Sterile Seeds: Is that our Future?

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Abstract:

Oxford Dictionary defines Seed as 'the unit of reproduction of a flowering plant, capable of developing into another such plant'. To millions around the world seed represents life. It represents inexhaustible source of living food. Here in this article I seek to explore the effect of patenting this seed of life, the effect of converting an inexhaustible resource into the money making machine for a few patent holders.

Introduction:

India became a signatory to TRIPs [***T***rade ***R***elated aspects of ***I***ntellectual ***P***roperty right***S***] Agreement to enjoy the world of opportunities thrown open by the World Trade Organisation. In the initial stages of TRIPs negotiations India was constant in opposition along with many countries like Brazil, Peru, Egypt, Cuba, Nigeria, Tanzania, Argentina, South Korea and Yugoslavia. But the opposition was overcome by intense lobbying and pressure exerted by the developed nations, especially USA. USA initiated S. 301 of Trade Act, 1974, against Brazil and South Korea. This S.301 authorises the President of USA to take all appropriate actions including retaliation, to obtain removal of any act, policy or practice of foreign government that violates international trade agreement or burdens and restricts United States commerce. United States further made it clear that it will initiate similar action against other opposing countries, unless they were ready to sit down for negotiations on trade related aspects of intellectual property. Finally, one by one all the countries succumbed and agreed to enter negotiations.

TRIPS Agreement sought to provide certain level of uniformity in Intellectual Property Regime across its member nations. It lays down minimum standards of protection to be implemented in respect of certain intellectual properties which included copyright trademarks and industrial designs. WTO was well aware that the developing as well as the under developed countries will need transition period to implement all the minimum standards laid down in the Agreement. India which fell under the developing nation category got up to 1/1/2000 to implement all the aspects of the Agreement. India also got until 1/1/2005 to provide for product patent in areas of technology which were not previously allowed under the Indian patent regime (food, drugs & chemical substances). To allow for product patent in all these areas as well as become TRIPS compliant the Patent Act was amended in 1999 followed by another noteworthy amendment in 2005.

One of the most alarming aspects of TRIPS agreement is Article. 27, that permits patenting of plant and animal material. Invariably this Article has elicited lot of protests from the Third World Nations[1], as it facilitates and directs seed development from local communities with centuries old traditions right to the doorsteps corporate laboratories. As ***Vandana Shiva*** observed apart from the monopolies, created over food supplies, it diminishes genetic diversity.[2] Thus the drought resistant varieties of seeds that sprouted from Indian Traditional Knowledge are left wide open for misappropriation and exploitation. With the advent of Convention of Biological Diversity, this threat has been mitigated to certain extent. CBD calls for *informed prior consent* and *mutually agreed terms* for *access and benefit sharing* with respect to Traditional Knowledge[3]. But this is just one facet of the problem that has been addressed to certain extent.

Seed Patenting - Impact

Another issue to be addressed is the level of monopoly that can enforced upon such seeds by the patentee. Do the farmers have right to store seeds from their harvest from the patented seeds for the next cycle or must they pay royalty every time? On first glance we will be tempted to say, farmers must pay royalty every time they use the seed, but let us consider this example. Let us suppose X purchased a patented branded

[1] See, Robin Mansell, Marc Raboy, The Handbook of Global Media and Communication Policy, John Wiley and Sons, 2011.
[2] See, Vandana Shiva, Biopiracy: The Plunder of Nature and Knowledge, South End Press, 1997.
[3] See, Article 8(j) of Convention on Biological Diversity

mobile phone. After a few months of use, X is pretty much bored with the mobile and purchased a new one. This old mobile that X has in his hand can be used by him in any way he wants, including selling the used mobile, dismantling it and sell some parts of the cell phone or throwing into the dustbin. This right of X is guaranteed by the concept of **Patent Exhaustion**. Can we not extend this logic to say that the farmer is allowed to harvest and sell those patented seed produce right away or store a part of it for his next farming cycle? Does the farmer not have a basic right to sow and re-sow the seeds? For eons, since the dawn of agriculture farmers around the world enjoyed basic right to store a part of the seeds harvested for next farming cycle.

On the other hand it can be argued that there is a fallacy in my above example. When we purchase a patented article we have indeed exhausted the patentee's right as far as the article we have purchased is concerned. But, we have not gained any right to replicate the article and sell that. So by this argument, a farmer who had purchased the patented seed is having all right to sow it or re-sell it or even consume it, but he has no excuse to replicate the seed and re-sow those replicated seeds. Again a counter argument can be presented that the farmer purchases the seeds with a sole aim to replicate it; he sows the patented seeds with a hope of high yield, that he intends to sell in the market. Generally companies that own seed patents enter into specific agreements with the farmers which contain the limited use clause that prevents the farmers from using the seeds for more than a single season or saving any seed produced from the crop for replanting.

The angle of *Patent Exhaustion* was discussed in 2013 in detail by USA Supreme Court in the famous ***Bowman V Monsanto Co***[4] *case.* The crux of the decision was that patent exhaustion doctrine is not applicable in cases of self-replicating technologies.

Bowman V Monsanto Co[5]

Facts: Monsanto Co had invented and patented soy seeds that made them resistive to the herbicide Glyphosate, even after repeated exposures. Glyphosate was very effective herbicide often used by farmers to kill weeds that grew when soy beans was farmed. Thus, these patented seeds ensured that even when the farmers used glyphosate to kill the weeds, the soy beans were not killed. The company sold the seeds under the name Roundup Ready soybean, subject to a licensing agreement that permitted farmers to plant the purchased seed in *one, and only one, growing season*. Growers may consume or sell the resulting crops, but were not allowed to save any of the harvested soybeans for replanting.

Bowman had purchased the soybean seeds from a grain elevator, where it was sold for consumption and not for farming. The purchased seeds contained combination of many kinds of soy seeds including the Roundup Ready soybean seed. He planted these seeds and treated all the plants with glyphosate. All the plants that were not resistive to the herbicide were killed and what remained was just the patented seed. He collected all the harvest, to do his next round of farming, circumventing the license as well as royalty payable to the company. Company getting a wind of this, filed a case for patent infringement. Bowman took the defense of patent exhaustion.

Judgment: Bowman argued that allowing Monsanto to interfere with the normal way the farmer's use the seeds will create impermissible exception to the exhaustion doctrine for patented seeds. The Court refused this view and pointed out that defense of patent exhaustion falls flat, as it is Bowman who is trying to create an exception to the well-settled rule that exhaustion does not extend to the right to make new copies of the patented item. It was pointed out that the doctrine restricts the patentee's rights only as to the "particular article sold". It doesn't affect the patentee's ability to prevent a buyer from making new copies of the patented item. Patent exhaustion does not permit a farmer to reproduce patented seeds through planting and harvesting without the patent holder's permission. It was also pointed out that, unless this specific protection against patent exhaustion was provided the patent given to the company would be meaningless. Unless such protection was provided seed companies could produce the patented seed to compete with Monsanto, and more importantly the farmers would need to buy seed only once. Thus it was held that, Patent exhaustion does not permit a farmer to reproduce patented seeds through planting and harvesting without the patent holder's permission.

[4] 569 U.S. ___ (2013), Docket No.11-796, 11 S. Ct. 1761
[5] 569 U.S. ___ (2013), Docket No.11-796, 11 S. Ct. 1761

While we can understand the legal logic behind the above judgment, the farmers are sure to feel dazed by a ruling that they no longer have the rights to store seeds for re-planting. Since man began farming, the farmers have stored seeds for replanting. In countries around the world, farmers have been using their own traditional methods to store seeds for next season's farming. Even in India have their own methods to store seeds, for replanting such as mixing the seeds with salt, camphor, neem leaves, neem oil or cow dung depending on the type of seed to be preserved.[6] But this basic right to store seeds from their harvest for replanting, has been removed from their hold and handed to large companies, under the cover of patent rights.

The story gets even murkier when we bring the 2004 judgment of Canada Supreme Court regarding cross-pollination. Pollination is a process through which pollen of a flower (male sex cells) is transferred to the stigma of a flower (female sex organs) enabling fertilization. Pollination generally occurs when pollen is carried by wind or bees or similar insects. When it happens within the same plant it is called as self-pollination. But when it happens between the pollen of one plant with the stigma another plant of same species, it is called as cross-pollination. From this explanation it is self-evident that cross pollination occurs by reason of nature involving factors such as air or insects. So, a new question came before the courts, what if the patented genetic trait is transferred to a non-patented seed by way of cross pollination? Is this a case of patent infringement?

Monsanto Canada Inc v Schmeiser [7]

Facts: This case involves canola seeds that were genetically modified to become glyphosate herbicide resistant. This seed was developed and patented by Monsanto Company under the brand name Roundup Canola seed. Percy Schmeiser in 1997 planted normal canola seeds in his field. He had used the Roundup glyphosate herbicide to clear weeds and canola plant that grown in a ditch and around a pole besides his field. He observed that some of the canola plants had survived the herbicide spray. Noticing this, he conducted a test by spraying the same herbicide upon a part of his filed some 3 to 4 acres area, and found that 60 % of the plants survived. He collected and stored the seeds from the plant that survived the herbicide spray. In 1998 he used this seed collection to seed 4 acres of land. Noticing this Monsanto approached Percy Schmeiser to sign their standard license and pay licence fee. Schmeiser refused, stating that the 1997 contamination was due to cross pollination making him the owner the seed he harvested, and he could use the harvested seed as he wished because it was his physical property. He further pointed out that he had not used Roundup gylphosate herbicide.

Judgment: It was observed that even though Schmeiser stated that there was cross pollination in his 1997 yield, he took no such defence in his 1998 yield. Evidence showed that the level of Roundup Ready canola in Mr. Schmeiser's 1998 fields was 95-98%, indicating a level of purity that cannot be accidental. The Court opined that key element in Mr. Schmeiser's patent infringement in his 1998 crop was that he knew or ought to have known the nature of the gylphosate-resistant seed he saved and planted.

The court held that the right to use the seeds is subject to the same legal restrictions on use rights that apply in any case of ownership of property, including restrictions arising from patents in particular. The court held that a farmer whose field contains seed or plants originating from seed spilled into them, or blown as seed, in swaths from a neighbour's land or even growing from germination by pollen carried into his field from elsewhere by insects, birds, or by the wind, may own the seed or plants on his land even if he did not set about to plant them. *He does not, however, own the right to the use of the patented gene, or of the seed or plant containing the patented gene or cell*.

However, Schmeiser had partial victory, as the court held that he doesn't have to pay Monsanto his profits from his 1998 crop, since the presence of the gene in his crops had not afforded him any advantage and he had made no profits on the crop that were attributable to the invention.

The effect of the judgment is that if there is any cross-pollination, the farmer automatically loses his right to store the seed and use it in his next farming season, as the genes are patented. It is not his mistake that by way of pollination the patent seed found a way into his field, still he loses his right to store the produce from such cross contaminated seeds and then use it for next seeding cycle. There is an argument that when the farmer found about the cross contamination, he did not take steps to eliminate it, he rather identified the

[6] See, C Karthikeyan, D Veeraragavathatham & S Ayisha Firdouse, Traditional Storage Practices, Indian Journal of Traditional Knowledge, Vol. 8(4), October 2009, Pp. 564-568.

[7] [2004] 1 S.C.R. 902, 2004 SCC 34

same and allowed those cross pollination seeds to be separately preserved and used for next round seeding, making him an infringer. The judgment has still not decided what is to be the impact of cross pollination, where a farmer aware of cross pollination, merely suffer the same and does not take any special steps to increase its volume actively. Conversely, let us suppose a farmer, who is aiming for organic non-genetically modified product, gets his field contaminated with genetically modified seed due to cross pollination, in such scenario will the patent holder be held liable?

Sterile Seeds: Terminator Technology

While these questions and many similar questions remain unanswered, seed companies have found a way to circumvent the problem of farmers storing patented seeds for the next seeding. Terminator seed has the potential to replace the intellectual property rights regime itself, from the viewpoint of seed companies, it is superior. There is no need to contest in courts for to prevent the farmer from storing the seeds for seeding, even if they store the seeds, those seeds will be sterile and thus of no use. Terminator seeds are also called as suicide seeds and are based on *Genetic Use Restriction Technology [GURT]*. This causes the second generation seeds to be sterile, so that there will be no use in storing the seeds from the patented seed produce.

Conceptually there are two variants of GURT namely:

→ The GURT produces sterile seeds, thus seeds from GURT crops can be used for sale as food or fodder.
→ This GURT modifies the crop in such a manner that the genetic enhancement engineered into the crop doesn't function until crop plant is not treated by a special chemical combination that is sold by the seed company. Thus even if farmer stores the seeds, enhanced trait in the seed will not reveal itself unless they are treated with a special chemical sold by the patent holder.

The GURT has been patented though it is not commercially available in the markets yet. The gene was developed under a cooperative development and research agreement between *Agricultural Research Service of the United States Department of Agriculture* and *Delta & Pine Company* in 1990s. It is to be noted that Delta and Pine Company was obtained by Monsanto, the world's largest cotton seed company.

Many of the developing and third world nations have mentioned their reservations against this technology. In 2000 the governments at UN Convention on Biological Diversity created a moratorium on GURTs via decision V/5, III which recommends that the governments must not approve field testing or commercial use of terminator seeds All Parties, including Canada, reaffirmed their support of the above recommendation at the Eighth Conference of the Parties to the CBD(COP-8), which took place March 20 - 31, 2006 in Curitiba, Brazil. All Parties, including Canada, reaffirmed their support of the above recommendation at the Eighth Conference of the Parties to the CBD (COP-8), which took place March 20 - 31, 2006 in Curitiba, Brazil. .[8] The two major issues that are raised by environmentalists regarding this terminator technology are:[9]

- ✓ Pollen from the terminator technology plants may invade neighbouring fields and render those plants' seeds infertile also.
- ✓ Third world and developing nations will become dependent on buying seed every year rather than storing seed from one year's crop for the next year planting.

This worry that farmers will become dependent on seed companies is not mere exaggeration. In India we are viewing the effect of introducing Bt.Cotton with our own two eyes. Vandana Shiva observes that the introduction of Bt.Cotton by Monsanto's wrought out the following changes in Indian Seed sector:[10]

- ✓ Indian companies were locked into joint ventures and licensing arrangements and concentration over the seed sector increased. Monsanto now controls 95% of cotton seed market through its genetically modified seeds.
- ✓ Seed which was common resource of farmers has now become intellectual property of Monsanto. Renewable resource has now become non-renewable patented commodity.

[8] http://www.inspection.gc.ca/plants/plants-with-novel-traits/general-public/gurts/eng/1337406710213/ 1337406801948, last accessed on 5/11/2019

[9] www.maizecdna.org/outreach/e2.html, last accessed on 4/11/2019

[10] Vandana Shiva (31 March 2013), Seeds of Suicide and Slavery Versus Seeds of Life and Freedom, Al Jazeera English, retrieved from www.aljazeera.com/indepth/opinion, last accessed on 4/11/2019

- ✓ Open-pollinated cotton seeds become displaced by hybrids including genetically modified hybrids.
- ✓ Cotton which was earlier been grown as a mixture with food crops now had to be grown as a monoculture, with higher vulnerability to pests, disease, drought and crop failure.
- ✓ Monsanto started to subvert India's public resources to push its non-renewable hybrids and genetically modified seeds through Public Private Partnerships.
- ✓ Above all the price of cotton seeds jumped 8000% due to Monsanto's royalty extraction and high costs of purchased seeds and chemicals. This has created a death trap, resulting in high suicide among framers in Maharastra - the cotton belt of India.

Conclusion

It is high time that Indian Parliament recognises the basic rights of farmers such as right to sow and exchange seeds, as well as right to farm in a manner he chooses – such as right to farm without use of genetically modified sterile seeds or indulge in organic farming without introduction of genetically modified cross pollinated seeds – a right to farm without the interference of technology if he choose to do so. These basic rights, I speak of are directly tied to the farmer's livelihood. In fact Indian Supreme Court had recognised the right to livelihood as early as in 1986 as a fundamental right under Article 21 our constitution.[11] In 2011, the Delhi High Court in one of its judgment regarding copyrighting DNA observed as follows[12]:

'An inventor or innovator undoubtedly should be provided a fair regime which protects his creative efforts, and rewards him. But in the absence of thought out policies, which weigh the advantages as well as the drawbacks, that may manifest in the unhindered enforcement of such impulses, there is a danger of imperilling the right to occupation, guaranteed by Article 19 (1) (g) and the right to livelihood, so emphatically held to be an intrinsic part of Article 21 of the Constitution of India, by our Courts.'

India has already seen the ill effects of allowing of seeds. We are in need of better seed policies that ensure that the farmers have their basic rights reaffirmed, such as right to store seeds, exchange seeds, freely reproduce plant material exchanged with other farmers and get affordable and diverse seed varieties. Even though we have our responsibilities to comply with the TRIPs agreement, we must also remember that we have a primary responsibility towards our own farmers. Seed policies in India must primary reflect the needs of our farmers. Even Article 27.3(b) of TRIPs Agreement calls for a mandatory review regarding patentability of plants and animal inventions. Thus this mandatory review must be done taking into consideration the needs of the farmer's around the world.

I would in fact suggest for a specific constitutional amendment, something similar to Art 21A which guarantees right to education over and above the rights of private sector educational institutes – an amendment that ensures that the basic farmer's rights stand protected under Part III of our Constitution.

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