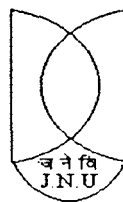


IPRs AND BIODIVERSITY: IMPLICATIONS AND OPTIONS FOR INDIA

Dissertation submitted to the Jawaharlal Nehru University
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MASTER OF PHILOSOPHY

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CERTIFICATE

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It is certified that the dissertation entitled "**IPRs AND BIODIVERSITY: IMPLICATIONS AND OPTIONS FOR INDIA**" submitted by **R. Radhakrishan** is in partial fulfilment of the requirements for the award of the degree of Master of Philosophy of this University, this dissertation has not been submitted for the award of any other degree in this University or any other University and ^{is} his own work.

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INTRODUCTION

The following study focusses on the linkages between Intellectual Property Rights regimes and biodiversity. It seeks to explore the implications of the linkages between the two especially for Third World countries like India. It also tries understand the options available to India under the circumstances.

The rapid development of biotechnology in the recent decades, the transfer of such technology, globalisation and the role of TNCs the impact of multilateral agreements like TRIPs, GATT, UPOV and the problems of traditional patent Regimes form the main focus of the study. The politico-economic implications of the developments are of enormous interest to India.

The nature of India's response both at the state and societal levels assumes importance and the study tries to understand the various facets of these developments. It raises questions on the ethical implications with regard to conservation of biodiversity, biotechnology in the context of local indigenous communities and their knowledge systems.

The earth's biological wealth, - its range of life forms and their habitats - is called biodiversity. It has survived nearly 4 billion years of evolution. The increasing loss of this bio-wealth has posed serious threat to the very existence of man kind. If the depletion continues, one quarter of the world's species may be gone by the year 2050.

The preservation of biodiversity involves both ethical and practical reasons:

- I) the right to life of the various living organisms making up the biodiversity
- II) their role in the maintenance of eco-balance, responsible for the very survival of life on the planet.

According to Article 2 , of the International Convention on biodiversity formulated during the Earth Summit of United Nations Conference on Environment and Development (UNCED), 1992, biodiversity is defined as “Variability among the living organisms from all sources including inter alia terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are the part; this includes diversity within species, between species and of the ecosystems”. This very broad, is essentially a synonym for “life on Earth”. Biodiversity is the totality of genes, the species, the ecosystems in a given region of the world.

Various communities survive entirely on the riches offered by biodiversity. The continuing erosion of biodiversity is one of the causes of the increasing inequities in the access to resources. Continued reliance upon technological control of nature has resulted in an inequitable power system, which has resulted in a major disparity in the sharing of benefits arising from the resources.

Not only a simple depletion of biodiversity, but various issues like intellectual property rights and patenting of life forms, the biodiversity-rich Southern Countries like India and economically powerful Northern countries, inequitable world order have been brought

into sharp focus in an increasingly liberalised world. Specifically, biological species and varieties, technologies and knowledge related to them have always been openly exchanged between societies and individuals, but the unequal world order today, has resulted in the misuse of this common heritage.

This brings us to some important questions:

- (i) How does the world today conceive of this “common heritage”?
- (ii) What are the indigenous communities who have nurtured them?
- (iii) Is it ethically right to patent life forms?
- (iv) What are the implications of allowing private monopoly rights on biological and genetic resources and on the knowledge and technology involving these resources? And
- (v) In the realm of the relationship between countries, local communities and corporate interests, what is the impact of the developments with regards to Intellectual Property Rights?

In this study, we have tried to address the above questions in a preliminary way. Our attempt would be to understand these issues in a politico-economical and ethical perspective. The study mainly uses the secondary literature available, analysis of various political scientists, other social scientists, activists and other promotional material.

The first chapter of the study deals with intellectual property rights and the Indian Agricultural Scenario. The second chapter focusses on the various multilateral trade agreements, Convention on biodiversity and their various implications. The final

chapter concentrates on the role of multi-nationals, their use of biotechnology , biopiracy and the attendant problems.

Chapter 1

IPRs And The Indian Scenario

IPRS AND THE INDIAN SCENARIO

Since some decades the concept of development has passed through several phases by laying emphasis on economic growth, with equity, participatory development to most recently sustainable development.

The issue of biodiversity has become very significant and predominant in the project of sustainable development. Seventy percent of the earth's biological diversity is in the tropical and subtropical regions of Africa, Asia and South America. Farmers and local communities in these areas have over the centuries developed a rich store of germ plasm of crops and plants. According to Klopperberg the total genetic change achieved by farmers over the millennia was far greater than achieved by the hundred or two hundred years of more systematic science based efforts. Hence the diversity of crops and livestock is not completely natural rather the farmers have played a major role in selection, field level cross breeding and planned exposure to a range of natural conditions.

In India the local communities were largely self sufficient and their stake in safe guarding biodiversity was greater as they depended on their own natural resource base for meeting their diverse needs¹. Their land settlement pattern was unambiguous. It was predominantly tenant based farming who got the land from the state which was regarded as the de jure owner of all land. The tiller enjoyed all rights related to ownership like inheritance, transfer, rent out and mortgage which was also acknowledged by their customs. The state did receive rents from cultivates which was quite low till the later

¹ A. Damodaran :- Local Self Government and Geometry of Biodiversity Conservation - Roots of the Incompatibility, EPW February 22, 1992, Bombay.

part of eighteenth century. According to Guha and Gadgil "The State in pre colonial as well as under colonialism invested little except in maintenance of law and order and the collection of taxes. There were some investments in roads, communications and irrigation, but the management of natural resources depended greatly on private and community effort"². 1793 is the time that marks a water shed in India's social and economic history when the Britishers started centralisation of state power. This also led to deconstruction of self sustaining village economics with the commercialisation of forestry and the take over of waste lands adjoining the fields. The waste lands and common lands contained forests and plant wealth which was of great value to traditional socio-ecological communities came under direct control of the colonisers who realised its immense economic potential.

At the social level, the inception of the 'permanent settlement'³ framed by Lord Cornwallis led to the imposition of a new powerful class of estate owning intermediaries (zamindars) on the peasant community cutting the old bonds which directly linked the peasants to the state. In non-zamindari areas Mahalwari system and Ryotwari system prevailed. Under Mahalwari system (joint village tenure) introduced in Agra, Awadh the estates were held by village communities with common land rights while Ryotwari envisaged accountability of individual owners for land revenue payment. These measures were instrumental in the destruction of local organisations of the village communities and their ecological space. Hence in a period of 66 years, that is 1793 to

² Guha and Gadgil, 1995, Ecology and Equity, Penguin Books, India, P-49.

³ This Settlement envisaged granting proprietary rights to zamindars over the areas placed in their charge for collecting rents.

1859 the village communities perished while the proprietary class grew in strength and size. The community rights in biological resources were replaced by individual rights and there was emergence of non ecological power centre at the local level i.e. the zamindars serving the British empire.

Almost half of India was under zamindari system wherein 80 percent of the agricultural land was in the hands of absentee landlords and four fifths of the land was cultivated by people who did not own it. "Land to the tiller" was the battle cry on the eve of India's independence. The post independence land reforms generated a mobilized producer class comprising of new entrepreneurial farmers from the middle rung castes who were cultivating lands⁴. While in some cases the non cultivating absentee landlords opted to take up the role of rich farmers with the use of hired labourers and share croppers.

Nehru's agrarian model apart from land reforms laid emphasis on land self government- the Panchayat Raj which succeeded the community Development Program to supervise land reforms and to ensure that co-operatives facilitate rational land use, taking vote of collective interest of the village. This was followed by two more objectives, firstly to accelerate agricultural procedure by incorporating scientific practices into traditional agriculture. Secondly to bring villages under modern education system⁵. However, the resolution of the congress government to achieve productivity through collective farming which was called co-operative joint farming in 1959 was defeated (Nagpur Session of Congress Party) due to the local elite's remained well

⁴ Rudolph and Rudolph have defined them as Bullock Capitalists, 1987, In Pursuit of Lakshmi, Chicago: University of Chicago Press, PP 49-55.

⁵ Ashutosh Varshney, 1995, Democracy, Development and the Country Side : Urban-Rural Struggles in India, Foundation Books, New Delhi, PP 31-32.

entrenched in local self government from which they were supposed to be dislodged. The local bureaucracy after came from predominant castes who catered to the biases of the existing social hierarchy⁶. The landlord- peasant relationship by and large remained a patron- client institution marked by reciprocity or authority and subordination. The structural reasons for the limited effectiveness of agrarian demand under dispersed conditions that inhibited their ability to mobilise as a unified force in terms of organisation. More over Nehruvian model was based on a condition of urban and rural interests united behind an essentially urban industrial strategy. The junior partners in the Nehruvian regime were mostly large land owners who survived intermediary abolition and blocked the implementation of land ceilings.

After the departure of Nehru the arrival of Lal Bahadur Shastri witnessed the deep divisions between the proponents of industrialisation and agricultural development. It was generally felt that agriculture didn't get adequate emphasis earlier. This phase was marked by drought in 1964 and India's dependence on food from US (PL 480). The take over of Food and Agriculture Ministry by C. Subramaniam gave preferential treatment to technological inputs in agriculture. The rise of Shastri with pro- rural instincts led to changes in the planning commission⁷. This was also the time when foundations were being laid for the Green Revolution. Since 1954 institutions of agricultural sciences were set up and funded by Rockefeller and Ford Foundations. This helped India in raising its own pool of agricultural scientists and man power by mid sixties. Dr. Norman Borlaug's

⁶ Pranab Bardhan, 1984, *The Political Economy of Development in India*, Oxford University Press, New Delhi, PP 49-50.

⁷ Ashutosh Varshney, 1995, *Democracy, Development and the Country Side : Urban-Rural Struggles in India*, Foundation Books, New Delhi, PP 31-32.

plan to test dwarf seeds on a pilot basis got C. Subramaniam's approval. This led to a National Demonstration Program in 1965-66, so a small amount of new seeds (200 tonnes) was imported from Mexico to be tried on a thousand plots with good irrigation facilities. The government assured the farmers of reimbursement in case they incur any losses. This project succeeded in midst of a second drought in 1966-67. India's foodgrain output rose from 74.2 million tonnes in 1966-67 to 95 million tonnes in 1967-68. The area under High Yield Variety seeds cultivation rose to 15.4 million hectares in 1970-71. It also marked the beginning of a new strategy for agricultural development where emphasis shifted on technological modernization.

The Green Revolution arrived with the 'miracle seeds' which stood in contrast to earlier stagnation in agriculture⁸. By 1977-78, 35 percent of rice and 70 percent of wheat growing areas were under High Yield Varieties (HYV). It led to monetization of Indian agriculture and conception of a price support policy on a fairly remunerative basis. The greater use of modern inputs removed the insulation from the fluctuations in the world market. The project however has been criticised on various grounds. The general reasons are its confinement to North- Western India and presence of stagnating economic zones. It mainly benefited the better off farmers who had holdings in well endowed regions. The arrival of mechanisation along with Green Revolution lent credence to the perception that it was making the rich richer and the poor poorer as one of the consequence was to reduce demand for labour resulting in depressing real wages.

⁸ Sudhir Sen, 1975, Reaping The Green Revolution :- Food and Jobs for All. Tata McGraw Hill Publishing Co. New Delhi.

But the most persistent controversy surrounding the Green Revolution is the social consequences, that is whether it has increased or decreased social disparities. Environmentalists feel that the fertilisers have broken the symbiotic relationship with nature. It has fostered homogeneity of crops resulting in erosion of genetic loose and biological diversity which sustains agriculture. The most devastating effect has been the salinization of irrigated lands, chemical poisoning of soil, water and food at economic level and regional imbalances and inequities between various agricultural classes at social level. The miracle seeds have displaced the indigenous varieties which are pest resistant and also provide an alternative to the farmers in case of natural calamities by crop rotations. This sustain broad genetic base while hybrids lose their viability after some years. In modern agriculture from outside resulting in severe constraints to retain the same output.

At the social level the local knowledge system withers away due to effective adaptation of 'modern'⁹ knowledge system and its legitimisation in traditional societies. This has resulted in major change in the value system as farmers discard traditional practices and local seed varieties which they seem as inferior. This has also brought forth the question of indigenous knowledge system and its ability to match modern scientific inputs. The impact in some cases has led to movements to preserve traditional farming after the failure of modern scientific tools to deliver the goods. The sustainable farming system is well depicted by the practice of barahnaja¹⁰ a method practised in rainfed hills of

⁹ Modern Western Knowledge shares an inalienable relationship with economic development. It has played an effective role in legitimising homogenisation, Vandana Shiva, *Monocultures of The Mind :- Perspectives on Biodiversity and Biotechnology*, Natraj Publishers, Dehradun, 1993.

Garhwal region. There a mixture of twelve crops are grown together to maximise the productivity and maintain the soil fertility. It also meets diverse household needs. Dr. M.S. Swaminathan favours a socially sustainable process which he refers to as 'Evergreen Revolution'¹¹ which could be carried out if there is a well planned integration of the tools of biotechnology, information technology and recycling technologies with traditional wisdom and technologies.

The peasants remain the custodians of the common genetic heritage in all the ecological communities. But there has been a qualitative change in their functions due to the rapid changes that have taken place in the northern part of the world. The traditional seeds/crops have been replaced by high yielding varieties developed by biotechnology firms which have been transformed into private property protected by patents rights. Presently large Multinational Corporations own biotechnology firms and have emerged as major supplier of seeds replacing farmers who were also breeders.

India has acceded to World Trade Organisation and has started reformulating those of its laws which are not in consonance to the international guidelines. The persistent fears in India and other developing countries is the disruption of traditional farming societies due to seed monopolies of trans-national seed industries. There is need to understand the

¹⁰ Mandua (finger millets), ram dona (amaranthus), rajma (common beans), ogal (buck wheat), urad (green gram), moong (black gram), naurangi (mix of pulses), garath (horse gram), bhat (Soya bean), lobiya (French beans), Kheera (Cucumber) and other crops.

V. Jardheri and Ashis Kothari- Conserving Agricultural Biodiversity : The Case of Tehri Garhwal and Implications for National Policy, 1997, International Development Centre, Ottawa, Canada.

¹¹ M.S. Swaminathan- An agenda for Food Security, 13 January 1999, The Hindu.

Intellectual Property Rights Regime and to explore the possibilities of reconciling local interests with international obligations with regard to international economic order.

The present world order is guided by knowledge based trade system. The major growth industries are microelectronics, biotechnology, software and telecommunications, which are often termed as brain power industries. In their growth information revolution has played a major role and in this context Skills and Knowledge of Individuals have brought in the Centrality of Intellectual Property Rights¹². So the trade in information goods and protection of new technologies are of prime concern. The TRIPS agreement raises the issue of economic rent due to the international exploitation of intellectual property with main emphasis on all forms of creativity being value oriented. The goods and services generated because of its needs. Intellectual Property Rights come into protect the inventions which fulfil those needs.

Intellectual Property Rights can be defined as rights to thoughts, ideas and information about new inventions and processes, endowing an inventor to exclude imitations from the market for a specific time. The main purpose of such rights is to stimulate industrial innovation by offering higher returns than the market would normally offer.

TRIPS agreement covers severe categories of intellectual property namely Copyright, Trademarks, Geographical indicates, Patents (which also includes “micro-organisms” and “Plant Varieties”), integrated circuits and trade secrets. The last Uruguay round of

¹² Lester. C. Thurow, Harvard Business Review, September- October, 1997.

talks in 1994 and the establishment of World Trade Organisation in 1995 have insitutionalized intellectual property rights. Before TRIPS the main emphasis on the use of patents was justified on the grounds of 'reward' theory. The assumption of this theory was that production and innovations is possible only by bestowing monopoly award and positive incentive. Moreover it was felt that the person who puts in labour in creating intellectual property should be morally entitled to the fruits of that labour¹³. This perception goes back to 1474 when the first general patent statute was issued in the Venetian Republic. In United States during the drafting of the Bill of Rights Jefferson sought time bound monopolies for literature and inventions through a constitutional provision¹⁴. While in France on 26 August 1789, intellectual creations were declared to be among the rights of Man. The monopoly was granted on the condition that the invention was worked in France within two years in order to maintain its exclusivity¹⁵(1791). Many countries enacted patent statute in nineteenth century before the Paris Convention (for protection of Industrial Property of 1883). Before the inception of TRIPS agreement several countries excluded certain subjects from the purview of patent protection such as chemicals, inventions in agriculture, horticulture, plants, animals and medical diagnostics. Refusal to patent applications in certain areas was prevalent in some countries. Prior to Paris Convention Spain and Bolivia did not grant

¹³ Lockean View. It is based upon the promise that as one has property rights in one's body a right can also extend to the product of that body's labour i.e. those who engage in labour deserve in justice to be rewarded.

¹⁴ Jefferson rejected a natural rights theory in intellectual property rights but accepted patents as on inducement to facilitate flow of new knowledge.

¹⁵ While accepting that any idea who development helps the society belongs to the person who conceived it but made 'right of man' as an entitlement time bound.

patents for inventions unless such inventions in addition to being new also established a new industry in the country.

The principle of national treatment under Paris Convention often resulted in the domestic industries getting greater access to technology through compulsory licensing or the condition that the product be worked locally. It also felt that low standards of patent protection in countries like India, Brazil and china have facilitated the development of industries particularly in the pharmaceutical field¹⁶. It has been argued that the previous patent laws established by the Indian government which excluded plant varieties and bio-technological products have served the Indian interests well. The main reason for refusal to adhere to higher standards of patent protection often reflected ethical, political and economic concerns to serve the national interests¹⁷. The developing countries have been concerned about the impact of patenting bio-technological processes and products because of their colonial legacy. The collection and outflow of germ plasm from the tropics continues even today in a clandestine manner. The advanced industrial countries though extremely poor in natural occurring or agricultural plant diversity are as rich in ex situ (offsite) gene collections as the tropics. In some cases (wheat, food, legumes,

¹⁶ Intellectual property has transcended national boundaries. These countries have been subscribing to process patents rather than pharmaceutical firms in selling the same product after producing them locally which has kept the drug prices reasonably low compared to the west.

The new act grant EMR (exclusive marketing rights) to foreign firms in presently being debated. USA has now and then threatened these three states India, China, Brazil under super 301 for infringement of IPRs.

¹⁷ The 1970 Act excluded all methods of agriculture and horticulture from patentability which exempted the Indian farmers from paying for using yield variety seeds. The Green Revolution could be launched due to preferential grants the state and foreign aid. Farmers in India are also natural custodians of seeds as well as breeders.

potatoes) some industrial countries today possess more stored germ plasm than the nations of origin.

The IPRs agreement also has become a significant issue of conflict between 'international law' and human rights as the freedom of a collective to observe, develop and preserve their heritage. The issue is of the existing incompatibility between IPRs and cultural institutions with the Third World societies which hold it as invalid under their tradition and customs¹⁸. So the major challenges faced by the state in the south is to fulfill its obligations towards its traditional societies and to adhere to TRIPS agreement. Patent system in developing countries have so far had very little judicial involvement in the creation or maintenance of the rudimentary bodies of law which regulate their domestic patent regimes.

Knowledge in many indigenous societies is not perceived as something that can be commodified or objectified through law. The use of cultural knowledge to facilitate innovative process has been widely noticed. China was the first country where Block Printing was invented yet it did not protect creativity in the manner done by the European Jurisprudence. The duplication of literary work for example is not perceived as

¹⁸ Stiff resistance in Asian and African countries when modern patents regime were introduced. There are many cases of oral tradition and community secrecy for ex the Yorba tradition in Nigeria which does not accede to codified form of knowledge rather believes in oral tradition and folk lore.

stealing but as making a good thing accessible to general public. The TRIPS agreement does not grant rights or provide a frame work for recognising indigenous knowledge and its use in developing drugs which are patented under modern laws. It is equally significant to note that in 1998 the Governing Council of the organisation of African Unity (OAU) at a meeting had approved the adoption of a model Act by member states which would lead to African States not recognising any patent on a drug made from natural products found in Africa unless it acknowledges the ownership and contribution of the respective community to the new product.

Chapter 2

Patent Regimes and Biodiversity

INDIA , TRIPS and CONVENTION ON BIODIVERSITY

The industrialised countries have been dominating the international order since 18th century. This dominance has continued inspite of tremendous changes. The increase in the share of services in global economy has brought the issue of IPRs to the fore and the Developed countries started looking for new ways to sustain their dominance. The developing countries initiated in the UN and in UNCTAD a wide ranging series of negotiations with the West on order to seek the establishment of New International Economic Order and had organised themselves as group of 77(G-77) in the post second world war period. However the developing countries faced crisis in the 1980's due to balance of payment, external debt, growing budgetary deficit. They had to approach international financial organisations like IMF and World Bank to deal with the crisis and were forced to submit to there structural adjustment programme. UruguayRound of negotiations in the GATT where started by the North during the difficulties faced by the South.

While many organisations like the UNO, UNCTAD, the universal fora for the north-south negotiations were left behind, the GATT was resurrected for conducting negotiations which were mostly not in its domain. Unlike the UN and G-77 the GATT was a club of the rich countries and it was chosen, as the developing countries were not organised. As intellectual property rights are not exclusively related to trade so Uruguay Round included only trade related ones i.e. TRIPS. However, in a World order governed

by interdependence, where all countries economy have linkages to foreign trades it is not viable to isolate those issues which are not trade related.

The issue of intellectual property rights has brought into sharp focus the existing polarisation between the North and the South. A stir has been created among the developing countries due to the inclusion of IPRs in the Uruguay Round of Multilateral Trade Negotiations under the GATT, as it is anticipated that this would pave way violating all norms of conduct in international relations and grant unlimited powers to the North to decide on issues like technology transfer.

The failure to arrive at a consensus at the historical Uruguay Round of Trade Negotiations during 1986, resulted into a comprehensive blue print for congenial world trade, popularly called "Dunkel Draft". The Intellectual Property Rights (IPRs) remained the most debated issue under the Trade Related Intellectual Property Rights (TRIPs) for conspicuous reasons. The TRIPs are nothing but the the intellectual property rights (IPRs) refer to the legal ownership by a person or business of an invention/ discovery attached to a particular product/ process which protects the owner against unauthorised copying or limitation.

The IPRs are categorised into seven types viz., copyrights, trademark, geographic indication, industrial designs, patents, integrated circuits and trade secrets. Further, amongst the different types of TRIPs the legal dimensions concerning the patents particularly, and geographical indications to some extent, involved whole lot of

discussions. According to WTO, 1995, a patent is a statutory privilege granted by the government to the inventors and other persons deriving their rights from the inventor, for a fixed period of years, to exclude other persons from manufacturing, using or selling a patented product or from utilising a patented process or method.

GATT finally resulted in the formation of World Trade Organisation(WTO). This could have far reaching consequences for the long-term growth of the developing nations. The GATT traditionally dealt with matters related to tariffs and trade in goods with basic functions to ensure free and fair trade among its member nations. The issue of IPRs was part of the World Intellectual Property Organisation (WIPO) but western countries wanted incorporation of whole range of IPR issues including patents, trade marks etc within GATT on the grounds that trade distortions should be reduced and IPRs are trade related.

Their argument is based on the claims that rise in production and trade in counter feit goods is the results of inadequate and ineffective protection provided to intellectual property rights. So an international enforcement of the TRIPS was sought on a uniform level applicable to all its members. There was divergence of views between the countries of the North and the South and also among them with regard to different aspects of the issue of intellectual property protection and particularly patent protection. But at the end of the Uruguay Round talks the then director general of GATT Arthur Dunkel presented a draft in 1991 which the member states signed in December 1993.

India has committed to strengthen its Intellectual Property Rights Regime to the levels demanded by the Industrialised West, after having acceded to the final act of the Uruguay Round in 1994 in Marrakesh of which the TRIPS is an integral part. The agreement at the final meeting of Uruguay round culminated in WTO. India subsequently has joined the Paris Convention and Patent Co-operation Treaty for protection of intellectual property in August 1998. The obligations under the TRIPS agreement differ from that of Paris Convention and have far reaching implications for India. International pressure to harmonise global standard with national patent laws after strengthening them in India has increased and is cited as the reason for India acceding to these treaties.

PARIS CONVENTION AND PATENT COOPERATION TREATY

The Paris Convention was signed in 1883 and thereafter amended in 1979. It covers patents, utility models, industrial designs, trademarks, service marks, trade names and geographical indications. In the matter of intellectual property rights the concept of national treatment applies for all the citizens of the member states of the Paris Convention (Art.2). In all the member states the patent application of the citizen of any member state would get preference for a year (Art.4), the applicant is free to procure patents for same invention in different countries, there will be some criteria to grant compulsory licenses in cases where the patent is misused by its owner (Art.5).¹⁹ However the states are free to frame their own respective national patents laws in

¹⁹ See WIPO Paris Convention for the Protection of Industrial Property, Geneva, 1984.

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accordance to their national interests (as the stated conditions are general principles) with regard to ascertain the scope and duration of patents and to exclude some products.

All the member states after acceding to this convention have to adhere to the principle of national treatment and can not discriminate against nationals of another member country with regard to intellectual property rights, which is also the fundamental principle. So among the member states of the Paris Union the issue of reciprocity with regard to treatment of foreigners is excluded. The role of the Secretariat for Paris Union is performed by WIPO. The members of the Union are allowed to accede to the patent cooperation treaty adopted in Washington in 1970. It envisages protection for invention in several countries by providing a mechanism to file an international application for patents. It amounts to filing applications separately in all the countries for patent protection in terms of legitimacy and impact. This application is scrutinised in terms of finding out prior art after finding relevant papers, in various countries the application is processed independently and they may grant or refuse a patent. The advantage of having acceded to the 147 member Paris Convention is that Indian Patent applications could seek equal treatment and right for preference. So far bilateral agreements were the basis to secure these privileges on reciprocal basis which India had with 78 states.

FACTORS PROMPTING DECISION TO JOIN PARIS CONVENTION

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The WTO rulings against India may have been a factor in India acceding to Paris Convention. Its decision to accede to Paris Convention is not questioned as it had

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already adhered to higher norms of patent protection which seeks considerable amendment in its patent act of 1970 and it is also because the TRIPs norms incorporate most of the provisions of the Paris Convention. Secondly the need to enter into bilateral arrangement for equal treatment to its citizens and need to seek reciprocal arrangements are not required anymore. This facilitates multinational corporations to establish research and development centres in India which offer skilled R&D workforce at a fraction of the cost unlike the West and also to benefit from the knowledge and quality work carried out in government owned R&D centres in India.²⁰ So far MNCs have been seeking patents in their home countries on the inventions done in their centres based in India due to relatively weak patent laws and lack of priority in other countries.

The entry into Paris Convention is likely to make India lucrative for the MNCs who conduct R&D at a global level. Thirdly the rights of India are not curtailed in terms of granting product patents or EMRs as needed under TRIPs. In the end it may strengthen India's viewpoint with regard to giving evidence of its initiatives to integrate and harmonise its domestic patent laws with the said global standards. The question is why India resisted joining this convention earlier. The clue is to be found in the global financial and trading system which is being constructed by the industrialised West through their dominance in all international regimes like WTO. India's resistance generated from its provisions to check abuse of monopoly power by the patentees and the restrictive norms of the Paris Convention in the grant of compulsory licenses. The

²⁰ Kumar, Nagesh, Intellectual Property Protection, Market Orientation and Location of Overseas R&D Activities by Multinational Enterprises, *World Development*. 1996, 24(4):p.673-88.

TRIPs agreement too is no less different and there is no exit point so the point is why favourable factors of the convention be neglected.

TRIPs vs TRADITIONAL IPRs

The framework for the protection of the industrial property has been provided by the Paris convention being revised from time to time. The developed countries always initiated moves to compel the developing countries to join the convention though they were under no obligation to do so. Yet the acceptance of TRIPS under GATT rules does not imply adherence to Paris Convention. Earlier India was not a member of the Convention though it had signed the GATT. It also enacted Patents Act of 1970 after careful considerations. The important feature of the Patent Act was the preference to national interests over those of foreign industries. Hence it is to be found as to what extent TRIPS under GATT differ from traditional IPRs and divergence from the Indian Patent Act.

The Negotiating Group started with a mandate which stated that an effective and an adequate protection of intellectual property rights needs to be promoted and distortions and hinderances to international trade be reduced and also to ensure that IPRs do not hinder legitimate trade.

So new set of rules were formed for TRIPS to be accepted as a standard by all the members. These also would lead to end of the flexibilities, which existed under the Paris Convention. The arrival of TRIPS implies that it would have a bearing on the international trade. The developed countries argue that trade distortions have arisen due to inadequate protection of patent rights. The inadequacy means the high level of protection as followed in the West in comparison to the developing countries.

The departure from traditional IPRs is particularly evident in case of national treatment, working and duration of a patent.

NATIONAL TREATMENT

There is a fundamental difference in the interpretation of national treatment, which has been provided in both the Paris Convention and new WTO. The WTO envisages national treatment to goods rather than to persons under Paris Convention. While foreigners under Paris Convention are provided with rights and obligations which are applicable to the nationals, the WTO removes discrimination against imports in case of sales, distribution, use, transportation, discrimination between foreign and domestically produced goods. So under patent provision any restriction on free imports is regarded as trade distortion.

In such a scenario the patent holder would have inherent rights to import. The nationals of the developed countries own most of the patents, which are in force, and nationals of

developing countries hold patents in a very insignificant proportion, which has significant implications. The foreign products would be preferred by consumers given the effect of strong brand names and this would result in restricted entry in the market for the local firms. Imitative and adaptative activities won't take place, as local firms will not have the scope of doing research on imported products. In such a scenario there would be prolonged dependence on foreign products even after the expiry of the patent as the importing country won't have an opportunity to adopt modern technologies. This could result in local resources being unutilised and spurt in unemployment.

WORKING OF THE PATENT

The patentee is obliged to work the patent under the Paris Convention through commercial exploitation in the country that grants patent but the working of the patent didn't cover importing the patented product. The patent granting authority had the power to license the patent to anyone who was willing to work in case that patent was not being worked. This balanced rights and obligations of the patentee. However compulsory licensing has been ruled out by the WTO and has introduced importation as working of the patent.

The working of patent can facilitate transfer of technology and technological development. The industrialisation and innovation in these countries will be adversely affected if patent is used for import monopoly. The countries would be deprived of the benefits in case a foreign patentee does not work out his patent. Technological advance

would be restricted through imitation and adaptation while foreign investment and technology will be effected by patent monopoly. So the contradictory views are: compulsory licensing is considered by the developed states as trade distorting while it used to avoid abuse of monopoly by the developing states. In fact, the recognition of imports as working reflects the trade based approaches which is a clear departure from the present patent system. It is also important to note that the G-7 countries own majorities of the patents while the MNCS of these countries have most of the effective patents.

The member states were free to exclude certain fields of technology from patents under the Paris Convention. These ranged from agricultural, machinery, fertilizers, and chemical products particularly food products and drugs were excluded on grounds of public health. The exclusion of patents in certain areas was considered as trade distortions by the developed countries. The Dunkel draft reads “patents should available for inventions, whether products or processes in all fields of technology”.

This provision covers the unexplored areas in terms of coverage of patents like forms of life. Patents or sui generis system or a combination of both is provided by the Dunkel draft for the protection of plant varieties. So this would result in forms paying royalties to plant breeders while higher prices for seeds will have to be paid by the farmers. However these may be one-time payments given the possibility of recycling of crops and retention of a part of the produce and resale of seeds probably may not be against the new WTO rules. Though it is not clear as to what extent patent rules in case of plants,

cattles are enforced however reproduction of hybrid seeds could be affected due to product patenting. In developing countries there might be lot of implications in case of patenting biotechnological inventions or micro organisms in terms of research and cost. Most of the patents in genetically engineered microorganisms and plant varieties are held by MNCs whereas the Indian Patent Act 1970 forbids patenting in those areas. So under the provisions one has to seek a license from the patenting to use any method or microorganisms that has already been patented.

TRIPS-IMPLICATIONS FOR BIODIVERSITY

The implication of adherence to the modern intellectual property rights regimes could be negative in case the state does not have the social ethos for its adaptation. In developing new products scientists take plant samples from the field to the laboratory, here a simple act of transferring a gene from a one part of the cell to its another part could result in a plant variety which could qualify as new and patentable invention. So the claims for patenting whole cell line is not viable and can restrict further research. The privatisation of genetic resources that have been engineered and patented, promoted monoculture of crops. This has resulted in erosion of other varieties which used to cover the country side. For example in India the peasant producers have cultivated around 50000 varieties of rice through their own uncoded knowledge system. Once the seeds are patented the farmers would lose their right to harvest and reuse the seed. In a country where 70% of the seed supply is still from the farmers, the new draft legislation defines the farmer as cultivator and conserver but not significantly as breeder.

The TRIPS agreement does not define 'invention' and leaves member countries relatively free to distinguish between 'non-patentable' discoveries and actual 'inventions' in the biological fields. The grant of EMR (Exclusive Marketing Rights) to agro-chemical till 2005 has evoked a strong reaction as a patent would have been granted till 2004 and also a full examination of the marketability of the new product is sought by conducting trials in public interest. The TRIPS agreement does not grant any recognition to informal knowledge, local community knowledge system in innovations or rights.

The TRIPS proposals also undermine one of the basic philosophy of production i.e. the furtherance of the public interest. Public interest can never be defined universally as with regard to an issue, it varies from country to country. The TRIPS also highlights the proposals of the Intellectual Property Rights owners especially MNCs who are seeking abolition of compulsory licensing system for non-working of patents. The enforcement of the principle of reciprocity could lead to an increase in technological gap between the North and the South as a reciprocity is not possible between states having unequal level of development. The developed countries while seeking introduction of technology transfer related issues also deny any right to equitable transfer of technology to developing countries under the code.

Moreover efforts of the developed countries in seeking amendment in patent laws of the developing countries should be understood against the background of the demand for a

new international economic order since 1974. The movement for right to development, permanent sovereignty over national resources, benefits from science and technology, principle of equality of nations in international economic system are the basis for a new international economic order.

These principles should play a major role before any amendment of the patent laws in any Third World country. The UPOV convention is rigid in its norms and requires its members to adopt its standard as national law. The convention which has drifted towards high degree of standardisation goes against the existing socio-economic diversity of different countries. As stated earlier the majority of seed supply is from the farmers i.e . the farmers play an inalienable role in breeding and conservation of seeds and germplasm. Whereas in European countries nearly all the farmers are also consumer of seeds supplied by seed industry.

The new sui generis system too fails to take into account the uncodified knowledge of farmers of the Southern countries. They usually go for across the fence exchange and buy some seeds from the breeders who are not representing biotech firms in the Indian context. The new definition in UPOV- 91 does not define farmer as the conserver and the breeder. The breeders and farmers are under UPOV-91 norms at the disposal of PBRs holder who are generally corporate seed industries and in this case transnational corporations. So the Third World regimes would have to abide by the 'reasonable' limits set by the TNCs. Patents on plants create a centralised and a monopoly control on common living resources. This also results in higher prices for producers and consumers

by influencing orientation towards more capital intensive modes of production of food which are outside the control of the producer.

TRIPS REGIME AND INDIAN AGRICULTURE

The mixed reactions in India were largely in response to the gross variance contemplated between the existing and proposed norms of patent laws. The new patent laws under the WTO accord demand introduction of “product” patents in lieu of the existing “process” patent, extension of uniform patent period of 20 years, limited scope of compulsory licensing and lastly provision for patenting of “living forms” (Bhasin, 1998).

The creation of new goods and services, process, which reduces the cost of producing existing products, is termed as product innovation. It can also be implied protection of new active compounds or good itself irrespective of method by which they are produced or the manner in which they are used or sold. While process production implies that only chemical methods by which an active substance is produced can be protected.

Patent Life

Patent life has become an important issue in terms of compromise between the provisions of incentives and social costs of monopoly. A patentee would have a longer monopoly if the patent term is longer and needed incentives may not be available in case it is for shorter time. There has been no unanimity on the question of duration of patents. Members were free to decide on the period of protection under the national laws according to the Paris convention. India before becoming a member of the Paris Convention gave a time frame of 14 years for general patents and 7 years for pharmaceutical industries. In such a scenario given the differences among the Indians in terms of cultural practice, human resource development a duration of 20 years under TRIPS seems irrational. The problems of the provisions are:

Firstly, it does not take into account the distinct conditions prevailing in different countries. The duration of the patents should be shorter in the interests of the developing countries so that it can be utilised after the expiry.

Secondly, no patented technology is expected to last long due to technologies becoming obsolete very fastly in an era of rapid change.

Thirdly, the longer duration of patents gives fewer incentives to start production by the patentee so the economy will not be benefitted by some of the important innovations.

TRIPS OBLIGATIONS

The Indian patent act of 1970 which at present provides the legal background in terms of grant of patents is consistent with most of the provisions of the Paris Convention, while in order to comply with WTO guidelines under the TRIPs the patent act of India needs to be amended. A number of provisions of the Paris Convention have been incorporated in the TRIPs agreement. Like the Paris Convention it also provided national treatment, most favoured nation treatment, compulsory patenting for inventions in all fields with exception on grounds of national security. Thus India needs to grant protection for 20 years from the date of filing applications on all patents in an uniform manner which will also include product patents in food, pharmaceuticals and chemicals. So Indian patent law would require amendment as its present law permits 14 years protection for all patents and seven years in case of pharmaceutical and chemical process patents. Other changes that are needed includes reversal of burden of proof.²¹ Other differences are in case of the compulsory license that can be issued by the government, compulsory license cannot be granted in cases where the applicant is importing the patented product in the country and it is considered to be working under TRIPs. So the patentees could use this provisions to secure import monopolies.

A time frame has been set by the TRIPs agreement which links the implementation with the level of development of member states. The developed countries were to modify their national legislations in accordance to the TRIPs provision by the 1st january 1996.

²¹ Dhar, Niranjana and C.N. Rao, Dunkel Draft on TRIPS, *Economic and Political Weekly*, February 8, 1992, p:275-78.

The developing countries had four years to implement by 1st January 2000 and in cases where these countries did not provide for product patents in areas like food, pharmaceuticals, chemicals an additional period of 5 years was provided as on 1st January 1995. However the countries have to accept applications from 1st January 1995 for a product patent and could examine it according to their law. During the transitory period the application should be granted exclusive marketing rights (EMR) from the date of obtaining marketing approval till they are granted or rejected the product patent which period is shorter.²²

Hence the time frame provided for transition to introduce product patents has been annulled by the provision of EMR which grants recognition to product patent even before a country's law grants or rejects patent after examination. The general impact is the need for amendments in Indian patent laws by 1st January 2000 in case of major provisions of TRIPs agreement with the exception of the provision for product patents in pharmaceuticals and fertilisers. Apart from this India needs to enact provisions to accept the patent applications and to grant EMR until their applications are processed for the grant of patents. The Indian government had prepared a patents amendment bill in 1995 for providing a mechanism to accept and examine the product patent application and grant EMR in order to comply with the obligations (the bill could not be passed, India's patent act of 1970 still governs IPR regime).

²² Watal, Jayashree, Implementing the TRIPS Agreement: Policy options open to India, *Economic and Political Weekly*, September 27, 1997, pp.2461-68

India's failure has resulted in US and European Union lodging complaints in the WTO for its failure to comply with the 'mailbox' provisions for accepting product patent applications (Art. 70.8) and for EMRs (Art.70.9). the panel said by WTO's Dispute Settlement Body has indicted India for non-compliance with its obligations.²³ So India has been under considerable pressure to amend its IPR laws and comply with its obligations under the TRIPs agreement.

The supporters of TRIPS feel that India holds lot of promise in the liberalised trade regime and the TRIPs accord would bring in favourable changes to the Indian economy, for India harboured valuable national resources and the scientific man-power. World Bank discussion paper (1990) indicating massive evidence reiterated the critical role of IPRs for productive research and inventions. According to the Ministry of Commerce estimates, Indian exports between 1992 - 93 and now grew by Rs. 56,000 crores, which is one percent of the growth in the World trade. Without being WTO signatory, India's share would be half of it.

In the face of growing information technology, evolution o global media and communication revolution, there has been untold rise in plagiarism, counterfaiting and other malpractices rendering owners of IPRs severely affected. When patent laws Are at variance between the trading nations, these give rise to trade and industrial disputes,

²³ *Business Standard*, August 31, 1998.

besides untoward effect on the investment flows. Apprehensions over losing free access to seed materials by farmers, however, should not be overstated.

There is always a provision to protect the interests of the farmers and the researchers through evolving an effective sui generis system. Sui generis system is a milder/ diluted form of patent, which provides a favourable framework of plant breeders rights, through which protection is accorded to the researchers and farmers with regard to the use and exchange of seeds and plant genetic material.

Some of the apparent apprehensions regarding the new patents regime are that, it would promote bio-colonisation, legalise monopolies in the form of MNCs, seriously endanger many of the Indian traditional medicinal plants through bio-piracy and over exploitation, the interests of researchers and farmers would be worst owing to patenting of seeds of other biological materials and product patents would sky-rocket the prices of pharmaceutical making them inaccessible to the common man. Some of the recent patent disputes and violations have triggered further such concerns. Even the studies sponsored by the Ministry of Environment and Forests (MoEF) revealed that the harvesting of medicinal plants in the many habitats of the country is beyond sustainable level, calling for drastic regulatory measures. Yet another area of dissatisfaction by many was the 20 years of patent period was too long a period and this might promote monopoly practices by the patent holders.

As the agenda of the WTO is to promote free trade and using this logic one may argue for the case of intellectual property rights for free flow of ideas. Hence in the agenda of GATT, TRIPS seems to be in contradiction to its spirit. However the need to permit to inventors to export the products that symbolise their innovations is the argument of the proponents of TRIPS on the grounds that protection of intellectual property is favourable to trade.

IPRS AND TECHNOLOGY TRANSFER

The economics revolving IPRs is well understood in context of a closed economy. The grant of patent protection obstructs spread of knowledge and social efficiency is affected while lack of IPRs protection also leaves scope of innovations and further development. Hence a balance is sought between the protection of IPRS and social efficiency. But the above balance has different implications in context of world trade as it is easier to implement intellectual property rights at a national level but enforcing it at an international level is sometimes hindered due to lack of co-operation of the host government due to the absence of dispute settlement mechanism.

In case all the IPRs of the North are protected by the Southern regimes the northern industries would gain a comparative advantage and lack of IPRs would result in piracy of their innovations and Southern firms will have an equal footing which would promote welfare of the South at the cost of the North.

On the other hand there is redistributive costs to the developing countries even if we forget other costs and intellectual property protection is granted all over the world. Developing countries are of the view that inventors have an undesirable monopoly that hinders their development efforts due to sanction of IPRs and their poverty is prolonged. So there is a demand to make available knowledge at a reasonable price.

But the advanced countries differ for they argue that private investors take substantial risks in developing and commercialising new technologies hence IPRs need to be enforced for ensuring fair returns to their innovations. This would be detrimental to innovations and nations interest if there is no incentive. The inclusion of equity and distribution of consideration leads against the interest of the poorer nations. The nations can legislate IPRs in accordance to their own socio-economic, cultural characteristics and development goals but this is perceived to be discouraging as IPRs transcends national boundaries easily than tangible properties.

The abuse of monopoly powers was avoided in the traditional intellectual property system and also it ensures dissemination of knowledge in an effective manner. These are in forms of sub-licensing and compulsory licensing in order to make the owner of IPR to fulfill the obligation to work the protected invention. However the traditional IPR system is threatened by the internationalisation of world economy. At present R&D involves huge amount of capital and so it is largely defined by global rather than national considerations. Subsequently there has been demand to upgrade and enforce harmonise international protection standards from the developed countries. The GATT has a subject

on IPRs given the fact that WIPO has no enforcement power or mechanism to settle trade related disputes.

CONSEQUENCES

India is well-known for a number of items like pepper, Darjeeling tea, Basmati rice and host of traditional medicinal plants. Efforts are made by Western MNCs to bring about new strains of similar quality and also specific purpose medicines and chemicals. Many experts consider that India's flora is on its way to vandalism and further there is a silent plunder of our precious manuscripts and ancient books.

They also express their gross dissatisfaction over India's patent lethargy in documentation, realise how serious the situation really is made by being a signatory of the WTO, could be negated by its inaction. India's mastery of traditional sciences and its potential exports are facing grave danger because of foreign patents. India is world's leading Basmati exporter (70%), valued at Rs. 1193 crores. Prospects of millions of Indian farmers and thousands of exporters could seriously be thwarted if Ricetec's basmati(Basmati 867) enters the world market. Of course, it must be noted with concern that the basmati patent and a few failed attempts of US patents, are just a tip of the iceberg.

Unfortunately many remedies and recipes that our grandmothers knew are becoming patented products, with the rights for commercial production channeled to foreign

inventors and companies. ... a loss in the long term lucrative potential market. A recent study by a NGO found that foreign patents were granted because of India's poor patent literacy and lack of appropriate patent laws, today US alone holds 40 patents on products developed from the Neem and about 50 from other countries, while Indians hold just three. Similarly, US holds many patents on the plants extensively grown in India such as pomegranate (as antiviral agents), "mustard" and "soapnut" (as fire retardants) "bittergourd" (treatment of tumors and HIV infections) "amla" (for antiviral activities and Hepatitis) "pepper" (piperin for nutritional use) while India holds too few patents on them. Thus legally India's biological wealth is open for global exploitation!. Unfortunately India is taking this whole matter rather casually, for which it may have to pay a very high price in the time to come. It heralds a good period ahead that India has finally decided to appeal to Dispute Settlement Body of the WTO to appoint an arbitrator to gain 15 months to amend its patent laws. India must explore ways and means of changing its patent acts of 1970, though sanctions may not deter much, but India's non-compliance with the WTO accord might lead to fall in exports and siphoning of India's rich traditional knowledge.

CONSERVING BIODIVERSITY

The United Nations convened a meeting of all nations in 1992 at Rio De Janeiro. The focus of the meeting was to highlight the state of environment and development and one of its important issues was the convention for conservation of the biological diversity. One of the highlights of the conference was the evident gulf between the affluent

countries of the North and the more biodiversity rich countries of the South. The conference was marked by the participation of many of the affluent states and the biodiversity rich countries of the South. Since many years one of the major areas of disagreement between the countries of the North and South was their respective perception on the problems of environment and development.

In 1972 the UN conference on the world environment in Stockholm steps were taken to promote the concept of sustainable development. It started with a premise that there should be a single universal concept of sustainable development for application but later it was realised that different countries had distinct perceptions and positions due to their location at different points in terms of development. In this scenario the World Commission on Environmental and Development defined sustainable development as “meets the need of present without compromising the ability of future generations to meet their own needs” (WECD: Our Common Future, New York, OUP: p-8).

All the countries were left with options to decide on their own to balance their present needs with their citizen’s expectations. But this approach failed to take into account that certain resources are not confined to the national boundaries of any single country so there was a need to have consensus to formulate a joint international strategy for conservation and development of natural resources e.g. the protection of the global biodiversity. The global community acknowledged for the first time that there is a need to set up some common agenda for management of those resources, which need governance on a global level. Hence the common platform to correlate the interests of

rich and poor countries for the global management of biodiversity was needed. Deliberations were going on for protection of biodiversity, since many years at various levels. The International Union for the Conservation of Nature has been playing an important role since many years to formalise a strategy for conservation of nature. It had completed two rounds of discussions and successfully drafted two different volumes on the subject. However much of its role centered on the goal to evolve norms agreed at global level that would be implemented at the national level. There was less emphasis on intervention on international level for biodiversity conservation.

Since the last two decades various groups have been debating the issue of biodiversity conservation in different context ranging from wild life and trading controls, agriculture and gene banks. In all the cases the common underlying point was the issue of equitable sharing of resources, sharing the costs of the conservation, and to find out an institutional framework to respond to the challenges to the biodiversity and implementing the solutions.

The convention on biodiversity also provided an opportunity for a meeting point for various groups working on the same set of goals to correlate their interests.

INDIAN SCENARIO

India is one of the World's top twelve mega diversity countries. It is characterised by a complex combination of distinct agro ecosystem based on climatic, soil, vegetational and

other natural features. India is classified into twenty broad agro ecological zones. 33% of the flowering plants and 18% of all plants found here are believed to be endemic i.e. they are found in India only. The Russian scientist N.I. Vavilov who studied and documented the origin of almost all known crop plants had identified the centres of genetic diversity. He identified the Indian Subcontinent as one of the important centres of origin of crop and plant diversity. At least 166 species of crops are known to have originated here. The diversity of varieties is also very wide for instance there are roughly 50,000 to 60,000 varieties of rice grown in India.

Yet the country's biodiversity is also facing threats of erosion. 10% of India's recorded wild flora and a larger fraction of its wild fauna are on the list of threatened species, many of them on the verge of extinction. In the last few decades India has lost around 50% of its forests, polluted 70% of its water bodies. Thousands of crop varieties have disappeared from the field and not all of them remain in gene banks. India's efforts at countering the rapid erosion of biodiversity have varied ranging from one of the World's largest networks of protected areas, almost 500 national parks and sanctuaries providing *insitu* conservation. It also has a project to document and preserve germplasm of domesticated plants, livestock and fish in *exsitu* conditions. But the project of biodiversity conservation is also facing challenges due to some loopholes. First the notion that the conservation of nature excludes humans especially the tribal settlements, second the focus is restricted to protected areas like the forest tracts, while biodiversity outside the nature reserves, land around villages are neglected, third the role of

bureaucracy and the use of arms against local communities and finally in using the locality folk knowledge on environment.

The diversity of crops and livestock is not only accidental nor it is purely natural but the outcome of selective, planned exposure to a range of natural conditions. More than mere physical adaptation a host of economic, cultural, religious and survival factors have played a role in this diversification. For example the Varli tribals of Maharashtra grow a great diversity of rice grown for different water and soil needs, varying maturing periods, resistant to different diseases and cultural events.

Tribal villages in the hills of Nagaland for instance have been going over 20 rice varieties within a single year in their terrace fields. This kind of practice has been prevalent in many parts of India till they got subsumed by sweeping changes of the Green Revolution. This marked the arrival of high yielding varieties with chemical fertilisers and pesticides.

Live-stock diversities also facing the threat of extinction. It is estimated that the 10 of goat breeds, 5 of the cattle breeds and 12 of the sheep breeds are today threatened. The recent one is of the vechure cow of Kerala. One of the reason for the loss of diversity is the deliberate cross breeding with exotics and the neglect of indigenous breeds. Finally a focus on diversity would include the local indigenous communities who share a symbiotic relationship with nature. It is their knowledge system and way of living which is getting steamrolled by the modern industrial economy. Their knowledge system and

culture is deeply embedded in the ecosystem. For example 2000 species of plants are known to be used for medicinal purposes. There is also a need to see traditional communities life-style as a equally valid base of living because of cultural plurality and also recognition of their knowledge system for seeking solutions to the problems of biodiversity. Hence in a larger perspective development policies need to be altered to respect their natural habitats.

THE GOALS OF THE CONVENTION

The primary goal of the convention is the conservation and sustainable use of biological diversity and equitable sharing of the benefits occurring as a result of the utilisation of its resources. These goals could be made more relevant by recognising the various movements, which played a role in the conception of various agendas of the biodiversity convention. The movements dealt with protections of natural reserves and parks, pursuing controlled wildlife utilisation and maintenance of plant genetic resources and fair distribution of their benefits. Hence movements with different goals came together to draft different norms and obligations within the Biodiversity Convention. These movements clearly emphasised the need to frame conservation plans around the interests of individual communities. In all the cases it will be the local people living with the resources hence they will decide its future while other sections may have a legitimate interest in the resource.

The need to develop incentives within conservation projects developed within each movement in order to coopt the interests of local decision-makers with the goals of the movement. In the case of parks movement, for example, there was the drafting of the programmes for the involvement of local communities in the administration of the parks, the movement for protection of genetic resources generated international recognition of the farmers rights and the movement concerning plant genetic resources has resulted in bilateral agreements like the MERCK/INBIO agreement for bioprospecting in Costa Rica. All these developments highlight the need to integrate the interests of the states, communities and individuals for conservation projects and they are the foundation steps for infusing economic incentives into international conservation plans.

The movements could immensely benefit and be rationalised by utilising the oppurtunities offered by the convention. The confluence of these major movements gives a better understanding of the convention and the profile of these negotiations. These problems arising out of pursuing their goals and various concerns are sought to be integrated by this convention. Hence it is not merely obligations but an oppurtunity which is represented by the convention for the states acceeding to it. The convention in itself does not offer solutions to the problems of the destruction of biodiversity rather it is for the respective contracting parties to use its framework for transforming their respective national conservation goals into an effective global action.

CONVENTION ON BIODIVERSITY

The convention on Biodiversity is an attempt to balance the interests of the North and the South on a global level and represents a general commitment to the conservation and sustainable use of biodiversity. This is also in consonance with the present global scenario in which new environmental laws and principals have recognised serious human threats to the biodiversity as a whole. Hence there has been movemnt to evolve new doctrines of state responsibilty and liabilities.

The Convention on Biodiversity (CBD) was signed by 171 countries including India in Rio De Janeiro (Brazil) in June 1992. The Convention recognised and reaffirmed the intrinsic value of biological diversity and the sovereign rights of states over their biological resources. It also laid emphasis on biological diversity and the equitable sharing of benefits arising from its use. The CBD was held under the United Nations Conference on Environment and Development (UNCED) and it entered into force on 24th December 1993 after 30 states ratified it. By the time the first conference of the parties was held a year later, there were 106 members and 30 observer states. The United States initially did not sign the Convention but later the Clinton administration signed and submitted it to the Senate for its advice and consent subject to some understanding i.e. global patent protection for its biotechnology and biosafety protocol.

The issue of protection of Biodiversity is an international problem and any threat to species (plants and animals) assumes an international character (transboundary impact). International trade in natural resources if not restricted could lead to biopiracy and poaching resulting in extinction of many species hence international mechanism was

needed to implement national conservation projects taking into account the shared common heritage. Secondly the benefits of conservation are global in nature for they are repositories of valuable information in the form of genetic codes. The preservation of this information will eventually make the development of new drugs or crops possible. Biodiversity also provides safeguards against events that might devastate a particular species (due to pests or disease).

International environmental law has been guided by three principles : a) The precautionary principle which has been developed by Daniel M.Badensky. He argues that the international community should expedite immediate action to protect the environment and not wait for scientific certification in case the potential harms are irreversible. This has been recognised by the CBD. b) The principle of inter generational equity which lays stress that people have a duty to conserve resources for the benefit of not only the present generation but of the future generation as well. c) The principle of differentiated responsibilities implies that countries should contribute differently on their capabilities and their historical responsibilities. This could be interpreted for the role of North in destruction and subsequent redressal. In practice this principle has meant preferential treatment of poor, developing countries and a greater contribution by rich, developed countries.

But it is also being argued that these principles offer no solutions nor do they envisage the extent of evidence needed for undertaking the project of conservation. The Brundtland Report specifically recognised the role of states in safeguarding the

ecosystem and related ecological processes needed for the functioning of the biosphere, to maintain biological diversity by ensuring the survival and launching conservation projects in the natural habitats of all species of fauna and flora. It also undertook measures for checking environmental pollution and promoting ecofriendly technologies. While the Brundtland Report gives a framework for developing international environmental principles, it is not backed by any legal regime and not binding. Moreover the states are reluctant to adhere to strict liability due to the political and economic reasons. In fear of liability for environmental damages due to their own activities, no state is in the forefront to seek the imposition of international regulation. If some global environmental regime had been in place, Sweden could have brought a case against the USSR for ecological damages due to Chernobyl nuclear plant accident.

The CBD lays emphasis on the following aspects:

- The basic requirement of *in situ* (Onsite) conservation of ecosystem and natural habitat.
- The supportive role of *ex situ* (Offsite) measures outside natural habitat i.e gene banks.
- The recognition of the role of local communities and women in the conservation and sustainable use of biological diversity.
- To respect and protect the knowledge system of traditional communities and share equitably the benefits arising out of their knowledge to the larger society.
- Adoption of social and economic incentives for conservation.

- To provide access to genetic resources on mutually agreed terms with prior informed consent of the country providing it and with the commitment of the user country to share the benefits of the use.
- To evolve an international protocol on the safe transfer, handling and use of genetically modified organism resulting from biotechnology.
- To develop strategies for conservation and sustainable use of biodiversity and to incorporate biodiversity issues into national plans, programmes.

The potential of the convention in achieving some measure of equitable sharing of the benefits of biodiversity was dramatically illustrated at an intergovernmental meeting held in mid 1994 in Nairobi to prepare ground for its implementation. They strongly recommended intergovernmental control of the germplasm collections held by International Agricultural Research Centres. These collections represent World's greatest *exsitu* (offsite) stores of seeds and other genetic material mostly taken from farmers of the Third World. They also stalled World Bank's bid to take over the germplasm from research centres.

The convention draws attention to the so far neglected areas of biodiversity, the extinction of cultivated and domesticated animals and plants. The world wide spread of modern intensive agriculture and animal husbandry has displaced thousands of varieties of cultivated crops and domesticated animals giving way for laboratory generated varieties. It is significant for a country like India to ensure that the laboratory-generated varieties do not displace the traditional seeds nurtured by the farmers. So measures

would have to be taken to maintain the biological diversity and check the loopholes of the Green Revolution strategies.²⁴ (Shiva 1991, *The Violence of Green Revolution*).

The financial mechanism and technology was sorted out by agreeing to function within a democratic and transparent system of governance. The Global Environment Facility (GEF) was accepted as an interim mechanism till alternative arrangements to democratic and transparent system of governance was developed. The claim of the South to the finances and technologies of the North is justified in terms of the ecological devastation caused by the Northern countries. A global biodiversity fund was suggested as an alternative fund GEF called as Southern Green Fund (Chakraborty, George and Matthew) which functions on a one country, one vote system, is sensitive to every countries environment and cultural context and priority needs. The Indian Government sought a substantial sum (10-12 millions) from the GEF biodiversity funds for an eco-development around selected protocol areas to divert human pressure away from these biodiversity rich areas.

PATENT REGIMES AND CONVENTION ON BIODIVERSITY

The post war has been guided by the principles of General Agreement on Trade and Tariffs (GATT) in the international trade. The spirit behind it was to dismantle existing uneven trade relations and to remove tariff and non-tariff barriers to foster progressive liberalisation.²⁵

²⁴ Shiva, Vandana, *The Violence of Green Revolution*, 1991.

²⁵ Dubey, Muchkund, *An Unequal Treaty: WTO After GATT*, New Delhi, New Age International, 1992.

The Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) came into effect on January 1, 1995.²⁶ It is considered to be the most comprehensive multilateral agreement on intellectual property rights. It requires countries to incorporate specified norms into national law and permits nations to maintain laws necessary to prevent the abuse of intellectual property rights. The mechanism to implement TRIPS is the conferment of patents. A patent confers on the owner the exclusive right to make, use, sell or import the patented product.

The issue of intellectual property rights protection in biodiversity and agriculture is of recent origin. This has been primarily due to two factors. First the economies of major developed countries were reeling under recession in 1980-81 which led to exploration of those areas which showed signs of competitiveness and access to markets. Thus biotechnology which had made striking technological advancement to qualify as a brain power industry came under sharp focus.²⁷ Second there has been consistent demand from the developing countries for access to transborder technology for attaining socio-economic objectives. The provisions of TRIPS dealing with protections of inventions are

- it requires states to grant patent protection for all products or processes in all fields of technology provided they meet three criteria
 - a. they must be a new invention (novelty)

²⁶ Round of Multilateral negotiation held at Marrakesh on 15 April 1994 ratified TRIPS as part of WTO.

²⁷ Biotechnology role in a) Plant breeding b) tissue culture c) embryology and hormonal plants d) genetic manipulation of micro organism from Buttell, F.H.M, Kenny and J.Kloppenber, 'From Green Revolution to Bio-Revolution', *Eco Development and Cultural Change*, vol.34(1),1985, pp. 31-56

b. consist of an inventive step

are capable of providing industrial application for 20 years²⁸. It further needs member states to grant patents without discrimination on the basis of place of innovation, field of technology or nationality of the inventor.²⁹

- It permits countries to withhold protection on account of protection of human, public order or morality, animal or plant life or to avoid damages to environment.³⁰
- The countries can also exclude from patentability, plants and animals other than microorganisms and essentially biological processes the production of plants and animals other than nonbiological and microbiological processes. The countries shall provide protection to new plant varieties by patents or through an effective sui-generis system or any combinations of both.³¹
- The applicant for patent should disclose sufficient information to enable it to be carried out by a person skilled in that art\process.³²

²⁸ Seeks uniform patent for 20 years India does not grant product patent but has given exclusive marketing rights.

²⁹ The national treatment clause forbids discrimination between a Nation's own citizens and citizen of other countries while the Most Favourable Nation between the nationals of different countries.

³⁰ Article 27(2)

³¹ Sui generis : It is a special form of protection for new varieties of plants which grants rights to the developers of new plant varieties in the form of plant breeder rights.

Effective sui-generis system means special system of protection gives to plant breeders protecting their innovation from piracy. This system operates in Europe and other Western countries where the seed production is in the commercial sector.

³² Art 29

The right to defer the implementation of these provisions has been determined on the countries' economic capacity on relative terms. The agreement (WTO) gives all members transitional periods. The developed states had to comply from January 1, 1996, the developing states have to comply from January 1, 2000, while the least developed countries (LDCs) have been given a period of eleven years. (i.e., 2006).

But developing countries like India have to adhere to some obligations during the transitional period like creating an infrastructure by which patent applications regarding agricultural chemicals and pharmaceutical products could be filed. It has also been providing exclusive marketing rights (EMR) for those products whose patent application has been filed and have procured a product patent and marketing approval in another country.³³

Apart from these criteria UPOV³⁴ (Union for Protection of New Varieties of Plant) is another mechanism to implement intellectual property rights. It is sometimes referred to as plant breeders rights (PBRs). The PBR are codified in the UPOV agreement. The PBR holders have been given monopoly rights on sale of variety but not on the variety itself or its genes.

Any (PBR) according to this convention is permitted to use any protected variety for further breeding work which is known as breeder's exemption. The other exemption

³³ UPOV- 1961 amended in 78,91

³⁴ UPOV - International Union for Protection of New Varieties of Plant - formed in 1961, in Paris. UPOV- 1961 was amended in 1972, 1978, and 1991.

was granted to the farmers who had procured those seeds with the rights to save it or produce further. This is known as farmers privilege. The primary objective of the UPOV was to keep the members informed of the latest achievements of breeders' new plants varieties and to make them available to the members on exclusive property rights. This continued till 1991 when the UPOV was further amended. But the Third World countries were given an option to accede to UPOV-78 till December 1995³⁵ as the terms of upov 91 were stricter. The new provisions have drastically altered their rights.

The Breeders and researchers will have to pay royalty to the PBRs holder to use the protected variety for breeding other varieties. The exemption granted to farmer has been made conditional subject to approval from PBRs holder. It is also eliminated the breeders' exemption to market a new variety. In other words if a breeder inserts a single new gene into a protected variety then he has to seek permission from the PBR holder to market that new variety. This is restricted by the TRIPS agreement which allows developing countries to enact their own legislations in consonance with their national priorities to give effective protection to their breeders. It is also anticipated that patent regime may be imposed in case sui-generis system is not implemented which has been in harmony with the existing laws in the developing countries. (It permits exemption to breeders and farmers under UPOV-78).

However the most significant aspect of the UPOV-91 is its conferment to its members to choose both PBRs and patents which could erode the rights of farming communities. It gives enough scope to the plant breeders using the tools of molecular genetics in seeking

³⁵ India has not joined and would have to accede to UPOV-91.

both kinds of protection. Moreover unlike the Plant Breeder Rights the new utility patents are broad based granting monopoly rights over individual genes to whole cell line.³⁶ The significant case is of the grant of plant patent to Kenneth Hibberd (molecular genetics scientist). Hibberd was granted patents on tissue culture, seed and whole plant of a corn line and his application included 260 supportive claims seeking right to exclude others from the 260 aspects.³⁷

It is also feared that the traditional practice of selling seeds to other farmers will be seriously affected if the new regime is introduced. Earlier the rapid distribution and acceptance of high yield variety or improved disease resistant varieties has been possible because of a strong and viable inter farmer network.

POLITICS OF BIODIVERSITY

The preservation of global heritage is seen as part of the sincere efforts on behalf of the world's governments. But so is not the case as biodiversity conservation has assumed political overtures like any other issue and it is also a main agenda in electoral campaign. Devoid of their content, portions of the text appear like manifestos with the industrialised countries and the poor countries of the South being in contention.

³⁶ Multiple claims covering not only whole but parts, processes of the plant.

³⁷ Belcher, Brian and Geoffery Hawtin, 'A Patent On Life : Ownership of Plant and Animal,' *IDRC*, Canada, 1991.

Differences have been there since the beginning over the guiding principles. The opinion that biological entities are part of a common heritage is not contested, as throughout the history there has been frequent exchange of biological species and technology and the information knowhow treated to them among individuals and societies, which led to all round development. But the existence of an uneven world order generates scepticism about it. As there are cases of the concept of common heritage being misused.

The last few centuries witnessed the countries of the North who are deprived of biodiversities plundering the countries of the South and also raising protectionist regime to safeguard and monopolise the technologies and benefits which arose out of the use of those resources. Hence the concept of common heritage has become an acronym of colonialisation for the North. As a result the countries of the South sought the deletion of the term 'common heritage' during the negotiations in the convention. The principle of sovereign rights of respective state over its natural resources uses was emphasised and accepted. Though the concept of national boundaries dilutes the morally stronger position of common heritage yet it seems inevitable in an unequal world order. In the Biodiversity Convention many Southern States have perceived the vested interests of the North. This concern was shared by a range of peoples groups in both the sides of the globe. It has generated doubts due to many reasons. First the treaty may formalise the on going exploitative practices of the North in plundering the rich biological resources of the South under the garb of information exchange and conservation.

Secondly it could be used for arm-twisting tactics by the Northern countries by giving conditional aid to the South. Third, this could be a precursor to the controversial climatic change negotiations which deals with conservation of tropical forest cover to act as a safety valve for the high emissions of green house gases in the North.

Biotechnology and Intellectual Property Rights

One of these concerns was addressed to in 1992 when the then Union Minister of Environment and forests Kamal Nath stated that India would oppose the Biodiversity Convention if the benefits made by the North in the fields of biotechnology arising out of the resources and knowledge of the South accrued only to the Developed World. One of the most clandestine manner through which it is being pursued is in form of patents or other methods of IPR which is one of the highly contested issues in the convention negotiations.

While the idea of patenting life forms is unjust and unreasonable for any person yet there is no limitation to the expansion of global capital in a scenario where the North wants commercialisation and privatisation of nature as a whole.

Since some centuries resources and knowledge have been freely taken by the colonial and neo-colonial powers from the Southern countries and were experimenting with them in their research laboratories. They seek to establish patents using the logic that these materials are result of their huge capital investment in their experiments. This is more

suites to generate good returns for the producers but also with the motive to sustain monopolies for high profits. The patents have not only covered pharmaceutical products but has expanded to seeds, germplasm, genetically modified organism and in some cases entire species. It has assumed new heights in countries of the North for instance U.K. where a newly discovered species could be patented by its discoverer. In the U.S. a plant which had been in common use in Guatemala has been granted patent using the argument that U.S. law allows patent for anything not patented and considers it novel which do not have documentary evidence in form of publication. Such methods have been rejected by countries like India. While it is being argued that private monopolistic controls should not cover resources and information which are being used for the benefit of humanity as a whole, there is also no second thoughts about rewarding the people who work towards gaining the resources and information. But the question is why should it be confined to scientists and corporations and not the indigenous and traditional communities who have for centuries played an important role in biodiversity conservation or the farmers who pioneered in discovering wild plants, carried out cross-breeding and selection methods for generation.

The scientific discoveries of modern biotechnologies are rooted in this traditional knowledge system and resources. Viewed from this context the North owes an unaccountable debt to the South and its local communities. These two aspects, intellectual property rights and compensations for knowledge and resources are dealt in separate parts of the convention. In an article on 'Access to and Transfer of Technology' the text states "that the contracting parties recognise the role of patents and

other intellectual property rights on the implementation of the present convention, they would also cooperate subject to national legislation and international law to ensure that such rights are supportive and are not in contradiction to the goals of the convention”.

In an article on ‘insitu’ conservation the draft commits each signatory nation to respect to “respect, acknowledge, record and protect, promote the wider dissemination of knowledge, practices of the indigenous and local communities depicting traditional lifestyles relevant for the conservation and sustainable use of biological diversity with the custodians of such knowledge and to share equitably the benefits arising from the utilisation of such knowledge.

Both the formulations are not clearly worded but due emphasis for strengthening them may result in the benefit of Southern states and traditional communities. The increasingly monopolistic North dominated international trade regime which is being currently propagated could be countered by the Biodiversity Convention if it becomes an effective weapon of the South. The international order which is other wise so unequal could be dealt with by our biological resources being used as a bargaining lever. In a same manner the traditional communities facing exploitation by their national elites and whose knowledge system and resources is under attack by the forces of modernisation could seek the use of provision safeguarding their rights on the lines of the UN Declaration of Human Rights which has been used by beleaguered communities.

RIGHTS OF LOCAL COMMUNITIES

A major concern aired more by the civic groups rather than by the government is that the Western definition of conservation of biodiversity may get legitimised by this convention. Generally local communities have faced eviction from protected areas or faced restrictions on their rights and movement in cases of wildlife protection. While such policies succeeded in countries like in India in protecting species and habitats but in the long run has resulted in alienation of the local communities. For example, it is being accepted in India that programmes like Project Tiger which favoured 'guns and guards' approach neither favours conservation of biodiversity nor does it find any acceptance in a democracy. Yet it remains the ruling ideology reflected by the previous drafts of the convention. The present draft has only a token acknowledgement of the local communities interests in areas of substantial biodiversity. There is a commitment to "protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with sustainable use requirements". The provisions are considered to be weak and inadequate as there is no clear and evident guarantee of the local communities rights in areas to be protected for conserving biodiversity. This is where adequate emphasis should be laid by action groups.

Second is the question of technology transfer which has become a contentious issue of the convention.

The Southern States are aware of their respective commitment to environment but if they need to take any special measure above their existing programmes then there is need to transfer relevant technology and capital to make them work. The present

formulation after a series of negotiations favour countries to commit its technology transfer for the conservation and sustainable use of biological diversity or usage of genetic resources and not cause damage to the environment. It also favours transfer of technology on reasonable conditions. The main stumbling block is the issue of financial commitment that the South can derive from the North. While this may give an impression that funds are important for biodiversity conservation, it is crucial from the strategic point of view of the South. Given the differences between the North and the Southern states seeking new additional funds independent of the development and environmental assistance granted to them while many Northern states are willing to provide 'incremental costs' but are reluctant to provide additional funds over the existing expenditure carried out by the South. Secondly, the Southern countries want the contribution to a global biodiversity fund mandatory for the North - a term which the latter finds unacceptable.

Thirdly there is no consensus on the handling of the global fund. The Western nations strongly favour that the capital for biodiversity should be channelised through existing Global Environment Funds (GEF) the fund which is under the governance of the World Bank, UNDP and UNEP while Southern states favour a separate fund for biodiversity. Their contention is that the GEF is North - centric and has not responded to the genuine needs of the South, its conditional grant of funds and its experimental functioning for a mere three years.

Hence the South needs to firmly adhere to its position on funding, there has also been support of this move against GEF from various people groups who want funding on the basis of transparency and democracy and societal environmental effectiveness.

Policy Options For India

An amendment is likely to take note of the obligations. There are two probabilities : first to grant a 'mailbox' arrangement and EMR and devise laws for product patents by 1st January 2005. To provide product patent and other provisions in a single amendment in an alternative manner. The second option is preferred as the impact of EMR tantamounts to providing more than a product patent as an import monopoly for an invention is sanctioned without it being examined as worthy of patent grant under the country's law. Whereas by providing product patent a country at least generates a chance for local production of the product. So a number of developing states like China, Argentina and Brazil have opted for product patents instead of EMRs.

Finally it is being debated that there is scope for manipulation in the TRIPs agreement by not clarifying the scope of certain laws and leaving them open to interpretation³⁸ while amending the patent act this needs to be taken care of and specifically legislations to counter anti-trust policies are being argued in order to counter the patent holders from abusing the monopoly power in the new regime.³⁹ Yet the innovative activities of the Indian enterprises are likely to be adversely affected in the pharmaceutical industry and push up the prices of drugs by the new regime.⁴⁰ Yet there is likely to have some space for the local industries for process innovations since a large number of drugs are in the public domain after the lapse of the patents. It would result in the international divisions

³⁸ Watal, Jayashree, op.Cit.

³⁹ Correa, Carlos, New International Standards for Intellectual Property: Impact on Technology Flows and Innovation in Developing Countries, *Science and Public Policy*, 1997, 24(2), p.79-92.

of labour where countries like India could specialise in manufacture of drugs which are cost competitive in the public domain and there would be newer and patented drugs from the industrialised with no or low price competition.

Strategies

Documentation of bio-wealth and heritage: India is a repository of world biowealth and rich cultural heritage. Unfortunately very little of them are made known in terms of appropriate catalogues. If catalogues all such information on scientific basis then many of our patent disputes either would not occur at all or can be solved with least problem. It is not that India was totally unconcerned with its biowealth and biodiversity.

As back as 1982 Ministry of Environment and Forests (MoEF) had launched an all India coordinated project on “ ethnobiology” to identify and document its indigenous knowledge and biological diversity. It had covered about 65% of the tribal areas. The MoEF has also set up ‘ Environmental Information System’ to document the biological resources. In 1994 government notified ‘ Environmental Impact Assessment Act’ to assess the impact of any developmental projects on environment. A small beginning is also made by the Spice board to collect and document all the information on the medicinal and therapeutical properties of spices. However these efforts must not be like a routine government work but should yield some concrete documents at the earliest which can be consulted by the patent office anywhere in the world while granting

⁴⁰ Prasad, Ashok Chandra, and Shripad Bhat, *Strengthening India’s Patent System: Implications for Pharmaceutical Sector*, *Economic and Political Weekly*, May 22, 1993, p.1037-58.

patents or settling patent disputes. Similar attempts must be made in other fields as well to protect and strengthen the biowealth of our country.

Modification in patent laws: stray reports about governments proclivity to pin point geographical indications, product patents and so on, presumably reflect desultory official thinking on the subject. After signing WTO Accord, changing, from ‘ Process Patent’ to ‘Product Patent’ is inevitable to India to continue as a global trade partner under the WTO regime. The MoEF, after signing the ‘ Convention on Biological Diversity (CBD) in 1993, initiated the process of ‘formulating National Bio-diversity Action Plan’ (NBAP) under the chairmanship of Dr. Swaminathan. Owing to rising biopiracy cases and patent problems, the MoEF initiated to draft ‘Biological Diversity Bill’ on lines of NBAP and CBD. Kothari (1998) feels that this bill also missed critical provisions regarding conservation, sustainable use and benefit sharing. Geographical indication law provides the legal means for interested party to prevent use of ‘native names/nay means’ in designation or presentation of a ‘Good’. Unfortunately, India does not have any specific law on geographical indications. Hence, it cannot safeguard its native ‘products’ like ‘Basmati’, Bikaneri Bhujia, Shrikhand, Paneer and a host of products warns Bhasin (1998). Recent ‘Basmati’ issue is a strong case in point. A geographical indication bill could have made India’s case for protecting ‘Basmati’ stronger.

Improvement in the Working Efficiency of Patent office’: Still another part of strategic action with regard to patents is to set right the slow-moving patent office. In India it takes about 7 years to get the patent claim cleared or granted against hardly 2

years in United States of America. To speed up the process, the Ministry is contemplating an investment of Rs. 75 crores spread over five years besides, improving the staffing establishment of a 'National Patent Office' is also under the serious consideration by the Ministry for enabling easy patent registration. Joining 'Paris Convention' is also another issue that India is keen to consider by virtue off which India can have direct access to 'Patent Corporation Treaty' (PCT) which would facilitate patent registration in abroad, remaining in India.

Patent Literacy: patent awareness is relatively at a lower ebb in India as compared to the developed nations. Entrepreneurs, scientists, technologists and related persons must be given good awareness through mass media exposures, periodic seminars and symposia. Patents are published in Indian Gazettes. Few have access to them and many are ignorant of such patents. Still another aspect of patent literacy pertains to the fact that many don't know the pre-requisite for patents. They are not aware of the fact that inventor should file a patent application before publishing his/her invention or using that invention publicly. A patent can be denied even for a useful and commercially attractive invention in case the above precautions are not taken, reports TIFAC bulletin (1997).

The inclusion of the TRIPS under GATT is one of the unique features of Uruguay Round of Talks. The objective as stated in the Dunkel Draft reads as follows: "The protection of and enforcement of IPRs should contribute to the promotion of technological innovations and to the transfer and dissemination of technology to the mutual advantage of producers and users of technological knowledge and in a manner

conducive to social and economic welfare and to a balance of rights and obligations". It is also stated that the parties adopt measures necessary to protect public health and nutrition and to promote public interest in sectors of vital importance to their socio-economic and technological developments subject to these measures do not go in contradiction of the agreement. The WTO has made available the Dispute Settlement Body (DSB) to institutionalise the process of resolving the differences over interpretations of TRIPS provisions.

However the question is to what extent the countries' which are poor in terms of technological benefit in the new international order. There is marked difference in terms of education, living standards even among the Third World nations. Hence, it is felt that the enforcement of intellectual property rights on uniform basis would lead to imposition of an unequal regime with regard to division of knowledge and information resources in an unequal world order.

It is by now clear that India must not renege on its commitment to be a WTO partner. To put an end to the on-going patent related problems, India must document its bio-wealth and traditional knowledge; effect changes in existing patent laws particularly on product patents, and geographical indication laws; improve the patent offices in terms of their infrastructure, working efficiency and finally popularise patent literacy and other related aspects. These must receive utmost policy support from the government as well. the expert committee on patents must understand the TRIPs related issues in the true national perspective and suitably act as 'think tanks' to the government and general

public. India must rethink on its exclusive 'defensive strategy' to fight patent problems. 'Fencing' the Indian frontiers of biowealth through the aforesaid long-term patent strategies appears to be a practical long-term approach.

Furthermore, India should approach the WTO to treat patent violations and spurious patenting using pirated genetic materials as punishable crimes. The combined results of these efforts can enable India to safeguard its bio-wealth from the planned plunders by the MNCs.

Ethical and Social Implications

The issue of patent rights in the late 20th century primarily deals with the rights of nature and rights of people to common resources. These are essentially ethical concerns. The biotechnology and patents though aim at the protection living things, rob species identity and species integrity. The basic argument is that the life forms differ from mechanical innovations because the living resources and their potential to reproduce have been the common heritage of humanity. Hence patenting of life forms generates a medieval notion of enslaving life and freedom. Moreover the mere genetic manipulation of a creature does not determine the fundamental life processes which make that creature work. This assumes greater significance due to the fact humans are being commodified and used as guinea pig for patent claims.

The scientists in the West especially in the US have made thousands of patent claims on gene sequences, cell lines and other materials derived from the human body. The Human Genome Diversity Project was carried out in which human tissue from 722 communities including tribal groups is being collected. A patent claim was made on a cell line developed from cells collected from Guaymi tribal women of Panama which was found to be resistant to particular disease. It also tries to provide argument in favour of human colonialism. The work of nature in creation over millenia and of people as custodians over centuries is being gradually altered by few people in the laboratories. Nature through evolution is believed to have been responsible for 90% of plant variation and 9.9% variation has been created by germplasm selectively bred by Third World farmers over thousands of years. Only 0.1% is the result of modern breeding and they are patented.

The patenting of manipulated life forms has major ramifications on public lives. The immediate fallout could be ecological disruption due to genetically engineered life forms. They could cause pollution of native gene pools with altered genes.

Chapter 3

MNCs And IPRs

MULTI-NATIONAL CORPORATIONS AND IPRs

Multi-national corporations represent the revolution in the conquest and control of the material world through modern science and technology. The hegemonic operation of the Western paradigm of development through control over nature has ensured that, MNCs have an over-arching dominance over state structures and local communities. Their gigantic administrative and financial strength has remained outside the scope of state structures and local communities. It has tore apart the social and political fabric of, particularly, developing countries and local communities, thereby seriously rupturing the symbiotic relationship that these share with nature. It has led to the exploitation of most forms of resources, including the rich bio-diversity. This has posed a serious threat to the local knowledge systems of the utilization and conservation of bio-diversity by local communities.

The international IPR regimes are grappling with the problem of transfer of technology, and ownership and marketing rights of various players in the just utilization of knowledge systems involving bio-diversity. The new IPR regimes do not make any distinction between traditional knowledge systems, "...which have been evolved by societies over centuries, and the new ones involving inventions of Modern Science."³⁸ At a general level, IPRs permit persons/MNCs/institutions to exclude others from using their ideas \ or for example, plants, except under license or royalties. When the ideas or the plant-medicine or other knowledge systems emanate from local communities and their folk practices, it becomes extremely difficult for these communities to contest for

³⁸ Ramachandran, R., "For a new Science-Society contract," *Frontline*, May 21, 1991, p.82.

patent rights with MNCs who may use them under the present inequitable power system and regimes.

LOCAL COMMUNITIES AND KNOWLEDGE SYSTEMS:

It is important to realize the nature of relationship that the local communities share with their knowledge systems and the distinct disadvantage they face under the market-oriented dominant systems.

Local communities depend on nature and natural resources for their survival, in a symbiotic relationship. Their dependence has also resulted in the development of unique methods and knowledge in conserving them so that they can be used by future generations. This knowledge may include identification and conservation of plants and animals with medicinal and agricultural properties or with some other day-to-day use. Traditionally, the knowledge and resources are considered as 'for common good' and passed on from generation to generation and retained by the local communities around the world. Before the Convention on Bio-diversity, " there are no national and international legal instruments or standards which adequately recognize indigenous and local communities' rights over their knowledge, innovations or practices."³⁹

While the Convention on Bio-diversity envisages various measures for the recognition of the role of local communities in the conservation of biological diversity and sharing of

³⁹ Singh, B. and Neethi Mohanty, (ed.), 'Intellectual Property Rights and The Tribals', *Tribal Studies of India Series T179*, 1997, p.58

the benefits from their use, proper methodologies to implement them are yet to be developed.

Even, in case the IPR regimes were neutral to all parties, the local communities lack awareness and the knowledge resource to make use of them. Also the costs and instrumental mechanisms involved in making use of the regimes distinctly favor Multi-national enterprises. This is where the role of the State, especially in third-world countries become important, as they still lack the mechanism to prevent the flight of control over such knowledge to richer countries and institutions. IPR regimes involve quick decision making, organizational skills and other such factors to make effective use of them. So decisive State intervention in favor of local communities becomes difficult, as MNCs being less complex structures are better equipped to use the regimes to their advantage. For example, "...most of the 7,000 natural compounds used in modern medicines have been employed by traditional healers for centuries, and 25 per cent of American Prescription drugs contain active ingredients derived from plants."⁴⁰ Neither the State nor the traditional communities were able to share the commercial benefits of the knowledge. Basmati, Turmeric and Neem provide illustrations of not only bio-piracy but also the advantage MNCs have under the present regimes in making effective and swift use of them.

The important aspect of MNCs role in crippling third-world economies, and local communities' food security is through the unethical use of biotechnology with the

⁴⁰ *ibid.* pp. 122-3.

protection of patents. Local communities, as already stated, depend on biodiversity for their survival. Introduction of non-sustainable agricultural technologies by MNCs cuts the lifeline of local indigenous communities. Being monopolies, MNCs, with their patents for such techniques make agricultural survival dependent upon their markets. Thus, for a comprehensive understanding of MNCs, the linkages between Biotechnology and intellectual property rights have to be explored.

For removing the economic problems of rural people in India, the use of technology has been advocated for a long time. There are some positive results from this strategy: India became self-sufficient in food grains in seventies because of Green Revolution, the technological revolution brought about by the scientific and farming communities. It has reinforced the governmental thrust on agricultural research and technology transfer from lab to land in its strategy for agricultural development.

During the same period, many developments like consumer preference, vast technological possibilities in agriculture and perceptible rise in land prices and labor wages in the agriculture of developed countries, took place, which affected world agriculture. Dietary habits have shown marked shift towards more consumption of vegetarian food, especially fresh fruits and vegetables. Technological possibilities were seen through micro-propagation, micro-irrigation and molecular genetics.

The above developments also affected the agricultural trade between the US and Europe: European Union has followed a well-concerted and comprehensive policy for agriculture, known as Common Agricultural Policy. The Policy enabled Europe to convert from the position of a net importer of food until sixties to a net exporter of food in seventies. This caused a major concern for American policy makers and consequently, agriculture was included for the first time in the GATT negotiations of Punta del Este, Uruguay in 1986.

The above developments show how the economic conditions have changed for absorption and diffusion of agricultural research and technology. The World Trade Agreement leading to formation of World Trade Organization has opened up enormous opportunities for expansion of Indian agriculture and at the same time brought stringent condition through Intellectual Property Rights Protection mechanism. All the member countries of the WTO are expected to put legal mechanism in place for protection of IPR. Since the Green Revolution was guided by the State, the technology was freely accessible to farming community, the technologies of today (controlled by MNCs) will involve cost, thereby changing the conditions significantly. So, it becomes important to assess the significance of Biotechnology for Indian Biodiversity and the implications of emerging intellectual property rights regime.

SIGNIFICANCE:

Biotechnology has been defined by the Inter-departmental Committee on Biotechnology in the U.K. as “the application of scientific and engineering principles to the processing of materials by biological agents to produce goods and services.”⁴¹

In the context of Indian agriculture Dr. C. Rangarajan, one of the architects of India’s present Monetary and Credit Policy has observed about biotechnology as under:

“Biotechnology may be broadly defined as technology that deals with living organisms. Modern biotechnologies can help better plant breeding because of the breakthroughs achieved in molecular and cellular biology by way of gene identification and manipulation. It may also potentially conserve natural resources and improve environmental quality by using organisms for degradation of toxic chemicals and wastes. Biotechnology can enhance product quality by improving the characteristics of plants and animals. Biotechnology encompasses a mix in the form of an enabling tool (e.g. a gene marker in plant breeding), a process (e.g. fermentation), or a product (e.g. a transgenic seed)”⁴²

Government bodies like Indian Agricultural Research Institute (IARI), and various other research institutes have made tremendous contributions to meaningful use of Biotechnology. But the entry of MNCs brings in a new dimension to the whole issue of

⁴¹ Bull, Holt and Lilly, *Biotechnology, International Trends and Perspectives*, OECD, Paris, 1982, p. 21.

⁴² ‘Sustainable Development’, *The Hindu*, March 18, 1998

state's role in control and regulation of Biotechnology in the interests of Indian Biodiversity.

Biotechnology can be classified in four broad categories:

- i) Technique of Cell and Tissue culture
- ii) Technological developments associated with fermentation process
- iii) Techniques that apply microbiology for screening, selecting and cultivation of cells and micro-organisms and
- iv) Technique for manipulation and transfer of genetic material.

The categories relating to the cell and tissue culture and the technique for genetic engineering have extensive application to agriculture. "Plant tissue culture" essentially involves 'in vitro' cultivation of parts of a plant under aseptic condition. A controlled aseptic environment and a suitable nutrient medium are two chief requirements of tissue culture. The basic technology can be divided into five classes depending upon the material used for tissue culture; viz., callus, organ, meristem, protoplast and cell culture.

Breeding and selection by hybridization is a very slow process in woody species. Many of the species are fairly difficult to propagate. In these cases, 'in vitro' cloning of select species has a tremendous potential. Success in propagation has been achieved in a wide variety of plants and trees including forest trees. Tissue culture affords large scale rapid multiplication of genetically uniform plants from elite specimen. Cell culture enables development of new hybrids between different cultivators and species by means of

protoplast fusion. Horticultural crops are the main beneficiaries of tissue culture. Tissue culture has been successful in propagation of tea, eucalyptus and coffee. In propagation of ornamental plants also tissue culture has been successful and cost effective.

APPREHENSIONS

Notwithstanding the achievements in agriculture through biotechnology, there is a growing sense of apprehension in various sections of Indian society about the deleterious effects of transgenics on bio-diversity. Recent demonstration of public protest in Karnataka and Andhra Pradesh on the experiments/trials pertaining to transgenics of cotton are a pointer to the growing apprehension of farmers and their leaders. There are apprehensions about the fairness of the intentions of the multinational firms.

India has evolved an approach for granting permission to conduct trials on transgenics. There seems to be an elaborate framework of regulatory mechanism in this regard. The application of recombinant DNA (r DNA) is controlled by a set of three committees viz., (a) Institutional Biosafety committee (b) Review committee for Genetically Modified Organisms and (c) Genetic Engineering Approval Committee. Even then, the people are not satisfied with the present safeguard against transgenics. Even Dr. Rangarajan does not appear satisfied as he has gone on record indicating the existing system may not be adequate to meet the future challenges.

Let us examine why such a fear is obtaining in the minds of people in India. Three types of risks are associated with transgenic varieties (I) the transgenic crops plants will become weeds of agriculture or invasive of natural habitat (ii) Their engineered genes will be transferred by wild relatives whose hybrid off springs will become more weedy or more invasive and (iii) engineered plants will be a direct hazard to humans, domestic animals or beneficial wild organisms.

The operation of such mechanisms can be explained through two recent examples from biotechnology giant MONSANTO: Terminator Technology and the case of Transgenic cotton trials in India.

TERMINATOR TECHNOLOGY

In 1998, American Multi-national Giant acquired a patent on a controversial biotechnology, which would drastically alter traditional agriculture and food security, specifically in Third World countries. More particularly, it would be disastrous for tens of millions of poor farmers in India. The technology, named Terminator technology, alters seeds genetically and the altered genes would yield seeds that do not germinate by terminating their reproductive capacity, abort the embryo and make them sterile.

Some 90% Indian farmers traditionally save a portion of their seeds for the next sowing season and choose their seeds according to soil condition.⁴³ The Terminator mechanism

⁴³ Krishnakumar, Asha, "Terminator of Food Security", *Frontline*, October 23, 1998, p.85.

would leave traditional farmers unable to use or exchange saved seeds. Thus 'monoculture' would be introduced, genetic biodiversity would be lost because of absence of exchange and conservation efforts would be greatly affected. Geri Guidetti of The Ark Institute has commented that "Never before has man created such an insidiously dangerous, far-reaching and potentially "perfect" plan to control the livelihoods, food supply and even survival of all humans on the planet. In one broad, brazen stroke of his hand, man will have irretrievably brazen the plant-to-seed-plant-to-seed cycle, the cycle that supports most life on the planet. No seed, no food unless you buy more seed. The Terminator Technology is brilliant science and arguably "good business", but it had crossed the line, the tenuous line between genius and insanity. It is a dangerous, bad idea that should be banned..."⁴⁴

Thus, it can be derived that patenting of life forms, like seeds, have grave political, economical, cultural and ethical implications. Politically, patents for such technology takes over the control of agricultural patterns and social structure from the hands of the local community and the State: For any given crop, there will just be one kind of seed and every year it has to be purchased from the same company, thus not only affecting self-sustaining agricultural communities, but also restricting their choice.

This loss of control over agriculture in India would have enormous politico-economic implications, as one of India's main economic parameters is sustainable agricultural productivity. It may lead to a rigorous and dynamic dependence of India's political

⁴⁴ Quoted in "MONSANTO" – Peddling "Life-Sciences" or "Death Sciences"?, Research Foundation For Science, Technology and Ecology, New Delhi.

objectives to giant Trans-national corporations. The monopolization of biotechnology by MNC seed industries poses an even greater threat to India than the ecological problems of Green Revolution as the latter was guided by a common interest, whereas the former is peddled by corporate interest.

The tragedy of genetic erosion and depletion of bio-diversity and the consequent dependence of Indian agriculture on seed companies and their penetration by powerful MNCs can be illustrated through another example, the case of Transgenic cotton trials in India.

BOLLGARD SEED

For India, cotton has been one of the chief cash crops. Historically, cotton and textile industries have played a major role in Indian History. It has also been one of the major sources of employment both in the urban and rural areas. However, the eroding practice of traditional agricultural techniques and the increasing influence of seed industry has significance for cash crops like cotton. While the area under cotton cultivation showed a considerable increase, in recent years there has been repeated failure of the crops leading to tragic suicide by the farmers. The failure of the crops has been traced to the supply of poor quality seeds by the seed industry.⁴⁵ The penetration of seed industries by MNCs and their technology has highlighted the spurious nature of the arguments regarding the positive role of technology imports, especially concerning bio-diversity and their conservation.

⁴⁵ Shiva, Vandana and et al, 'Globalisation and Threat to Seed Security: Case of Transgenic Cotton Trials in India', *Economic and Political Weekly*, March, 6-13, 1999.

Monsanto, the American Multi-national giant, dubbed as the 'Microsoft' of seed industries, has acquired patents regarding transgenic seed varieties. The cottonseed containing the Bollgard gene has been patented by Monsanto, which authorizes the purchaser to only use the seed and not saving or selling the seed for replanting. Or in other words, the growers have to purchase the seed every single time after cultivation for replanting.

Monsanto has entered into an agreement with Maharashtra Hybrid Seeds Company (Mahyco) and formed a joint venture to introduce genetically modified cotton in India. The claim of Monsanto is that Bollgard, the new cotton seed will reduce the need for pesticides significantly. Over 40,000 tonnes of pesticides-half the country's total pesticide consumption-goes protecting the cotton crop every year. The farmers' income could go up while the harmful impact of pesticides would come down through the use of Bollgard, the new cottonseed of the company.

Bollgard is a transgenic seed. A useful gene of one organism has been stitched into another. The company claims that use of Bollgard has raised yield and reduced pesticide consumption in China and the US. It is a new seed. It does not harm traditional varieties. It is devoid of gene protection technology. Further, it enhances income of the farmer and thus widens choice of farmers.

One of the said objectives of Monsanto in this venture is to capture the entire sales of hybrid cotton within a decade. Such a scenario is fraught with danger. As Green

Revolution has taught us, that change in cropping pattern of farmers' varieties from mixed cultivation based on internal inputs to uniform cultivation of modern varieties adversely affect the genetic pool.

Also, the domination of the seed market by a few varieties would threaten agriculture with plant diseases, insect pests and weeds. Bollgard cotton variety will secrete a toxin derived from the *Bacillus Thuringienis* (Bt) and the toxin would fight pests.⁴⁹ This is supposed to replace the synthetic insecticides that are presently used to control insect pests. However, usually crops are affected by a diversity of insect pests.⁵⁰ Not only that, Monsanto company's promotional material admits that bollworm larvae greater than ¼ inch long or 2 to 4 days old are difficult to control with Bollgard alone and recommends supplementary insecticide use.⁵¹ Thus neither pesticide use would be reduced nor there would be tangible economical benefits because of transgenic plants. Also, it has been observed that yields of transgenic plants showed no distinct over hybrid variety.

Biotechnology is a fertile area of ressearch. Its techniques are of great importance for the human race. In the face of burgeoning population pressure on land for food, fibre and fuel is increasing. Such pressures have been fought with the available tools of plant breeding and engineering research in India. For example, the challenges emanating from the above were fought with the technology of the Green Revolution.

⁴⁹ "Seeds of Discord", *The Hindu*, December 10, 1998, p.10.

⁵⁰ Gould, F., "Potential and Problems With High-Dose Strategies for Pesticidal Engineered Crops", *Bio-control Science and Technology*:4, pp.451-61.

⁵¹ Shiva, Vandana, op. Cit., p.608.

However, the technology of the Green Revolution is no longer sufficient to meet the emerging challenges for food, fuel, shelter and fibre. Further breakthrough in yield enhancing techniques in agricultural production are required. Biotechnology has demonstrated its capacity in varietal development. Through the use of recombinant DNA technology, varieties with resistance to pest attack can be evolved. This in turn can reduce dependence on chemical pesticides. Biotechnology can facilitate fast multiplication of seeds through tissue culture. It can speed up the process of breeding in woody plants which is an extremely slow process in natural conditions. It has widened the choice of research in plant breeding, disease and pest control, animal breeding, animal hygiene, human health, pharmaceutical industry, beverage industry, and a host of other areas.

IPRS AND BIOTECHNOLOGY

The world Trade Agreement (WTA) signed in December 1993 and ratified by at a ministerial meeting in April 1994 leading to formation of the World Trade Organisation (WTO) on the 1st January, 1995, envisages a comprehensive scheme of protection of intellectual property rights under a broad category viz., Trade Related Aspects of Intellectual Rights (TRIPS). Various articles under TRIPS cover various forms of intellectual property viz., patents, trademarks, copyrights, industrial designs, geographical indications, layout designs of integrated circuits and protection of undisclosed information. All these forms of intellectual property have a bearing on industrial and agricultural sectors of the Indian economy.

There is a general feeling that enforcement of TRIPS will give rise to monopoly conditions and our indigenous industries may not grow especially when they have to face multinational corporations. Members shall provide for the protection of plant varieties either by patent or by an effective sui generis system or by any combination thereof. The provisions will be reviewed four years after the entry into force of the Agreement establishing the WTO". Under TRIPS micro-organism, nonbiological and microbial processes could be patented. It also requires that plant varieties must be protected either by patent or an effective sui generis system or any combination of the two. A Sui generis system effectively means that is specially designed to protect plant varieties. The obvious model for this is the protection of Plant Breeders' Rights (PBR).

While India is seriously considering to evolve a suitable legislation in this regard, it is generally conjectured that India's seed industry which has an annual turnover of Rs. 2,000 crore or so may not grow once MNCs like Monsanto enter the seed business.

Most of the biotechnological inventions leading to development of plant varieties may have interface with plant genetic resources (PGRs). In the course of development of new varieties desirable characteristics of one plant may be synthesised through recombinant DNA technology. In other words, biotechnological research in plant breeding will be heavily dependent on PGRs.

But access to PGRs and control over them has a different story. The PGRs of the world are in control of the developed countries, especially the United States. The U.S. began ex-situ collection of PGRs much early and now a stage has been reached when the USA has almost all the PGRs with it through ex-situ conservation mechanism. This has been seen as unfair expropriation of resources, which belong to traditional communities. A view is strongly held and rightly so that a plant variety indigenous to a community is a product of 'selection' of suitable plants by ancestors over a span of many centuries. If some country has been able to access the germplasm of that plant in past and by virtue of this act, it now uses that material for evolution of varieties, there is a strong case for rewarding the country to which the plant originally belonged to. Plant Breeders Rights (PBR) have in existence since 1961, under UPOV (International Union of Protection of new plant Varieties). The countries offering PBRs modified the principle of common heritage with new interpretation. The approval of PBRs was balanced with Farmer's Rights. In 1991, FAO explicitly endorsed that nations have sovereign rights over their PGRs. However, the operational mechanism for enforcing the above mentioned rights was not effective and it is because of this reason that PGRs attracted maximum attention in the Convention of Biological Diversity (CBD) in 1992.

The above digression has been made to show the importance of sovereign rights on PGRs held in ex-situ collections. The developed countries are able to carry out research in plant breeding with the help of PGRs held in ex-situ collection. The MNCs, mostly based in Developed countries of West, have access to huge gene resources from these ex-situ collections. For instance, the largest herbarium in London,U.K., has a

considerable collection from India,taken away during colonial rule. The Intellectual Property generated in this manner owes its debt to the farming communities who have preserved PGRs. Farmers' Rights therefore must be available concomitant with Plant Breeders' Right because a breeder evolving a new variety with the help PGR should also accept the right to farmers who have preserved the material over centuries. Since further research in plant breeding will be heavily dependent on biotechnological methods, the relationship between biotechnology-based research at IPR of farmers and breeders is established.

LOCAL COMMUNITIES AND GENETIC RESOURCES

The role of farming communities in selection and preservation of genetic material has been of great significance. Dr. Swaminathan has observed that indigenous knowledge systems are similar to general scientific information in that they are part of public knowledge. The usual criteria for recognizing IPR. The usual criteria for recognizing IPR i.e. novelty and non-obviousness tend to ignore the knowledge systems of rural and tribal families. While the knowledge itself may not be patentable, the products of this knowledge namely "folk" varieties, and races and genetic diversity provide the basic raw material for modern plant breeding and biotechnology (Swaminathan, 1994). The plant breeding and seed industry of the developed countries has used this knowledge for development of new varieties without compensating the farmers who had preserved the genetic stock. It is against their background that the concept of 'Farmers' Rights' emerged in international fora.

Thus it has been strongly advocated that the farmers retain their traditional right to save, use, exchange, share and sell the propagated material and seed from harvest. But the right is restricted to non-commercial sale and branded seeds cannot be sold.

BIOPIRACY

Imperialism in the ancient times was governed by the values of 'God, Gold and Glory'.⁵² But it took a leap only in the early nineteenth century due to the technological advancement in Europe which had resulted in the occurrence of the Industrial Revolution. J. Hobson pointed out that in the industrialized countries there emerged excessive surplus capital which led to search for new markets.⁵³ The saturation in the European markets had played a major role in exploring new avenues. This led to the establishment of an unequal order where the colonized society led a subservient existence for the economic gains of the conquerors.

The process of stealing and plundering the biological wealth of a nation can be termed as biopiracy. A.W. Crosby has defined the transfer of biological resources from the Americas to Europe as the Colombian exchange, as with the arrival of Columbus followed the subservience of the native community and destruction of their natural habitats.

⁵² The tradition was to conquer a country, loot its riches and to spread the faith of the victors. Imperialism was pursued for political and ideological reasons rather than economic.

⁵³ Hobson, J.A., *Imperialism : A Study*, 2nd Ed. London, 1948, p.14

The present distrust of the IPRs regime among the countries of the South is primarily due to their colonial legacy. Europe largely derived its wealth from the extraction of biological resources from its colonies. Guha and Gadgil have argued that the British colonial rule has resulted in commercial exploitation of Indian of the forestry and the alteration of the property rights of the local communities⁵⁴. Many countries of the South are opposing the concept of biological resources as a common heritage of humankind and are not willing to allow unconditional access to genetic resources under their national jurisdiction. There has also been considerable pressure from the developed countries on the South to accept uniform patent laws while they are also refusing to make any commitments on access to biotechnology and associated technologies. This assumes greater significance as the world seed industry now accounts for over US \$ 15 billion each year much of which derives from crop varieties that have been in the words of one ethno-botanist, “selected, nurtured, improved and developed by innovative Third World farmers for hundreds, even thousands of years”.

The challenges which have emerged with regard to uncodified knowledge i.e. the oral traditions prevalent among local communities is their non-recognition by modern patent regime, rather documentary evidence is sought in the courts of western nations. In countries like India it is the local farming communities which have been working collectively and sharing knowledge over many centuries. So it is difficult recognise innovations at individual level of seeds and plant varieties which Vandana Shiva refers

⁵⁴ Guha and Gadgil, *This Fissured Land*, OUP, 1992, pp.118-22.

to as 'Intellectuals Commons.'⁵⁵ The ethical questions we may confront is whether it is justified for exploitation of indigenous knowledge and resources in a manner that its sustenance is threatened? The past developments proved that the indigenous population of the North lost their medical knowledge to businessmen who destroyed medical plants on a large scale in the rainforests.⁵⁶

There have been some cases in India wherein the use of indigenous knowledge has been acknowledged. The recent case is of the Tropical Botanic Garden Research Institute, Thiruvananthapuram to share the royalties of the drug 'Jeevani' with the Kani tribes who gave information on the potential of *Triphopus zeyalanicus*, the plant which was used to make the drug has been hailed.⁵⁷ But it is to be seen that if the present trend of expansion of the formal patent law continues while non-recognition of informal knowledge system remains, it could lead to a widening of the economic gap between industrialised and poor countries. The present paradigm lays emphasis on biopiracy, as a problem between countries while a broader definition and focus on the other dimension would bring in bioporacy within the national boundaries. The relational various communities also place a determining role in the use of natural resources. The classic case of the Onge tribal community of the Little Andaman. Recently a move by scientist of the regional centre of Indian Council of Medical Research at Port Blair to patent a plant having cure for Cerebral Malaria was stalled. The Onge had been using it for stomach disorders.⁵⁸

⁵⁵ Shiva, Vandana, 'Agricultural Biodiversity, Intellectual Property Rights and Farmers' Rights', *Economic and Political Weekly*, June, 22, 1996.

⁵⁶ Kirk, Patrick, *The Conquest of Paradise: Christopher Columbus Legacy*, Harper, New York, 1990

⁵⁷ Anuradha, R.V., 'Mainstreaming Indigenous Knowledge: Developing Jeevani,' *Economic and Political Weekly*, June 27, 1998

⁵⁸ Kothari, Ashis, *Understanding Biodiversity*, Orient Longman, New Delhi, 1997

During the colonial times the magnitude of biopiracy could be assessed by some of the cash crops (plantation) which spread to the distant parts of the world. Coffee is a classic example. Native to Ethiopia it was transported to countries like Yemen, Sri Lanka and India. When Dutch took over Sri Lanka around three hundred years ago they took some plants to Indonesia and later to Latin America.⁵⁹ In the same manner in 1876 rubber seeds were smuggled out of Brazil by the Britons and introduced in their colonies (Sri Lanka and Malaysia). The Brazilian rubber industry collapsed and its share in the global market came down from 95% to 5%. Guha and Gadgil have very succinctly explained the impact of colonialism “The man presiding over the British Empire perched on chairs of Burma teak at tables of African mahogany, consuming Australian beef washed down with French and Italian wines. Their women were decked in Canadian furs and clothes of Egyptian cotton, dyed with Indian indigo, glittering with diamonds from South Africa and gold from Peru.”⁶⁰ Recent developments in the international arena seemed to reinforce the scope for genetic colonialism after the formal end of bio-imperialism and colonialism. At present the control of the Third World biodiversities has to be assessed in the context of agriculture and bio-technology emerging as new avenues in widening market access and as an epicentre in the North-South economic relations.

The most classic case of bio-piracy by the multinational corporations is that of the neem and Basmati. There were large-scale protests when the US firm RiceTec Inc. Texas got patent (no.5, 663,484) on Basmati Rice lines and grains. It highlighted the growing

⁵⁹ Shiva, Vandana, *Monocultures of Mind*, Natraj Publishers, Dehradun, 1993. P.79.

⁶⁰ Guha and Gadgil, *Ecology and Equity*, Penguin Books, 1995, p.5.

concerns over the exploitation of rich germplasms of developing countries by Western biotech firms and corporations. The main claims made in the patent of Basmati are that it is a rice plant that has been cultivated in parts of America with specific characteristics. It has not been possible to grow such quality Basmati grain outside the confines of Indian subcontinent till recently, so they have claimed novelty for crossing Basmati lines with one or more semi-dwarf grain rice lines. So in order to invalidate the patent, following factors should be taken into account.

- The need to verify whether the new rice lines have characteristics different from and superior to the existing Basmati grains

- The need to establish Basmati a non-generic name and to defend geographic appellation.

A geographic appellation is an indication that identifies goods that originate from a particular place where a given quality, reputation or other characteristics of the goods is essentially attributed to its geographic origin. For example, in *Scotch Whisky Association versus Mohan Meakins (1986)* the Delhi High court restrained Mohan Meakins from using the word Royal Scot.⁶¹ Hence once the geographic appellation is defended on account of its origin restricted to Indian subcontinent, then steps should be taken for protection of the name Basmati as geographic appellation. Rice Tec had secured trademark protection for the names Kasmati and Texmati. So it has to be ascertained whether the two names would qualify for a trademark against Basmati. In the famous Champagne case, the plaintiff companies prayed for injunction on the plea that the wine produced in district et of champagne of France alone was to be called champagne and the defendant Spanish champagne would deceive and mislead persons

that wines sold under such descriptions was champagne. The injunction was granted.

Neem also represents communally created and held knowledge systems. Neem or *Azadirachta indica* is to large degree known for its chemical constituents. Its properties were well known to Indians and were termed as Sarva Roga Nivarani in Sanskrit i.e., the cure of all ailments for its medical values. There has been substantial research into the properties of neem conducted in leading research institutes like Indian Agricultural Research Institute and the Malaria Research Centre. At present there are large number of medium sized industries producing neem-based products. Recently a US company W.R. Grace & Co. patented a pesticide made from Indian neem seeds. The pesticide is based on an extraction process widely known to India farmers.⁶² This has evoked strong protest in India from common people to Scientists who have questioned TNC's right to appropriate the fruits of centuries of indigenous experimentation. The justification for patents by W.R. Grace is based on the claim that these modernised extraction processes constitute a genuine innovation, which therefore has an element of novelty. This has been rejected in India on the grounds that its indigenous knowledge system is codified. By citing a lack of formal publication as a proof of non-obviousness the local communities are dictated to adhere to modern regime.

It is also being argued that in cases where the corporations manage to secure patents on the basis of novelty the solution lies in terms of royalties and adequate compensation.

⁶¹ 'IPRs: Pros and Cons', Bibek Debroy, *Social Action*, October-December, 1998, vol. 48, no.4

⁶² 'Seeds of Conflict,' *TIME* Magazine, September 25, 1995, p.67.

Under the provisions of the Convention of Bio-diversity Rice Tec. Owes to the Source country India as share of the benefits that it has accrued from the commercial exploitation of the original germplasm⁶³. While the institutionalisation of indigenous knowledge system may be a distant reality, it may be given a due reality, it may be given due recognition through informal mechanism. The Bio prospecting model which allows ethnobotanists, collectors to go to indigenous communities offering compensation in form of gifts, shares in royalties in exchange for their knowledge has been criticised on the grounds that it may disrupt the traditional balance between the ecosystem and indigenous community. In 1994 FAO Assistant Director General Obaidullals Kher referred to such bioprospecting as biopiracy. The scepticism has been generated regarding the compensation due to the gross disparity between the two sides, there is a great degree of divergence between the local community and the corporation in terms of references knowledge and influence.

The measures to tackle this trend could be to apply the concept of 'prior art' i.e. to substantiate that which is being claimed as 'novel' or new in the patent application was obvious and people were aware of it e.g. the medicinal value of neem. There is also a need to take a long-term perspective on the entire issue of biodiversity and its access to outside agencies. Despite being part of an unequal world order India cannot afford to deny access to its natural resources and a physical blockade on transfer of genetic materials is impractical. Hence in order to exploit the full potential of its natural resources it is prudent to be a part of formalised collaborations with international agencies on clear-cut terms. There are several countries, which do not have laws on

⁶³ Nair, M.D., 'Basmati: Biodiversity and Germplasm Issues', *The Hindu*, May 6, 1998, p.21

access to natural products. So rather than seeking monetary compensation for transfer of genetic resources bilateral and multi-lateral arrangements can be made for compensation in form of suitable technology, training and raising a pool of scientists from the source country and setting up a centralised agency to oversee the payment of shares in royalties.

The movement of genetic resources has been very unconventional and unguided even before biopiracy began or the transfer was considered illegal. Karen Lehman stated that “For centuries, seeds, moved freely across the continents on the wind, in birds bellies, in traders caravan, conqueror’s pockets, and immigrants Knap sacks. They were available to all the sole property of none, the common heritage of the planet earth”.⁶⁴ Biopiracy has received international attention after the spurt in the innovations in biotechnology and agriculture, which also marked large-scale depletion of genetic resources in the North.

How can these developments be conceptualized? Economic liberalization and Intellectual Property Rights regimes have resulted in opening up of the private sectors for importing foreign germplasm, especially through foreign collaborations. Also, MNCs dominate in crops where there is access to international germplasms when compared to national companies. So control of Biotechnology, by and large, rests with multi-national corporations. However, companies like Monsanto does not foresee transfer of its technology to domestic companies. Monsanto explicitly states that agricultural biotechnology developed by it and the business would be exclusively controlled by the

⁶⁴Lehmen, Karen, ‘Pirates of Biodiversity: The Global Threat to Earth’s Seeds’, Condensed Version, *The Heart of the Beast puppet Theatre commemorative Booklet*, Minneapolis, USA, 1994.

multi-national corporation.⁶⁵ So the benefits that accrue from agreements like Monsanto-Mahyco would go to the seeds and chemical MNCs through expanding markets, the costs and risks are borne by Indian farmers.

The experiences of Monsanto transgenic cotton trials have clearly shown that bio-safety regulations in India are needed to be strengthened at the earliest. The trials have also demonstrated that there are many gaps and weaknesses in the regulation of genetically engineered crops.

For example, in the case of Monsanto, the Agriculture Ministers of Andhra Pradesh and Karnataka were not informed about the cotton trials in their states. So, it is possible under the present regulations to conduct trials in the field without the knowledge of either the state governments or the local community or the Gram Sabha. Vandana Shiva writes, "The approval for trials should include information and consent of state governments, local communities or Gram Sabhas. The states should be included because decentralized democracy and Panchayat Raj are commitments, which have been made through the Constitution. The present regulations have no respect for decentralised democracy required by Panchayat Raj. Nor do they have any room for public participation in decision-making regarding genetic engineering both at the

⁶⁵ Shiva, Vandana and Tom Crompton, 'Monopoly and Monoculture: Trends in Indian Seed Industry', *Economic and Political Weekly*, September 26, 1998, P. A-150.

experimental stage and at the commercialization stage. These lucanae must be filled to ensure democratic participation and decision making.”⁶⁶

The entry of MNCs into India’s agricultural sector and its implications for biodiversity should be considered in the perspective of liberalization and the WTO Regime, which requires the providing of intellectual property protection and patents by January 2002. While WTO has liberalized trade in goods, it has strict controls in case of transfer of technology. In the field of biotechnology, even while disregarding its effect on biodiversity, MNCs like Monsanto are reluctant to transfer technology to local players. So while the traditional knowledge systems are freely looted by MNCs, there has been no corresponding sharing of profits even to the extent of transfer of biotechnology.

As already seen in the cases of introduction of terminator technology and transgenic plants, they have no positive influence either upon Indian economy or upon conservation of biodiversity or upon respect and protection of local knowledge systems.

⁶⁶ Shiva, Vandana, ‘A Call to Save The Environment’, *The Hindu*, December 27, 1998, p.M – IV.

CONCLUSION

Th world over the conservationists are trying hard to find ways of doing survey of the regions with high biodiversity. Various efforts in conservation of biodiversity will help design patterns of exploitable and non-exploitable parks and regions and their immediate surroundings so that local people can be integrated into th conservation process.

Protection of areas with the highest speicies diversity is the most cost effective action as far as the conservation is concerned but the uncertainty and the lack of knowledge of structure and function of biodiversity are the major hinderances in identifying the scale of conservation. In India, a step towards the conservation of the biodiversity has come in the form of collective or participatory forest management through village forest protection commitees in different states viz., Madhaya Pradhesh, Andhra Pradhesh and Orissa. This has started after the formulation of new national forest policy in 1998 which clearly states that management of forest resources in India needs active participation of the local people in order to save its biodiversity.

The developed countries are the super consumers in the temperate zones have limited biodiversity, but are more effective in conserving their resources. But the developing countries in the tropical zones rich in biodiversity faced severe problems in conserving it in view of their pressing economic and population related problems. It is there fore important for both the developed and developing countries to bridge the gap and work

with the shared objective. there is an inseparable link between conservation and development. While conservation of biodiversity is fundamental to the success of the development process. Development has to be both people centered and conservation based.

Biodiversity and intellectual property rights have emerged as important issues for humanity due to various factors. The public awareness of environmental degradation is one of the most persistent growing political realities. There is heightened awareness in the global civil society that the situation is not favourable though the prominence of environmental issues has been rising and waning along with the major events like Earth Summit in 1992. The situation is alarming particularly in agriculture and plants with medicinal values. So there is need to overcome threats to biodiversity.

Due to environmental problems like ozone depletion, Greenhouse Gases result in new diseases, pattern for people, plants and life stock. Our existence is intrinsically related to the existence of genetic diversity. Meanwhile bio-materials have undergone revolutionary changes due to human genius and innovation. Bio diversity is being used by biotechnologists in an unprecedented manner. There is a general understanding among the decision makers and opinion makers that this socio-economic force is to be reckoned with, although issues like ethics and safety of genetic manipulation has evoked mixed opinions.

On the other side increasing need for biological resources is matched by an erosion of resource base of biomaterials. This could be a clear case for a conservation and a solution for economic benefits. While the gains are rarely predictable and are of high duration in genetic conservation. Predictability determines economic benefits for a short term. Conservation cannot generate windfall rewards in the near future. It is clear that there has been no monopolisation of markets over biodiversity by any country and nor any country has achieved self-sufficiency in genetic resources. There are also instances of biologically rich countries depending on countries with less biological resources for food and medicines. So a strong multilateral arrangement is needed through which access to resources and management can be done by the nation-states. The coming into force of the Convention on Biological Diversity and the inception of WTO brings under focus these broad issues. While in the trade agreements intellectual property rights have become a dominant factor, in the context of biodiversity, it remains controversial.

Intellectual property symbolises changing market mechanisms which can influence public-private sector relations rather than being only a mechanism for invention. The interest of the rural societies can also be deeply affected by the intellectual property rights. The question of how to approach towards intellectual property rights needs to be determined by the Governments, indigenous communities and industries. The national policies assume importance when there is absence of acceptable international arrangement.

The role of indigenous knowledge system has been adequately emphasised in the conservation of plant genetic resources by the factors that led to the convention of

biodiversity. The relevant approach is to encourage co-operation between the local communities and formal governmental structures for evolving a viable national conservation and enhancement programmes. The conservation projects involving the local communities, can only be viable.

It has to be recognised that for farmers the absence of seed on the fields could result in extinction. The preservation of seeds in gene bank is not surety for farmers to have access to it. The farmers should be guaranteed access to germplasm by the genebanks and the conservation projects. Simultaneously both the public and private sectors need to be involved in institutionalised arrangements through which the industries can make constructive contribution. The biodiversity convention presents the hope of becoming a symbol of multilateral commitment in the preservation and development of biodiversity. There are two issues which are very significant. Firstly, the status of ex-situ collections where in two thirds of all crop germplasms are not in their countries of origin. The second issue relates to the recognition of contribution of farmers to plant genetic resources and their right to compensation and the industry's interest seeking intellectual property protection for bio materials.

There is need to rethink the place of innovation in a national and global context in face of evolving an approach to the new trade regime (WTO) involving intellectual property rights. In context of technological advancements there are challenges in reconciling the informal knowledge system (local communities) with formal innovators public and private research centres). One group has a deep 'macro biological'

understanding of their micro environment while the other group has sound micro biological understanding of their macro environment. Hence in order to conserve and develop biodiversity both the sections need to enter into a positive relationship. The local communities in order to get their due recognition need access to germplasm, information, funds and technologies.

Conservation is no longer a function of building a fence around an area and declaring it as a protected area. It requires a monumental struggle and dedicated efforts by various groups and organisations. It requires peoples' participation and complementarities between biodiversity - poor/technology - rich developed countries and biodiversity - rich/technology - poor developing countries.

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