

Transgenic Organisms: An Ethical Dilemma for Pakistan

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Abstract: This study reviews the attitudes and policies *vis-à-vis* Genetically Modified Organisms (GMOs) in Pakistan's social and legal context. The study recommends an open and serious debate on bio-ethical issues arising out of the introduction of GMOs from abroad or their indigenous development. All strata of the society needs to be made aware of the issues associated with GMOs; comprehensive legislation, effective regulatory mechanisms and competent institutions needs to be created for exploiting GMOs in an ethical and sustainable manner for the long term prosperity of the masses. A survey of social attitudes also concludes that a vast majority regards religious beliefs as the only framework for setting ethical standards. Hence, it is proposed that religious scholars may be educated on the issues and consulted for input during legislation and formulation of policies. A core group of experts is needed for guiding the legislators, policy makers and the public at large.

Key words: Bioethics, GMO's, legislation, pakistan, transgenics

INTRODUCTION

A Genetically Modified Organism (GMO) is an organism whose genetic material has been altered using genetic engineering techniques, generally known as Recombinant DNA technology. The technology enables scientists to assemble DNA molecules with small segments from DNA of other organisms. The DNA segment may be borrowed from another individual of the same species, a closely related species or even from species of another kingdom of living organisms. The modified DNA molecule works as the blue print for future development of the cell with definite characteristics. The single modified cell may multiply into a mass of millions of identical cells or may develop into a multi-cellular organism. The alteration of DNA allows the expression and development of certain desired traits. This is made possible by the fact that the modified DNA produces altered proteins which are intermediaries between the phenotype of the organism and the DNA blue print. The power and potential of the new technology has inspired authors to name their books with titles such as 'Playing God', 'The Eighth Day of Creation', 'The Genetic revolution' etc.

Attitudes towards GMOs and the legal provisions or Policies concerning the production, sale, purchase, and use of GMO's vary from country to country and even between regions or social strata of the same country. For example, most extreme opponents (particularly Western Europe) want to see Genetically Modified (GM) crops totally excluded from production and consumption in their countries. In contrast, farmers in North America and several large developing countries, notably Argentina and China, have actively developed and adopted GM crops.

Citizens in these countries have generally and perhaps unwittingly, accepted such products of Biotechnology (Anderson and Nielsen, 2001).

The bio-ethical questions pertaining to GMOs are even more crucial for developing countries like Pakistan which has to strike a balance between sustainable food security for its citizens on one hand, and realizing the ethical ideals and addressing environmental concerns on the other hand. Pakistan has a population of 173.4 million people; twenty-three percent of them live below the poverty line. The literacy rate (57%) is among the lowest in the world. Disparities with regard to gender, region and urban/rural divide are prevalent. The contribution of agriculture to the national GDP in Pakistan is 23% while the manufacturing industry is also dependent on agricultural raw material (mainly cotton) (Anonymous, 2010), the country needs to exploit the new recombinant technology in all spheres, specially agriculture, live-stock and health sectors.

Currently, there is little international consensus regarding the acceptability and role of GMOs. However, the role of genetic engineering techniques in exploring and deciphering complex biochemical processes, understanding disease mechanisms and development of effective and cheaper drugs have been widely accepted and adopted.

SITUATION IN PAKISTAN

The government of Pakistan rightly considers biotechnology as high priority area for research and public sector investment because the economy is highly dependent on agriculture and livestock sectors, precisely the areas where biotechnology and genetic engineering

offers greatest potential. The Government is funding projects worth more than one billion rupees (\$16.7 million) on research and development in biotechnology and genetic engineering related projects. However, it should be noted that Pakistan very low base line figures for spending on R&D. Similarly related indicators such as number of scientists per 1000 population, number of publications by local scientists, number of patents etc is also very low. Despite heavy investments in higher education followed by significant improvements in R&D related indicators since 2001, the country still has only around 5000 Ph.Ds. Although there are a total of 28 biotechnology centres in the country, only three to five centers are capable of doing DNA recombination research, or develop of GMOs (Ayub, 2007). Small quantities of a variety of biotech crops are being produced, but none have been commercialized so far. Strains of locally developed cotton, wheat, sugarcane, tomato, potato and canola are being experimented *in vitro* for including traits such as insect./virus/disease/herbicide resistance, salt tolerance, drought tolerance and male sterility for hybrid seed development etc. (Anonymous, 2005a).

The National Bio-safety Guidelines were issued in April 2005 for regulating the R&D and trade of GMOs. However the establishment of monitoring and evaluation systems envisioned in the National Bio-safety rules, are yet to be established (Ilyas *et al.*, 2008). The National Institute for Biotechnology and Genetic Engineering (NIBGE) has submitted an application to the National Bio-safety Committee (NBC) for approval of one GM crop, however a decision is pending for want of the appropriate evaluation and monitoring mechanisms. A directorate is being established in the Ministry of Environment with the necessary expertise to monitor and evaluate incoming proposals.

LEGAL PERSPECTIVE

The government intends to have strict monitoring of the transportation and trade of GMO's in accordance with the provisions of Bio-safety Rules. The Ministry of Environment has constituted a special National Bio-safety Committee to monitor the standards and procedures for risk assessment and labeling of living modified organisms, however the situation on ground is far from ideal and there is no doubt that GM crops, their seeds and products imported from abroad, whether legally or illegally, have found their way into Pakistani markets and farms.

The Bio-safety committee is mandated to ban or restrict import, export, and sale/purchase of any living GMO which may cause, or is likely to cause, risk to public health, safety or environment. The committee is also expected to develop linkages with counter-part

foreign organizations, to ensure that genetic manipulation practices in Pakistan, address international Bio-safety concerns and are in accordance with relevant codes of conduct (Anonymous, 2005b).

The rules formulated by the Pakistan Environmental Protection Agency (EPA) also provides for a regulatory framework for import, export or commercial release of living GMOs. However, the relevant organization is yet to be established.

In conclusion, it can be said that implementation of Bio-safety regulations, particularly those concerning GM crops/food/organisms, is far from satisfactory.

CONCLUSION AND RECOMMENDATION

The extremely low literacy rate entails low level of awareness about Bio-ethical issues among the masses in Pakistan (Ilyas *et al.*, 2009). Therefore, awareness needs to be created at all levels so that the people in general and specific segments such as legislators, policy makers, opinion leaders, can formulate a "considered opinion" rather than joining the band-wagon of supporting or opposing GMOs.

Ethical issues, apprehensions and expectations pertaining to GMOs, need to be understood with respect to requirements of Pakistani society. Open debate on print and electronic media and seminars, conferences and workshops should be held to encourage interaction between experts, academicians, researchers, legislators, students, policy makers etc. In order to sensitize the educated youth about the potential cost/benefit of GMOs, the curricula of academic programmes at University, college and school level need to be modified to include appropriate courses on bioethics.

The government needs to provide the necessary legal/regulatory frame work and institutions for dealing with bioethical issues and concerns. It must also be emphasized that bio-ethical concerns are not limited to apprehensions or expectations pertaining to GMOs; there are also other, equally or even more important issues, such as organ transplantation and trade, cloning, test tube babies etc. The government should institutionalize consultations among all stake-holders such as legislators, policy makers, technical experts, opinion leaders, farmers, doctors, patients and industry etc. Ulemas (religious scholars) should be consulted for their opinion while formulating laws or rules and regulations concerning bioethical issues because the general masses consider religious beliefs as the most important framework for setting up ethical standards and norms. All said, there is no denying that the number of experts who can be consulted on bio-ethical issues, is limited. Hence there is a need for having a pool of experts who can guide the government and the general public on bio-ethical issues, including those pertaining to GMOs.

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