

Plant biotechnological patents from the legal perspective

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Abstract

The purpose of this article is to examine the extent to which plant biotechnological patent in terms of natural product which has human intervention, different from other product and the entitlement of such a patent whether it is the inventor or biological donor's patent? In addition, the article discusses how would one determine the "value" added" by the company's researchers as opposed to the value contributed by the original genetic material. Meanwhile, the poor farmers and indigenous people who are the "pioneers" in terms of the knowledge of the plant, they are left unprivileged and deprived of their contribution and benefits. Thus, this article would highlight the significance of the contribution made by the original donor especially, in a poor developing country whose natural heritage has been "taken away" without any consideration, acknowledgment and how to strike a balance between the rights of an inventor and biological donor?

Keywords: Plant Biotechnology, Patents, Inventor, Biological Donor, Developing countries

Introduction

Agriculture is expected to reach 8000 million by 2020 and 6700 million will be in developing countries. New technology such as biotechnology is a useful tool to enhance agricultural crop in the future. Biotechnology is defined as the use of living organisms to produce products beneficial to mankind or specifically, the application of biological organisms to all technical, agricultural and

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industrial process. Biotechnology has been identified as one of the key engines for the country's economic growth. Biological diversity or biodiversity refers to the vast variety of living things on Earth and the complex interactions between them. A more scientific or technical approach would describe biological diversity as referring to genetics, species and ecosystem variety.

Issues pertaining to Biotechnological Patent and its protection

"Plant Biotechnology "is defined as encompassing all aspects of plant cell and tissue culture as well as techniques arising from plant molecular biology. An invention is patentable if it is new, involves an inventive step and is industrially applicable. Biotechnology has been developed supported with a stronger intellectual property rights (IPR) regime for the protection of technology Chattervedi, Sachin (2002). Article 53(b) European Patent Cooperation prevents patents from being granted for: "plant or animal varieties or essentially biological processes for the production of plants or animals; this provision does not apply to microbiological processes or the products thereof". Thus, mere discovery is not protected under patent law. Similarly, products pre-existing in nature is not patentable. Only products of nature with human intervention and different from natural products are patentable.

An invention must, in general, fulfill the following conditions to be protected by a patent. It must be of practical use. It must show an element of novelty, that is, some new characteristic which is not known in the body of existing knowledge in the technical field. This body of existing knowledge is called "prior art". The invention must show an inventive step which could not be deduced by a person with average knowledge in the technical field. Finally, its subject matter must be accepted as "patentable" under law. In many countries, scientific theories, mathematical methods, plant or animal varieties, discoveries of natural substances, commercial methods, or methods for medical treatment (as opposed to medical products) are generally not patentable.

A patent is an exclusive right granted for an invention, which is a product or a process that provides a new way of doing something, or offers a new technical solution to a problem. A patent is an exclusive right given to an inventor to exclude all others from making, using and/or selling an invention. Once issued, a patent gives the inventor the legal right to create a limited monopoly by

excluding others from creating, producing, selling or importing the invention. This right is of limited duration, for a period of 20 years from the date of filing the patent application. In exchange for the right of exclusion, the inventor must disclose all details describing the invention, so that when the 20-year patent right expires, the public may have the opportunity to develop and profit from the use of the invention. Patent protection means that the invention cannot be commercially made, used, distributed or sold without the patent owner's consent. These patent rights are usually enforced in a court, which, in most systems, has the authority to stop patent infringement. Conversely, a court can also declare a patent invalid upon a successful challenge by a third party.

The inventor versus biological donor

A patent owner has the right to decide who may - or may not - use the patented invention for the period in which the invention is protected. The patent owner may give permission to, or license to other parties to use the invention on mutually agreed terms. The owner may also sell the right to the invention to someone else, who will then become the new owner of the patent. Once a patent expires, the protection ends, and the invention enters the public domain, ie, the owner no longer holds exclusive rights to the invention, which becomes available to commercial exploitation by others.

Patents are necessary because patents provide incentives to individuals by offering them recognition for their creativity and material reward for their marketable inventions. These incentives encourage innovation, which assures that the quality of human life is continuously enhanced. All patent owners are obliged, in return for patent protection, to publicly disclose information on their invention in order to enrich the total body of technical knowledge in the world. Such an ever-increasing body of public knowledge promotes further creativity and innovation in others. In this way, patents provide not only protection for the owner but valuable information and inspiration for future generations of researchers and inventors. Thus, the following two things shall not be patentable, that is plant and animal varieties and essentially biological procedures for the breeding of plant or animals.

Among concerns of developing countries is lack of expertise to draft appropriate legislation (PVP or patents) and implement the administration of such system. They are more concerned that new technology will be solely held in the private sector and will be inaccessible to them; this concern is levied at multinational companies in particular. An example of such a model is USAID Collaborative Research Support Project (CRSP, <http://crsps.unl.edu/>) has acted as a financier research collaborated between agricultural scientists working within US universities and counterpart scientists working within national agricultural research systems in the developing world. According to the terms of CRSP, a vital share of all research funds must be spent by partner scientists within the developing country (C. Juma et al.2001).

Regarding ethics of protecting, or 'owning', living organisms, whether it is appropriate or not to developing countries may question the ethics of protecting, or "owning", living organisms. They fear of not being able to afford patented technology. For example, developing countries are concerned that farmers, often the traditional innovators, may not benefit from IP protection. However, with appropriate IP systems, developing countries can stand to benefit from the protection of their genetic resources by encouraging investments in the plant breeding industry and in the long run attract international collaborations. Biotechnology patents are assets to life science companies as these assets provide a basis for commercialization. Patent right will not be available if they are only in a country in which no commercial activity occurs. Thus, the value

of biotechnology patents as assets will depend upon having enforceable rights in the country with a significant commercial opportunity for the invention.

An inventor is not defined in the Act. According to UK Patents Act 1977 "...an inventor is the actual deviser of the invention". According to the patent law, an inventor is given the right to ownership and thus his invention of plant can be patented. Thus, the biological donor is left underprivileged. However with full consideration, according to the humanitarian's point of view, it is unfair to let their natural resources and inherited skills and knowledge unappreciated. Due to the fact that without their involvement in the first place, there will be no invention. Also, most of the inventors have relied upon the indigenous knowledge and skills.

According to the Indigenous people, based on their community leader, they have unwritten rules that they take only the more mature *Eurycoma longifolia* Jack and leave out the young ones and cut only the shoots of leaves whereas outsiders uproot the whole plant. The holder of a plant breeder's right enjoys an absolute monopoly to sell, offer for sale, otherwise market, import or export or to stock for the purposes the "propagating material" for his plant variety, and to produce, multiply or condition such material. Allied to this is his duty and exclusive right to apply the registered name to that protected variety.

The Plant Varieties Act 1997 (Act 1997) , section 9, contains several provisions to support schemes for royalty payments, or equitable remuneration to be paid on farm saved seed, at a rate 'sensibly lower' than for new propogating material. For small farmers, no remuneration may be levied. There are general exceptions to plant breeders' rights. Section 8 of Act 1997 provides that the rights do not extend to private and non-commercial use, or use for experimental purposes or to develop another variety. These exceptions have their counterparts for patents. Section 10 of the same provides that plant breeders' rights in relation to propogating material are "exhausted" by marketing the material.

Thus, where can the inventor invent such an invention if without relying on a secured and reliable source from the Biological Donor? Do not forget that the invention was derived from the "know-how" knowledge of the indigenous people for example in making a special tonic to help men/women rectify their sexual problems by using the indigenous' special knowledge on herbs such as *Eurycoma Longifolia* Jack which contains several phytochemicals (plant chemicals) that support healthy testosterone levels (the sex hormone) required for male sexual function. It also supports healthy sexual organs and mental alertness or *Labisia pumila* (*Myrsinaceae*) that has been used by many generation of the Malay women to induce and facilitate childbirth as well as a post-partum medicine (Burkill, 1935) Thus, the writer is of the view that the biological donor should be given some sort of acknowledgment and recognition.

The advantages and disadvantages faced by the developing countries

How would one determine the "value" added" by the company's researchers as opposed to the value contributed by the original genetic material? . Assuming that labour's fruits are valuable, and that labouring gives the laborer a property right in this value, this would entitle the labourer only to the value added ,and not to the total value of the resulting product. Though exceedingly difficult to measure, these two components of value (that attributable to the

object laboured on and that attributable to the labour) need to be distinguished (Edwin C. Hettiger 1989).

Imagine a company from a developed country “prospects” for genetic material in a poor tropical country, takes some plant specimens back to the lab, and inserts a gene from the “prospective” material into an ordinary domestic plant, later producing a very valuable new plant (Merges, Menell & Lemley 2000).

According to the approach taken in the excerpt, how should the rights be allocated between (1) the poor country’s government, which claims ownership of the raw genetic material, and (2) the company that developed the new plant? As a result, the increased use of herb and spice based products include increasing awareness and interest in natural healthcare, acceptance of traditional medicine in mainstream healthcare, availability of better quality herb and spice products and increasing variety through research and development.

Developing countries lack of proper avenue with limited capacity for innovation in terms of knowledge, financing, market opportunities and incentives, compared to developed countries (C. Juma et al. 2001). Thus, in order to safeguard the interests of farmers, agricultural research urge more international cooperation with strong direct links between scientists in donors and recipient countries (C. Juma et al. 2001).

This development together with monetary investment required to develop novel seed varieties, may lead to the willingness of companies which heavily invested in research and development (R&D) to isolate, test and commercialize genes to assert their legal claims to specific plant varieties as they are entitled for their inventions. Critics of intellectual property rights in the agriculture sector contend that they help accelerate undesirable trends like centralization and the loss of economic power by small farmers (Merges, Menell & Lemley 2000).

For many farmers in developing countries, especially those in sub-Saharan Africa, the Green Revolution materialized because its agricultural practices required upfront investments such as irrigation systems, chemical fertilizers and pesticides which go beyond the financial reach of small-scale farmers. Today’s biological agricultural revolution is knowledge intensive, not capital intensive because its technical advances are incorporated into the crop seed. As a result, small-scale farmers with limited resources should no longer be restricted to the large volume commodity crops that provide a return on investments because of the remarkable flexibility provided by crop biotechnology.

Thus, realizing biotechnology’s extraordinary capacity for improving the health, economics and living conditions in developing countries, many universities, research institutions, government agencies and companies in the world have developed relationships for transferring various biotechnologies to developing countries. Regarding the aspect of commercialization, we are in the process of active participation.

While technology transfer has been and will continue to be an essential mechanism for sharing crop biotechnology, many developing countries are taking the next step by investing resources to build the center for biotechnology research, development and commercialization. The leaders in developing countries may begin to recognize the modern usage of biotechnology to provide agricultural self-sufficiently, preserve their natural resources and provide income to small farmers and thus lead to a more diversified economy and independence.

However, they must anticipate that each agricultural problem is unique and thus can be solved by locals who are familiar with the intricacies of the problems. By using their local traditions and applicability in developing local strength in crop biotechnology. For instance, Uganda’s national Council of Science and Technology which established its first commercial agricultural biotechnology in order to produce disease-free coffee and banana plantlets.

According to the International Service for the Acquisition of Agri-Biotech Applications, the following examples have led to the environmental and economic benefits for farmers in developing countries: From 1999 to 2000 in China, insecticide usage decreased by 67 per cent, yields increased by 10 per cent gains of \$500 per hectare. Extensive field trials in India from 1998 to 2001 demonstrated a 50 per cent reduction in insecticide spray increase in yields, which equals an increase in income from \$75 to \$200 per hectare. Small farmers in South Africa gained through a 25 per cent yield increase and decreased number of insecticide from 11 to four, reducing pesticide costs by \$45 per acre. The higher cost of Bt seed (up to \$15 hectare) resulted in an average economic advantage of \$35 per hectare.

However, the motion of granting intellectual property rights over the genetic materials in native species has its advantages and disadvantages. Its advantages include incentives given to the developing countries to protect rainforests and other genetically rich areas as well as increasing productivity and environmental benefits. Generally, the granting of intellectual property rights over a resource can be expected to lead to more efficient use of the resource or at least it will prevent over exploitation of the resource due to its free quality (Merges, Menell & Lemley 2000).

In Australia, in order for someone to make a commercial research, besides making an application for an access permit, he/she must enter into a benefit sharing agreement with the relevant access providers. Monetary benefit such as royalties and payments for samples collected and non monetary benefits may include a guarantee (Brad Sherman 2003). However, this scheme has been criticized as the service providers are forced to rely on commercial practices to protect themselves against the misuse of the genetic resources. Thus by relying on the contract is not adequate and their position is vulnerable (Brad Sherman 2003). In order to overcome this problem is to establish an intangible property right in genetic resources as to establish a (quasi) legal relationship between the access provider and parties that use their genetic resources which is deemed to be capable of protecting their interests irrespective of whether they have a contractual relationship with the user (Brad Sherman 2003).

Therefore, since indigenous and local knowledge systems do exist in the developing world, it is advisable for developing countries to develop their indigenous knowledge systems, while building up national science and technology capability and interactive local learning networks which make them more viable participants in an international system of collaboration. Indeed, these indigenous knowledge systems are currently being used as a basis for screening the pharmaceutical potential of a wider range of plants, animals and microorganisms. They may provide part of the foundation for agricultural and industrial development and should be recognized as vital for future development (C. Juma et al. 2001).

Conclusion

Intellectual property right (IPR) provides legal protection to the holder or inventor against unauthorized use or reproduction of the inventor’s discoveries. Basically IPR covers any creative ideas on a new product and or its processing technology, expressions in the

form of words, shape and even associated colors on the product that make it distinctive from other inventions in the market. IPR enables the inventor to have the sole and exclusive use of his invention unless he decides to enter into an arrangement whereby he gives permission to interested parties to reproduce his invention in return for an agreed monetary sum or royalty. At the same time, the developing countries should be given fair distributing gains an incentive to protect rainforests and other genetically rich areas, leading to more efficient use of the resource and to preventing over-exploitation of the resource due to its free quality as not to deprive the rights of a biological donor.

In short, with the advent of modern information technology, creative ideas, new products and inventions are widely circulated thus making it difficult for inventors to stake a claim for their inventions especially when they are being reproduced and exploited in other countries. The same applies to an unsuspecting local firm producing a particular product without permission from an overseas patent holder. So, patenting or filing a patent application will safeguard one's invention against exploitation by others. In a long term, it could serve to improve the way genetic resources are used and value from where it is located originally. In practice, one party along the chain has the potential to play in shaping the way parties deal with biological resources. As for the indigenous people, it may increase their "sentimental value" of the knowledge and natural resources. Biotechnology can help meet the ever-increasing need by increasing yields, decreasing crop inputs such as fertilizer and providing pest control methods that are more compatible with the environment.

REFERENCES

- Brad Sherman (2003) Regulating access and use of genetic resources : IPL & Biodiscovery, IEPR 7:301
- Chattervedi Sachin (2002) Agricultural Biotechnology and New Trends in IPR Regime : Challenges before Developing Countries. Available via JSTOR. <http://www.jstor.org/pss/4411924> Cited 28 August 2009
- Edwin C Hettlinger (1989) Justifying Intellectual Property, 18 Phil & Pub Aff 31:37
<http://www.ff.org/rff.news/features/America-Patent-Policy-Biotech-and-African-Asiaculture.cfm>. Cited 20 May 2005
<http://pewagbiotech.org/events/0717> Cited 20 May 2005
<http://www.fao.org/biotech/sector2.asp> Cited 20 May 2005
- Juma C, Fang K et al. (2001) Global governance of technology: meeting the needs of developing countries, Int.J.Technology Management 22:(7/8): 629-655
- Merges, Menell, Lemley (2000) Intellectual Property in the new technological age, 2nd Edition, pg.344
- Sreenivasulu NS, Raju CB, Sreenivasulu NS, Raju CB (2008) Biotechnology and patent law: patenting living beings. Manupatra, Delhi.