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Trade-Related Intellectual Property Rights, Biotechnology, Biodiversity and Indian Agriculture

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I

INTRODUCTION

There has been intense controversy on multilateral trade negotiations since the Eighth Meeting of member countries started in 1986 called Uruguay Round under General Agreement on Tariffs and Trade (GATT). Seven rounds of talks have been held after the establishment of GATT in 1947. The crucial issues discussed in these seven rounds have been: Tariffs, Production, Textiles, Restrictions, Dispute Settlement System and Working System of GATT.

During the Eighth Round, three more subjects were included. These were (i) Trade Related Aspects of Intellectual Property Rights (TRIPs), (ii) Trade-Related Investment Measures (TRIMs) and (iii) General Agreement on Trade in Services (GATS). All these issues were discussed at length under the purview of Dunkel Draft Text (MVIRDC, 1994, pp. 18, 26 and 181). The outcome of the controversial issues envisaged a new strong patent regime established by the TRIPs agreement at Marrakesh in 1994. Consequently, a new organisation came into existence called World Trade Organisation (WTO). The implications of these product patents, homogeneous in nature for all member countries are multidirectional and interwoven for the Indian economy in which agriculture is no exception but rather on priority. India is primarily an agricultural country. Agriculture contributes nearly 30 per cent to the stream of national income and supports nearly 70 per cent of the population. Therefore, the search for the most controversial arrangements for new world economic order, i.e., TRIPs and its impact on various agricultural aspects, is of paramount importance. This paper deals with TRIPs in relation to biotechnology and biodiversity and their implications on plants, seeds, germplasm, etc., and offers a few suggestions in the present situation.

II

INTELLECTUAL PROPERTY RIGHTS

Anything coming out of the intellect can acquire the attribute of a private property and the same can be patented. Even an equation like $E = mc^2$ can be patented. In the biological sense, any living organism or genetically modified living organism is a private property and can be subjected to patenting and rights could be established. Therefore, a change in Indian Patent Act 1970 has to be followed and agreed by the Government of India compatible completely with the new proposals of World Trade Organisation (WTO) and World Trade Agreement (WTA). The process of change to the new order of proposals has to be materialised by the year 2005 in order to conform to the international patent regime (IPR) as

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prescribed. Till the year 2005 transitional amendments are to be made as required by TRIPs agreement, especially Exclusive Marketing Rights to be granted to companies and the setting up of a mail box for receiving patent applications.

As noted earlier, agriculture being the core and basic sector, acts as the backbone of India's growing economy. The use of latest seeds, fertilisers, insecticides-pesticides, weedicides, herbicides, machineries, etc., has increased significantly. Vast research and development in these areas has changed the whole scenario and broken the old production and marketing strategies. Among all other things, seeds and plants are very much fundamental and most important for agricultural production and have to be visualised under new Intellectual Property Rights (IPRs) and latest technologies.

Intellectual Property Rights and Plants

To repeat, it has been demanded that any living organism or genetically modified living organism could be patented. What does it imply ? It implies that life can be quantified and control can be established over it. "The Third World biodiversity has in recent years been treated as common heritage of mankind." In contrast the modified biodiversity will be sold back to the Third World with a price attached to it through patented material. As Jack Kloppenburg has observed: "Whereas germplasm flows out of the South as the 'common heritage of mankind' it returns as a commodity" (Shiva, 1993, p. 555). They will go even further. "They will patent not just plants but plant parts also; plant tissues, cells, cell lines, fragments of DNA, specific sequences cytoplasm, cytoplasmic organelles like plasmids, plastids, proteins, enzymes, specific biochemical processes at the cellular and molecular levels" (Joshi, 1993). "Extension of the areas of patentability by including microbiological processes and plant varieties (Article 27.3 of TRIPs agreement) as well as atomic energy also .... implies that all plants and animal varieties developed outside purely from natural surroundings can be patented. This could be achieved through patent act or through an effective *sui generis* system" (NWG, 1992, p. 32). The effective *sui generis* system therefore should be followed.

III

SUI GENERIS AND INTERNATIONAL CONVENTION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS (UPOV)

As the situation prevails now, by adopting TRIPs agreement, India will have to provide patent protection to plant varieties by the year 2000, or choose a system of *sui generis* or a combination of both. *Sui generis* system is unique in nature that a country has adopted on its own and it provides protection to plant varieties. This system looks simple but in new IPRs proposal the understanding is that *sui generis* system too would allow for individualisation of rights on plant varieties. "Individualisation of private property in place of common property like in parks, highways, water and common land, etc., which could be

priced to highlight the scarcity of the product is considered better in fund-bank-WTO circle for better use of the product and provide solutions to environmental and ecological disturbances" (Dasgupta, 1999, p. 987).

Plant Breeders' Rights

The other alternative which was suggested in India is to follow UPOV, in other words, International Plant Breeders' Rights (PBRs) Convention held in 1961 and established in Geneva for co-ordinating the inter-country implementation of PBRs supported by 37 countries. UPOV was thrice amended in 1972, 1978 and 1991, and the option to join the UPOV treaty revised in 1978 closes in 1999. To be eligible for protection, varieties have to be "distinct from existing known varieties, sufficiently homogeneous and stable and new in the sense, these must have not gone through commercialisation prior to some reference date of application for protection" (Mishra, 1999, p. 19). With the growing need for privatisation to encash research and skills abnormally the demand for eliminating breeders' exemption and farmers' priviledge grew which resulted in 1991 amendments. Now a plant breeder will have exclusive trading rights to a variety developed by him. He will obtain the exclusive rights to produce, sell, import and export the protected seed. A breeder can license the right over the variety. The biggest drawback in UPOV is that it ignores the interest of farmers while it protects the interests of plant breeders. Plant breeders are also given Exclusive Marketing Rights for their varieties.

IV

BIODIVERSITY AND IPRS

Biodiversity is another crucial issue before the people of the Third World countries which are less developed. A good amount of biodiversity and genetic variability exist in the semi-arid, tropical/sub-tropical countries like India. Vast germplasm and species are nature's free gifts and the livelihood of a majority of the people in India depend upon agriculture, fisheries, animal husbandry, fruits and medicinal herbs, etc., since ages. India has nearly about 7,500 highly valued medicinal plants. Conforming to Convention on Biodiversity (CBD) of 1995 is set aside and safeguards against illegal patenting of species and germplasm have not been made satisfactory. A new draft was prepared based upon the report headed by M.S. Swaminathan. The draft places foreign firms in easy position and extends access to these medicinal plants, in exchange for a fee to be paid to the community in the name of benefit sharing. But a lot of royalty will have to be paid for the patented plants later on developed from these medicinal plants. The majority of farmers are ignorant about these gimmicks. Negotiations pertaining to biodiversity and biological shoots are complicated. Biodiversity is a common property for rural societies. For researchers and breeders it is a private property and is engulfed under IPRs. All knowledge, intellect regarding biodiversity is maintained by traditional societies and moreover through different ethical, cultural and social mechanisms has been conserved and utilised and freely exchanged for the benefit of the community.

V

BIOPIRACY

The issue of biopiracy is no less important to Third World countries rich in biodiversity and resources but quite poor economically. Since the inception of TRIPs in Marrakesh agreement the giant MNCs (Multinational Corporations) are collecting germplasm in Third World countries to get them modified and patented to obtain monopoly massive profits.

The process of stealing the biological wealth of the Third World countries by the MNCs has been termed as 'biopiracy' by these countries. Countries like India, Brazil, Peru, Pakistan, Indonesia and Mexico are far ahead in biological wealth than any of the developed nations. But gene banks are operating in a number of developed countries since nearly last two and half decades for collection of germplasm all over the globe. These gene banks numbered 227 at present.

For a long time western countries and the U.S.A. have been complaining about stealing of their intellectual property by China especially and by some Asian countries in common. The United States had imposed sanctions like Super 301 during 1990 against eight countries for violating IPRs. China was also threatened of Super 301 and to pay royalties in 1986 but China ignored this threat and did not succumb to pressure. Now what are the MNCs of developed nations engaged in?

The patenting of Neem tree by Larsen Company came under big controversy. Neem is known for its medicinal properties since ages in India. "Similar patent claims have been made on other medicinal plants like *haldi, salal, dudhi, gulmehndi, karela, bagbherenda, amla, jar amla, anar, rangoon ki bel,* castor, *vilayeti sisham, chamkura* and several others. However, *haldi* patent for healing wounds got set aside after a big tussle with US medical school by India" (Dasgupta, 1999, p. 984). Another case of glaring example is Basmati rice. Rice tec, a Texan seed breeding company collected genetic material of Basmati rice from India and got it patented after modifying it with crossbreds and declaring it as a new product. The US will be able to drive Indian Basmati rice out of internal and external markets with the help of this new product but with almost the same taste and characters as Basmati. Therefore, companies like Rice tec are not inventing anything for which they are patenting and earning enormous profits. Surprisingly, they are not facing any trial for stealing by the governments of the countries of their origin rather getting rewards and compensation for the act of biopiracy. Thus the dual character of these nations is fully exposed all over the globe.

VI

SEED AND BIOTECHNOLOGY

It is an overwhelming fact that seed dominated the realm of green revolution. Free availability of research material made things easier for seed multiplication programmes. Under these free accessibility conditions, Indian seed industry gave rise to the establishment of National Seed Corporation (NSC) in March 1963 under the Companies Act, 1956. The NSC has played a vital role for the development of Indian seed industry during the last about three and half decades. State Seed Corporations (SSCs) under National Seed Programme were tied with NSC. "The production of foundation and certified seeds rose from 304 and 124 quintals in 1963-64 to the order of 56,868 and 3,11,916 quintals during 1973-74. The

production of breeder, foundation and certified seeds during 1983-84 and 1993-94 were observed as 4,214, 81,571, 5,43,273 quintals and 2,074, 20,661 and 3,63,693 quintals respectively" (Sidhu *et al.*, 1997). This programme along with other enabling factors gave rise to three to four times increase in food production in India. In spite of increase in production and distribution of quality seed, Indian farmers exchange a large percentage of seed among themselves.

Table 1 reveals that 92 per cent of home grown seed is used in wheat. Gram tops the list and over 97 per cent of home grown seed is used. Similarly in paddy, *arhar*, groundnut, soybean and rapeseed-mustard, their use accounted for 88, 92, 93, 91 and 76 per cent respectively. Thus the farmers' needs largely are met by the inter-farmer sales.

TABLE 1. AVAILABILITY OF QUALITY SEED AND USE OF HOME GROWN SEED IN INDIA, 1996-97

Crop	Area (lakh/ha)	Seed requirement (lakh qtls)	Total quality seed distributed (lakh qtls)	Percentage of quality seed to total seed required	Percentage of home grown seed used in cultivation
(1)	(2)	(3)	(4)	(5)	(6)
Wheat	129.3	259.30	20.40	7.86	92.14
Paddy	432.0	129.84	15.20	11.70	88.30
Gram	71.0	53.25	1.40	2.62	97.38
Arhar (*tur*)	36.1	7.22	0.55	7.62	92.38
Groundnut	78.1	117.15	8.00	6.83	93.17
Rapeseed-mustard	68.6	3.34	0.80	23.95	76.05
Soybean	52.3	34.00	3.00	8.82	91.18

Source: Sharma, S.P., cited in Mishra (1999, p. 17).

Biotechnology, having applications in areas like food, vaccine, drugs, energy and mining, employ production processes based upon living organism like bacteria. Even the plant varieties are living forms. Biotechnology has a wide spectrum, which can be classified into four broad groups: (1) technique of cell and tissue culture, (2) technological developments associated with fermentation process, (3) techniques that apply microbiology for screening, selection and cultivation of cells and micro-organisms and (4) technique for manipulation and transfer of genetic material.

Categories 1 and 4 have wide applications to agriculture which relate to tissue and cell culture and genetic engineering. Horticultural crops are mainly accessible to genetic engineering in recent times. Biotechnology can prove to be a boon for increasing production in agriculture if used properly. Since it has been an integral part of quite modern agriculture, the adoption of such crops, which were first produced in 1982 and field trials began in 1986, has increased a lot. The area under such crops which was 2.8 million hectares worldwide in 1982, increased to 12.8 million hectares in 1986 and further to 26.3 million hectares by the end of 1998. Therefore, the scope of transgenic seed and crops is tremendous in future.

Bollgard seed: Bollgard is a transgenic seed (Mishra, 1999, pp. 17-18). A useful gene of one organism has been tied with another. It produces Bt. toxin in nature and controls the bollworm. One of the US Monsanto companies preparing Bollgard claims more production with quite less use of pesticides.

Terminator technology: Very recently 'terminator seeds' are being prepared, called 'terminator technology' (Dasgupta, 1999) through Agrobacterium tumifacians mediated transfer and Genegun technologies. This technology retards the production capacity of the seed making it sterile, i.e., use of the seed second time is not possible and most of the farmers use homegrown seed. Similarly, biofertilisers and biopesticides are being produced specific to a seed variety.

VII

CONCLUDING REMARKS

From the foregoing discussion what implications and menace to Indian agriculture are apprehended under the shadow of new IPRs and strong patent regime? Keeping inferences in view and taking liberty of some relevant extensions, these are: "Third World countries own less than one per cent of world patent grants. The patent system is quite clearly the most unequal, unjust of all the relationships between the North and the South" (Patel, 1993). It has been quite absurd to contemplate that the same laws can be made suitable for countries with unequal level of development.

Emergence of private sector at the cost of public sector will be followed. NSCs, SSCs, life-giving institutions to farmers will be jeopardised. Healthy competition between public and private seed sector will cease with the full control of MNCs in seed sector. Plant Breeding Institute in Cambridge has been sold to a MNC, Uniliver.

"Proliferation of legal cases which many developing countries may find it difficult to cope with and finally the private sector will not be interested to breed varieties for different situations like biotic and abiotic stresses leaving them to be tackled by public sector" (Gill, 1993, p. 212).

The large MNCs may promote only those products that are based on their package of practices only requiring their weedicides, pesticides, etc.

Unless and until taken very seriously our own germplasm will be patented with the increase of biopiracy by MNCs and sold back to us at high prices and royalties.

The most distinct feature of ongoing biorevolution is its essentiality of private character. But still because of the specialised nature of the IPRs in this area, enforcement problem will be manifold: "Firstly it could be difficult to identify a patented plant or seed because both are subject to natural genetic drift and mutation. Secondly, agricultural inventions can give rise to derivative or dependent inventions drift with the result that multiple royalties could occur on a single product. Thirdly, very often infringement can only be proved by comparing the entire genetic make up. All these mean that mechanisms to prove infringement can prove to be quite costly for LDCs" (Nachane, 1995).

Now as Government of India has made up its mind to follow TRIPs as per Marrakesh Agreement, what measures could be possible in the interest of the nation?

Since India is a poor country and since no private small firms can compete with the giant MNCs in any respect, therefore Agricultural Universities and Agricultural Institutes and scientists should come forward for patenting every local germplasm and genetic material in the country and should compete with MNCs.

The Government should invest in a big way on research and development in new bio-fields so that our scientists may develop indigenous biotechnologies and get these patented without delay.

Terminator seed like Bollgard should be banned till our own seeds favourable to our soil and agro-climatic conditions are produced and patented. Biopiracy should be checked with heavy hand. No seed and plant varieties prepared by MNCs should be recommended unless and until tested in local conditions for a few years and getting approval of grid of scientists working in agricultural institutions.

In this situation India alone cannot resist. Therefore, SAFTA (South Asian Free Trade Association) should be established and strengthened like EC (European Community) and NAFTA (North Atlantic Free Trade Association) to counter trade pressures in new situations. All SAFTA countries should sink their differences in the interest of their poor suffering masses and should not be allowed to be duped by the developed nations in any way. New laws and legistations should be enacted like social security and other related measures so that farmers may not be at the mercy of the MNCs and their rights may be protected in the long term.

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