

Impact of GM food on health, environment and society

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Genetically modified crop production has resulted in far reaching environmental benefits. Chemical pesticides use on crops such as soya beans, corn, cotton and canola in the countries where transgenic crops have been planted, have fallen by 286 million kg accounting for -7.9 per cent. It has resulted in a significant reduction in the associated environmental impact estimated at 15.4 per cent in 2006.

This has further facilitated green-house gas emission reductions equal to 14.76 billion of kg of carbon dioxide in 2006 equivalent to removing 6.56 million cars from the roads for a year. Green house gas emission reductions have been derived from reduced fuel use on account of less frequent herbicide and insecticide applications, and a reduction in the energy use in ploughing the land. The facilitation of reduced tillage production systems by the high-tech agricultural biotechnology has led to less ploughing and increased carbon storage in the soil. The additional carbon sink in the soil reduces carbon dioxide emissions to the environment.

Apart from the unresolved controversy pertaining to their health risks, there are also genuine environmental concerns associated with GM crops. The dramatic effects to rotations and intercropping on crop health and productivity have been confirmed by scientific research. Because of the convenience they afford to growers on account of their producer-friendly traits, GM seeds generally encourage monoculture cropping contributing to further decline in land productivity and genetic diversity.

Genetically modified crops are considered a potential risk if they contain a strain that confers significant fitness advantage in natural situations. In order to minimize ecological impact, our aim should be the conservation of all plant and animal species in their natural communities. One of the objectives of the United Nations Environment programme is the conservation and sustainable use of biological diversity. Effort should be made to establish or to regulate, or to control the risks associated with the use and release of genetically modified living organisms, which are likely to have adverse environmental impacts that could affect the conservation and sustainable use of biodi-

versity.

Biotechnology has the potential to help the society solve serious problems, but the new technology has to be handled very cautiously to protect the flora and fauna from unintended consequences. The fear is that the transgenic crops will become weeds and that novel genes may be transferred to wild populations, leading to super weeds. This is not that easy, as it depends on the nature of pollination and many other factors. Hence, the fear of loss of entire biodiversity needs further critical examination. Genetically modified seeds and derived foods have been the subject of a fierce debate currently ranging the world with issues such as health and ecological safety.

Crop plants engineered to suit the environment better through incorporation of genes for tolerance to biotic and abiotic stresses, and thereby an ethical advance, while others regard such crops as being just as environmental unfriendly. The immediate environment, farmland, and the surrounding, non-farmed environments could be affected by introduction of new technologies. GE of crops for reduced fertilizer requirement through in planta nitrogen fixation could be beneficial through reducing

the negative impact on the soil and the subsequent effects of run-off into rivers and seepage into ground water. The application to agriculture of these new technologies certainly opens interesting perspectives, but also raises potential problems.

Biotech crops have raised peasant incomes and the incremental farm income when spent on goods and services, has had a positive multiplying effect on local, regional and national economies. In poor countries, the additional income earned from GM crops has enabled farmers to meet their food subsistence needs and to improve the economic well being of their households. In India and the Philippines where farmers use Bt cotton and corn respectively, their household incomes have increased by more than 30 per cent. The additional production from GM crops has also contributed enough energy to feed more than 300 million people per annum. Further, transgenic crops have also made important contributions to meeting protein and fat requirements of people.

Farmers, plant and animal breeders are being told that the biotechnological multinational companies will be able to gain patents that could, for instance, prevent them from free-

ly developing new strains, or force farmers to pay substantial royalties on a new, patented product.

Biotechnology may accentuate economic and social inequalities in developing countries: Big farmers with their financial strength will harness biotechnology whereas poor and indebted farmers may give up their farming practices. The end result is that small and poor farmers leave the land and migrate to cities in search of jobs while farms become bigger and concentrated in the hands of fewer individuals leading to widening income and wealth disparity between the big and small farmers. Large-scale farmers always favour transgenic technologies. This will cause loss to the third world markets through export substitution. For instance, the artificial sweeteners created negative effects on the sugar industry of the tropics. It seems that the poorer sections of society are bound to lose out.

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