science delivering the type of products that would make a big difference in the medium or even long term. Even if the science were up to it, a variety of other factors make a pro-poor biotech unlikely. Among these are:

- the limited availability of public funds;
- the complications of intellectual property arrangements, and the aggressive insistence of the private sector majors on holding on to their proprietary rights; and
- constraints associated with the way the agri-food industry is increasingly organised around a limited number of multinational companies (see Briefings 3 and 4).

The most likely scenario is a 'worst case', one where multinationals dominate the agricultural sector, promoting biotechnology products only of interest to better-off farmers in higher resource endowment areas.

TEN KEY (SOMETIMES HIDDEN) ASSUMPTIONS OF THE PRO-POOR BIOTECH ADVOCATES

1 The priority for tackling poverty and food insecurity needs to be focused technological transfer to support agricultural development.

2 Declining yield growth in the major food crops is the key factor affecting food insecurity and both chronic and acute famine.

3 Biotechnology can deliver elusive solutions to key agricultural constraints affecting poor people, including resistance to pests and diseases, salt and drought tolerance and yield improvements in crops.

4 The resulting products will be acceptable to farmers because they will provide improved returns, both reducing costs and providing tangible benefits.

5 Biotechnology options offer more cost-effective and sustainable solutions to key agricultural problems than more conventional, lower tech solutions.

6 Major increases in international public research funds will be available for both basic and applied research in high-end biotechnology.

7 Intellectual property issues will be dealt with through 'public-private partnerships' modelled on the Vitamin-A rice brokered deal.

8 The private sector will deliver solutions to developing countries suited to local needs in areas where there are high returns: high-value or cash crops, or well-established hybrids such as maize.

9 Food and biosafety issues will not be a major issue in the promotion of biotechnology. Transgenic products are essentially 'substantially equivalent', and appropriate refuge strategies for new introductions will prevent major risks to biodiversity. Problems of antibiotic marker resistance will be ironed out through scientific developments.

10 Regulatory issues will be dealt with throughout the world by international 'capacity building' along standardised lines.

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But a non-biotechnology future may not be so rosy either. The critics, in turn, must assume that the development of alternative technologies can result in the necessary returns (in terms of production, risk reduction etc.) to increase food security, over areas far larger than the relatively isolated case examples documented to date. They must also assume that policies for local, national and international redistribution of food will take place. This is unlikely where governments lack capacity or are constrained from intervening in the economy.

So far, the answers are not clear. The emerging mainstream consensus position on 'pro-poor biotechnology' is far from established. With the current cosy talk of win-win solutions, couched in a swathe of problematic assumptions, a major redefinition of the parameters of – and, crucially, participants in – the debate is essential.

Issues of ownership, control and involvement are central to guiding the directions of innovation, the form of risk assessment and the broader structure of the agri-food business. The technical questions at the centre of policy debates are thus inevitably political. The future is not just about the need for more scientific effort and technical breakthroughs generated by both more public funding and private sector interventions, but centrally about the political economy of agriculture and food in the developing world. With the policy debate cast in these wider terms, there may be more chance of seeing under what conditions biotechnology can indeed benefit the poor.

This briefing was written by Ian Scoones (IDS). It is based on papers 22, 23 and 41 (see publications list). These are available at: **www.ids.ac.uk/biotech**

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