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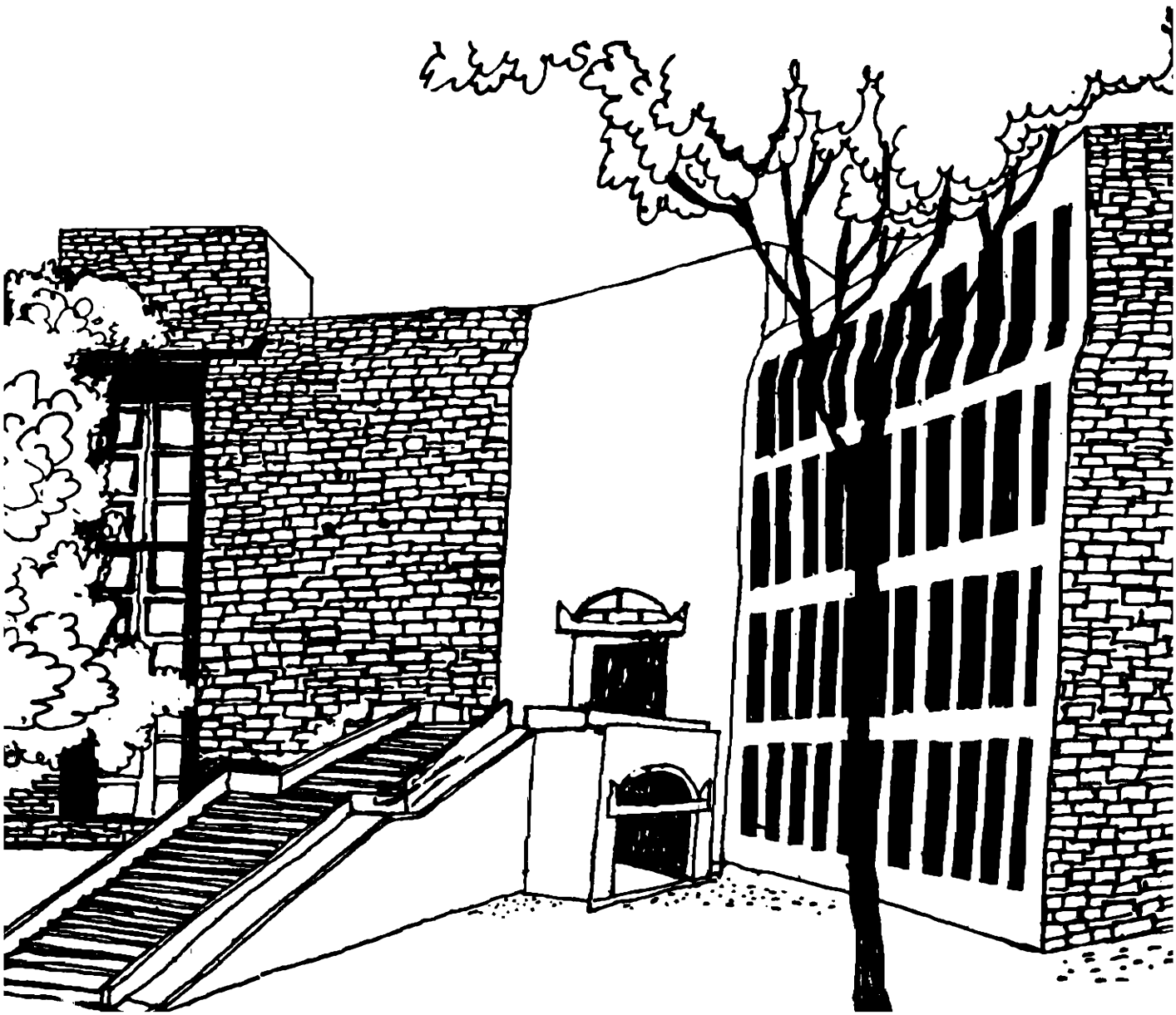

INTELLECTUAL PROPERTY RIGHTS, FARMER'S RIGHTS AND PLANT GENETIC CONSERVATION: AN OVERVIEW

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Intellectual Property

Inventions are based on novel and useful ideas. Those ideas are the intellectual property of the inventors and they should be recognized and sufficiently rewarded in order to make inventors disclose the idea for the benefit of the society. Conferring the right over the idea to the originator is justified on the grounds of Lockean labour theory that the efforts of labour should be rewarded with property. If special incentives were not available inventors would engage in a lower level of research and development activity than would be socially desirable. Further, the idea might "die with their inventors and forever be lost to society". The most prevalent method of intellectual property protection are i) Patents, ii) Plant Breeders Rights (PBR), iii) Copyrights, iv) Trade Marks and v) Trade Secrets. Of these patents have figured most prominently in the Intellectual Property Rights (IPR) debate.

Patent protection is in conflict with the conditions necessary for the efficient functioning of a free market economy. Patents may be barriers to market entry, they may impede the flow of information and the mobility of factors of production. Evaluation of the patenting system is a benefit cost analysis. The benefits which flow to the society must be weighed against cost of creating statutory monopolies. " The incentives to innovate, the diffusion of information through publicly describing and specifying the invention, the distribution of invention through the market and the additional societal welfare through wide use of the invention are the benefits. Costs include monopoly rents and the market inefficiencies which accompany them". The patent system creates a property right to inventions. The idea of creating incentives for innovation by providing the inventor or innovator a period of protection during which the inventor retains the right to exclusive ownership and control of the invention and may attempt to recoup the costs of investment in the innovation process.

Granting of exclusive rights for an invention is nothing new, it can be traced back to ancient times. Greek records show that monopoly rights were granted as early as 200 BC The Romans granted monopolies to inventors and merchants in the form of "Letters Patent" derived from *Literae Patentes* or open letter addressed to the public. The German patent system originated

in the 11th century. The first patent like privileges were granted in England in 1378 by feudal dukes in the mining industry for pumping sub-surface mines. In recent times, an international convention for the protection of industrial property was held in Paris in 1883. The Paris Convention marked a major step in the internationalization of IPRs. Subsequent conventions such as the Strasbourg Convention (1963), The Patent Co-operation Treaty (1970), The European Patent Convention (1973). The Budapest Treaty (1977) etc., tried to harmonize laws of different countries.

For an item to be patentable, it must be novel, useful and non-obvious. The object of the Intellectual Property may be so new that it is unknown to anyone else. At the time of propertization the idea is thought to be generally unknown. It should be economically useful. Non obvious addresses the question of how much distance there must be between the prior art and the claimed novel invention.

Plant Variety Protection

Prior to 1930, plants were not patented because it was believed that plants and its functioning cannot be described in writing as to permit patenting. Description is required to enforce exclusive rights from infringement. The US Office of the Technology Assessment states, "living organism is extraordinarily more complex than any machine. Although the inventor of most complex machine knows all of its parts and understands how it functions no one knows all of the components of the simplest micro organism or understands completely how it functions".

Luther Burbank who gave the US over 800 plant varieties and a leading advocate of plant variety protection lamented. " A man can patent a mousetrap or copyright a nasty song but if he gives the world a new fruit that will add millions to the value of the earth's annual harvest he will be fortunate if he is rewarded by so much as having his name connected with the result. Though the surface of plant experimentation has thus far only been scratched and there is so much immeasurably important work waiting to be done in this line I would hesitate to advise a young man to adopt plant breeding as a life work until it (Congress) takes some action to protect his unquestioned right to some benefit from his achievement".

The perceived inability to describe life forms fully that is to satisfy disclosure requirement for a patent was viewed as an insurmountable obstacle to patenting life forms. The US Congress modified the disclosure requirement to be " reasonably possible" and passed the Plant Patent

Act of 1930. This act, however, admitted only asexually reproduced plants, cuttings, bulbs, spores but not tubers. Seeds remained excluded from the purview of the Act. In Europe, there were attempts to introduce patent like protection to plants In Germany, a system of seed registration was followed from 1905 and patents were issued to plants in early 1930s. However, attempts to reintroduce patents in the post war period was not successful.

The International Association for the Protection of Industrial Property (IAPIP) noted that it was necessary for new plant varieties to be protected either under patent law or by any other means. More specific suggestions were made by the International Association of Plant Breeders (ASSINSEL) for the protection of plant varieties at its 1956 Congress at Austria.

In 1961, an International Union for the Protection of New Varieties of Plants -UPOV (Union Internationale Pour La Protection Des Obtentions Vegetables) was established in Geneva for coordinating the intra country implementation of PBR. The purpose of UPOV Convention is to ensure that member states of the union acknowledge the achievements of breeders of new plant varieties by making available to them an exclusive property rights on the basis of a set of uniform and clearly defined principles. To be eligible for protection varieties have to be:

i) Distinct from existing commonly known varieties.
ii) Sufficiently homogeneous.
iii) Stable and
iv) New, in the sense that they must not have been commercialized prior to certain dates established by reference to the date of application for protection.

Despite the 1930 Act and UPOV Convention, plant breeding in US was confined to publicly funded institutions. The Plant Variety Protection Act was passed in 1970. The act extended protection to seeds but excluded hybrids and bacteria.

The UPOV Convention which was signed in Paris in 1961 was revised in 1972, 1978 and 1991. From 1961 to 1991, the UPOV Convention provided breeders and farmers with the privilege of using protected varieties for specific purposes. However, with the growing privatization of plant breeding research the demand for elimination of breeder's exemption and farmer's privilege grew resulting in modifications in UPOV 1991. Under the convention breeder's exemption for an essentially derived variety was eliminated. Essentially derived variety is defined as a variety predominantly derived from another(initial) variety which retains the expression of the essential characteristics from genotypes or combination of genotypes of the initial variety. With regard to

farmers use of harvested material or on farm seed saving there was no consensus among members. Therefore, an "optional exception" was given under which it is up to the national government to decide whether to permit farmers to use seeds of a PBR protected variety for propagation on their own holdings.

Meanwhile, the US Supreme Court in a landmark judgment in 1980 on *Diamond Vs Chakraborthy* case extended the scope of patentable inventions to "anything under the sun that is made by man". But the Patent and Trademark Office (PTO) continued to deny patent protection to seeds covered by the PVPA on the grounds of interpretation of Congressional intent. It felt Congress would not have passed the PVPA if its members had intended seeds to be included under the general statutes. That interpretation was struck down on internal P.T.O appeal in September 1985, molecular genetic scientist Kenneth Hibberd and his co-workers were granted patents on tissue culture seed and whole plant of corn lines selected from tissue culture.

In October 1994 the US Congress passed a legislation which restricts the farmers' exemption under the US Plant Variety Protection Act. Though the US farmers will continue to be allowed to save seed for replanting on their own farm, the new law eliminates the traditional right of farmers to sell harvested seed to their farm neighbours without having to pay royalties or seeking protection.

Since there was not much progress under the World Intellectual Property Organisation (WIPO) between developed and developing countries regarding Intellectual Property Rights (IPRs) it was linked to international trade under General Agreement on Trade and Tariff (GATT). This move made the developing countries access to export markets in industrialized countries contingent upon advances in IPRS. The Trade Related Intellectual Properties (TRIPs) agreement negotiated under GATT stipulated that inventions in all branches of technology whether products or processes shall be patentable provided they are new involving an inventive step and are capable of industrial application. The member countries are required to develop a new system to protect plant varieties by patents or by an effective *sui generis* system or by any combination thereof.

Farmers' Rights

Incidentally, the industrialized North which is aggressively pursuing protection of plants and seeds developed by them is poor in terms of genetic resources. However, these countries argue for treating the genetic resources of the world as the common heritage of mankind thus trying to dominate the technologically poor but genetically rich third world countries through patent laws. On the other hand, germ plasm is gathered from third world at no cost through which many varieties were developed. There are number of cases where the germ plasm is taken from the third world which contributed millions of dollars to the economy of developed countries but not a single dollar accrued to the country in which the gene originated. Prescott and Allen estimated that between 1976 and 1980 genetic material from wild relatives contributed $340 million per year in yield and disease resistance to US farmers. According to them wild germ plasm contributed $66 billion to the American economy. These valuable germ plasm are routinely collected from the third world countries to the US without any compensation[1]. It had become increasingly clear that farmers and breeders from developing countries were freely providing the feedstock for western plant breeding and seed companies. The varieties developed on the basis of genetic resources supplied free were protected by such companies. " Free access to genetic resources thus became a one way subsidy of the poor to the rich".

The developing countries began to campaign for the just share of benefits to the countries in which the genetic material originated. They insisted the contributions made by the local farmers and tribal communities in selecting and maintaining crop diversity be recognized and rewarded. It is their important intellectual property which needs to be given due recognition.

The FAO Commission of Plant Genetic Resources (1983) recognized the farmers contribution towards global genetic diversity. The concept of Farmers' Rights has been proposed. It is considered as a LDC response to Breeder's Rights over crop germ plasm. FAO's Commission on Plant Genetic Resources (1989) defines Farmers' Rights as " ..... rights arising from the past, present and future contributions of farmers in conserving, improving and making available plant genetic resources particularly those in centres of origin/diversity. These rights are vested in the international community as trustee for present and future generations of farmers, for the purpose of ensuring full benefits to farmers and supporting the continuation of contributions".

[1] op.cit. Fowler and Mooney 1990.

The adoption of farmers' rights over crop genetic resources is a means to recognize the contribution of the farming populations of the cradle areas of plant domestication and genetic diversity.

The US which maintained that farmer's rights was merely a concept signed the Global Plan of Action on Plant Genetic Resources adopted at the Lelpzig conference in June 1996.

Farmer's rights are fundamentally different from breeder's rights and other form of intellectual property rights. Plant variety protection and utility patents are rights to monopoly profits for the purpose of encouraging research. Farmer's Rights are group rights assigned to the collective interest of those who have nurtured crop germ plasm. These rights are not assigned to specific varieties, types of plants or to specific farmers. Monopoly profits are not involved in farmers rights and their purpose is to encourage farmers to nurture and conserve and to utilize and improve genetic resources. Farmers Rights do not imply direct compensation or bilateral reciprocity such as selling a license for exclusive rights to collect the crop germ plasm. While the value of breeder's rights is determined by the market that is established by the government protection. Farmers rights must be valued by other non market mechanisms. The implementation of farmers rights is quite complex. Before going into that it is worthwhile to know why farmer's contribution need to be recognized and rewarded.

Out of thousands of plant species in the world most of our food comes from just twenty species of which just nine account for three fourth of our energy requirements. However, continuous supply of food from the 20 odd species depends on thousands of varieties within each species resistant to pests, diseases and other stresses evolved over time. The genetic diversity found within individual species is of tremendous value as it helps in breeding new cultivars of the species. Apart from the species that supply food there are many others which are used for medicinal and other purposes. Genetic diversity is a capital asset with great potential which should be exploited in a sustainable way to ensure our food and other requirements in the future.

Modern agriculture dictated by market forces requires uniformity of growth and higher productivity which led to the dependence on fewer varieties. The narrow genetic base of modern agriculture makes it vulnerable to unforeseen pests and diseases. The corn blight of

1970 in the US, the loss of wheat crop in Ukraine in 1972 and the devastation of rice due to grass stunt virus in large parts of Asia highlighted the vulnerability of modern agriculture. It is "impressively uniform and impressively vulnerable". Each time these catastrophe was prevented from turning into a calamity largely due to the genes of wild and traditional varieties of the crop. The loss of genetic resources and the vulnerability of modern agriculture focused attention towards conservation. As a result the International Board for Plant Genetic Resources (IBPGR) was set up in 1974 under the aegis of Consultative Group on International Agricultural Research (CGIAR) and a global network of gene banks were established. The collections in different gene banks are accessible to plant breeders in many parts of the world and are really a boon to their breeding programmes. How safe are the gene banks? It is estimated that even in developed countries 30-50 percent of seeds collected and stored in gene banks had been lost. There are several reasons for the losses and decline in viability such as negligence, poor storage conditions, power failures, equipment break down, fire, disease etc. Further, seed of every crop and every variety of the crop responds to life in a gene bank differently whatever be the toughness of seed, a sample will eventually degenerate to a point where it must be rejuvenated. Ideally accessions requiring regeneration should be returned to the areas of their origin but this is not always possible.

These kinds of shortcomings in storing seeds in gene banks have given rise to the opinion that the genetic diversity of the crops and their wild relatives is best preserved *in situ* that is farmer's fields and in natural habitats. Protecting wild plant and species may be relatively easier compared to conserving landraces. Creating bioreserves, sanctuaries may help to prevent erosion and use the genetic resources in a sustainable manner. For example, the Govt of Costa Rica's National Biodiversity Institute (INBIO) and the US based pharmaceutical firm Merck and Co Ltd had entered into an agreement under which Merck is awarded all rights to develop and manufacture any ' useful ' genetic resources discovered by INBIO. In return, Merck has paid an up front fee of $ 1 million for the exclusivity agreement and has agreed to pay royalties on any resultant commercial product. There are similar arrangements worked out in other parts of the world. Japan has launched a major biodiversity research programme in Micronesia. Indonesia and Kenya are establishing inventory programmes similar to INBIO's for possible biodiversity prospecting activities.

In case of conserving landraces there are complex questions involved. With the onslaught of green revolution technologies the landraces had disappeared from the fields in many countries.

Only in small isolated tribal communities these varieties are still grown. But the developmental works like laying roads etc are linking these communities to market economies facilitating these people to take up modern varieties in place of local varieties. How to sustain the interest of the farmers in their traditional crops? If adequate compensation is to be given for not growing the modern varieties how to administer the payment, who will monitor that the farmers continue to grow traditional varieties, how to determine the compensation. Where is the market for some of those crop?

Some Initiatives and Concerns

Although there is agreement that farmers' rights should be implemented there is as yet no agreement on how to do it or fund it. There has been suggestions to impose royalty on seed companies which benefited from the cultivars maintained by the farmers. But there are practical difficulties. For example IR 64 that was released in 1985 by IRRI has some 75 parents and among these are 20 landraces from eight countries. There is simply no way to estimate the contribution of the five landraces from India as opposed to four from China or the breeding stocks that does not have well documented pedigrees.

At the UN Conference on Environment and Development held at Rio de Janeiro in June 1992, the Government of Netherlands, proposed that all industrialized countries provide an additional ODA of 0.1 per cent of their GDP as "Earth Increment". This amount would be reserved for conserving and improving earth's life support system of land, water, forests, biodiversity, oceans and the atmosphere. The 1996 Madras Consultation (Swaminathan Foundation) proposed a two percent levy on all seed sale for being credited to a community Gene Fund for implementing farmers' rights.

Germ plasm is analogous to natural resources or to objects of cultural heritage for which nation states are the responsible actors in protection and disposition . National government represents the interests of all farmers who produce crop genetic resources. It is impossible or inappropriate for any government or international body to assign rights to specific farmers or groups of farmers. There is no way to single out specific farmers or groups who are responsible for crop germ plasm or to identify the contribution of specific collections.

In many areas the farmers who nurture crop genetic resources are economically and technologically isolated ethnic minorities. "The Kurds of Southwest Asia are responsible for a

great diversity of wheat landraces. Traditional potatoes in Peru are kept mostly by Quechua speaking peasants, maize in Mexico is kept by Mayan and other indigenous language groups and rice in Asia is kept by such cultural minorities as the Naga of India, the Ifugao of Philippines or the Karen of Thailand." If farmers rights are implemented through national governments, they may serve the interest of the ruling elite and not the minorities who are nurturing the diversity.

Therefore, it is extremely important to properly utilize the Global Fund coming into the country. Instead of allowing bureaucrats to manage the fund it should be jointly done with NGOs and local people's representatives. The whole system should be transparent and should be easily understood by the people involved. The benefits should reach to those people who are really involved in conservation, otherwise the whole exercise of conserving landraces for sustainable use may come to naught.

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