



CGPRT

Flash



Volume 2, No. 12 December 2004

ISSN

1693-4636

Short Article

## No Such a Christmas Gift for the Rural Poor: Biotechnology

Biotechnology is often presented as the new miracle solution for solving the world's food problem; after the Green revolution, the Gene Revolution. However, concerns are rising in developed and developing countries about the real impact of one branch of biotechnology, Genetic Engineering, and its application through the introduction of Genetically Modified Organisms (GMOs) in the world ecosystem. Voices of independent scientists are challenging the myths of genetic engineering (Hickey and Mittal, 2003). One key issue in this debate is the alleged contribution of genetic engineering for solving poverty problems in rural areas. It is not incidental that the theme of the 2004 FAO report is the question "Agricultural Biotechnology: Meeting the needs of the poor?" (FAO, 2004).

As argued in the aforementioned report, genetic engineering could improve the condition of the rural poor basically in two ways. The first is through the development of more productive crops that have been genetically modified to suit the needs and conditions of the rural poor's ecosystems. The second is the enhancement of the nutritional content of the crops grown and consumed by the Poor.

Regarding the first point, evidence shows so far that most of the trials and varieties released by the companies who trust the world GMOs market, focus on a limited number of crops and resistance traits (Pingali and Raney, 2003). For the Poor, the good news is that some of these crops are secondary crops (maize, soybean, potato, sorghum, lentils). The bad news is that the varieties under trial relate mostly to resistance to biotic stress (insects, diseases, weeds) when abiotic stress (drought, salinity, soil toxicity, erosion) is often what most limits crop productivity in marginal areas. Arguments that pest resistance is needed for the crops grown by poor farmers because it will reduce the cost (and risks) of pesticides deliberately ignore the fact that these costs are negligible for poor farmers who cannot afford them anyway. Besides, how can they afford the cost of the new seed varieties that must be purchased for each planting season? There is no evidence of GM crops safety as far as transgenic contamination is concerned (World Bank, 2004), so how much less hazardous is it to grow them in the fragile environment of the rural poor?

The belief that higher yielding varieties would improve the situation of the Poor shows only a limited understanding of their real conditions since, in Asia and the Pacific, most of them are landless people, and small farmers (Bourgeois, 2004; Gubbels, 2004) who usually have no land rights.

There is no reason why the use of GMOs will modify the land tenure, the land distribution, and the wage systems; all of which more significantly contribute to keep the disadvantaged rural populations in poverty.

With regards to the second point, enhancement of nutritional content is probably one of the major contributions of genetic engineering in improving the conditions of poor populations. However it won't make the poor richer, it will make them more resilient to endure their harsh conditions, but will these actually also improve?

Actually, the Gene revolution is as much unlikely to significantly reduce rural poverty as the Green Revolution was and it has even a more poor-adverse feature, being mostly promoted by multinational private companies for which it is above all a "Greens" Revolution. To produce GM crops requires huge financial and technical investment that must be paid off. Therefore, clients must be able to purchase the new technology; it won't be given away for free. The Indian biotechnology industry for instance, is expected to earn \$ 5 billion in revenues in the next five years (Ernst and Young, 2004), but that money will not come from the Poor. The Poor are not creditworthy; they are not an attractive market; they will be left behind. As of yet, the wealth to be generated from future genetically-engineered "miracle crops" seems unlikely to spread to the Poor.

Even with the dubious assumption that genetically engineered crops are safe, it is a long way before the Poor may feel any benefits. Governments and international organizations cannot hope for a hypothetic and spontaneous technological spillover from rich, developed and powerful biotechnology producers to poor, left-behind and powerless users. The development of rural poor areas and their populations is not only dependent on biotechnology progress, it is also dependent on rural infrastructure investment, on more equitable redistribution of economic growth, on more focus and understanding of the needs of the rural poor.

CAPSA in its new program of work for 2005-2010 has therefore included a research theme called "BIOTECH". It aims at assessing how and how far biotechnology applied to secondary crops can contribute to rural poverty alleviation in Asia and the Pacific ■

Written by Dr. Robin Bourgeois, IS/DB Programme Leader, UNESCAP-CAPSA, Bogor, Indonesia.

(References available upon request)

Flash **BREAKING****Increasing Fund for the Poor**

Half the people in the world live on less than \$ 2 a day. A fifth live on less than a \$ 1 a day. Over the next 25 years, two billion more people will be added to the global population -97 per cent of them in developing countries, most of them born into poverty. To address the urgent needs of the poor, the World Bank called upon the donor community to increase funding to the International Development Association (IDA), the World Bank's lending arm for the poorest countries. The countries eligible for IDA are home to 80 per cent of the world's poorest people who live on \$ 1 a day.

Wolfensohn, James D., 2004. Eradicating Poverty for Stability and Peace, <http://web.worldbank.org>, (3 October 2004).

**Impressive Achievements in Reducing Poverty**

Most countries strive to improve living standards and reduce poverty, but China, India, and Uganda stand out for their achievements. China's growth over the last 20 years has been unprecedented, lifting 400 million people out of poverty. India has more than doubled its average growth rate since the 1970s, making big steps towards reducing poverty. Uganda achieved a growth rate from 1993 to 2002 that was eight times the average in Sub-Saharan Africa, simultaneously slashing poverty.

Devarajan, Shantayanan and Smith, Warrick, 2004. A Better Investment Climate for Growth and Poverty Reduction, World Bank, Press Release, <http://web.worldbank.org>, (30 September 2004).

**Challenges for Marginal Areas Development**

About 1.9-2.2 billion people live in marginal, ecologically fragile, rural areas in developing countries of Asia, Africa and Latin America. Their agricultural systems are complex, high-risk and low yield (less than 1 ton per hectare). Moreover, small-scale farmers, herders and landless rural laborers are the world's struggling underclass. They constitute almost four-fifths of the world's estimated 800 million chronically hungry people.

Gubbels, Peter, 2004. Promoting Integrated Approaches to Rural Development for Poverty Eradication and sustainable development: The Critical Role of Smallholder Agriculture, World Neighbors, <http://www.wn.org/WNB-3048FallNeighbors.pdf>.

**Link between Poverty and Industrial Growth**

A survey using a recently constructed cross-country data set on absolute poverty found that the poverty-growth linkage is strongest in East Asia and that this linkage is essentially driven by growth in the industrial sector. By contrast, industrial growth has had little positive impact on poverty reduction in any other region. These findings are consistent with the notion that East Asia's greater success in poverty reduction lies in its greater openness and market orientation, which created a pattern of labor-intensive industrial growth that led to rapid growth in employment and poverty reduction.

Hasan, R. and Quibria, M.G., 2004. Industry Matters for Poverty: A Critique of Agricultural Fundamentalism, Blackwell Publishing, <http://www.ingenta.com>.

**The Threat of Invasive Alien Species**

Dr Kathy MacKinnon, the World Bank's lead biodiversity specialist, has warned that invasive plants, animals and other organisms (invasive alien species) pose a severe global threat to the world's food supply. Invasive alien species are non-native species which are accidentally or intentionally introduced into new areas. They range from microbes to mammals. After being brought into an area, the alien species will take over and crowd out native species, leading to adverse impacts both on agriculture and biodiversity. The alien species can reduce crop yields, choke irrigation canals, block hydroelectric dams and cut the lifespan of development investments. As a consequence, the invaders not only contribute to economic hardship, but also constrain economic growth, poverty alleviation, food security and biodiversity conservation. In India, the cost is put at more than \$ 100 billion dollars a year, Brazil's estimates are \$ 50 billion and South Africa is estimated at \$ 7 billion in lost production. Soybean rust costs Brazil \$ 1 billion a year while the cassava mealy bug and green mite causes crop losses of 60-80 per cent respectively ■

Based on The World Bank, 2004. The Alien Threat to Biodiversity, Feature Stories, <http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0x>.

**Biodiversity, Trade, and Poverty**

The trend toward globalization has been driven in part by the new technologies and in part by reduced barriers to international trade or trade liberalization and investment flows. The result has been a steady increase in the importance of trade and investment in the global economy while the economy quintupled and world trade grew by a factor of 14. On the other hand, it increased global inequality; the benefits of growth have been very unevenly spread and skewed in favor of the developed northern countries. In many cases trade and investment disrupted ecology, biodiversity and the livelihoods of millions of poor people, particularly in the least developed and developing southern countries. As we know, biodiversity makes up the structure of the ecosystems and habitats that support essential living resources, including wildlife, fisheries and forests. It helps provide basic human needs such as food, shelter, and medicine. It composes of ecosystems that maintain oxygen in the air, enrich the soil, purify the water, protect against flood and storm damage and regulate climate. Biodiversity also has recreational, cultural, spiritual and aesthetic values. Maintaining biodiversity and access to it, while obviously a planetary public good, is crucial for the poor. The World Health Organization has estimated that 80 per cent of the world's population depends on traditional medicine derived from local plant varieties for their primary health needs. Wild plants, in field and forest, make a significant contribution to the diet of many poor communities. In many developing countries, poor communities are able to draw at least half their food from forest products ■

Based on Rahman, Atiq and Mallick, D.L., 2004. Biodiversity, Trade and Development Linkages, the New Nations, Reader's Forum, <http://nation.ittefaq.com/artman/publish/article>, (3 July 2004).

## Support for the Right to Adequate Food

On 23 September 2004, the FAO Committee on World Food Security (CFS) adopted Voluntary Guidelines to support the progressive realization of the right to adequate food in the context of national food security. Seen by many as a breakthrough, the adoption of the Right to Food Guidelines comes after two years of often difficult, but constructive negotiations. The objective of the guidelines is to provide practical guidance to states in implementing their obligations relating to the right to adequate food. This should improve the chances of reaching the hunger reduction target of the World Food Summit. The voluntary guidelines take into account a wide range of important principles, including equality and non-discrimination, participation and inclusion, accountability and the rule of law, and the principle that all human rights are universal, indivisible, inter-related and interdependent. The guidelines are a human-rights-based practical tool addressed to all states. They cover the full range of actions that need to be taken at the national level to build a supportive environment for people to feed themselves in dignity and to establish appropriate safety nets for those who are unable to do so. The guidelines can serve to empower the poor and hungry to claim their rights. We now have an additional instrument to better address the needs of the hungry and malnourished ■

*Based on Riddle, John, 2004. Committee on World Food Security adopts Right to Food Guidelines, FAO, Newsroom, 24 September 2004, Rome.*

## Biotechnology for the Poor

The dominance of the private sector in agricultural biotechnology research and commercialization has raised a number of concerns about who will benefit from biotechnology. The available empirical evidence on the impact of transgenic crop research in developing countries shows that resource-poor farmers can benefit from GM crops if the crops address their needs and if they have access to the products. There are some policies needed to provide more technology to the poor. The initial policies are those to encourage private investment in research and marketing biotechnology applications that meet the needs of the poor. Secondary policies are those to increase public research needed on the problems of the poor. Sustainable public biotechnology research for the poor requires the development of groups that will lobby for the poor. Thirdly, governments have to support the development of joint public-private ventures to make efficient use of the correct technology developed by the private and public sectors in industrialized countries. Fourth, investments have to be stimulated first in strengthening the national capacity to develop varieties (plant breeding) and seed systems; only then will investments in biotechnologies produce the expected results for poor farmers ■

*Based on FAO, 2004. Section C: Making Biotechnology Work for the Poor, the State of Food and Agriculture 2003-2004, Agricultural Biotechnology Meeting the needs of the poor?, [http://www.fao.org/documents/show\\_cdr.asp?](http://www.fao.org/documents/show_cdr.asp?)*

## FlashEVENTS



### Organic Community - Diversity from Soil to Plate

28 - 30 January, 2005  
Syracuse, New York, USA

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### International Edible Legume Conference/ 4<sup>th</sup> World Cowpea Congress

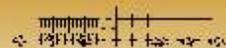
17 - 21 April, 2005  
Durban, KwaZulu-Natal,  
South Africa

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### 2<sup>nd</sup> International Symposium on Sweetpotato & Cassava

14 - 17 June, 2005  
Kuala Lumpur, Malaysia

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**DISTRIBUTION** Fetty Prihastini

**PRINTER** SMK Grafika Desa Putra

**LAYOUT DESIGN** Fransisca A. Wijaya

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## Book Review

### Sweetpotato Post-Harvest Research and Development in China

Proceedings of an international workshop held in Chengdu, Sichuan, P.R. China, November 7-8, 2001, Edited by Keith O. Fuglie and Michael Hermann, International Potato Centre, East, Southeast Asia and the Pacific Region (CIP-ESEAP), Indonesia, July 2004

An important feature of secondary crops is that their role may have diminished as a food staple in direct consumption to human beings, but they have gained in importance as raw materials for post-harvest use i.e. feed, processed food and other industrial products.

Though focused on sweet potato in China, readers can expect to find in these proceedings general implications about value adding activities of secondary crops and their contribution to poverty reduction. Over the last 25 years, China, the world's largest sweet potato producer, has experienced a fundamental transformation in its sweet potato production. Similar to other secondary crops, sweet potato has changed from being a staple food to a major source of animal feed and a raw material for food processing industries. While direct consumption of sweet potato as food in China has declined dramatically, production has actually grown, as the new use has generated more demand for the crop. In this way, sweet potato continues to contribute to farmers' economic well being in China.

This book consists of three sections including eleven papers; (1) Utilization and breeding of sweet potato, (2) Sweet potato utilization for animal feed, (3) Sweet potato utilization for starch. In the first section, two papers present new estimates of trends in sweet potato utilization in China overtime and the feasibility of changing the principal nutritional quality traits in sweet potato through genetic means. In the second section, this proceedings turn to an economic analysis of sweet potato and pig production in China. A Policy Analysis Matrix (PAM) for sweet potato and maize production shows how policies may unintentionally favor one commodity over another with serious consequences for farmers. The analysis of rural survey data suggests that improving the sweet potato-pig production system may be a way for policy makers and scientists to achieve pro-poor agricultural development, since the system appears to favor small-scale producers. In the third section, the book analyses the supply and demand of starch in Asian markets and suggests that tropical root crops (sweet potato and cassava) supply about half of all starch consumed in Asia. The fact is often missed in government and industry statistics on starch since much of the processing from root crops is done by the informal sector where relatively low-income rural households are engaged. The other papers review the research and development activities on sweet potato processing mainly aimed at improving the efficiency and quality of output from small-scale rural sweet potato processors.

Although this book includes various technical findings like "ensilaging sweet potato and foliage to improve nutrient value and storability", "the new technology to produce nutritional, tasty and aromatic instant noodles from sweet potato" etc., I would like to see it more focused on socio-economic aspects and policy implications of the discussion on the book. First, we can learn that biased policies may deteriorate the income opportunity in rural poor. Sweet potato is grown by mainly marginal poor farmers and has a good potential of use as feed. However, this book shows that policy distortions have penalized sweet potato relative to maize. Maize is also another secondary crop and the largest feed crop in China, but the growing portion of maize consumption in China may be met through imports since China is less competitive than the world major maize exporters. This book concludes that agricultural policy in China has tended to disfavor sweet potato and without policy changes it will be difficult to increase the contribution of sweet potato in meeting growing demand for feed. Secondly, we need to remember the importance of the small-scale processing industry. This book stresses that root and tuber crops' processing is an important source of income and employment in rural areas. Despite diseconomies of scale, rural small starch firms often coexist with large starch mills because the former provide intermediate processing of root and tuber crops to reduce their perishability and bulkiness. The rapid expansion of starch utilization in Asia can positively affect small-scale value adding activities and favor the rural poor if proper policy measurements encourage rural entrepreneurs.

This book is published as the proceedings of an international workshop focused on research findings by Chinese and CIP researchers. The only shortcomings might be the lack of an additional section for comprehensive discussion about how to translate research findings into relevant policy actions. If the findings in eleven papers could have been integrated and synthesized in policy recommendations to solve the problem in sweet potato post harvest issues, I believe this book could have worked not only as quality academic literature but also as a reference for policy planners in China and other secondary crop producing countries to enhance value adding activities for rural poverty alleviation ■

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