

# **Use of Terminator Technology in GMOs: Implications for Farmers' Right to Save Seed in Bangladesh<sup>1</sup>**

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## **1.1 Introduction**

For the first time in South-Asia on 30<sup>th</sup> October 2013 Bangladesh Govt. has approved the commercial use of BT Brinjal (also known as eggplant, begun, or aubergine), a genetically modified organism (GMO) containing terminator technology seed. Despite the fact that in India, amidst various protests, former environment minister Jairam Ramesh declared an indefinite moratorium on introducing BT Brinjal in 2009. There are lots of controversies regarding these GMOs containing terminator technology around the globe. Despite of its some advantages this terminator technology is widely criticized for its impacts on environment, biodiversity, health and farmers' right to save seed etc. In our country farmers have a long traditional right to use the saved seeds. But this terminator technology prevents farmers from planting their saved seeds. In this assignment I have shown how this terminator technology affects our farmers' right to save seed and our traditional agricultural system and how we can get rid of this terminator technology.

This assignment is divided into seven chapters. Chapter one conceptualize both genetically modified organisms and terminator technology. Chapter two shows different reasons for introduction of terminator technology shown by its promoters and various impacts of terminator technology. Such as impacts on human health, environment, biodiversity and farmers' right to save seeds etc. Chapter three deals with the international regulation regarding terminator technology. And for this purpose I have focused on the Convention on Biological Diversity (CBD), the Conference of Parties (COP), the Subsidiary Body for Scientific, Technical and Technological Advice (SBSTTA), the Moratorium and the Cartagena Protocol on Biosafety of the Convention on Biological Diversity etc. Chapter four shows the origin of the concept of farmers' rights and its various elements. The concept of farmers' right is traced in the International Undertaking (IU) and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). Chapter

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<sup>1</sup> This was my assignment topic for Intellectual Property Law course during my LL.M. degree in University of Dhaka.

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five discusses about the laws relating to seed in Bangladesh. For this purpose I have focused on the draft Seed Act, 2013. Chapter six points out what can we do under this circumstances. Such as use of flexibilities under TRIPS, development of a sui generis regime, recognition of community right and farmers' right, recognition of farmers as breeder, farmers access to benefit sharing and engagement in ongoing debates on GURT etc. Finally chapter seven concludes that now we can either ban or impose restrictive legal regime to this terminator technology. As a member to TRIPS we can impose a sui generis regime and exploit its flexibilities. At the same time we can enforce the draft Biodiversity Act and draft Plant Variety Protection Act containing provision for farmers' rights in line with fair and equitable sharing of the benefits from the utilization of genetic resources.

## **1.2 What is Genetically Modified Organism (GMO)?**

Genetically modified organism (GMO) is defined as organism (except for human beings) in which the genetic material has been altered in a way that does not occur naturally by mating and/or natural recombination. A wide accepted definition of living modified organism (LMO) is given in the Cartagena Protocol of Biosafety to the Convention on Biological Diversity which is considered to be equivalent to the meaning of genetically modified organisms (GMOs). According to this protocol:

“Living modified organism” means any living organism that possesses a novel combination of genetic material obtained through the use of modern biotechnology.<sup>3</sup> This definition has two parts: "living organism" and "modern biotechnology”.

“Living organism” means any biological entity capable of transferring or replicating genetic material, including sterile organisms, viruses and viroids.<sup>4</sup>

“Modern biotechnology” means the application of:

a. In vitro nucleic acid techniques, including recombinant deoxyribonucleic acid (DNA) and direct injection of nucleic acid into cells or organelles, or

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<sup>3</sup> *Cartagena Protocol of Biosafety to the Convention on Biological Diversity*, 29 January 2000, 39 ILM 1027 art 3(g).

<sup>4</sup> *Ibid* art 3(h).

b. Fusion of cells beyond the taxonomic family, that overcome natural physiological reproductive or recombination barriers and that are not techniques used in traditional breeding and selection.<sup>5</sup>

Most often the genes are altered to render the plant resistant to either insects or herbicides. And BT Brinjal which is a genetically modified organism approved in Bangladesh is an insect resistant. Sections of the DNA from the bacteria known as *Bacillus Thuringiensis* (BT) are isolated and inserted into the plant cells by a process known as genetic transformation for this purpose. BT crops are made poisonous to some species of insects through the insertion of the bacterium *Bacillus Thuringiensis* in order to create a certain insect resistance. And terminator technology is used in BT Brinjal like other GMOs.<sup>6</sup>

### 1.3 What is Terminator Technology?

On March 3rd, 1998, the US patent entitled "Control of Plant Gene Expression" was jointly issued to Delta & Pine Land Company (D & PL) and the US Department of Agriculture (USDA).<sup>7</sup> This is the first patent for terminator technology. Terminator technology, technically known as a Genetic Use Restriction Technology (GURT), is designed to render seeds sterile at harvest. There are two main categories of GURTs: T-GURTs, which restrict the expression of a certain trait (phenotype) by switching on or off a specific group of genes responsible for particular phenotypic expressions; and V-GURTs, which restrict the use of the entire plant variety by switching on a gene that terminates further reproduction of the plant.<sup>8</sup> The expression of terminator genes is controlled by an external stimulus involving the application of a particular chemical (typically tetracycline) to the seeds containing these genes.<sup>9</sup> In V-GURTs, the expression of the exogenous genes is designed for the sole purpose of inducing sterility. This is the reason for the popular designation of GURTs as terminator technology.<sup>10</sup>

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<sup>5</sup> Ibid art 3(i).

<sup>6</sup> M S Siddiqui, 'BT Brinjal row: How other countries deal with controversy', *the Financial Express* (Dhaka), 17 Jan 2014.

<sup>7</sup> P.K. Gupta, "The Terminator Technology for Seed Production and Protection: Why and How?" (1998) 75 *Current Science*, 1319-1323.

<sup>8</sup> Bert Visser, et al. "The Impact of 'Terminator' Technology," (2001) 48 *Biotechnology and Development Monitor*, 9-12.

<sup>9</sup> Gupta, above n 5.

<sup>10</sup> C.S. Srinivasan & Colin Thirtle, "Impact of Terminator Technologies in Developing Countries: A Framework for Economic Analysis" in R.E. Evenson, V. Santaniello & D. Zilberman, eds., *Economic and Social Issues in Agricultural Biotechnology* (New York: CABI Publishing, 2002) 159 at 168.

The Action Group on Erosion, Technology and Concentration (ETC group), formerly RAFI (Rural Advancement Foundation International), has been leading the crusade against GURTs (specifically V-GURTs) since the late 1990's. When it began its campaign against GURTs, the ETC group (then RAFI) coined the term "Terminator Technology" referring to GURTs. The name "Terminator Technology" appears appropriate since this technology is used to alter the plant genome so as to produce sterile seeds. "Terminator technology" and related "genetic use restriction technology" (GURT) are one of the more controversial aspects of intellectual property rights relating to GM crops.<sup>11</sup> This technology would allow biotech companies to produce sterile seeds, i.e. seeds that would allow farmers to grow one generation of crops, but the resulting plants would be sterile.<sup>12</sup>

Terminator technology is a special concern because some 1.4 billion people rely on farm-saved seed.<sup>13</sup> These people may not be able to afford to buy seeds and the triggering chemicals needed to gain their full benefits.<sup>14</sup> Such seeds would prevent farmers from doing their own hybrid breeding, and unintentional hybridization with their existing crop varieties could render those crops sterile.<sup>15</sup> If the farmers use the terminator seed then they will not be able to plant their farm saved seed and have to buy seed every year from the seed companies. This terminator technology is in gross violation of our farmers' long traditional practice to save seed. So terminator technology will infringe upon the basic rights of farmers' and allow seed companies to use poor farmers as a mere means to maximize their profits.

## **2.1 Reasons for Introducing Terminator Technology**

Terminator technologies offer seed companies a method of protecting their IP more effectively than any other method. The easily reproducible nature of seeds has always posed a problem to seed researchers seeking to protect their IP interests.<sup>16</sup> This is because millions of dollars and years of research are involved in developing genetically engineered seeds that offer superior value to

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<sup>11</sup> Alan Mchughen, *Pandora's Picnic Basket: The Potential and Hazards of Genetically Modified Foods* (Oxford University Press, Jun 22, 2000) 192-193.

<sup>12</sup> Barnaby J. Feder, Monsanto to Bar a Class of Seeds, *New York Times*, Oct. 5, 1999, at A1.

<sup>13</sup> Holly Saigo, Agricultural Biotechnology and the Negotiation of the Biosafety Protocol, (2000) 12 *Georgetown International Environmental Law Review* 779.

<sup>14</sup> *Ibid.*

<sup>15</sup> *Ibid.*

<sup>16</sup> Sina Muscati, Terminator Technology: protection of patents or a threat to patent system? (2005) 45(4) *IDEA- The Journal of Law and Technology* 477, 481-482.

growers.<sup>17</sup> For research and investment in biotech research to continue, companies need the incentive of being able to share in the profit created by these crops.<sup>18</sup> And for this purpose the seed companies used to rely on the traditional IP laws.

Traditional IP protection mechanisms for genetically engineered seeds, however, have a number of shortcomings. Monitoring for cases of patent infringement or breaches of a licensing agreement is difficult and expensive, especially in developing countries. Additionally, when a case of infringement is found, the litigation that follows is expensive, time consuming and unpredictable. IP laws can also be politically unpredictable and are subject to potential legislative change, especially in a field as politically contentious as biotechnology patenting.<sup>19</sup> An alternative form of IP protection such as terminator technology bypasses these problems. With terminator technology, no seed is created, and there is simply nothing for farmers' to save, reuse or resell. As one commentator has put it, terminator technology creates seeds that come "with a built-in biological patent enforcement mechanism."<sup>20</sup> Patents create monopolies limited to 20 years that are restricted to specific claims and can in some cases be subjected to compulsory licensing of the underlying invention. With terminator technology, however, there is no such flexibility. Terminator technology offers a stronger and more far-reaching monopoly than IP, one unlimited in time, with no exemptions, and without a need for lawyers.<sup>21</sup>

## **2.2 Impacts of GMOs Containing Terminator Technology**

### **2.2.1 Impact on Human Health**

There is a growing concern that introducing foreign genes into food plants may have an unexpected and negative impact on human health. An article published in the *Lancet* examined the effects of GM potatoes on the digestive tract in rats.<sup>22</sup> This study claimed that there were appreciable

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<sup>17</sup> Martha L. Crouch, *How the Terminator Terminates: An Explanation for the Non-scientist of a Remarkable Patent for Killing Second Generation Seeds of Crop Plants*, ETC News Release (Jan. 1, 1998).

<sup>18</sup> *Ibid.*

<sup>19</sup> Sina Muscati, Terminator Technology: protection of patents or a threat to patent system? (2005) 45(4) *IDEA- The Journal of Law and Technology* 477, 481-482.

<sup>20</sup> Kojo Yelpaala, Owing the Secret of Life: Biotechnology and Property Rights Revisited, (2000) 32 *McGeorge Law Review* 111, 172.

<sup>21</sup> Muscati, above n 17.

<sup>22</sup> Effect of diets containing genetically modified potatoes expressing *Galanthus nivalis* lectin on rat small intestine (1999) 354(9187), *the Lancet*, 1353-1354.

differences in the intestines of rats fed genetically modified potatoes and rats fed unmodified potatoes.

The potential of genetically modified crops to be allergenic is one of the main suspected adverse health effects, due in part to research by Hi-Bred in the mid-1990s. A proposal to incorporate a gene from Brazil nuts into soybeans was abandoned because of the fear of causing unexpected allergic reactions.<sup>23</sup>

### **2.2.2 Impact on Environment**

Farmers may worry that their use of GM seeds will create "super weeds" or "superbugs" that, over time, become resistant to GM seeds and crops and to other herbicides and pesticides.<sup>24</sup> There is some research that suggests that weeds and bugs could possibly evolve into resistant organisms. Gene movement from crop to weed through pollen transfer has been demonstrated for GM crops when the crop is grown near a closely related weed species.<sup>25</sup> There is great concern that GM plant species are able to mate with their wild type counterparts and pass on their genetic material to naturally occurring species.<sup>26</sup> This transfer of genetic material from a GMO into the genome of another plant is called "genetic drift."<sup>27</sup> If left uncontrolled, genetic drift could result in GM traits entering the environment and possibly mutating or hybridizing to produce "subsequent generations [of plants] with unforeseen properties."<sup>28</sup> Similarly, insects have, in the past, developed a resistance to pesticides. A recent study documented a decreased susceptibility in pests to the use of BT as a sprayed pesticide.<sup>29</sup>

### **2.2.3 Impact on Biodiversity**

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<sup>23</sup> Identification of a Brazil-nut allergen in transgenic soybeans (1996) 334(11) *New England Journal of Medicine*, 688-692.

<sup>24</sup> David Krufft, *Impacts of Genetically-Modified Crops and Seeds on Farmers* (Nov 2001) <[http://www.law.psu.edu/\\_file/aglaw/Impacts\\_of\\_Genetically\\_Modified.pdf](http://www.law.psu.edu/_file/aglaw/Impacts_of_Genetically_Modified.pdf)>

<sup>25</sup> Colorado State University, *Transgenic Crops: An Introduction and Resource Guide* <<http://www.colostate.edu/programs/lifesciences/TransgenicCrops/risks.html>>.

<sup>26</sup> Stuart Smyth, Liabilities and Economics of Transgenic Crops, (2002) 20 *Natural Biotechnology*, 537, 537.

<sup>27</sup> Richard Repp, Biotech Pollution: Assessing Liability for Genetically Modified Crop Production and Genetic Drift, (2000) 36 *Idaho Law Review* 585, 587.

<sup>28</sup> Jason A. Barron, Genetic Use Restriction Technologies: Do the Potential Environmental Harms Outweigh the Economic Benefits? (2008) 20 *Georgetown International Environmental Law Review*, 271, 286.

<sup>29</sup> *Ibid.*

There is great concern that if GM plant species are able to reproduce in the wild, their genetic advantages will allow them to overtake native plant species.<sup>30</sup> Typically the genetic modifications made to GM plants make them more hardy and competitive than wild type species. Many GMOs are designed to be drought or pest resistant, which allows them to survive in environments where wild type plants cannot.<sup>31</sup> This can result in GMOs creating a decline in biodiversity by dominating ecological niches usually filled by the less vigorous and hardy wild type species.<sup>32</sup>

A laboratory study was published in the *Nature*<sup>33</sup> showing that pollen from BT corn caused high mortality rates in monarch butterfly caterpillars. Monarch caterpillars consume milkweed plants, not corn, but the fear is that if pollen from BT corn is blown by the wind onto milkweed plants in neighboring fields, the caterpillars could eat the pollen and perish.

#### **2.2.4 Impact on Farmers' Right to Save Seed**

There is a long tradition of saving seed, and it is believed as a “fundamental principle in agriculture” that ought to be protected.<sup>34</sup> GURTs are designed to stop farmers from saving seeds from their harvest for planting the next year’s crop.<sup>35</sup> This would be detrimental to farmers’ practice of saving seeds, which is especially important, for poor farmers of developing countries.<sup>36</sup> Farmers in developing countries are reliant on the practice of seed saving.<sup>37</sup> For example, “ninety-five percent of the millet grown in Zambia comes from saved seed.”<sup>38</sup> Sterile seed technology would also be detrimental to crop genetic diversity in traditional farms, where farmers often breed and adapt local landraces of crops and exchange seeds.<sup>39</sup> Since seed saving is so prevalent in

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<sup>30</sup> David Daniel, *Seeds of Hope: How New Genetic Technologies May Increase Value to Farmers, Seed Companies, and the Developing World*, (2010) 36 *Rutgers Computer & Technology Law Journal* 250, 285.

<sup>31</sup> James Ewing, *Agricultural Biotechnology: Is the International Regulation of Transgenic Agricultural Plants for the Birds (and the Bees)?* (2002) 25 *Suffolk Transnational Law Review* 617, 634.

<sup>32</sup> Daniel above n 28.

<sup>33</sup> John E. Losey, Linda S. Rayor & Maureen E. Carter, *Transgenic pollen harms monarch larvae*, (20 May 1999) *the Nature*, 399(6733), 214.

<sup>34</sup> Justin T. Rogers, *The Encroachment of Intellectual Property Protections on the Rights of Farmers’*, (2010) 15 *Drake Journal of Agricultural Law* 149, 161.

<sup>35</sup> *Ibid.*

<sup>36</sup> P.K.Gupta, *The terminator technology for seed production and protection: why and how?* (1998) 75 *Current Science* 1319-1323.

<sup>37</sup> Jason A. Barron, *Genetic Use Restriction Technologies: Do the Potential Environmental Harms Outweigh the Economic Benefits?* (2008) 20 *Georgetown International Environmental Law Review* 271, 286.

<sup>38</sup> *Ibid* 272-273.

<sup>39</sup> Tony Szumigalski, *Literature Review on Genetic Use Restriction Technologies* (April 2006) Canadian Foodgrains Bank <[http://foodgrainsbank.ca/uploads/GURT\\_review.pdf](http://foodgrainsbank.ca/uploads/GURT_review.pdf)>

developing countries, GURTs that inherently disrupt and prevent this practice will have a major impact, if widely used.<sup>40</sup> Many farmers in developing countries rely on the seed from their harvest not only for future planting but also as a direct food source.<sup>41</sup> It is foreseeable that farmers would use crop seeds as a food source in cases where food shortages arise.<sup>42</sup> This could increase pressure on farmers to buy GM seed. However, if that seed has terminator technology the farmers will then be heavily tied to seed manufacturers, since their traditional seed saving practice is not possible.<sup>43</sup> Richer countries and richer farmers are likely to gain most of the benefits from this technology.<sup>44</sup> Thus it appears that corporate concentration and increased controls on farmers' autonomy could threaten farmers' food security.<sup>45</sup>

### **3. International Regulation Regarding Terminator Technology**

Although there is no law with international jurisdiction governing GURTs, several international treaties mark out the limits of their possible use in the future. The following section describes the main treaties in force.

#### **3.1 The Convention on Biological Diversity (CBD)**

The CBD is a legally binding agreement under the United Nations Environment Programme (UNEP) that was adopted at the Earth Summit in Rio de Janeiro in Brazil in 1992 and entered into force in 1993. The objectives of the CBD are: i) conservation of biological diversity; ii) sustainable use of its components; and iii) fair and equitable sharing of benefits arising out of the utilization of genetic resources.<sup>46</sup> Bangladesh signed CBD in 1992 and ratified in 1995.

#### **3.2 The Conference of Parties (COP)**

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<sup>40</sup> Ibid 282.

<sup>41</sup> Ibid 284.

<sup>42</sup> Ibid.

<sup>43</sup> Ibid.

<sup>44</sup> Eaton, Van Tongeren, Louwaars, Visser, and Van der Meer, Economic and policy aspects of 'terminator' technology (2002) 49 *Biotechnology and Development Monitor* 19-22.

<sup>45</sup> Szumigalski, above n 37.

<sup>46</sup> UNEP, *Convention on Biological Diversity* (1992) <<http://www.cbd.int/convention/text/>>

The Conference of Parties is a body of the Convention which is created pursuant to Article 23 of the Convention on Biological Diversity and is also the ultimate authority. The COP brings together all governments that have ratified the Treaty of the Convention.

### **3.3 The Subsidiary Body for Scientific, Technical and Technological Advice (SBSTTA)**

The Conference of Parties may rely on the expertise and support of several other bodies established by the Convention, such as the Subsidiary Body for Scientific, Technical and Technological Advice (SBSTTA), which was set up pursuant to Article 25 of the Convention. It plays a key role in making recommendations to the COP on scientific and technical issues.<sup>47</sup> When the first GURT patent was filed in May 1999, the SBSTTA was mandated to assess the nature and implications of GURT technology, with respect to i) the conservation and sustained use of biological diversity, ii) the ability of farmers' to save and reuse seed, iii) plant breeding and the seed sector, iv) the relationship between agro-industry and ensuring food security.<sup>48</sup> In moral and ethical terms, the SBSTTA report highlights the potential effects of T-GURTs and V-GURTs on the ability of farmers' and breeders' to reuse and conserve seeds and desired plant characteristics while taking into account the farmers' privilege and the breeders' exemption. In addition, the report states that according to specialists, neither T-GURTs nor V-GURTs are likely to be commercialized for at least five years.<sup>49</sup>

### **3.4 The Moratorium**

In 2000 a de facto moratorium on GURTs was imposed by the Parties to the Convention on Biological Diversity (CBD). In 2002, it was recommended that the Conference of the Parties reaffirm paragraph 23 of its decision V/5.<sup>50</sup> In October 2004, the SBSTTA examined another report of the ad hoc Technical Expert Group on GURTs and recommended that Parties and other governments consider the development of regulatory frameworks not to approve GURTs for field-

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<sup>47</sup> CBD, *Sustaining Life on Earth. How the Convention Biological Diversity Promotes Nature and Human Well-Being* (1999) 13. < <http://www.cbd.int/doc/publications/cbd-sustain-en.pdf>. >

<sup>48</sup> CBD, *Consequences of the use of the new technology for the control of plant gene expression and sustainable use of biological diversity*, (1999) 5, < <http://www.cbd.int/doc/meetings/sbstta/sbstta-04/official/sbstta-04-09-rev1-en.pdf> >

<sup>49</sup> Ibid 13.

<sup>50</sup> CBD, *Thematic Programmes of Work – Progress Reports on Implementation: Biological Diversity of Inland Waters; Marine and Coastal Biological Diversity; Biological Diversity of Dry and Sub-Humid Lands; and Agricultural Biological Diversity*, (14 February 2002) 3. < <http://www.cbd.int/doc/meetings/cop/cop-06/official/cop-06-11-add1-en.pdf>.>

testing and commercial use.<sup>51</sup> Finally, at the Eighth Meeting of the Parties to the CBD, held in Brazil in March 2006, the Parties agreed to maintain the moratorium and to reject the proposal opening the way to field trials.<sup>52</sup> Since then, GURTs have not been on the agenda of either the COP or the SBSTTA.

### 3.5 The Cartagena Protocol

The Cartagena Protocol on Biosafety of the Convention on Biological Diversity was adopted in Montreal in January 2000 and entered into force on 11 September 2003. The objective of this Protocol is to contribute to ensuring an adequate level of protection in the field of the safe transfer, handling and use of living modified organisms resulting from modern biotechnology that may have adverse effects on the conservation and sustainable use of biological diversity, taking also into account risks to human health, and specifically focusing on transboundary movements.<sup>53</sup> To get rid of such technology seeds that get in the way of farmers' rights, the *Cartagena Protocol on Biosafety* appears as a milestone.<sup>54</sup>

### 3.6 Access and Benefit Sharing (ABS)

Access and Benefit Sharing (ABS) is promoted by Objective 3 and Article 15 of the CBD. The relationship between ABS and GURTs resides in the fact that GURTs could bring about possible restrictions on the use of genetic resources, which would in turn run counter to the objectives of ABS and the CBD.<sup>55</sup> Work is underway to establish an international ABS regime. The regime will also have to take account of the International Treaty on Plant Genetic resources for Food and Agriculture. The Treaty focuses on access and benefit-sharing, is closely linked to the CBD, and

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<sup>51</sup> CBD, *Advice on the Report of the Ad Hoc Technical Expert Group on the Genetic Use Restriction Technologies*, (21 October 2004) 5. < <http://www.cbd.int/doc/meetings/sbstta/sbstta-10/official/sbstta-10-15-en.pdf>. >

<sup>52</sup> CBD, *Decisions Adopted by the Conference of Parties to the Convention of Biological Diversity at its Eighth Meeting*, (20-31 March 2006). < <http://www.cbd.int/doc/decisions/cop-08/full/cop-08-dec-en.pdf> >

<sup>53</sup> *The Cartagena Protocol on biosafety of the Convention on biological Diversity*, 29 January 2000, 39 ILM 1027, Art 1.

<sup>54</sup> Mohammad Towhidul Islam, *TRIPS Agreement of the WTO: Implications and challenges for Bangladesh*, (Cambridge Scholars Publishing, 1<sup>st</sup> ed, 2013) 94.

<sup>55</sup> Commission de L'ethique de la Science et de la Technologie, *An Ethical Examination of Genetic use Restriction Technologies* (2008), < [www.ethique.gouv.qc.ca/en/assets/documents/OGM/.../TRUG-avis-EN.pdf](http://www.ethique.gouv.qc.ca/en/assets/documents/OGM/.../TRUG-avis-EN.pdf) >

is a vital instrument for ensuring the availability of plant genetic resources needed to feed the populations of all countries.<sup>56</sup>

#### **4. Origin of the Concept of Farmers' Rights and its Various Elements**

The origin of farmers' rights can be traced in the debates within the FAO on the asymmetry in the distribution of benefits between farmers as donors of germplasm and the producers of commercial varieties that ultimately rely on such germplasm.<sup>57</sup> Farmers in developing countries usually possess traditional knowledge over PGRs and ecosystems, as well as simple, traditional techniques to conserve, manage and develop them.<sup>58</sup> The systematic nature of farmer nomenclature for landraces has been documented as evidence of their thorough knowledge of crop resources.<sup>59</sup> While a commercial variety could generate returns to the commercial breeders, no system of compensation or incentives for farmers' had been developed.<sup>60</sup>

##### **4.1 The International Undertaking (IU)**

The International Undertaking (IU) was adopted by the FAO Conference in 1983 as a non-binding instrument subscribed to by most FAO members, excluding USA, under which the State Parties agreed to provide other parties adhering to the Undertaking "free access" to the plant genetic resources within their territory<sup>61</sup> on the basis of the principle of common heritage of humankind. The concept of farmers' rights was first introduced in 1989 when FAO Resolution 4/89 was adopted to provide for an agreed interpretation between the parties of the IU provisions. This provides a hope for equity for farmers' to receive their share of benefits from PGRs they have long been providing the world with.<sup>62</sup> Moreover, Article 1 of the Resolution 4/89 declared the

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<sup>56</sup> CGRFA, International Treaty on Plant Genetic Resources for Food and Agriculture, <<http://www.fao.org/ag/cgrfa/itpgr.htm>>

<sup>57</sup> C. M. Correa, *Options for the Implementation of Farmers' Rights at National Level*, Trade-Related Agenda, Development and Equity (T.R.A.D.E.) Working Paper 8. Geneva, South Centre, (December 2000), 3.

<sup>58</sup> P. C. Marin, Providing Protection for Plant Genetic Resources, Patents Sui generis System and Bio-partnerships, *Kluwer Law international*, [2002], 60.

<sup>59</sup> S. Brush, Providing Farmers' Rights Through in Situ Conservation of Crop Genetic Resources, (Background Study Paper No. 3E, First Extraordinary Session, Commission on Plant Genetic for Food and Agriculture, Rome 7-11 November 1994), 4.

<sup>60</sup> Correa above n 55.

<sup>61</sup> Ibid.

<sup>62</sup> Marin, above n 56.

compatibility of the plant breeders' rights as provided under UPOV (1978) with the IU. And developing countries won endorsement of the concept of "farmers' rights".<sup>63</sup>

In 1991, the Conference of the FAO adopted Resolution 3/91 which recognizes the sovereign rights of nations over their own genetic resources. An International Fund for Plant Genetic Resources was proposed in Resolution 3/93 as a means of implementing farmers' rights and to support plant genetic conservation and utilization programmes, particularly, but not exclusively, in the developing countries. The FAO Conference Resolution 7/93 called for the revision of the IU in harmony with the CBD.<sup>64</sup> The CPGRFA started to revise the IU in 1994,<sup>65</sup> and continued until the adoption of the new Undertaking as a binding instrument on November 3, 2001, which is now known as the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA).

#### **4.2 Farmers' Rights under the ITPGRFA**

Article 9 of the PGRFA Treaty recognizes the local and indigenous communities and farmers' enormous contribution to conserving and developing plant genetic resources for food and agriculture. It further gives broad guidelines to states concerning the scope of the rights to be protected under the concept of farmers' rights. This includes the protection of traditional knowledge, farmers' entitlement to a part of benefit-sharing arrangements and the right to participate in decision making regarding the management of plant genetic resources. In addition, the right of farmers' to save, use, exchange, and sell farm saved seeds and propagating material is recognized.<sup>66</sup> However, the Treaty is silent with regard to farmers' rights over their landraces.<sup>67</sup> In fact, the recognition of farmers' contribution to plant genetic resources conservation and

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<sup>63</sup> M. Blakeney, Protection of Plant Varieties and Farmers' Right (International Seminar on the Role of Intellectual Property in the Field of Biodiversity and Traditional Knowledge, Jointly Organized by the Brazilian National Institute of Industrial Property and the European Commission, Manaus/ Amazonas/ Brazile, 9-11 September 2001) 2

<sup>64</sup> In 1992, Agenda 21 called for the strengthening of the FAO Global System on Plant Genetic Resources, and its adjustment in accordance with the outcome of negotiations on the CBD.

<sup>65</sup> The First Negotiating Draft of the Treaty was reviewed at the First Extraordinary Session of the CGRFA held in November 1994.

<sup>66</sup> Hossam El-Saghir, James Mwijukye and Grace Issahaque, Plant Varieties, Biodiversity and Developing Countries. <<http://www.turin-ip.com/course-documents/documents-2007/archive/2007-edition/papers/papers-2003/El-SaghirMwijukyeIssahaque-1/view>>

<sup>67</sup> Philippe Cullet, The International Treaty on Plant Genetic Resources For Food and Agriculture, (IELRC Briefing Paper 2003-2) <<http://www.ielrc.org/content/f0302.htm>>

enhancement under the ITPGRFA does not include any property rights. In this context, the only rights that are recognized are the residual rights to save, use, exchange and sell farm-saved seeds.<sup>68</sup>

## 5. Laws Relating to Seeds in Bangladesh

Presently in Bangladesh the major law relating to seed is the Seed Ordinance, 1977 which is amended twice in 1997 and 2005. The Seed Rules 1998 was made under the said Act. With the use of the Seed Ordinance, 1977 and Seed Rules, 1998, even the private sector can import and market any non-notified seeds.<sup>69</sup> As a result the importing and marketing of terminator or GURT seeds is also allowed under Section 17(3). Recently, the McDonald Seeds in collaboration with the ACI markets the seed of 'shufala' rice. Such seed sponsors publicly advise the farmers not to reuse the seed, since it stops enhanced yielding, due to the terminator technology used therein.<sup>70</sup> Farmers' rights groups in Bangladesh vehemently oppose such technology seeds.<sup>71</sup> Farmers' rights groups are trying to make people aware of the effects of the terminator technology and pressing the government to adopt a biosafety regulation in line with the Cartagena Protocol on Biosafety.<sup>72</sup>

In this context, Bangladesh has made a draft Seed Act, 2013. This act also allow the import of seeds of any kind or variety not approved by national seed board (NSB) but only for the purpose of research and adaptability testing.<sup>73</sup> There is also a provision for compensation to the farmers' in this draft Act. If registered seed fails to provide the expected performance under such given conditions thereby and the farmer incur losses, the farmer may claim such compensation from such producer, dealer, distributor or vendor.<sup>74</sup>

## 6. What can we do?

Terminator technology or GURT is a technology. And Trade Related Aspects of Intellectual Property Rights (TRIPS) have provisions against discriminating against particular kinds of

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<sup>68</sup> Ibid.

<sup>69</sup> M.B. Dastagiri, 'The Seed Laws of Asian Countries under the WTO and IPR Regime: A Paradigm Shift' (2008) 37(4) *Outlook on Agriculture* 297.

<sup>70</sup> Mahfuz Ullah, *Intellectual Property Rights and Bangladesh* (Bangladesh Environmental Lawyers Association and Centre for Sustainable Development, 2002).

<sup>71</sup> Mohammad Towhidul Islam, *TRIPS Agreement of the WTO: Implications and challenges for Bangladesh*, (Cambridge Scholars Publishing, 1<sup>st</sup> ed, 2013) 95.

<sup>72</sup> Farhad Mazhar, 'Genetic Resources Conservation and Utilization: The Role of the Farming Communities' (Presented at National Committee on Plant Genetic Resources, BARC, Bangladesh, 26-29 August 1997).

<sup>73</sup> Draft Seed Act 2013 Section 33(3).

<sup>74</sup> Ibid, section 21(1).

technologies. So the application of GURTs in Bangladesh is to be countered through non recognition of intellectual property protection (IPP) for GURTs or to limit the IPP given for GURTs through explicit legislation. The following are some strategic measures:

### **6.1 Use of flexibilities under TRIPS**

The use of flexibilities under TRIPS is one way of exempting particular technologies from patentability, especially if they are a threat to national security.<sup>75</sup> Framing a food security or environmental sustainability argument as a national security concern is one way in which Bangladesh can limit the negative impacts of GURTs and IPP. Since GURTs are proven to impact adversely on access to seeds by farmers and this is linked to national food security, Bangladesh may be able to argue that it will not grant patents for GURTs.

### **6.2 Development of a *Sui Generis* Regime**

Under Article 27.3(b) of TRIPS, countries can provide for the protection of plant varieties by patents and/or by any effective sui generis system. There are no parameters for a sui generis system and the term ‘effective’ is not defined. For this reason, each country can pattern its national laws to correspond to its particular circumstances and aspirations. One way of countering GURTs would be the protection and enforcement of community rights, farmers' and breeders' rights through a sui generis system<sup>76</sup>.

### **6.3 Community Rights**

The community should be defined as a legal entity referring to a group of people having a long-standing social organization and include indigenous people and local communities. Such a community should have inalienable rights over its biological resources, innovations, practices, knowledge and technology (including the community’s right to use and collectively benefit from those resources)<sup>77</sup>. The recognition of the community’s intellectual rights should not be predicated

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<sup>75</sup> Patricia Kameri-Mbote and James Otieno-Odek, ‘The Genetic Use Restriction Technologies, Intellectual Property Rights and Sustainable Development in Eastern and Southern Africa’ (Working Paper No 14, Trade Law Centre for Southern Africa, August 2006) 28 <<http://erepository.uonbi.ac.ke/bitstream/handle/11295/40487/Kameri.pdf?>>.

<sup>76</sup> Ibid 29.

<sup>77</sup> Ibid 30.

on registration, and customary laws and practices of communities should be applicable to community rights.

#### **6.4 Farmers' Rights**

Farmers' rights should be expressly recognized and protected as the rights arising from the past, present and future contributions of farmers in conserving, improving and making available plant genetic resources. Like community rights, these rights must not require prior declaration or registration. The rights must be defined as a form of IPR and would cover the products of farmer selection and breeding, and the traditional resources that contribute to the conservation, development and sustainable use of plant and animal genetic resources. They would include rights to use, exchange and market farm saved seeds, to protect traditional knowledge, and to make use of benefit-sharing and participation in decision-making at the national level. They must also include the right to information so that farmers can participate effectively in the decision-making process. Additionally, the customary laws and practices of the concerned communities must be applied in the protection of farmers' rights.<sup>78</sup>

#### **6.5 Recognition of Farmer as Breeder**

As farmers have played a vital role in innovation by selecting and maintaining seeds for centuries and most of the plant varieties legislations in agriculture prone countries recognize farmers as breeders. In India, farmers are specifically mentioned as breeders in section 2(c) of the Indian Plant Varieties Act, 2001. However the draft Plant Variety Act in Bangladesh does not have any reference to farmers as breeders either in definition of 'breeder' or 'farmer'. In the farmers' rights section, farmers' rights are taken merely to include propagating which to some extent qualifies farmers as breeders or innovators.<sup>79</sup>

#### **6.6 Farmers' Access to Benefit Sharing**

Agriculture-prone developing countries have started inserting the access to benefit sharing provision in most biodiversity legislations. However only Thailand has provided for benefit sharing in its Plant Variety Protection (PVP) Act. In India, the Biodiversity Act covers the access

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<sup>78</sup> Kameri-Mbote, Community, farmers' and Breeders' Rights in Africa: Towards a Legal Framework for sui generis Legislation, *University of Nairobi Law Journal* (2003) 102.

<sup>79</sup> Draft Plant Variety Act section 19.

to benefit sharing and this issue also has a place in the PVP Act.<sup>80</sup> In Bangladesh the access to benefit sharing is proposed in the draft Plant Variety Act and the draft Biodiversity Act.<sup>81</sup>

### **6.7 Engagement in Ongoing Debates on GURTs**

There is also a window of opportunity presented/granted by the Article 8(j) Working Group which was mandated to examine the socio-economic impacts of GURTs.<sup>82</sup> Bangladesh should participate effectively in this working group to bring its perspectives to bear on the findings and the actions decided on.

## **7. Conclusion**

By allowing BT Brinjal, a genetically modified organism (GMO) containing terminator technology or genetic use restriction technology (GURT) has been already introduced to Bangladesh. Though the promoters are showing some advantages of this technology, it affects our agriculture greatly. It also affects human health, biodiversity and environment. Bangladesh is an agro-based country. And its farmers' have long traditional practice of farm saved seeds. Our agriculture is also fully dependent on this practice of the farmers'. But due to introduction of terminator seed, farmers will not be able to save surplus seed for future cultivation rather they have to buy seed again from the seed companies since it stops enhanced yielding. So this terminator technology is a direct threat to our agriculture and our food security. Now we can either ban or impose restrictive legal regime to this terminator technology. As a member to TRIPS we can impose a sui generis regime and exploit its flexibilities. At the same time we can enforce the draft Biodiversity Act and draft Plant Variety Protection Act containing provision for farmers' rights in line with fair and equitable sharing of the benefits from the utilization of genetic resources. Then we will be able to protect our food security and agriculture within TRIPS mandate and other commitments arising from CBD and the ITPGFA.

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<sup>80</sup> [Indian] *Biological Diversity Act 2002* Sections 3,4,6 and 18; [Indian] *Protection of Plant Varieties and Farmers' Rights Act 2001* Sections 2(b) and 26.

<sup>81</sup> Draft Biodiversity Act Sections 4 and 18; Draft Plant Variety Act Sections 10, 11 and 22.

<sup>82</sup> Decision VII/16(D), Article 8(j) and Related Provisions, in Report of the Seventh Meeting of the Conference of the Parties to the Convention on Biological Diversity, UN Document: UNEP/CBD/COP/7/21 (2004).