The Impact of the International Patent System on Developing Countries*

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INTRODUCTION

The development of the patent system has passed through different phases in history. Initially, the concern was restricted within the domain of national territories so as to encourage local inventive and innovative activities. Later on, in parallel with the expansion of industrialization and international trade, the concern began to go beyond national territories. At this stage, the need to do something with a view to creating confidence for the smooth undertaking of inventive and innovative activities as well as the international movement of goods became imperative than ever before. The conclusion of the 1883 Paris Convention on Industrial Property Protection was the reflection of those earlier days' concerns. Of course, it may also be important to note that the concern was and is reflected not only through the international multilateral arrangements but also regional and bilateral agreements.

In its various phases of development, the historic evolution of the patent system has also faced a critical challenge regarding the scope of patenting. In earlier days, patent was granted on mechanical inventions. But, with the advent of the biotechnology revolution life forms became an attractive area for patenting. It may be at this phase in history that the patent system caught the attention of more people than ever before. The concerns range from the religious and ethical perspectives to the politics of genetic resources. Of course, these issues, except genetic resources related matters and the associated knowledge are not within the purview of this paper.

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In the eyes of many critics, the IP system is succumbing to enter into a more critical and decisive stage of development. Until the 1990s, it had been argued that the patent system was more flexible and within the discretion of the national patent laws. The TRIPS Agreement, which laid down substantive principles that all members of the WTO should respect, signaled the inevitability of a more harmonized and strong global patenting system. Thus, the implication of this new development has caught the attention of many governments, multilateral organizations, NGOs as well as civic societies. Some argue that the new development towards a global patent system would undoubtedly affect the interest of developing countries; while others, on the contrary, argue that the move towards a globally harmonized patent system would be advantageous to developing countries. The third tier of the argument says that the term developing countries is an umbrella and amorphous concept. It consists of the most populous country, with one-fifth of world's population, and the very small countries with a population of less than a million. It further includes the most advanced countries which in many respects are comparable to some of the OECD countries. Thus, they have argued that the impact of the global patent system would depend on the techno-economic development level of countries.

The main purpose of this study is to examine the impact of the international patent system on developing countries as well as shade light on the on-going harmonization process and the evolving international patent system. The paper also aims to assess the options that developing countries would have in the advent of global movement towards a more harmonized and global patenting system.

The article consists of five parts. Part I deals with the rationale for the introduction of the patent system, and what it looks like in developing countries in general. Part II focuses on examining the existing international patent system. In this regard, the driving forces to and the major legal instruments of the international patent system are discussed.

Part III deals with the implications of the international patent system on the developing countries based on selected functions of patent. This part mainly discusses the issues involved in relation to the international patent system. Any country has expectations in joining the international patent system. To what extent those expectations have materialized in developing countries and the problems associated with maximizing the benefits from the international patent system are examined in this chapter. The arguments against and in favor of strong and weak patent regimes respectively come into picture in the discussion under this Part.

The ongoing negotiations to harmonize procedural and substantive requirements for the protection of patents as well as the future trend of harmonization have been considered under Part IV. The options that developing countries have in the evolving international patent system and the possible strategies that may be followed by these countries are also highlighted in this chapter. In the last part of the article, an

attempt is made to show the lesson that is learned from the study and indicate what should be done by developing countries.

PART I: THE PATENT SYSTEM IN DEVELOPING COUNTRIES

A. JUSTIFICATION

1. General

Traditionally patents had been deemed to play a positive role in the fulfillment of a number of functions related to social and economic development. However, studies on the patent systems of different developing countries revealed that the patent system did not succeed in attaining adequately the presumed objectives and fulfilling the claimed functions[1]. This may be due to two main reasons. One of the reasons relates to the national patent system itself, particularly the way it is tailored. It has been noted that unlike that of the developed countries, the patent system of many of the developing countries did not evolve from within the national context, but was transplanted from abroad or tailored to meet international requirements and standards. Most of the patent laws of developing countries prior to the Agreement on Trade-Related Aspects of Intellectual Property Rights (hereinafter, TRIPS Agreement) were either introduced by or inherited from the colonial masters or directly adopted from WIPO model laws, which had to be used as a guideline and modified according to the needs and specific conditions of the countries concerned.[2] Of course, some developing countries, in the 1970's and 1980's, made efforts to revise patent laws with a view to customizing the patent system to their socio-economic realities.[3] However, these countries were forced to change their laws either because of the pressures from advanced countries or to comply with the requirements of the TRIPS Agreement.[4]

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[1] UNCTAD, *The Role of the Patent system in the Transfer of Technology to Developing countries*, TD/B/C.6/16, Geneva 1975, p.11

[2] G. Yankee, International Patent System and Transfer of Technology to Least Developing Countries: the Case of Ghana and Nigeria, Avebury Gower Publishing Company Limited, England, 1987.

[3] Examples are Mexico (see, UNCTAD, 1975a) and India.

[4] Mexico revised its patent law in 1991 due to the pressure made by the USA, while India was forced to change its law to meet the requirements of the TRIPS Agreement.

The other reason relates to factors outside of the patent system. In this regard, among others, lack of awareness on the role of the patent system as a tool for economic growth and wealth creation, weak indigenous technological base and capacity, and absence of complementary policies and support schemes can be mentioned. In some of the developing and least developed countries, the non-patent related factors seem to have more weight than the patent system itself.

2. Patents and Local Inventive and Innovative Activities

The patent system was basically conceived as an important tool to stimulate indigenous technological development, promote domestic inventive activity and enhance the exploitation of patented inventions. However, those expectations seem to be far from being realized in many of the developing countries. This may be explained by the number of patents granted locally and abroad to nationals of developing countries as well as the exploitation of patented inventions in these countries.

a) Ownership of Patents

In developing countries, the proportion of patent grants to foreigners tends to be much higher than patents granted to their own nationals. According to UNCTAD's study[5], developing countries accounted for 6% of the world stock of patents granted and their nationals held not more than 1%. Furthermore, a study conducted on the pattern of ownership of patents in Nigeria concluded that foreigners instead of nationals own most of the patents. During the period between 1978 and 1984, of the 51 countries that filed patent applications in Nigeria five Western industrial countries, USA, UK, France, Germany and Switzerland, accounted for 76.4% of all patents registered; whereas Nigerians accounted for 2.53%.[6] In some of the LDCs such as Ethiopia, patents are granted almost invariably to foreigners or foreign owned firms.[7]

The reasons for the small number of patents granted locally may not necessarily reflect the low level of inventive activity. It may relate to the absence of a scheme

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[5] UNCTAD, *The Role of Patent System in the Transfer of Technology to Developing Countries*, TD/B/AC.11/19/Rev.1, Geneva 1975, at p.**328**

[6] Yankee, *supra* footnote 2, at p. 258

[7] In Ethiopia it is only a single Patent that was granted to a local researcher and local Research institute. The rest are owned by foreigners. (Ethiopian Intellectual Property, Industrial Property Data Base, 2006)

that protects inventions that may not meet the requirement of patentability. Most of the developing countries have no utility model protection.[8] As a result, a large number of useful technologies are excluded from protection mainly due to the stringent requirements of patentability: i.e. novelty, inventive step, and industrial applicability.[9] Countries that have such a scheme have succeeded in stimulating local inventive and innovative activities. In this regard, the experience of the young patent system of Ethiopia can be cited as an example. The patent law was first introduced in 1995 and was implemented after the regulation was enacted in 1997. Until February 2006, for example, 172 utility model applications have been filed, of which 81 have secured utility model certificates.[10] Ethiopians filed all of the applications.

At the international level, the number of patents granted to nationals and residents of developing countries is also insignificant, although the share of individual countries varies depending on their level of development. In 2001, for example, less than 1% of US patents were granted to applicants from developing countries, about 60% of which were from seven of the technologically advanced developing countries.[11] According to the study conducted by the Commission on Intellectual Property Rights (hereinafter, CIPR), the share of developing countries from the total PCT applications for the period between 1999 and 2001 was less than 2% of which over 95% were from just five countries: China, India, South Africa, Brazil and Mexico. Besides the question of patent ownership, the distribution of patents seems to concentrate on few fields. The greater concentration of patents in developing countries is in the chemical and pharmaceutical sectors, which are sensitive to patent protection. A study undertaken in Ghana shows that the number of inventions registered in mechanical fields, which are crucial to the development of the capital goods sector, were negligible.[12]

Here, it is important to note that low level of protection may be attributed to other factors such as capacity, awareness, cost of processing patent applications and maintenance of titles.

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[8] The countries that provide utility model protection include Argentina, China, Colombia, Costa Rica, Ethiopia, Guatemala, Kenya, Malaysia, Mexico, OAPI, Peru, Philippines, Republic of Korea, Republic of Moldova, Trinidad & Tobago and Uruguay. Information available at http://www.wipo.org/sme/en/ip_business/utility_models/utility_models.htm accessed in February 2006

[9] C. Juma and B. Ojwang, (eds.), *Innovation and Sovereignty: The Patent Debate in African Development*, African Center for Technology Studies Research Series, No.2., ACTS Press, Nairobi, 1989, at p. 127

[10] See Industrial Property Data Base, 2006, *supra foot note 7.*

[11] Commission on Intellectual Property Rights: *Integrating Intellectual Property Rights and Development Policy, Report of the CIPR*, London, 2002, at p. 12

[12] Yankee, *supra* footnote 2, at p.178

In most of the developing countries, the critical issue for innovativeness and patenting are not adequately available. For example, in these countries, the numbers of researchers and potential inventors are few; the research facilities are poor; funds are also meager. Furthermore, there are no clearly and comprehensively articulated patent and technology policies that will encourage inventive and innovative activities. The synergy between the patent system and the national socio-economic development plan is not maintained.

The amount of fund allotted for R&D varies among developing countries. It is estimated that in 1994 China, India and Latin America together accounted for nearly 9% of the world's research expenditure, but sub-Saharan Africa accounted for only 0.5%, and developing countries other than India and China accounted for only about 4%.[13] Generating revenues from R&D results has not yet been considered as an important strategy to mitigate the funding problems of these countries. Research is mainly done in public research institutions and universities. This activity may result in inventions which could be patented and generate revenue that may be used for further inventive and innovative activities. However, because of a wrong attitude in many academic circles that considers patenting of research results as falling outside their domain, most valuable knowledge assets in many countries have been wasted and the opportunity to generate fund for further research has been lost.[14] The inaccessibility of the patent office, the high cost involved in patenting and maintenance of the title as well as enforcement of the rights in cases of infringement have also impacted the patenting of inventions. In this regard, a CIPR[15] report notes that firms in developing countries can seldom bear the costs of acquisition and maintenance of rights and, above all, of litigation if disputes arise.

Cognizant of these problems, and recognizing the need to complement the patent system, some developing countries have taken positive steps and encouraging results have been registered. In this regard, it may be worthwhile to mention that some Asian countries such as Philippines, Vietnam, Thailand, Indonesia and Singapore have already established a system of intellectual property management, incentive and support system to patent owners.[16]

The Philippines established Invention Development Assistance Fund (IDAF) that provides fund to inventors for prototype development and early stage research

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[13] CIPR, *supra* footnote 11, at p.2

[14] Kamil Idris, *Intellectual Property: A power Tool for Economic Growth*, Geneva 2002, at p.103

[15] CIPR, *supra* footnote 11, at p.15

[16] WIPO, *Case study on Using Intellectual Property as a tool for Economic Growth in the ASEAN Region*, conducted by WIPO for the Association of Southeast Asian Nations (ASEAN), Geneva , at p.25

experiments while Vietnam and Thailand have financial award programs for R&D projects.[17]

Some developing countries such as Indonesia have taken measures to promote the use of patents by public research institutions and universities. Indonesia has established "IP management offices at universities and research centers all over the country. Twenty centers for IP management have been set up to offer IP licensing expertise, IP rights management, counseling, patent searching and other functions to promote knowledge based national economic development through encouraging inventive culture, protecting and selling intellectual property works."[18]

To deal with the problem of the cost of processing of patent applications, financial assistance schemes have been developed and implemented in Singapore and Vietnam. Singapore has established a patent application fund to provide financial assistance to meet the cost of patent applications to her citizens, permanent residents, and companies, thereby, promoting a patenting culture in the country.[19] WIPO's study has also noted that Vietnam has a scheme of providing financial assistance for filing of patent applications.[20]

In Africa, little is known of measures similar to the above. In Ethiopia there is a local research grant scheme that aims to encourage young researchers. Although, the main objective of the scheme is to develop a research culture and capacity, some of the results have been protected by utility model certificates and are exploited.[21]

b) Exploitation of Patented Inventions

It is instructive to note that the number of patents granted in developing countries may not be sufficient to evaluate the economic significance of the patents since the figures alone may not show whether the patented inventions are exploited or not. It is, therefore, said that the figures on patents granted in developing countries overstate the significance of patents since the majority of these have minimal economic or technological importance as many of them are not worked or exploited in the

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[17] ibid

[18] Idris, *supra* footnote 14, at p. 102

[19] WIPO, *supra* footnote 16, at p. 40

[20] WIPO, *supra* footnote 16, at p. 25

[21] See Getachew Mengisite, 2006, Intellectual Property Assessment in Ethiopia, Published by the Ethiopian Intellectual Property Office (EIPO).

countries.[22] It appears that all patented inventions are not exploited and that there is a problem of non-use of patents in both advanced and developing countries. However, the degree of non-use of patented inventions is much higher in developing countries than the developed ones.[23] Studies made in Canada, UK, and USA revealed that in these countries only between 40 and 70% of the patents registered were commercially exploited.[24] This figure is much lower in developing countries. According to UNCTAD the rate of patent utilization is about 5% in Argentina and Chile, 1.1% in Peru and below 1% in Tanzania.[25]

The underlying reasons for non-use of patents in production are different in the developed and developing countries. In the former countries, non-use is due to the realization that patented inventions are not, or are no longer of commercial significance; whereas in the latter countries the non-use is relating to commercial strategies of foreign patent owners. Some argue that foreign patent owners apply for patent protection in developing countries mainly to protect local markets from domestic and foreign competition.[26] A study made in Ghana and Nigeria revealed that the majority of patents were not worked domestically, but exploited by patentees through the importation of the patented product or products derived from the patented processes.[27] It has also been explained that foreign patent owners used their right as a "scare crow" and legal barrier not only to the containment of competitors but also to prevent any potential indigenous "intruder" in the field.[28]

Furthermore, it has been argued that patents have been used to impose direct and indirect restrictions on local technological development. Patent licensing has served to impose direct limitations such as restrictions on the freedom of access to competitive technology and requirements that inventions and improvements developed by the licensee must be handed over to the licensor. Moreover, contracts of apprenticeship had been used to impose restrictions that bind nationals from using or disclosing technological know-how even after the termination of the labor contract.[29] It has been noted that such restrictions have direct effect on the development of

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[22] M. Blakeney, Legal *Aspects of the Transfer of Technology to Developing Countries*, Oxford: ESC Publishing. 1989, at p.80

[23] UNCTAD, *supra* footnote 5, at p. 40

[24] M. Blakeney *supra* footnote 22, at p. 80

[25] UNCTAD, *supra* footnote 5, at p.80

[26] UNCTAD, *supra* footnote 1, at p. 19

[27] Yankee, *supra* footnote 2, at p. 289

[28] Yankee, *supra* footnote 2, at p. 53

[29] UNCTAD, *supra* footnote 1, at p. 16

indigenous technological capability. In addition to the direct impacts, the restrictions will also have indirect bearing on related matters.[30]

Moreover, the absence of sanctions or safeguards against patent abuses has worsened the situation. A study showed that in some countries such as Ghana there were no provisions for dealing with abuses of patent rights including non-use.[31] In other countries, there may be sanctions but are inadequate and full of loopholes. To ensure the exploitation of patented invention, working of invention, for instance, was considered as one of the duties of the patentee in most Latin American countries but without defining the concept precisely. As a result, working of the patent outside the country was accepted as evidence for compliance with the legal requirment.[32]

In spite of the fact that compulsory license has been conceived by many countries to be the major instrument of sanction against non-working of patents, in practice it has been proved virtually of little value.[33] Furthermore, the Commission on Intellectual Property Rights in its study[34] noted that developing countries have not used compulsory license though the TRIPS agreement as further elaborated by the Doha Ministerial declaration allows it. The Ministerial declaration recognizes that "each member has the right to grant compulsory license and the freedom to determine the ground upon which such licenses are granted."[35] The reason for the non-use of compulsory license include the absence of the requisite administrative and legal infrastructure as well as the non availability of potential licensees having the necessary know how and capacity to exploit the patented invention without the cooperation of the patent owner.[36]

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[30] It has been explained that "[a] number of studies have shown that patents have been used indirectly as a means of regulating or influencing not only the behaviors of other enterprises linked by restrictive clauses…but also have impact on national economic policies… relating to exports, substitution and selection of imports, price controls, employment etc. The use of lawful monopolies has, in general, had adverse effects on certain key aspects of industrial development by restricting exports of patented products by "tying" the purchase and supplies of licensed enterprises, by setting arbitrary price for products under patents or manufactured under licensing agreements, by imposing restrictions on employment of local personnel etc." UNCTAD, *supra* footnote 1, at p. 22.

[31] Yankee, *supra* footnote 2, at p.197

[32] UNCTAD, *supra* footnote 1, at p.19

[33] UNCTAD, *supra* footnote 5, at pp.335-340, See also Yankee, *supra* footnote 2, at p.73

[34] CIPR, *supra* footnote 11, at p. 42

[35] WTO, Doha Declaration on the TRIPS agreement and public ,2002: p.25

[36] CIPR, *supra* footnote 11, at p. 42

It is instructive to note that there are a number of factors that may affect the exploitation of a patented invention in a country. This may relate to indigenous capacity and economic factors such as market size and finance. It is hardly possible to invoke compulsory license and exploit a patented invention in most of the low-income and least developed countries such as Ethiopia. Persons with the requisite capacity and resources are often non-existent. Furthermore, the size of the market is too small to influence the decision to exploit an invention.

3. Patents and Transfer of Technology

The existence of a patent system and appropriate mechanism of enforcement of patent rights are prerequisites for technology transfer and investment. Without patent protection, no business is comfortable in disclosing or transferring its technologies.[37] There is, thus, a need to create an enabling environment for transfer of technology. One such environment is the existence of the patent system. Patents are of vital importance to facilitate the transfer of technology directly by stimulating the introduction of foreign technology and indirectly by making available technological information through patent documents. It is believed that the existence of the patent system not only makes possible for patentees to disclose and register their inventions, but also provides some guarantee and security to foreign owners of invention to exploit and authorize the exploitation of their technology. According to Blakeney[38] the role that patents could play in the transfer of technology is the principal justification for the existence, or introduction of the patent system in developing countries.

However, studies reveal that the role of patents in transfer of technology in developing countries is negligible. It has been estimated that patents accounted for less than 2% of the technology transferred to developing countries.[39] This estimate, however, does not include the contribution made to the transfer of technology by information derived from published patent documents. The principal way in which patents may contribute directly to the transfer of technology to developing countries is through the exploitation of the patented technology in the patent granting country by the foreign patent holder himself or with his consent by third parties. The former mainly takes place in the form of foreign direct investment or joint venture, while the latter chiefly occurs through a licensing arrangement.

The technology transferred through foreign direct investment or joint venture seem to be negligible as almost all of the foreign owned patents are not exploited in the

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[37] Idris, *supra* footnote 14, at p. 84

[38] Blakeney, *supra* footnote 22, at p. 57

[39] Yankee, *supra* footnote 2, at p. 87

developing countries. It was noted that in most developing countries, patents have failed to promote joint ventures and foreign direct investments since their owners have not used the majority of the patented inventions. The exploitation of few of the registered inventions have been made possible not because of the protection offered by the patent system, but because they form part and parcel of an entire investment project.[40]

The transfer of patented technology via licensing arrangement to developing countries seems to be rare and/or ineffective particularly in middle and low-income developing countries. A study undertaken in Ghana and Nigeria revealed that in both countries "patent licensing as a vehicle for the transfer of technology is very rare for lack of competent licensee capable of independently exploiting the licensed inventions or due to the difficulty patentees face in getting capable licensees."[41] Moreover, it was found that effective transfer of technology could not be possible due to a number of unfavorable terms and conditions stipulated in license agreements. It is common to find onerous terms, which are one-sided and constitute restrictive practices or monopolistic abuses, prohibited by anti-trust legislations of advanced countries, imposed on developing countries. According to UNCTAD sample study of license agreements, 90% of licensing contracts had been found consisting of unreasonable restrictions. Examination of the sample agreements showed that 94% in Peru, 97% in Mexico, 91% in Chile and 43% in India had restrictions that would inhibit growth of indigenous technology and perpetuate technological dependence.[42] The unreasonable restrictive clauses include grant back provisions, which impose obligations on the licensee to transfer to the licensor any improvement made on the transferred technology, restrictions on R&D which prohibit the licensee from conducting further research on or making improvement of, or adaptation to the licensed technology, restriction on use after expiration of the patent protection would diminish the benefit of introducing patented invention into the developing countries.[43]

In spite of the above-indicated limitations, it is argued that in the absence of security of patent protection foreign technology will not be disclosed and that a system of patent protection is considered to be a hallmark of a reliable environment for investment. There is a belief that the existence of the patent system in countries does not only make it possible for patent owners to register their inventions in other countries, but also provide some guarantees and security to foreign owners of inventions to license their technology.

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[40] Yankee, *supra* footnote 2, at p.198

[41] Yankee, *supra* footnote 2, at p. 22

[42] UNCTAD, *supra* footnote 1, at pp. 15-16

[43] See, UNCTAD, *supra* footnote 1, at p. 15, UNCTAD, *supra* footnote 5, at pp.23 to 28.

It is also important to note that the patent system in itself is not sufficient, although undoubtedly important, to effect transfer of technology. There are a number of factors that influence the transfer of technology. Effective transfer of technology presupposes the existence of indigenous technological capability. The importance of such capacity is explained as follows:

> For developing countries, like the developed countries before them, the development of indigenous technological capacity has proved to be a key determinant of economic growth and poverty reduction. This capacity determines the extent to which these countries can assimilate and apply foreign technology. Many studies have concluded that the most distinctive single factor determining the success of technology transfer is the early emergence of an indigenous technological capacity.[44]

Indigenous technological capacity includes the capacity to select, adapt and apply foreign technology. Such capacity differs among developing countries thereby affecting the degree of transfer of technology. Developing countries such as China and India have the requisite technological capacity compared with Sub-Saharan African countries, excluding South Africa.[45]

The size of market also affects transfer of technology. In this regard, it was noted that a developing country with a relatively small population of potential consumers or low level of manufacturing base may not be an attractive location for licensing because the royalties that can be realized in such a market are too small.

4. Patent as a Source of Technological Information

The patent system that provides exclusive right over inventions for a limited period of time helps to stimulate technological development through patent documents. The grant of a monopoly right over an invention may be regarded as a trade off between the state and the inventor. The latter is granted a limited exclusive right in return for prompt disclosure of new inventions so that inventions are not kept secret and society benefits from the disclosure thereof.[46] It is a standard requirement of most patent laws that the patent description discloses the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art. The rationale behind this requirement is to facilitate the use and dissemination of technological information. That is to enable other persons to exploit the invention upon the expiry

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[44] CIPR, *supra* footnote 11, at p. 11.

[45] CIPR, *supra* footnote, at p. 2

[46] Yankee, *supra* footnote 2, at p. 60

of the patent right protection or under prescribed conditions during the currency of the patent without the consent of the patent holder or to use it for lawful purposes such as R&D activities. The technological information helps to avoid duplication of and reorient local inventive efforts and to invent around the patented invention when there is a capacity to do so.

The technological information contained in patent documents facilitates and helps to overcome problems related to selection, negotiation, acquisition and transfer of foreign technologies. The information helps, *inter alias*, in alleviating the problem developing countries, such as Ethiopia face in the identification, selection, negotiation, acquisition and transfer of foreign technology due to lack of information on alternative sources of technology. It has been noted that a "patent document presents concrete solution of technological problems in a standard, concise and easily accessible form. The comprehensive information contained in patent documents permits receivers of patented technology to see precisely what they will be receiving together with an evaluation of comparable technology and alternative solutions."[47] In spite of the fact that patents help in making available valuable information that would help to stimulate local inventive effort as well as facilitate transfer of technology, little has been made in using it. This is true in particular in the majority of the developing countries in Africa and elsewhere. Patents in the majority of sub-Saharan African countries are being administered by offices, which often discharge a mere function of registration and deposit of registers.[48]

Patent offices can play a role of a development agency by rendering technological information services. This can be evidenced by looking at the experience of the young Ethiopian Patent Office, which was established in 1994. One of the major functions entrusted to it is to render technological information services. Prior to the establishment of the Office, there was no single patent document consisting of technological information. A concerted effort was made to collect patent documents. This effort bore fruit with the generous support obtained from the World Intellectual Property Organization (WIPO), the African Industrial Property Office (ARIPO) and European Patent Office (EPO), the United States Patent and Trade Mark Office (USPTO), Japan Patent Office (JPO), Swedish and UK patent offices. At present

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[47] Blankeney, *supra* footnote 22, at p. 85.

[48] In this regard, it has been noted that: "Patent Offices of Ghana and Nigeria have merely served as patent registration centers and do not undertake any other functions expected of patent offices....do not adequately publish new inventions in any patent journal or publication and thus do not help to disclose new technical knowledge to the general public. In addition, as a result of very poor filing systems, general indifference and lack of absolute resource and governmental support, the two offices have also not been successful as data banks for technological information to the technological and industrial development in their respective countries." Yankee, *supra* footnote 2, at p. 286.

there are more than 30 million patent documents consisting of information in any field of technology and comprising inventions patented since 1790.[49] Although the number of users of the information when viewed in light of the collection and the technology needs of the country is small, encouraging results have been reported. There are entrepreneurs who improved their products using the technological information contained in these patent documents, which established enterprises and began to manufacture products that replaced imported ones. As a result, it became possible to save foreign exchange, provide employment opportunities and widen the revenue base of the government.[50]

B. REVISION OF THE PATENT SYSTEM IN DEVELOPING COUNTRIES

In spite of the fact that the patent system failed to adequately contribute to socio-economic development objectives of many developing countries, its abolition has not been suggested.[51] Instead, it has been said that, the patent system may serve useful purposes if it is properly administered.[52]

There is a belief that the patent system can be effectively employed to nurture the development of indigenous technological capability.[53] In line with this, some countries such as Mexico and India reformed their patent regimes so as to make them more appropriate to their respective needs and conditions.[54] However, the reforms made in the 1970's could not last long. The countries were forced to reform their patent regimes that were deemed weak by advanced countries. Furthermore, the reformed national laws were revisited to comply with international instruments mainly the TRIPS Agreement.

It has been noted that loopholes and flexibilities available under the TRIPS Agreement should be exploited in designing national patent systems.[55] However, the

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[49] National Intellectual Property Information and Advisory Center, Patent Data base, EIPO .

[50] These benefits may be explained by taking one success story as an example. A chemical engineer produced a printing ink that was found to be of a comparable quality with that which was imported. The product is now in the market with a reasonable price. One can easily see what this would mean to a poor country and what the effect could be if many of the patented technologies in the public domain would be exploited.

[51] UNCTAD, *supra* footnote 1, at p. 34

[52] Yankee, *supra* footnote 2, at p. 45

[53] Yankee, *supra* footnote 2, at p. 45

[54] See UNCTAD, *supra* footnote 5, at p. 13; Yankee, *supra* footnote 2, at p. 309

[55] CIPR, *supra* footnote 11, at p. 49

mere tailoring of a system in the way one thinks fit may not be on its own enough to generate wealth using patents as a tool. There is a need to put in place complementary measures.

C. COMPLEMENTARY POLICIES AND SUPPORT MEASURES

Many developing countries have not benefited from using patents as a tool for wealth creation. This may be partly due to the absence of complementary measures. Appropriate policy, legislative and related measures should be taken to complement the patent system. The patent law may, for instance, with a view to promoting local R&D effort, provide protection for minor inventions. However, this objective may not be achieved unless supported by complementary measures such as favorable fiscal and monetary policies and schemes. Since patents are policy instruments, they should be integrated with and supported by other national policies and related measures.

The measures that have been taken by a number of ASEAN countries to complement the patent system through other policy measures to stimulate local inventive activity and to encourage the transfer of foreign technology have been found promising.[56] Similar measures, however, are lacking in Africa.

A well designed patent system together with other policy instruments and commitment of the government, without doubt, will serve useful purposes and help nurture the generation and development of local technology and facilitate the transfer and effective use of foreign technology.

PART II: THE INTERNATIONAL PATENT SYSTEM

A. GENERAL

The international patent system evolved and developed to govern relations between states and deal with the difficulties arising from the territoriality of patents. The system includes international legal instruments as well as organizations entrusted with the administration of these instruments. The international patent legal regime consists of multilateral agreements, international organizations, regional conventions, treaties or protocols as well as bilateral agreements. The international patent institutional or administrative framework mainly involves organizations established to administer the

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[56] WIPO *supra* footnote 16, at pp. 14-45

multilateral patent agreements. This includes the World Intellectual Property Organization (WIPO), the World Trade Organization (WTO) and regional patent organizations such as the European Patent Office (EPO), the African Intellectual Property Organization (OAPI) and the African Regional Intellectual Property Organization (ARIPO). The purpose of this paper is not to deal with each of the constituent elements of the international patent system but to examine existing major multilateral patent agreements concluded at the international level that may have an impact on developing countries.

B. RATIONALE AND NATURE OF THE INTERNATIONAL PATENT SYSTEM

The reasons behind the conclusion of international patent agreements lie in the nature of inventions in the sense that inventions protected by patents do not know borders. However, patent protection is territorial in nature. As a result, various difficulties arise that may defeat the purpose of patents and affect the relation between states. If an invention is not protected under national law then it will constitute a public domain and can be freely used in the country concerned. Seeking patent protection in a foreign country could be difficult for a number of reasons such as possible discriminatory treatment, the variation between national laws, the problem of cost, time and distance relating to the filing and processing of patent applications. In order to avoid undesireable results that may arise in such circumstances and to mitigate the difficulties in securing a patent in a foreign country, international agreements were concluded.

The multilateral treaties concluded in the field of patents that are effective to-date include the 1883 Paris Convention on Industrial Property; the 1970 Patent Cooperation Treaty (PCT); the 1971 Strasbourg Agreement Concerning International Patent Classification; the 1979 Budapest Treaty on the Deposit of Micro-organisms and the 1994 Agreement on Trade Related Aspects of Intellectual Property (TRIPS). These international undertakings may be classified as substantive and procedural. International agreements that deal with substantive issues include the Paris Industrial Property Convention and the TRIPS Agreement. The PCT and the Strasbourg Agreement intend to harmonize formal standards and procedures.

In spite of the fact that the above agreements try to harmonize national patent systems by setting standards and common requirements, patents are still governed by national laws and where appropriate by regional agreements.[57] There is no international patent

[57] This is the case where patents are granted by regional organization such as OAPI, which are valid in member states.

law that provides for a world patent. The international patent agreements are not meant to replace national patent regimes, but facilitate the protection of the interests of nationals or residents of a member state in another member state.

The international agreements that deal with substantive issues such as the Paris Convention and the TRIPS Agreement merely set the minimum requirements. Countries that desire to go beyond the minimum standards are free to do so, as far as the step would not defeat the underlying objectives of the international agreements. There are, thus, variations among national laws. That is why the effort to harmonize national laws is going on. The discussion in this part is limited to the existing international patent legal regimes. Furthermore, it is limited to briefly explaining the main agreements that deal with procedural and substantive issues. As a result, the Strasbourg Agreement and the Budapest Treaty are not considered for the purpose of this article.

C. MAJOR MULTILATERAL PATENT AGREEMENTS

1. The Paris Industrial Property Convention

The Paris Convention, that was concluded in 1883 and amended in 1900, 1911, 1925, 1934, 1956, 1967 and 1993, is considered as the first multilateral agreement in the field of patents. From historical perspective, the 19th century, among other things, was characterized by the unprecedented expansion of trade across national boundaries. Thus, this new development required close international cooperation among nations with respect to various economic matters including patents. To be sure, the patent system is one of the factors that tie the economic and political sub-systems of nations to each other. Moreover, it was during this period than ever before that the centrality of patent to inventive activities was recognized. At the same time two developments took place, which tend to oppose each other. On the one hand, there was a growing demand, particularly from inventors and manufacturers for strong patent protection. On the other hand, advocates of free trade, particularly trade associations came on the scene to challenge the patent system.

By 1873, a propitious condition was created in favor of patent proponents. The international exhibition held in Austria in 1873, was considered as an important landmark towards the establishment of an international mechanism for the protection of intellectual property. It was the reluctance of the manufacturers, because of the fear that their ideas would be stolen, to participate in the Vienna Exhibition that eventually led to the conclusion of the Paris Convention on the Protection of Industrial Property in 1883.

The Convention could be described as the institutionalization of the patent system at the international level for the first time and signaled a more global concern for the protection of the intangible assets. Although, only a few countries signed the Convention, it laid down the fundamental principles of international patent protection. The basic principles and rules as stipulated in the Convention include the principle of national treatment, the right of priority and common rules.

The first signatories of the Paris Convention were the major advanced countries including Brazil and Tunisia from the developing countries. However, after the Second World War, a number of developing countries that enacted patent laws or inherited from their colonial masters joined the Convention.[58] The number of developing countries joining the Convention has increased particularly in the 1990s and the reason is attributable to the TRIPS Agreement. Maskus explains the increase in number, the type of countries that join the Convention and the reason behind such a step as follows:

> All new members since 1985 have been developing countries and countries in transition...while several key developing economies, including Venezuela, Singapore, India and Chile, chose to join in 1990s, most of the newer members are small and poor or new republics in transition. No doubt, much of the increase in membership stems from the need of WTO parties to implement TRIPS, which incorporates by reference the substantive legal provisions of the Paris Convention while not requiring membership *per se*[59]

By 5 February 2005, 169 countries, of which the majority were developing countries, were party to the Paris Convention.[60] Some argue that the Paris Convention, which was first signed and concluded mainly by developed countries to reflect their conditions and to cater to their needs, is inappropriate to and disadvantageous to the interests of developing countries. In this regard, it has been noted that:

> Developing countries, such as Kenya, which have acceded to the Paris Convention, have joined a regime of obligations that was not originally designed for their present condition. With the protection provided for by the Convention, the new states have in effect committed themselves to give a one-sided advantage to foreigners who operate from their land, as these have a much larger technological base than their own nationals.

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[58] C. Juma, *supra foot note 9,* at p. 39

[59] Maskus, K. *Intellectual Property Rights in the Global Economy,* Washington, DC,2000, at pp. 89-90.

[60] http://www.wipo.int/treaties/en/show results.jsp?lang=en& treaty id=2 accessed on 5 February 2006.

> Under these obligations the developing countries adhering to the Paris Convention have restricted their own direction to make such policy or legislation, as they deem best to enhance local priorities regarding inventions and patenting. Since the commitments already assumed by these countries are binding and ought, in principle to be complied with, the only respectable open course is for the countries to seek appropriate international negotiations leading to adjustments in the world regimes of patents. Indeed the developing countries have been calling for revisions in the Paris Conventions but no such changes have been made.[61]

It has, however, been argued that the Paris Convention leaves rooms to accommodate the needs and interests of developing countries regarding the requirements and standards for patents. The Convention is said to be weak compared to the patent requirements and standards in the developed economies. Moreover, it allows wide discretion to national laws as far as compulsory license, patentability, and setting opposition procedures are concerned.[62]

2 The Patent Cooperation Treaty

The Patent Cooperation Treaty (PCT) was concluded in 1970, amended in 1979 and further modified in 1984. The PCT was adopted mainly to deal with the problem of filing several applications in several countries within the period of time prescribed by the Paris Industrial Property Convention and overcome the duplication of effort by national patent offices. This is made possible by streamlining pre-patent granting procedures and requirements such as filing, search and examination. It provides for filing a single application, performing international prior art search and international publication. The Treaty also provides for international preliminary examination that is made optional to member countries.

Membership of the Treaty, in particular those of the developing countries, has increased in the 1990s mainly due to the benefits the system gives to applicants, the patent offices as well as countries. Nationals or residents of member states, among other things, have the opportunity to file international application with their national patent offices and receive international prior art search report from an international searching authority to decide to continue or not with their application. This would save considerable cost for the applicant. The availability of prior art search, international publication and examination facility would lessen the burden of national offices of developing countries, which often lack the requisite qualified manpower,

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[61] Juma and Ojwang, *supra* footnote 9, at pp. 39-40

[62] Maskus, *supra* footnote 59, at p. 91

information and documentation as well as the financial resource the tasks require. The PCT aims at assisting the economic development of the developing countries by providing easily accessible information on the availability of technological solutions applicable to their special needs as well as build their capacity through the technical assistance that may be obtained under the Treaty.[63]

PCT is considered as the most advanced mechanism in international cooperation in the field of patents since the conclusion of the Paris Convention. The PCT does not grant patent, but facilitates obtaining national patents in several countries. The patent granting procedure under the PCT system consists of two phases: an international phase and a national phase. The international phase deals with a centralized filing and searching procedure and optional international preliminary examination. The national and where appropriate the regional phase is concerned with the final patent granting procedure by the national and regional industrial property offices. The filing of only one international application has the same effect as if separate national or regional applications have been filed in all the countries which the applicant designates in his international application.

3. Agreement on Trade Related Aspects of Intellectual Property Rights

The Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS Agreement) that forms part of the WTO regime was signed on April 15, 1994 in Marrakech, Morocco, and came into effect on January 1, 1995. Before the TRIPS Agreement, intellectual property was not part of a multilateral trade agreement. When the developed countries led mainly by the USA and Japan tried to bring the intellectual property (IP) protection issues, during the Uruguay Round, under the frame work of the General Agreement on Tariffs and Trade (GATT), developing countries strongly opposed the idea saying that GATT is not the appropriate forum. However, the opposition was ignored and the effort to force some of the developing countries to revise their IP system and provide for stronger protection was successful before the formal linkage of intellectual property protection to international trade[64].

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[63] For technical assistance that may be given to developing countries, *see* the Preamble of the Treaty and Article 51(3) (a) and (b).

[64] This was partially achieved through unilateral pressure made by the USA. It has been said that under the guise of "Special 301" measures, access to US markets was used as a leverage to force Third World Countries to implement strict IP regimes ahead of any decision in the Uruguay Round. It has, for instance, been noted that special 301 measures were used against Brazil in 1988 in order to induce Brazil to extend patent protection to pharmaceuticals.

The reason for the conclusion of the TRIPS Agreement may be explained on two grounds. First, the need to provide a stronger IP protection to business communities of industrialized countries, which had been complaining that they suffered huge economic loss as a result of piracy and counterfeiting.[65] Second, the need to overcome the shortcomings of the existing IP conventions that failed to provide for effective means of enforcing intellectual property rights. The TRIPS Agreement, unlike prior IP conventions, provides an effective dispute settlement mechanism. Countries failing to comply with the TRIPS Agreement standards[66] could be subjected to trade retaliation if the dispute settlement mechanism of the WTO has determined the existence of a case of non-compliance with the Agreement.

A lot has been written on the TRIPS Agreement. Some writers argued that the Agreement deprives the freedom of States to tailor their own patent regime by setting minimum standards and stringent requirements, which are lopsided in favor of right holders. While others argue that the Agreement leaves developing countries some room in which countries may adopt national policies that favor the public interest, the encouragement of foreign direct investment (FDI) and transfer of technology as well as the stimulation of local innovation.[67] It also gives due care to protect "public interest" and to deal with the problem of misuse or "abuse" of patent rights[68]. Even though the implementation of the TRIPS Agreement standards will tend to promote a great deal of uniformity in many areas of patent law, the Agreement does not seek to

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[65] It has been said that "US business communities have estimated that world wide losses suffered by US corporations owing to IP 'theft' runs to the tune of around US$43 billion to US$61 per annum." *Cf.* M. Blakeney, *TRIPS: A Concise Guide to the TRIPS Agreement,* 1996; See also M. McGrath, *The Patent Provisions in TRIPS: Protecting Reasonable Remuneration for Services Rendered V. the Latest Development in Western Colonialism?* European Intellectual Property Review,1996.

[66] The TRIPS Agreement, *inter alias*, aims to: (a) harmonize intellectual property rights protection by providing with the minimum standards that should be adopted by member states; (b) enhance and broaden the scope of protection of patents by (i) reducing the scope of various restrictions and safeguards which used to be incorporated by national laws to protect the public interest and control abuse of a right by the patentee, (ii) expanding the scope of duration of protection by, for instance, requiring that patent protection shall be available in all fields of technology (Article 27(1) and making the duration of a patent 20 years (Article 33), (c) providing a mechanism that ensures effective enforcement of rights; violation of IPRs and failure of member states to provide with an effective enforcement of the same will entail severe consequences such as loss of trade rights and imposition of sanctions.

[67] Reichmann, *Universal Minimum Standards of Intellectual Property Protection under the TRIPS Component of the WTO Agreement*, The International Lawyer, Vol. 29, No. 2., 1995, at pp.345-388, cited by UNCTAD, **in**: *The TRIPS Agreement and Developing Countries The TRIPS Agreement and Developing Countries.* Geneva, 1996, p.32.

[68] UNCTAD, *The TRIPS Agreement and Developing Countries,* Geneva, 1996,, at p. 32.

achieve (nor its implementation likely to produce) a global harmonization of domestic patent laws.

PART III: MAJOR IMPACT OF THE INTERNATIONAL PATENT SYSTEM ON DEVELOPING COUNTRIES

A. IMPACT ON ECONOMIC AND TECHNOLOGICAL PROGRESS

1. Protection of Inventions

In developing countries the propensity to patent inventions has increased not only in terms of domestic applications but also international applications. However, patent applications made and patents held by residents of developing countries are few. Patents are owned overwhelmingly by foreign residents Looking at data from Mexico and Brazil attests to this. In 1996, in Mexico, only 389 patent applications came from domestic residents against over 30,000 foreign applications. In the same year, Brazil's domestic applications accounted for 8% of total applications.[69]

The reason for the low level of patenting in developing countries by their nationals and residents can be explained by a number of factors, including non-use of the system by universities and local research institutions.[70] It has been indicated that many inventions from developing countries, particularly in state-funded universities, have not been recognized as patentable. Thus, "the potential technological advances often never get to see the light of day."[71]

The low level of local inventive activity is also reflected in low level of patenting abroad. The share of developing countries in the world's patent distribution is insignificant, though, their position has remarkably improved. The table below shows the level of developing countries involvement in international patent applications.

Table 1: PCT Applications

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[69] Maskus, *supra* footnote 59, at p. 175.

[70] IERSNU, (Institute of Economic Research Seoul National University) *Industrial Property Rights and Technological Development in the Republic of Korea*, submitted to The Korean Intellectual Property Office and the World Intellectual Property Organization, 2002..

[71] Idris, *supra* footnote 14, at p. 44.

	1998	1999	2000	2001	2002
From all contracting parties	67,007	74,023	90,948	103,947	114,048
From developing countries	1,197	1,745	3,152	5,379	5,359
Share of developing countries	1.79	2.36	3.47	5.17	4.7
No. of contracting states	100	106	109	115	118
Of which developing countries	46	52	55	61	64
No. of developing countries from which at least one application was received	13	16	20	25	31

Source: WIPO, *The Patent Cooperation Treaty and the Developing Countries in 2002*; http://www.wipo.int/cfdpct/en/statistics/pdf/cfdpct_stats_02.pdf

The above table shows a remarkable growth of patent applications made by applicants from developing countries. This would, however, not give a complete picture of the discrepancy within the developing countries unless the distribution of the applications is examined. It should be noted here that most of the PCT applications were from very few developing countries. The ten major PCT applicants in 2002 were: Republic of Korea (2,552), China (1,124), India (480), South Africa (407) Singapore (322), Brazil (204) and Mexico (128), Columbia (33), Philippines (26) and Cuba (13). From the total PCT application from developing countries in the same year, the above statistics also shows that Asia and Pacific accounted for 84.31 percent, Africa 7.8 percent, Latin America & Caribbean 7.33 percent and the remaining 0.56 percent was from Cyprus and Arab countries. The participation of developing countries in the PCT system is increasing. From the above table, we can notice that by the year 2002 more than 50% of the PCT members were developing countries. The table also shows that the number of PCT applications from developing counties has exponentially increased in terms of absolute figures (from 1,197 in 1998 to 5,359 in 2002, with more than four fold increase). The number of developing countries that filed at least one PCT application has also grown by more than 50% (from 13 in 1998 to 31 in 2002).

Although the share of developing countries in the PCT application is low, a significant development has been seen with regard to institutions involved in patent applications. The public institutions and universities in the developing countries are now entering into the system of patent application. It has been noted that the Indian Council of

Scientific and Industrial Research and the National University of Singapore made 184 and 28 PCT applications respectively in 2002[72].

The share and number of patent applications made by and in developing countries seems to relate to their technological capacity. In the early stage, when the technological capability of a developing country was low, the local inventive and patenting activity was not only limited but also there would not be much foreign interest in the local market for technology, and hence for patent protection. The experience of the Republic of Korea shows that the lower the country's technological capability, the lesser foreign firms are interested in applying for patent protection in that country. Thus, the share of foreign applicants in Korea earlier, for example, was low among the total number of patents. When the technological capability of domestic firms showed impressive growth, and the market for technology was attractive in the 1980's, the share of Korean IPRs moved fast to catch up with foreign owned IPRs. Rapid upgrading of technological capability of Korean firms was made possible by massive R&D investment, and it led to the rapid rise of international patent applications by the Korean firms.[73] Studies noted that from the early 1990's, Korea emerged among the top 10 or 15 in the world in terms of the number of patents registered in the United States of America.[74] As per the information solicited from the USPTO, patents owned by Koreans rose from 7 in 1982 to 3,558 in 1999. The proportion of Korean patent holders in the US rose from 0.01% to 2.09% in the same period; and Korea ranked 6th in terms of patents granted in the US in 1999, following the USA, Japan, Germany, UK and Taiwan.[75]

Patent protection is a costly business. Many inventors in developing countries do not have the capacity to file and process their applications in countries outside their own. PCT has helped to deal with this problem by making available the filing of a single international application at a reduced cost. Residents of developing countries are entitled to a 75% reduction in all PCT fees. This will facilitate the protection of inventions generated in developing countries in as many member countries of the PCT as possible. This would in turn facilitate obtaining benefit from the exploitation of protected inventions abroad, through, for example, royalties from licensing arrangements. However, this would depend on the national technological capability of a country to generate inventions. Where this capacity is weak, the benefits that

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[72] See WIPO, *The Patent Cooperation Treaty and the Developing Countries in 2002*, available at <http://www.wipo.int/cfdpct/en/statistics/pdf/cfdpct_stats_02.pdf>, accessed on 10 July 2003.

[73] IERSNU, *supra* footnote 70, at p. 4

[74] IERSNU, *supra* footnote 70, at p. 2

[75] ibid

developing countries derive from international patent agreements such as the PCT is limited.

2. Transfer of Technology and Investment

There is no agreement among writers on the impact of the international patent system on transfer of technology and foreign direct investment (FDI). In this regard, some argue that the absence of IP protection encourages technology transfer and technological learning through copying and imitation, while others argue that IP protection is a mechanism, which encourages technology transfer from abroad through direct investment or licensing, and the indirect effects are effective means of technological learning.[76] Those who support the existence of positive relationship between patent and technology transfer or FDI argue that in the absence of protection or weak patent protection, decision making on technology transfer or investment would be difficult or even when decision is made the form and type of technology to be transferred or investment to be made would vary.

One of the key arguments made by advocates of stronger global IPRs is that such a system, as embodied in the TRIPS agreement, would increase FDI, and associated technology transfers to developing countries.[77] Idris[78] noted that many experts in the field have recognized the direct link between strong IP protection and an increased inflow of FDI. He explained that the steady and steeply rising increase in FDI in India and the spectacular growth in Brazil have been attributable to the enhanced patent protection after the revision of patent laws of these countries. Some authors argue that the form and type of technology to be transferred or investment to be made would depend on the level of patent protection. Maskus quoted different writers who stated that in countries with weak patents, the preferred mode of technology transfer is Foreign Direct Investment, the quality of technologies transferred would be obsolete and inferior; and that strong IP protection could facilitate technology transfer not only in quantitative terms, but also qualitatively. The incentive for foreign firms to license their best technologies lay on the degree of IP protection. Empirical studies demonstrate that the strength of intellectual property rights and the ability to enforce contracts have important effect on Multi-National Enterprise's decisions on where to invest and the level (sophistication) of the technology to be transferred.[79]

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[76] CIPR, *supra* footnote 11, at p. 21

[77] UNCTAD, *supra* footnote 68, at p. 17

[78] Idris, *supra* footnote 14, at p. 39

[79] See Maskus, *supra* footnote 59, at pp.139,154 to 155

In contrast to the above, some writers advance a different position. They argue that the existence of patents or stronger patents would affect the interest and hamper technological development of developing countries. There is a concern that stronger patents would increase the price of technology, thereby, reducing the transfer of technology to developing countries. It is argued that a strong patent would further strengthen the strong bargaining position of technology suppliers, thereby, enabling them to negotiate higher license charges and royalty fees that would reduce inward technology flows.[80]

The international patent system has also been described as a reason for the technological development problems of developing countries. Some experts argue that it is the international patent system that keeps developing countries technologically dependent and backward. In this regard, it was stated:

> Patent laws of developing countries, following international standards, have legalized an anomalous situation, which had come to act as a reverse system of preference granted to foreign patent holders in markets of developing countries. Instead of strengthening national capabilities and seeking special preference for themselves, legitimized by the standards of the Paris Convention, have brought about this situation. Quite clearly a fundamental revision of the entire patent system is needed to alter this peculiar, if not perverse, situation.[81]

Odle & Arthur[82] further argued that the international patent system has important social cost; it does not transfer technology but concede rights.

Although some authors expressed that from developing countries' perspective the TRIPS Agreement is seen as an important mechanism to attract inflows of advanced technology from abroad[83], others have different views. With respect to the latter, it has been noted that "some countries may use weak IP regimes as a means of gaining access to foreign technologies and developing them using reverse engineering, thereby, enhancing indigenous technological capacity. The implementation of TRIPS Agreement now restricts the ability of developing countries to follow this path."[84]

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[80] UNCTAD, *supra* footnote 68, at p. 18

[81] M. Odle and O. S. Arthur, *Commercialization of Technology and Dependence in the Caribbean*, Caribbean Technology Strategies Project, 1985, at p. 33

[82] ibid

[83] Maskus, *supra* footnote 59, at p. 150

[84] CIPR, *supra* footnote 11, at p. 8

Studies show that the relationship between weak or strong patent protection and transfer of technology and FDI vary from sector to sector and the type of investment to be made or technology to be transferred. It has been noted that the role of patent is considered to be important in the pharmaceutical and chemical industries as opposed to other sectors such as distribution or service sector. Studies also showed that firms, which put considerable investment in R&D activities, are reluctant to invest in or transfer technologies to countries with weak intellectual property protection.

In spite of divergence of views among authors on the role of weak or strong patent protection in transfer of technology and foreign direct investment, there is considerable agreement that there are a number of factors that would affect transfer of technology and investment in addition to patents. Decisions of investment or transfer of technology by a foreign party may be affected by the type of technology, whether the technology is low or sophisticated, whether the technology is easy or difficult to copy, the existence of technological capability and the size of the market.

Studies have revealed that IP protection by itself is not a sufficient factor to attract FDI. One study noted that:

> What is clear from the literature is that strong IP rights alone provide neither the necessary nor sufficient incentives for firms to invest in particular countries... investment decision is contingent on many factors. For most low technology industries, of the kind that less technologically advanced developing countries are likely to attract, IPRs are unlikely to be a relevant factor in the investment decision. Where technologies are more sophisticated, but relatively easy to copy, then IPRs may be – though not necessarily – a significant factor in investment decisions if a country has both the scientific capacity to copy and a sufficiently large market to justify the costs of patenting and enforcement and other relevant factors are favorable.[85]

Another study also indicated that the least developed countries opportunity to attract FDI (except in extraction sectors) is marginal due to the absence of the other pull factors in these countries such as high level of productivity, education, and skills.[86]

The determinants of effective technology transfer are many and various. The ability of countries to absorb knowledge from elsewhere, make use of it and adapt same for their own purposes is of crucial importance. This is a characteristic that depends on the development of local capacity through education, R&D, and the development of appropriate institutions. In the absence of such a capacity technology transfer on the

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[85] CIPR, *supra* footnote 11, at pp. 23-24.

[86] Maskus, *supra* footnote 59, at p. 122

most advantageous terms is unlikely to succeed. Effective transfer of technology or FDI requires the existence of indigenous capacity on the side of the recipient.[87]

It is of significance to assess the domestic capabilities of the recipient country in order to measure the impact of international technology transfer. In this regard, Rosenberg[88] says that "... perhaps the most distinctive factor determining the success of technology transfer is the early emergence of an indigenous technological capability."[89] This is applicable to all the developed countries as well as the newly industrialized countries. Segai[90] further argues that the international technology transfer cannot be structured so as to foster indigenous capacity. It means that the converse is always true, in a sense that indigenous capacity is a requirement to make sense out of the technology transfer arrangements whatever the modality is.

In spite of the above, developing countries are criticizing the international technology transfer system for their technological underdevelopment on the ground that technologies are inaccessible because of the patent regimes. However, studies indicate that it is the incapacity of developing countries to reap available opportunities that keep them simple bystanders in a technologically competitive world. In this regard, a World Bank study[91] has noted the following:

> A country without the capacity to carry out research on its own benefits very little from the research done elsewhere. A developing country's ability to screen, borrow, and adapt scientific knowledge and technology requires essentially the same research capacity as those needed to generate new technology. Yet few national systems so far have developed the administrative and technological capabilities to absorb and adopt, in an effective way, knowledge and technology that is becoming available to them from the work at the international centers and research institutions in the developed countries.[92]

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[87] See for example, CIPR, *supra* footnote 11, at p. 24; C. Freeman, *Technology Policy and Economic Performance: Lesson From Japan*, Pinter Publishers, London,/New York, 1987.

[88] RosenbergN. Inside the Black Box: technology and Economics, Newyork Cambridge University Press (1982) p. 271, quoted by A.Segai,*From Technology Transfer to Science and Technology Institutions,* in J. R. McIntyre, and D. S. Papp, (eds.): *The Political Economy of International Technology Transfer*, Quorum Books, N.Y/ Westport, Connecticut/London,1986 p.104

[89] Cited in A. Segai, *supra footnote 88*, at p. 101.

[90] Segai, *supra* footnote 88, at p. 100

[91] World Bank, Agricultural Research, Sector Policy Paper, Washington, DC, 1981, pp.25-26, Qouted by A.Segai, *supra footnote 88, p.104.*

[92] Cited in Segai, *supra* footnote 88, at p. 104.

The above argument posits that international technology transfer can only be tapped and harnessed to national development endeavors in a situation where the country has a better history of research and development activities, coupled with a relatively strong level of local technological capability. As Freeman observed[93], there is always something behind success and failure in technology development. That is why only very few countries have registered success stories in technological development, while for the majority of developing countries the situation is still gloomy and dim. They are not poised to make a difference in their position of the technologically divided world. In this regard, Segai[94] has expressed the reality by using a biblical expression, "… so many societies are called to science and technology, while it is that so few are chosen." It has been often quoted that since the 18th century Western Europe, America and lately Japan became exporters, while Asia, Latin America and Africa were and are importers. The imbalance has been a direct result of the exporters being able to acquire domestic S&T capabilities earlier and to sustain it.

Furthermore, the perception of technology, government policy etc., have been identified as factors that may influence technology transfer and FDI. It has been observed that the major problem created in connection with technology transfer is primarily associated with the conceptualization of technology itself. Technology is considered as a simple end product[95]. However, technology is applied knowledge that requires the ability to acquire and adapt it.

Government policies have also important role in using FDI as a learning opportunity and as a channel of technology transfer. Studies indicate that the difficulty is not to import, but to transform foreign technologies whatever their form: capital goods, licenses, direct investment, so as to contribute to a genuine upgrading of industrial technology development[96]. Availability of foreign technology cannot make a difference in the technological development of a country unless there is a critical minimum level of domestic capacity to make use of the technology, absorb and adapt it to local conditions. This could in part be made possible by putting conducive policy environment in place.

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[93] See Freeman, *supra* footnote 87.

[94] Segai, *supra* footnote 88, at p. 95

[95] J. McIntyer, *Introduction:: Critical Perspective on International Technology Transfer*, in J. R. McIntyre, and D. S. Papp, (eds.), *The Political Economy of International Technology Transfer*, Quorum Books, N.Y/ Westport, Connecticut/ London, 1986, at p.8

[96] See M. Hambert, *Globalisation and Glocalisation: Problems for Developing Countries and Policy (Supranational, National and Sub national) Implications*, Rio De Janeiro, 2000.

3. Access and Use of Technological Information Contained in Patent Documents

The PCT makes available patent documents to developing countries, thereby, facilitating access to and use of valuable information contained in patent documents. The valuable information made available through patent documents help in making technology transfer and investment decisions as well as avoiding duplication of effort and wastage of resources in R&D and inventive activities. The problem of duplication of efforts and wastage of resources mainly caused due to lack of information or absence of awareness of the importance and nature of the information contained in patent documents is a serious problem in many countries. In this regard, it has been noted that the European Patent Office estimated that the European industry is losing US$ 20 billion every year due to lack of patent information that results in duplication of effort and reinventing products that are already available elsewhere.[97] Patent documents enable the exploitation of technologies that are not protected in a given country or patents that have lapsed before the expiry of protection. Developing countries, where little patent protection is sought, are in a favorable position to freely exploit inventions patented elsewhere but not in their countries using the technological information disclosed in patent documents. Even when patents are protected, developing countries may use the information to invent around the patent or reproduce it when the patent lapses. The majority of patents lapse before the expiry of the duration of protection for not being maintained. Patent laws require for payment of maintenance fee during a prescribed period of time. If the patent is not maintained it is deemed as lapsed. It has been noted that "maintenance of patents that are not being practiced can be expensive, and the average "effective life" of a patent before abandonment is 5 years. Only 37 percent of patents are maintained until the end of their term."[98] In spite of all these opportunities and advantages, little or no use is made of such a valuable source in developing countries, the majority of which are sub-Saharan African countries.

4. Access to Essential Drugs

The relationship between patent and essential drugs has caught attention, particularly with the emergence of HIV/AIDS pandemic. Until the emergence of AIDS pandemic, the perception was that health problems were attributable to poor health care infrastructure, lack of health professionals, finance, distorted government policies and so on. It is the HIV/AIDS pandemic that arose a heightened debate on the relationship between patents and access to affordable medicine. It has been estimated that nearly

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[97] Idris, *supra* footnote 14, at p. 88

[98] Idris, *supra* footnote 14, at p. 92

40 million people in developing countries, of which 29.4 million in Africa, are living with HIV/AIDS.[99]

The major concern is based on the argument that patents inflate the price of drugs; prevent generic competition; and limits availability and affordability of drugs.[100] It has been argued that a key factor in determining the cost of a drug is its patent.[101] There are studies that show the relationship between patent and price. According to the WHO[102], most patented drugs are sold at 20-100 times marginal cost. Furthermore, Oxfam U.K.[103] noted that patented anti-retroviral therapies cost 3 to 15 times as much as their generic equivalents.

In addition to the impact of patent on price of drugs, the impact of such protection on manufacturing of generic drugs is also invoked as a reason for inaccessibility of essential drugs. Prior to TRIPS, a number of countries excluded patentability of pharmaceutical inventions or limited patent protection to process inventions. Article 27.1 of TRIPS Agreement which require the availability of patents in all fields of technology without discrimination forced countries to recognize patent protection to pharmaceutical inventions. Thus, it has been argued that it would not be possible to manufacture generic products and this may have undesirable impact on both manufacturing enterprises as well as accessibility of drugs to people. Critics have argued that patents would more profoundly affect the health sector. This is to say that, the generic version drug manufacturers that play an important role inmaking prices affordable to the majority of the poor will cease to produce. In this regard it has been noted that countries like India, Argentina, and those from the Middle East argue that TRIPS will seriously affect industries specialized in manufacturing generics and

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[99] B. Baker, *Death by Patents: Intellectual Property Rights and Access to AIDS Medicine*, (12/1102):Econ-AtrocityBulletins, available at <http://www.fguide.org/Bulletin/patent.htm>, accessed in June 2003.

[100] See the papers presented at a meeting held in Nairobi, Kenya, June 15-16, 2000, on the theme *East African Access to Essential Medicines*, available at <http://www.haiweb.org/mtgs/nairobi200006.html>, accessed in June 2003.

[101] O. ONG'Wen, *The Crocodile Tears: How "TRIPS" Serves West's Monopoly*; The East Africa, March 12, 2001 available at <http://www.nationaudio.com/News/EastAfrica/19032001/Business Opinion2.html>; C. Correa,: *Beyond TRIPS: Protecting Communities Knowledge*, available at <http://csf.colordo.edu/mail/eln/sept97/0047.html>, accessed in June 2003.

[102] Cited in M. Williams, *The TRIPS and Public Health Debate: An Overview*, 2001 available <http://www.genderandtrade.net/WTO/TRIPS_Publichealth.pdf>, accessed __

[103] Oxfam U.K., Patent Injustice: how would trade Rules Threaten the Health of Poor People, February 2001, available at http://www.oxfam.org.uk/What-We-do/issues/health/dc p.4, accessed on 11 February 2006..

improving production process.[104] Moreover, Fluconazole that has been used for the treatment of Aids related meningitis has been mentioned as example. It has been noted that several generic versions of the product are available for US $0.30 per 200 mg capsule, while the drug that is patented in Kenya costs US $18.00.[105]

On the other hand, there are arguments made in favor of the need for patent protection of pharmaceuticals to promote R&D and stimulate transfer of technology and investment. The pharmaceuticals industry, argues that most of the R&D investment estimated at US $24 billion for 1999 is made possible because of the guarantee provided through patent protection.[106] As Juma[107] has noted, less than one third of the approved drugs recoup average R&D costs and, the cost of introducing new drug into the market in the early 1990's exceeded US$500 million; and, thus, it is imperative that firms have to rely on successful drugs to fund new ones. Furthermore, it has been argued that the transfer of technology and investment will be made possible only if there is patent protection since pharmaceuticals are sensitive to patent protection.

As far as the link between patents and HIV/AIDS drugs is concerned, there are studies, which argue that there is no relation between price of drugs and patents. In this regard, it has been noted that most of the AIDS drugs are not under patent protection in most African countries, so governments are free to import or manufacture generic versions. The survey conducted by Attran and Gillospie-White, between October 2000 and March 2001, on 15 ARVs in 53 countries of Africa, showed that with the exception of South Africa, most of the drugs were not patented.[108] The survey concluded that there was almost no treatment of AIDS patients with ARVs in these African countries; and patenting was not found to be the

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[104] J. Dumoulin, (1998), *Pharmaceuticals: The Role of Biotechnology and Patents*, Biotechnology and Development Monitor, No. 35, pp. 13-15, available at <http://www.biotech-monitor.nl/3505.htm>, accessed in June 2003.

[105] See the reference cited above under foot note 97. Oxfam also argues that if a country were able to import the generic drug Fluconazole,used in the treatment of Cryptococcal mengities (an opportunistic infection associated with HIV/AIDS from Thailand, Kenya could reduce the annual cost of treatment from over US $3000 to US$ 104, suprafoot note 100., *supra foot note 103.*

[106] C. Juma, *Intellectual Property Rights and Globalization: Impacts for Developing Countries.* Science, Technology and Innovation Discussion Paper No. 4, Center for International Development, Harvard University, Cambridge, MA, USA 1999, at p. 7, available at http://www2.cid.harvard.edu/cidbiotec/dp/discuss4.pdf

[107] ibid

[108] See PhRMA: *Health Care in the Developing World: IP and Access to AIDS Drugs*, available at <http://www.world.phrma.org/ip.access.aids.drugs.html>, accessed in June 2003.

major barrier to access to treatment.[109] The problem in using drugs not patented in African countries seems to relate to the absence of capacity.[110] It has often been quoted that African countries have little ability to construct drug combinations that are effective, easy to take and have few side effects without running into drug companies' patent monopolies.[111] It has been noted that of the 40 major exporters of medicinal and pharmaceutical products in the world from 1994-1998, there were six developing countries from Asia (namely, China, Hong Kong, India, Singapore, Republic of Korea, and Thailand), and other four countries from Latin American region (namely, Mexico, Argentina, Brazil, and Colombia). There was not a single country from the African continent.[112]

It has been argued that the problem of health care in developing countries such as access to medicine goes beyond the availability of patent protection. The Independent Commission on IP[113], for example, has noted that the IP system is one factor among several that affect poor people's access to health care. Other important hurdles that impair access to medicines in developing countries are lack of resources and absence of suitable health infrastructure to administer medicines safely and efficaciously. According to the World Health Organization, "50 percent of the population in developing countries do not have access to essential drugs; 50-90 percent of drugs in developing and transitional economies are far beyond the purchasing power of the poor people in these countries; up to 75 percent of antibiotics are not prescribed with due care and diligence; and the patients who take their medicine correctly are less than 50 percent; anti microbial resistance is growing alarmingly for most major infectious diseases; less than one in three developing countries has fully functioning

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[109] A similar conclusion that patent protection is not a problem in Africa was also reached by International Intellectual Property Institute (IIPI), *Patents Protection and Access to HIV/AIDS Pharmaceuticals in Sub-Saharan Africa*, A Report Prepared for WIPO by International Intellectual Property Institute, 2000, at p. 3, available at http://www.iipi.org/reports/HIV_AIDS_Report.pdf

[110] It is essential to note here that the problem of incapacity is not limited to those drugs that are patented elsewhere, which may be new and sophisticated, but includes those that are off patent and are relatively less sophisticated. *Cf.* IIPI, *supra* footnote 106,, at pp. 52-54

[111] See Health Global Access Project, *Myths and Realities: In the Global Struggle for AIDS Treatment Access*, available at <http://www.globaaltreatmentaccess.org/content/ press_releases/01/ 10080_HGAP_FS_myts.pdf>, accessed in June 2003

[112] *See.* table 5, in N. Kumar, *Intellectual Property Rights, Technology and Economic Development: Experience of Asian Countries*, Study Paper 1B, prepared for the work of the Commission on Intellectual Property Right, at pp. 30-31

[113] *See.* CIPR: Press Release, September, 12, 2002, available at http://www.biotech-info.net/independent-commission.html

drug regulatory authorities; 10-20 percent of sampled drugs fail quality controls tests in many developing countries, often resulting in toxic, sometimes lethal products." [114]

There are writers who recognize the need for access to pharmaceutical inventions in developing countries and suggest ways for catering to the public interest. In this regard, for example, Juma[115] has noted that policy interventions are imperative to draw a balance between providing incentives for inventors and the public interest. One of the policy interventions is public sector funding to make sure that the R&D spillovers benefit everyone in the society without the privileges of exclusive rights. In the absence of such public R&D support, Juma[116] argues that extending intellectual property protection is one of the alternatives that can be devised.

In relation to access to medicine, it has also been noted that there are built in safeguards within the patent system that would enable to cater for the public interest. These are parallel imports, compulsory licensing and Bolar exception.[117] Compulsory license and parallel importing were identified as critical tools for developing countries to improve access to lower priced essential medicines

The TRIPS Agreement in Article 6 and Article 31 leaves member States to determine exhaustion of rights and provides for the grounds for the issuance of compulsory license. However, the use of compulsory license has been difficult. Most of the developing countries have no licensees with the potential to manufacture locally. Furthermore, Article 31(f) limits such use for the supply of the domestic market. This requirement made it difficult to import cheap drugs produced by other developing countries. The public health concern and the limitation of Article 31(f) was an issue of negotiations in WTO that resulted in The Doha Ministerial Declaration on Public Health. The Ministers clarified that TRIPS should not prevent countries from taking measures to protect public health. They confirmed that, within the terms of the agreement, compulsory licenses could be granted on grounds determined by member countries. Moreover, domestic demand could be supplied by parallel imports. They also recognized that a special problem existed in countries with insufficient manufacturing capacity in making use of compulsory license, and instructed the TRIPS Council to find a solution by the end of the year. The Council, however, had not arrived at the expected solution until 2003. The member states of WTO on 30 August 2003, made a decision to enable countries that have no manufacturing capacity

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[114] Cited in IIPI, *supra* footnote 109, at p. 9

[115] Juma, *supra* footnote 106, at p. 8

[116] *ibid*

[117] CIPR, *supra* footnote11, at pp. 39-50; *See* also papers presented at the Nairobi meeting, referenced above under foot note 97, and C. Correa, *Beyond TRIPS: Protecting Communities Knowledge, available* at http://csf.colorado.edu/mail/elan/sep 97/0047.html.

to import cheaper generic versions of patented medicines manufactured under compulsory license in the exporting country.[118]The decision waives the obligations under Article 31(f) that limit production of pharmaceutical products and its export to eligible importing member countries.[119] The member states agreed that the waiver would last until the article is amended and enters in effect.[120]

The general council further decided that the TRIPS council initiate by the end of 2003 work on the preparation of such amendment.[121]In line with this, negotiations were conducted, which resulted in a historical decision by WTO member states. The general Council on 6 December 2005 adopted the protocol[122] along with an ANNEX and appendix amending the TRIPS agreement and decided that it shall be open for acceptance by members until 1 December 2007 or such later date as may be decided by the Ministerial Conference.[123] The provisions of Article 31 *bis* that amended the TRIPS Agreement are the following:

1. The obligations of an exporting Member under Article 31 (f) shall not apply with respect to the grant by it of a compulsory license to the extent necessary for the purposes of production of a pharmaceutical product(s) and its export to an eligible importing Member (s) in accordance with the terms set out in paragraph 2 of the Annex to this agreement.
2. Where a compulsory license is granted by an exporting Member under the system set out in this article and the Annex of this agreement, adequate remuneration pursuant to Article 31 (h) shall be paid in that Member taking in to account the economic value to the importing Member of the Use that has been authorized in the exporting Member. Where a compulsory license is granted for the same products in the eligible importing member, the obligation of that member under Article 31 (h) shall not apply in respect of those products for which remuneration in accordance with the first sentence of this paragraph is paid in the exporting member.
3. With a view to harnessing economies of scale for the purposes of enhancing purchasing power for, and facilitating the local production of, pharmaceutical products: where a developing or least developed country WTO Member is a

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[118] World Trade Organization, Implementation of Paragraph 6 of the Doha Declaration on the TRIPS Agreement and Public Health, Decision of 30 August 2003, WT?L540. For the purpose of understanding eligible importing country and exporting country, see paragraph 1 of the decision.

[119] See, *Supra note* 118, paragraph 2.

[120] See, *Supra note* 118, paragraph 11

[121] ibid

[122] The protocol states that the Agreemnt on Trade Related Aspects of Intellectual Property Right (the "TRIPS Agreement') shall, upon the expiry of the protocol pursuant to paragraph 4, be amended as set out in the Annex to this protocol, by inserting Article 31 *bis and* by inserting the Annex to the TRIPS Agreement after Article 73.

[123] World Trade Organization, Amendment of the TRIPS Agreement, WT/L/641.

party to a regional trade agreement within the meaning of Article XXIV of the GATT 1994 and the Decision of 28 November 1979 on Differential and More Favorable Treatment Reciprocity and Fuller Participation of Developing Countries (L/4903), at least half of the current list of least developed countries, the obligation of that Member under Article 31(f) shall not apply to the extent necessary to enable a pharmaceutical product produced or imported under a compulsory license in that Member to be exported to the markets of those other developing or least developed country parties to the regional trade agreement that share the health problem in question. It is understood that this will not prejudice the territorial nature of the patent in question.

4. Members shall not challenge any measures taken in conformity with the provisions of this article and the Annex to this Agreement under subparagraph 1(b) and 1 (c) of Article XXVIII of GATT 1994.
5. This Article and the Annex to this Agreement are with out prejudice to the rights, obligations and flexibilities that Members have under the provisions of the Agreement other than paragraphs (f) and (h) of Article 31, including those reaffirmed by the Declaration of the TRIPS Agreement and Public Health (WT/MIN/DEC/2) , and to their interpretation. They are also without prejudice to the extent to which pharmaceutical products produced under a compulsory license can be exported under the provisions of Article 31 (f).

The Annex[124]to the above article defines the terms and conditions for using the system, and deals with issues, such as definitions, notification, diversion of pharmaceutical products to the wrong markets, developing regional systems to allow economies of scale, and annual reviews to the TRIPS Council.[125]The appendix deems least developed country members to have insufficient or no manufacturing capacities in the pharmaceutical sector and enumerates the conditions that eligible importing members should meet to benefit from the system.[126]

5. Access to Traditional Knowledge and Genetic Resources

There is an increasing recognition of the value and a growing demand of traditional knowledge and genetic resources to deal with various socio-economic and technological problems. Traditional knowledge has played an important role in identifying biological resources worthy of commercial exploitation. It has been noted that the search for new pharmaceuticals from naturally occurring biological materials

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[124] See, *supra note* 123, Annex to the Protoccol Amending the TRIPS Agreement, pp.4-6.
[125] Ibid ,
[126] See, *supra note 123,an* Appendix to the Annex to the TRIPS Agreement, P.7

has been guided by ethno biological data.[127] Furthermore, genetic resources have been used as a basis for the search of new products. It has been noted that of the 119 drugs developed from higher plants on the world market, it is estimated that 74% were discovered from a pool of traditional herbal medicine.[128] In monetary terms this is quite substantial. In 1995, the annual world market for medicines derived from medicinal plants discovered from indigenous peoples was estimated to amount to US$43 billion.[129] These resources, however, have often been misappropriated, accessed and used freely without the authorization of and benefit for local communities that have kept and nurtured them for generations.

The patent system is criticized, among others, for failing to prevent misappropriation, provide a scheme that would ensure sharing of benefits and a mechanism for protection of traditional knowledge. It has been noted that a large number of patents have been granted on genetic resources and knowledge obtained from developing countries, without the consent of the possessors of the resources and knowledge.[130] In this regard, the patents granted by the United States Patent and Trade Mark Office (USPTO) and the European Patent Office (EPO) can be mentioned as examples. The USPTO granted a patent in 1998, for a method of using turmeric powder to heal wounds. Turmeric is a plant of the ginger family that has been used as a traditional medicine to heal wounds and rashes by Indians for years. The Indian Council of Scientific and Industrial Research, challenged the validity of the patent; and eventually the patent was revoked. The case, which cost the Indian Government about US$ 10,000, is considered as a landmark where a patent based on the traditional knowledge of a developing country has for the first time successfully been challenged.[131] Similarly, the EPO granted a patent for a method for controlling fungal plants by the aid of hydrophobic extracted neem oil in 1994. Local communities in India have been using neem extracts to heal fungal diseases since time immemorial.

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[127] McCheney, *Biological Diversity, Chemical Diversity and the Search for New Pharmaceuticals*, in M. Balick, E. Elisabesk, and S. Larid, (eds.), *Medicinal Resources of the Tropical Forest: Biodiversity and its Importance to Human Health*, Colombia, University of Columbia Press 1996. at p. 12.

[128] Laird *et al* (eds.), *Biodiversity Prospecting: using Genetic Resources for Sustainable Development*, World Resource Institute, Washington, DC 1993, at p. 6

[129] J. Mugabe, *Intellectual Property Protection and Traditional Knowledge: An Exploration in International Policy Discourse*, Biopolicy International Series No 21, 1999; M. Blakeney, *What is Traditional Knowledge? Why should it be protected? Who should protect it? For Whom:Understanding the Value Chain*, WIPO/IPTK/RT/99/3, Geneva 1999, at p. 9

[130] C. Correa, *Traditional Knowledge and Intellectual Property: Issues surrounding the Protection of Traditional Knowledge*, 2001 , p.7 available at <http://www.quno.org/geneva,pdf/economic/discusssion/traditional - knowledge-IP-English.pdf accessed on 21 Februalry 2006

[131] CIPR, *supra* footnote 11, at p.75

The patent was challenged by international NGOs and representatives of Indian farmers and was revoked in 2000.[132]

The reason behind the grant of the above and similar patents, which are also referred to as bad patents, is linked to the non-availability or inaccessibility of relevant information and documentation to patent examiners. Traditional knowledge is often not documented. Even when documented, it may not be available in an organized manner to help patent examiners in undertaking prior art search. The mode in which traditional knowledge is available and its accessibility was invoked as a reason behind the issuance of bad patents. Correa noted that the US government has justified the problems behind the granting of invalid patents as follows:

> Informal systems of knowledge often depend upon face-to-face communication, thereby limiting access to the information to persons in direct contact with one another. The public at large does not benefit from the knowledge nor can the knowledge be built upon. In addition, if information is not written down, that information is completely inaccessible to patent examiners everywhere as prior art when they are examining patent applications. It is possible, therefore, for a patent to be issued claiming as an invention technology that is known to a particular indigenous community. The fault lies not with the patent system, however, but with the inaccessibility of the knowledge involved beyond the indigenous community."[133]

The problem, however, is beyond the absence of information. Even when information is available such as prior public use, such information may not be considered as part of the prior art for purpose of determining the novelty of an alleged invention. There is no uniformity in patent laws on what constitutes "prior art". In most patent laws, prior public use or disclosure of an invention defeats the novelty of an invention.[134] However, this is not the case in the USA. In accordance with section 102 of the US Patent Law, information that has been published in a written form in the USA or in any other country is not patentable. But, if the information was publicly used but not documented in a foreign country, novelty is not lost. Correa[135] argued that unless this relative standard of novelty is modified, the problems of appropriation of TK remain unsettled.

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[132] ibid

[133] Correa, *supra* footnote 130, at p. 7.

[134] *See*. Biotechnology, WIPO Working Group on Biotechnology recommendation of re-examining this issue WIPO/BIOT/WG/99/1, Paragraph 49 (October 28, 1999).

[135] Correa, *supra* footnote 130, at p. 8

This is one of the issues that are being looked into currently at the WIPO Standing Committee on Patents. The draft Substantive Patent Law that is under negotiation aims to determine what constitutes a prior art. As Kirk[136] noted, oral disclosures of traditional knowledge will be prior art available for use in rejecting patent claims in accordance with the present draft Treaty language.

India revised its patent law to prevent the granting of patents based on knowledge, which was not necessarily documented. Provisions had been incorporated to include the anticipation of inventions made available using local knowledge, including oral knowledge, as one of the grounds for opposition and revocation of patents, if patent is granted.[137]

The existing patent system is criticized for failing to provide for compensation or a mechanism that will facilitate the sharing of benefits. It has, for example, been noted that under the Australian Intellectual Property Law there is no obligation for companies, which utilize the traditional medicinal knowledge of Aboriginal people to provide any compensation or to recognize their equity in the commercial application of their knowledge.[138]

Patent laws do not require patent applicants to disclose the origin of biological resources used in inventions in their patent applications. Recently, efforts have been made to amend existing patent laws by imposing the obligation to indicate the origin of a genetic resource. India has already taken the initiative in this regard. The 1999 Patent (Second Amendment) Bill of India provides the grounds for rejection of the patent application as well as revocation of the patent. This includes non-disclosure or wrongful disclosure of the source of origin of biological resource or knowledge in the patent application. It has also been made incumbent upon patent applicants to disclose the source of origin of the biological materials used in the invention in their patent application.[139]

However, the mere revision of national patent laws is not enough. There is a need for incorporation of the same by other countries, particularly by the developed countries that have the capacity to use genetic resources accessed from developing countries.

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[136] M.Kirk, *Competing Demands on Public Policy,* WIPO Conference on the International Patent System, Geneva, 2002, at PP.8-9.

[137] WIPO Intergovernemntal Committie on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore, first session, Geneva, 2001, document WIPO/GRTKF/IC/1/13 pp.11.

[138] Blakeney, *supra* footnote 129, at p. 9

[139] See also *supra* footnote 129, at p. 11_, See also Correa, 2001, *supra foot note 130, at p.19.*

Nevertheless, the proposal made by the delegation of Colombia to incorporate such a requirement during the negotiation of the Patent Law Treaty was not accepted.[140]

The incorporation of such a requirement both by national and international laws would allow protection of the rights of the countries supplying the materials and the application of the principle of benefit-sharing as stipulated in the Convention on Biological Diversity (CBD).[141]

The need for protection of traditional knowledge is well felt. However, there is neither common understanding on the rationale nor uniformity in the approaches with regard to the protection of TK and genetic resources. As Correa[142] noted, some understood the concept of protection in the sense of excluding unauthorized use, while others considered protection as a tool to preserve traditional knowledge from uses that may negatively affect the life or culture of the communities that have developed and applied it. The approaches employed or proposed to be employed include use of existing IPR systems, a new *sui generis* scheme, documentation and registration, and contracts. Different countries have used the existing intellectual property rights including patents to meet the need for protection of traditional knowledge. China, for example, has used its patent law to protect traditional medicine. It was reported that 12,000 patent applications were filed with the Chinese Patent Office in 1999 for the protection of traditional medicines, most of which were domestic applications.[143]

Critics have argued that the existing patent system, however, is inadequate to accommodate the need for the protection of traditional knowledge. The system does not deal with any knowledge or the product thereof, but specific creations of the mind that would constitute an invention. This would exclude traditional knowledge that may not be explained as a product or process invention. Furthermore, the stringent requirements such as novelty exclude knowledge that is made available to the public. Even when the knowledge is secret, the requirement of disclosure will discourage the use of the system. Traditional knowledge holders are often hesitant to disclose their knowledge mainly for two reasons. First, they may not be confident with the system. Traditional knowledge holders such as traditional medicinal practitioners (TMPs) fear that they would lose their means of livelihood if the knowledge is disclosed without any mechanism to compensate them. The other relates to belief and value systems.

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[140] Correa, *supra* footnote 130, at p. 19 noted that other members did not accept the proposal made by Colombia.

[141] ibid

[142] Correa, *supra* footnote 130, at p. 5

[143] Z,Yongfeng, 2002, *The Means and Experience of Patent Protecion of Traditional Medicine in China,* Paper presented at a seminar on Traditional Knowledge organized by the Government of India in cooperation with UNCTAD secretariat, Delhi, available at http://www.unctad.org/trade_env/test 1/meetings/delhi/coutriestext/chinaspeech.doc, p.1

TMPs feel that the medicinal value of a certain product of knowledge would be lost if it is disclosed.

The use of a *sui generis* scheme to meet the need for the protection of traditional knowledge is often proposed; and some countries have adopted it. *Sui generis* is a Latin phrase meaning "of its own kind." A *sui generis* system, for example, is a system specifically designed to address the needs and concerns of a particular issue. The system could be a known IPR regime[144] or a regime that is entirely new. Such a regime might aim specifically to protect traditional knowledge or certain aspects of traditional knowledge such as those related to biological resources or biodiversity. In the latter case the protection of TK is accommodated within a broader set of objectives such as access and benefit sharing (ABS) systems and conservation framework legislation.[145] It may be because of this that *sui generis* protection schemes have been adapted by some countries and proposed by different writers.

The *sui generis* system mainly aims to protect traditional knowledge associated to biological resources. The countries that developed a scheme of protection of traditional knowledge associated to biodiversity include Philippines, Costa Rica and Brazil.[146] The main purpose of these regimes is the regulation of access to resources and accompanying knowledge and ensuring sharing of benefits. As such the regimes can hardly be said schemes of protection of traditional knowledge (TK); there is no definition for TK, the requirements that should be met for protection are not provided, the scope of rights is not determined, etc.

The need for documentation of TK is well recognized and steps have been taken. Documentation and registration of TK, amongst others, is intended to control bio

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[144] According to WIPO specific *sui generis* mechanisms have been developed with in general IP law to deal with particular needs or policy objectives relating to specific subject matter: these include specific legal provisions and practical or administrative measures. For example, *sui generis* disclosure obligations, in the form of requirements for the deposit of samples can apply to patent procedures relating to new microorganisms (in accordance with the Budapest treaty on International recognition of the deposit of Microorganisms for the purposes of patent procedure)- WIPO/GRTKF/IC/3/8 what makes an intellectual property system a *sui generis* one is the modification of its subject matter, and the specific policy needs which led to the establishment of a distinct system.

[145] G. Dutfield, *Developing and Implementing National Systems for Protecting Traditional Knowledge: A Review of Experiences in Selected Developing Countries*, Expert Meeting on Systems and National Experiences for Protecting Traditional Knowledge, Innovations and Practices, 30 October- 1 November, 2000, Geneva, UNCTAD 2000, at p.11.

[146] *Cf.* The Philippines 1995 Presidential Executive Order and Indigenous Peoples Rights Act, No. 8371 of 1997; biodiversity laws of Costa Rica and Brazil.

piracy, prevent loss of knowledge, and ensure sharing of benefits.[147] Several developed and developing countries have agreed on the importance of documenting TK. Once published, novelty on the disclosed information could not be claimed. The Indian Government initiative to establish a Digital Library System for Traditional Knowledge is considered as an important landmark to ease the problems that may arise in relation to IPR protection and traditional knowledge. India has "set up a TK digital library", namely an electronic data base of TK in the field of medicinal plants and took a step to put the data base on a network making it accessible to patent offices throughout the world.[148] Any body that sought any kind of IPRs protection on research based on biological resources or knowledge obtained from India would need to obtain prior approval.[149] The main purpose of documentation in India seems to prevent bio piracy and provide a basis for sharing of benefits arising out of the use of such knowledge. This positive step should be complemented by similar measures taken at the international level. In this regard Maskus[150] noted that WIPO's Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore is working to mitigate the problem of issuance of bad patents by establishing links between patent offices and those collections of traditional knowledge documentation that do exist as well as by encouraging the creation of documentation for other traditional knowledge that is in the public domain.

The issue of misappropriation of traditional knowledge and genetic resources as well as the absence of benefit sharing schemes has attracted international attention. Efforts are being made at regional and international levels to address the issue of protection of TK. Regional initiatives including those made by the OAU[33] and the Andean Group can be mentioned as examples.[151] The international forums at which TK is discussed, with a view to elaborating the concepts and issues involved, include WIPO, the CBD Secretariat, UNCTAD, WHO, and WTO. The WIPO Inter-Governmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore is working on issues relating to contractual practices, TK databases and preparation of a document with elements for a possible *sui generis* system for the protection of TK. The WTO forum tends to focus on the elaboration of the concepts of TK as well as review of the relationship between existing international legal instruments such as

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[147] For reasons of registration, *see*. Seedling Solutions, Vol.2, pp. 53-54.

[148] See M. Blakeney , *supra* footnote 126,at p.11

[149] *see* WIPO/GRTKF/IC/1/13 pp. 11-12.

[150] Maskus, *supra* footnote 56, at p. 8

[33] *See* OAU Model Law on the protection of the rights of communities, farmers and breeders and the regulation of access to biological resources,1998.

[151] See the common regime on access to genetic resources of the Andean community, Decision 391 and the Common Intellectual Property of the region of the Andean Community that entered in to force on December 1, 2000.

between the provisions of the TRIPS Agreement, Article 27.3(b) in particular, and the CBD.[152]

B. IMPACT ON CHANGE OF LEGISLATION AND ENFORCEMENT OF PATENTS

The harmonization of procedural and substantive requirements of patents has benefits and costs. An example of beneficial harmonization is that made by the PCT. The system, that made possible a single filing of patent application provides for a state-of-the-art search, a preliminary examination report and a centralized publication of applications. This system is advantageous to applicants, patent offices and developing countries. This may be elaborated by taking the available prior art search as an example. An applicant may use the report to decide to continue or discontinue his/her/its application. Patent offices can use the report to decide on whether or not an invention fulfills the criteria of patentability. This means a lot, in particular, to patent offices of developing and least developed countries. These offices lack qualified manpower, adequate information and documentation as well as the facilities to process patent applications.

On the other hand, however, critics argue that the harmonization of substantive requirements such as that was made by TRIPS Agreement restricts the freedom of developing countries in fine-tuning their patent system in line with their level of techno-economic development. Moreover, it has been noted that developing countries may incur cost as a result of the harmonization. Before the TRIPS Agreement, countries were free to exclude certain inventions such as pharmaceuticals, food products, and biological materials from patenting; to limit the exclusive right of the patentee such as excluding import monopoly from the exclusive right of the patent holder, setting flexible duration for a patent such as attaching the extension of the life of a patent to the domestic exploitation of the protected invention etc.[153] It has for example been noted that prior to TRIPS over 40 countries had not provided patents protection for pharmaceuticals, many provided only process and not product patents[154], and the protection was much less than 20 years in many countries; and these freedoms are highly restricted by the TRIPS Agreement.

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[152] See Paragraph 19 of the Doha WTO Ministerial declaration.

[153] M. Kohr, *Patent System Facing Legitimacy Crisis*, Third World Net Work, March 26, 2001, available at <http://www.twnside.org.sg/title/ef0110.htm>, accessed in June 2003.

[154] Oxfam noted that prior to TRIPS,approximately 50 developing countries either excluded medicnes from being patented or provided patents only for production processes rather than products, Oxfam, *supra foot note 103,* p.18

In addition to the above, the implementation of the TRIPS Agreement, among others, involves the amendment of existing legislations, the adoption of new ones, the strengthening of IPR administration and building up of enforcement capacity. These entail a huge financial cost on the developing countries. In order to appreciate the problem, the required reform and the estimated cost in selected countries is taken from an UNCTAD study as an example and shown in the table below:[155]

Table 2: UNCTAD case study related to estimated costs for reform and capacity building in selected countries

Country	Reforms Needed	Cost in US$
Bangladesh	Draft new laws, improve enforcement	$250,000 one time plus $1.1 million annually
Chile	Draft new laws, train staff administering IPR laws	$718,000 one time plus $837,000 annually
Egypt	Train staff administering IPR laws	$1.8 million
India	Modernize Patent office	$5.9 million
Tanzania	Draft new laws, develop enforcement capability	$1.0-1.5 million

It has also been noted that the above estimates do not include training costs that would be high in developing countries where trained professionals are extremely scarce. Maskus[156] underlined that the above indicated estimates may be low since they were not prepared on extensive studies using a standardized methodology. He has also noted that there is a concern that the largest cost of implementing an effective administrative system would be diversion of scarce professional and technical resources into such administration from other productive activities.[157]

Developing countries need to make effective use of loopholes as well as opportunities to deal with the problems they may encounter in their effort to comply with the TRIPS Agreement. It has been posited that the flexibilities available in the TRIPS Agreement could be exploited in designing patent legislations.[158] In order to deal with the problem associated with administrative cost and capacity building, developing countries may exploit a number of avenues such as levying fees on administrative services as well as seeking technical assistance from developed

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[155] UNCTAD, *supra* footnote 68, at pp. 25-26

[156] Maskus, *supra* footnote 59, at pp. 173-174, See also UNCTAD, *supra* footnote 64, at p.19

[157] Maskus, *supra* footnote 59, at p. 174

[158] See CIPR, *supra* footnote 11, at pp. 49, 114-121; ad Maskus, *supra* footnote 59, at pp. 177-180.

countries. Theses countries have the obligation to provide technical and financial assistance to developing countries to facilitate the implementation of the TRIPS Agreement.[159] Maskus[160] has underlined that developing countries may petition for technical and financial assistance from the industrialized countries and the multilateral organizations such as WIPO and WTO. There are others who argue that developed countries in particular foreign right holders should be the basic source of technical assistance. In this regard, CIPR argued that WIPO, the European Patent Office (EPO) and developed countries should significantly expand their programs of IP related technical assistance by making modest increases in intellectual property right user fees[161]

Joining regional patent systems and international patent agreements such as the PCT has also been indicated as an alternative means to cope with the administrative burden developing countries may face while trying to comply with the requirements of the TRIPS Agreement.[162] Maskus[163], for example, suggested that developing countries might join the PCT that provides significant advantage. Examiners may read the opinions of major patent offices about novelty and industrial applicability, rather than undertaking technical examination by themselves. This would reduce cost and the burden on the few trained patent examiners, if any, of patent offices of developing countries.

PART IV: CURRENT DEVELOPMENTS AND FUTURE TRENDS OF THE INTERNATIONAL PATENT SYSTEM AND OPTIONS FOR DEVELOPING COUNTRIES

A. CURRENT DEVELOPMENTS AND FUTURE TRENDS

1. The Patent Law Treaty (PLT)

The Patent Law Treaty (PLT) was adopted in a diplomatic conference held in June 2000. The Treaty aims to harmonize formal and procedural requirements for granting

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[159] See Article 67 of the TRIPS agreement.

[160] Maskus, *supra* footnote 59,, at p. 174

[161] CIPR, *supra* footnote 11, at p.151.

[162] *See* Maskus, *supra* footnote 59, at p 174, CIPR, *supra* footnote 10, at p. 143, UNCTAD, *supra* footnote 68, at p. 37.

[163] Maskus, *supra* footnote 59, at p. 174

and maintaining patents. These requirements include according filing date, content and form of application, representation, communication and notification. The Treaty provides for electronic filing of patent applications. This may be difficult to implement in many developing countries where patent offices are not equipped with the necessary facility. Cognizant of the position of developing countries, the diplomatic conference called for a grace period and requires for the provision of assistance to these countries to facilitate electronic filing of applications. The statement by the diplomatic conference regarding the treaty and the regulations under the Treaty stated that "with a view to facilitating the implementation of rule 8(1)(a) of this treaty, the diplomatic conference requests the general assembly of WIPO and the contracting parties to provide the developing and least developed countries as well as countries in transition with additional technical assistance to meet their obligations under this treaty, even before the entry into force of the treaty. The diplomatic conference further urges industrialized market economies to provide, on request and on mutually agreed terms and conditions, technical and financial cooperation in favor of developing and least developed countries and countries in transition."[164]

The PLT is open to States party to the Paris Convention or are members of WIPO, intergovernmental organization that has at least one member state party to the Paris Convention or WIPO and regional patent organizations that have adopted the Treaty in the diplomatic conference and duly authorized to become a party.

The Treaty will enter into force three months after ten instruments of ratification or accession have been deposited with the Director General of WIPO. As of January 15, 2006, only eleven countries ratified though there are 53 states and one regional patent organization that signed the treaty. The states that deposited the instruments of ratification and accession are Bahrain, Croatia, Denmark, Estonia, Kyrgyzstan, Nigeria, Republic of Moldova, Romania, Slovakia and Slovenia.[165] The majority of these are developing countries and countries in transition.

4.1.2 Draft Substantive Patent Law Treaty (SPLT)

The Paris Convention and the TRIPS Agreement deal with a number of substantive requirements with the aim to harmonize patent laws of member states. However, both agreements left a number of substantive issues to be dealt with by national patent laws. The Draft Substantive Patent Law Treaty (SPLT) therefore aims to fill this gap.

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[164] See WIPO, *Patent Law Treaty and Regulations under the Patent Law Treaty, Explanatory Notes on the Patent Law Treaty and the Regulations under the Patent Law Treaty*, pp. 64-65.

[165] WIPO, Treaties Database: Contracting Parties, http://www.wipo.imt/treaties/en, accessed on 17 January 2006.

The issues that SPLT deals with include the requirement for technical character of inventions, definition of prior art and exclusions from patentability. Since national laws for various considerations deal with these issues differently, the negotiation on the draft SPLT is full of serious controversy. Two issues, among others, may be taken as examples to show the debate between countries.

One of the most controversial and debatable issues in the patenting system is the requirement for technical character of the invention. In the earlier days, patentability was confined to technical inventions, and thus, there was no problem. However, with the advent of the biotechnology and information technology revolutions, the requirement for technical character of inventions has been challenged. This brought a change in the patent laws of countries such as the USA. So, now it is possible to secure patents for software and business methods, which are excluded in a number of countries from patenting.[166]

It has been noted that this issue was a dividing line between the developing countries and the USA. The developing countries want to stick to the concept that a patentable invention should show a technical character, while the USA argues that the technical character requirement unnecessarily limits innovations in new areas of technology and is contrary to Article 27.1 of the TRIPS Agreement that allows patenting "in all fields of technology". Furthermore, the USA argues that the standard for patentability should be that an invention only provides for a practical application having a useful, concrete and tangible result.[167]

The second substantive issue that was a bone of contention relates to the scope of patentability. The harmonization of the criteria of patentability is important. Michael Kirk[168] noted that this would permit patent offices to base their decisions to grant or deny patents on precisely the same criteria so that a decision by one office need not be completely reevaluated by other patent offices when the same application reaches them. However, there is a serious debate between the developed and developing countries in relation to the delimitation of the scope of patentability.

Some developing countries[169] sought the SPLT to incorporate the provisions of Articles 27.2 and 27.3 of the TRIPS Agreement to enable countries to exclude certain inventions from patentability on the ground of public interest. However, the United

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[166] C. Correa and F. Mussungu, *The WIPO Agenda: The Risks For Developing Countries*, Working Paper, South Center, 2002, at p. 19.

[167] *see WIPO/.* SCP/6/9 para. 185, cited in Correa and Musungu, *supra* footnote 163, at p. 20.

[168] M. Kirk, *supra foot note* 136, at p. 12

[169] These countries were Argentina, Brazil, and Guatemala, as noted by Correa and Mussungu, *supra foot note* 163, p.20.

States and the biotechnology industry argue that the TRIPS Agreement "provides for minimum requirements under the WTO" and that the SPLT, in contrast, would aim at establishing best practices at the international level."[170] These and similar issues are still under debate, and the resolution remains to be seen in the future.

3. Revision of the Patent Cooperation Treaty

The revision of the Patent Cooperation Treaty (PCT) which started in October 2000, arose from the need to deal with the challenges encountered by national patent offices and international searching and examination authority such as increasing work load and duplication of effort as well as the problems faced by patent applicants such as the cost of application and processing of patents.

The initiative to reform the PCT[171] had been supported by both developed and developing countries.[172] The PCT Assembly has amended the PCT regulations under the ongoing reform. The amendments made so far include the alignment of the PCT requirements with those of the PLT with regard to the language of international application and translations and the reinstatement of rights after failure to comply with requirements for entering the national phase within the prescribed time limit, which

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[170] See SCP/6/9, para.186, referred to by Correa and Musungu, *supra foot note* 163 at p.20.

[171] The aims of the reform are provided in the document Objectives PCT/R/1/26, para. 66 as follows:: "(a) simplification of the system and streamlining of procedures, noting also that many PCT requirements and procedures will become more widely applicable by virtue of the patent law treaty; (b) reduction of costs for applicants, bearing in mind the differing needs of applicants in industrialized and developing countries including individual inventors and small and medium sized enterprises as well as larger corporate applicants; (c) ensuring that PCT Authorities can meet their workload while maintaining the quality of the services provided; (d) avoiding unnecessary duplication in the work carried out by PCT Authorities and by national and regional industrial property offices; (e) ensuring that the system works to the advantage of all Offices, irrespective of their size; (f) maintaining an appropriate balance between the interests of applicants and third parties, and also taking into account the interests of States; (g) expanding programs for technical assistance to developing countries, especially in the area of information technology; (h) alignment of the PCT, to the extent possible, with the provisions of PLT; (i) coordination of PCT reform with the ongoing substantive harmonization work being carried out by WIPO´s Standing committee on the Law of Patents; (j) taking maximum advantage of modern information and communications technology, including the establishment of common technical and software standards for electronic filing and processing of PCT applications; (k) simplifying, clarifying and, where possible, shortening the wording of the provisions of the Treaty and the Regulations; (l) streamlining the distribution of provisions between the Treaty and the Regulations in order, in particular, to gain increased flexibility

[172] See PCT/R/1/26.

entered into force on 1 January 2003 and introduced an enhanced international search and preliminary examination system that entered into force on 1 January 2004.

Under the new system, the international searching authority would be responsible for establishing a preliminary non-binding written opinion on the questions whether the claimed invention appears to be novel, involve an inventive step and industrially applicable. The compulsory written opinion by the International Searching Authority is equivalent to the first written opinion of the International Preliminary Examining Authority. The report will also be used during the international preliminary examination. As a result the two tasks are referred to as preliminary international examination (Chapter I) and preliminary international examination (Chapter II). The main distinction between the two reports lie on the fact that the former is mandatory and is based on the text of the application while the later is made upon request of the applicant after receipt of the first report and is made following a dialogue between the applicant and the examiner.[173]

The reports that provide a reasoned opinion on novelty, inventive step, and industrial applicability of international applications will be useful for designated countries, in particular developing countries where patent offices have no capacity for search and examination.

4. The Patent Agenda

The Director General of WIPO introduced the "WIPO Patent Agenda" in the thirty-sixth series of meetings of the Assemblies of Member States of WIPO.[174] In his memorandum, the Director General highlighted the challenges and shortcomings of the existing international patent system, the need to streamline the ongoing harmonization initiatives, complemented by new ones and suggested solutions to some of the problems. In introducing the agenda, the Director General underlined that his "prime objective was to initiate open and world wide consultations to prepare a strategic blue print for change in the international patent system and emphasized that this initiative was not intended to replace or undermine on going activities with regard to PCT reform and harmonization of substantive patent laws, but rather it would complement and even strengthen them."[175] The Agenda was intended to prepare a

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[173] PCT/A/31/6, para. 16.

[174] *see.* WIPO document A/36/14: Memorandum of the Director General, Agenda for Development of the International Patent System, August 6, 2001: Geneva.

[175] *see* WIPO Assemblies of Member States of WIPO, thirty-sixth series of meetings, Geneva, September 24 to October 3, 2001, Geneva, Report adopted by the Assemblies, A/36/15, para. 195.

coherent orientation for the future evolution of the international patent system, ensuring that the work undertaken by the International Bureau and by member states in their cooperation with the organization was directed towards achieving a common goal. It was introduced with the belief that the international patent system should become more users friendly and accessible, and provides an appropriate balance between the rights of inventors and the general public, while at the same time taking in to account the implications for the developing world.[176]

The WIPO General Assembly, the Paris Union and the PCT Assembly approved the initiative of the Director General and instructed that further work, which would take into account the views expressed at the assemblies session, including the request for a study by the Secretariat on the possible implication of the proposal on developing countries be done and presented for discussion by the WIPO General Assembly and the assemblies of the Paris and PCT Unions in September 2002.[177] The secretariat presented a document, A/37/6, using comments received and matters raised in discussions during the Conference on the International Patent System held in March 2002 to discuss the WIPO Patent Agenda. The document outlined the challenges the international patent system faced, highlighted a number of issues and indicated options for the future development of the system.

During the discussions, member countries expressed common and different concerns. The shared concerns include appreciation of the challenges and how they should be addressed as well as the notes of caution made in relation to the initiative.[178]

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[176] See WIPO document A/37/6, para. 2. The studies commissioned by WIPO and the agenda were discussed during the Thirty-Ninth Series of the Assemblies of the Member States of WIPo. Member states expressed different views regarding the studies and the Patent agenda. The meeting took note of the contents of the document on the Agenda as well as the studies made available in documents A/39/13 Add.1 to Add.4. For the purpose of examining the divergent views of the states, see WIPO Assemblies of the Member States of WIPO: Thirty-Ninth Series of meeings, Geneva, September 22 to October 1,2003, General Report, Document A/39/15 Paragraphs 169-185.

[177] See WIPO document A/36/14, para. 42 and A/36/15, para. 222.

[178] Developing and developed countries had recognized the problem of workload faced and the need to simplify and streamline patent procedures. For example, the delegation of Barbados on behalf of the group of Latin American and Caribbean countries (GRULAC) expressed GRULAC's willingness to participate constructively in discussions to deal with the problem of workload aiming at the rationalization of patent procedure. The delegation of France also expressed the same feeling. It stated that the increasing workload of national patent offices and the PCT authority would be lessened and duplication of effort eliminated by further rationalization and simplification of the PCT system. Some of the advanced countries expressed their concern that the initiative is beyond the mandate of WIPO or is ambitious. The delegation of USA stated that

B. OPTIONS FOR DEVELOPING COUNTRIES

1. Options

We have seen that the international patent system is evolving. The harmonization of procedural and formal requirements and certain substantive issues are under negotiation. It will thus be high time to consider these and forthcoming developments and think of possible options for developing countries.

To sum up, the current and future harmonization measures will result in stronger patent protection that may affect the interest of developing countries. According to

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many of the proposals such as the creation of "substantive central patenting authorities" contained in the document appeared to go beyond the mandate of WIPO and may lead to unfocussed and undisciplined expenditures and diversion of resources that would be better directed elsewhere.

The delegation of Canada also expressed that the patent agenda was ambitious, and the work ahead was enormous in scale and that WIPO's immediate attention and efforts should focus on those activities that would yield an early harvest of concrete and tangible results. A number of developing countries also expressed various concerns regarding the initiative. These include the following: (a) The document was one sided and not balanced in that it focused principally on the interest of users of the patent system; (b) The need to maintain a balance between different interests such as the interests of users of the system and the general public, (c) A one-size-fits all solution should not be sought and that there should be flexibility in tailoring national patent systems to accommodate specific situation of different countries, particularly that of developing and least developed countries, (d) The implication of the Patent Agenda to developing countries be studied and evaluated, (e) Future developments should not increase the burden of developing countries or be detrimental to achievements in other international forums, which recognize sovereign rights of member states to protect and promote public policies.

The concerns raised were different and involved serious issues. However, the differences should be expected as the agenda was just introduced and meant for discussion at that stage. In this respect, the Director General stated that the intention was to provoke discussion, noting that the international patent system was already evolving, the inclusion of the item on the agenda was not meant for taking a decision but rather the WIPO patent agenda denoted an ongoing process that would give guidance to the international community and the WIPO in shaping the international patent system. Member states noted the contents of A/37/6 and decided to keep the WIPO Patent agenda for discussion at their next session in 2003.

Correa and Musungu[179] the SPLT, the PCT Reform and the WIPO Patent Agenda are separate but interlinked, which would aim to set up an international legal framework for a global patent that will further erode the limited policy space left under the TRIPS Agreement. Whether this will happen or not will be seen in the future. Considering the fact that there are a number of factors that would influence investment, transfer of technology and inventive and innovative activities; and noting that there will be developing countries that may benefit from a strong patent system, it may be difficult to arrive at a conclusion regarding the ongoing debate for and against the impact of strong patent regime.

Assuming, however, that the danger is there, what options do developing countries have? Is there an option in view of the increasing globalization and the growing linkage between international trade and intellectual property? Would harmonization be considered as given as globalization? A number of questions can be asked. Setting aside these queries, one would, however, think that there would be two options. Developing countries may either be part of the process or stay out of it.

a) Option 1: Staying out of the International Patent System

To stay out of the evolving international patent system is an easy option. In fact, some studies such as those made by CIPR and the South Center[180] advise developing countries to do so where the outcome of the ongoing and future harmonization results in an international patent system is not in their interest. Such a measure, one may argue, will help to make use of the technologies generated by others freely. However, this is hardly possible in view of the weak indigenous technological capability in the majority of developing countries as well as the need for relationship with and support of technology suppliers to make, adapt and assimilate foreign technology. Kitch[181] argues that it is not easy to copy technology and that effective and timely transfer of technology requires transfer of personnel and hands on assistance to transfer the state of the art techniques and methods.

Staying out of the evolving international patent system will be a costly option. Developing countries are extremely dependent on the developed countries for their export and import, having no access to their market will be difficult. In this connection, it was noted that "a country couldn't build its economy on technology appropriated from other countries and expect to be admitted to the international trading system on an equal basis. The countries from whom the technology is

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[179] Correa and Musungu, *supra* footnote 166, at p. ix

[180] See , CIPR, *supra* footnote 11 and Corea and Musungu, *supra* footnote 166.

[181] E. Kitch, *The Patent System: A Design for All Seasons?*, paper presented at the WIPO Conference on the International Patent System, March 2002, Geneva, at p. 6

appropriated will be moved to protect its value in their markets by barring imports from the appropriating country."[182]

Experience also reveals that industrialized countries may impose pressure using regional and bilateral trading agreements that would force countries to put in place a scheme of protection higher than that which is provided in a multilateral treaty or force them to join such a treaty. Mexico, for example, adopted laws based on the highest global standards as early as 1991 and have further tightened them in the context of NAFTA. The adoption of strong patent protection laws in the 1990s by Argentina, Brazil, Chile, South Korea, Malaysia, Thailand and Venezuela were partly due to external pressures.[183]

The concern that further harmonization of the international patent system will result in a "one-size-fits-all" scheme is appropriate. There is a need to have flexibility to accommodate the needs of countries that are at different level of socio-economic development. However, this concern may not be attended to by staying out of the evolving international patent system, but by being part of it and influence the developments therein.

b) Option 2: Being Part of the International Patent System

This is a good option if developing countries are in a position to influence developments. History shows limited and inactive involvement of developing countries in the process of international law making. Studies of international conventions and treaties in the field of intellectual property including the TRIPS Agreement reveal that limited participation, poor preparation and performance, weak negotiation capacity as well as lack of unity, among others, kept developing countries in weak bargaining positions. For example, the majority of these countries were not represented during the negotiation of the Uruguay Round. It was only Brazil, India, South Africa and Egypt that took part during the negotiation. Furthermore these countries were poorly represented both in number and qualification of experts during the negotiation.[184]

The situation has not yet improved. The participation and involvement of developing countries in the ongoing negotiations at the Standing Committee on Patents (SCP) has been limited. It was noted that few interventions were made by developing countries

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[182] Kitch, *supra* footnote 180, at p. 8

[183] Maskus, *supra* footnote 55, at p. 97

[184] G. Tansey, 1999,*Trade, Intellectual Property, Food and Biodiversity: Key Issues and Options for the 1999: Review of Article 27(3) (b) of the TRIPS Agreement*, A discussion Paper available , at http://www.geneva.quno.info/pdf/trips-col.pdf/PHPSESSID=98f3a25bea0bc6fa5cd2dc3b97d82bb, accessed on 8 February 2006, p. 9

at the Sixth Session of the SCP (Geneva, 5-9 November 2001), most of which were made by China and South Korea, while less frequent observations or questions were made by Argentina, Brazil, Dominican Republic, Egypt, Kenya, Morocco and Sudan.[185]

The international forum created by WIPO, where negotiations for the development of the international patent system is taking place can be used to fight for accommodation of the needs and interests of developing countries as well as pushing their own agenda. These could include seeking incorporation of an obligation of a patent applicant to indicate origin of a genetic resource used in biotechnological inventions to facilitate sharing of benefits and prevent misappropriation. The fact that developing countries are the majority in WIPO may help them to protect and promote their interests in international negotiations. This advantage has not been exploited for lack of active involvement and adequate coordination of negotiating positions. This may be explained by two factors: the level of importance given to issues related to patents as well as the capacity of developing countries.

There is a serious problem in appreciating the role and importance of patents in national development and the significance of taking part in the international standard setting process. The patent system is either the least in the priority list of the majority of governments of developing countries or it is totally forgotten. In most cases, there is nothing in national polices or government plans relating to patents and the use of the same as a tool for development. There is a tendency of taking the agenda of patents as that of developed countries. The low level of importance attached to the issue is a reflection of the low level participation of developing countries in the negotiations where international standards are set. Most of the Sub-Saharan African countries do not take part in the ongoing negotiations under the auspices of WIPO unless the latter sponsors delegates.

The other major problem relates to capacity. Most of the developing countries lack the financial resource and the technical capacity to take part meaningfully in international negotiations. However, developing countries that cannot send delegations from home owing to financial constraints have an option to take part in the negotiations through their representatives in Geneva. Indeed, a large number of developing countries have no permanent representation or missions in Geneva. As noted by CIPR[186], there are 36 developing country members of WTO; and 20 least developed countries that are members of the WTO and WIPO that have no permanent missions in Geneva. Even those with missions are often inadequately staffed or lack qualified experts in the field.

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[185] Correa, and Musungu, *supra* footnote 166, at p. 17

[186] CIPR, *supra* footnote 11, at p. 164

\Intellectual property experts are also lacking at home. Even when there are few, they may not be able to attend negotiations for lack of financial resource or may not be able to attend negotiations on a continuous basis. Lack of continuity of delegations is common in WTO and WIPO negotiations.

2. Strategies for Effective Engagement in Negotiations

In order for developing countries to take part meaningfully in the international debate and negotiations that may shape the future of the patent system, they need to devise strategies. These may include taking steps at national, regional and international level. Furthermore, international organizations such as WIPO may help in areas such as creating the necessary awareness and building up of capacity.

a) Measures that may be taken by Developing Countries

a) At National Level

At a national level, patents should be taken as a serious and important agenda by governments. There should be a mechanism where developments at the international level aree followed up, issues will be examined and discussed, national positions are formulated and continuity of participation of delegates in the international organizations is ensured. This can be done using patent offices as a focal point with little or no cost.

b) At Regional Level

Regional patent organizations may be used to represent member states in the negotiations or to develop common positions. In Africa, there are two regional offices: the African Intellectual Property Organization which consists of mainly French speaking African countries and the African Regional Intellectual Property Organization which consists of mainly English speaking African countries. Each of these organizations has 15 member states. Empowering regional patent organizations to represent member states in international forum may require revisiting the mandates of the organizations and conferring on them the necessary power. This may need serious thinking and a serious exercise. Short of that, however, these organizations may be considered as important forums to discuss issues and develop common positions.

Sub-regional trading arrangements and regional political bodies may also be used to streamline positions. There are sub-regional organizations, such as the Common Market for Eastern and Southern Africa (COMESA) that are mandated to harmonize

patent protection in member countries.[187] The forum created in such organizations may help to coordinate and promote common positions. Political organizations such as the African Union can also play a role in the formulation of regional positions.[188] The involvement of the different regional bodies may also help to examine issues from a different perspective and develop a well-reasoned position.

c) At International Level

In WIPO, positions of developing countries are developed and promoted by regional groupings such as the Africa Group, the Asia Group and the Latin American and Caribbean Countries Group (GRULAC). These would help to strengthen the negotiating position of developing countries and win better terms and conditions. To this effect, the positions of these groups should be strengthened and coordinated. The concession secured at Doha WTO Ministerial Conference regarding pharmaceutical inventions is a very good example that can be achieved in international patent negotiations if developing countries act together and present a well reasoned and articulated common position.

Support from international organizations such as WIPO may be solicited and used to promote awareness of patents at national level and build capacity in terms of qualified manpower through fellowship programs offered by the Organization. Technical and financial support could also be obtained from developed countries. The latter may be requested to discharge their obligations under the TRIPS agreement. Article 67(1) of the agreement requires developed country members to provide, on request and mutually agreed terms and conditions, technical and financial cooperation in favor of developing and least-developed country members. The required cooperation includes training of personnel.

Developing countries may exploit the support and sympathy of developed countries. Differences in positions are common within the developed countries.[189] These

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[187] COMESA, Member states agreed to jointly develop and implement suitable patent laws and industrial licensing systems for the protection of industrial property rights and encourage the effective use of technological information contained in patents (Article 128 (e)).

[188] The role that can be played by the African Union in promoting common positions can be explained by taking the measure taken by its predecessor regarding the revision of the TRIPS Agreement as an example. The sixty Eighth ordinary session of the OAU held in Ouagadougou, Burkina Faso, in 1998 passed a resolution which recommended that the Governments of member states "develop an African position to safeguard the sovereign rights of member states and the vital interests of local communities and forge alliance with other countries on the revision of TRIPS in 1999."

[189] An example is the support given by the delegation of The Russian Federation to the delegations of Argentina, Brazil and Guatemala at the six session of the Standing Committee

differences may be exploited by developing countries to promote their interests. Public opinion and pressure groups in the North may also be used to back the demands of developing countries. The relevant data and studies made by international NGOs may also be used in understanding issues and developing positions.

PART V. CONCLUSION AND RECOMMENDATIONS

The role of patents in technological progress and economic development is well recognized. Almost all developing countries have national patent systems. The majority of developing countries are also signatories to the major multilateral agreements concluded at the international level. The reason for the existence of the national patent system in developing countries as well as their membership to international patent system indicates a belief that such a system contributes to national socio-economic development. The experience of some developing countries shows how useful the patent system is in the creation of wealth. In others, where the impact is not big, the reason could be attributed to the low level of importance given to patents as well as other factors such as weak indigenous technological base, inadequate R&D funding and facility. In this regard, it may be plausible to note that the patent system by itself does not ensure success in technology development. In order to benefit from the patent system national technological capacity is of critical importance.

The belief in the role that patents play in wealth creation is shared among writers. The patent debate now is not the same as the debate in the nineteenth century between the proponents and opponents of patents. The debate now is on whether strong or weak patent helps to stimulate inventive and innovative activity, encourage transfer of technology and FDI.

The debate on the role of patents coupled with a number of factors that may affect transfer of technology and FDI will make it hard to arrive at a conclusion on whether or not the international patent system positively or negatively affects transfer of technology or investment. There is no comprehensive data or case study that shows the improvement or non-improvement of the flow of technology and investment to a given developing country by comparing the situation of a country before and after being member of an international patent regime. It has been noted that there is a paucity of studies that directly address issues such as whether or not strong patent protection would affect investment, R&D, access to foreign technology and domestic innovation process, let alone reach a definitive conclusions on the impact of IPRs.[190]

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on patents on the issue that the Draft SPLT incorporates the provisions of Article 27.2 and 27.3 of the TRIPS agreement to enable countries to exclude certain inventions from patentability.

[190] CIPR, *supra* footnote11, at p. 23

However, there seems to be an agreement among writers that there are a number of factors that affect inventive and innovative activities, transfer of technology and investment in addition to patents. In this regard, it has been noted that" the system needs to be accompanied by comprehensive policies that promote dynamic competition and technical change. Important among such initiatives are programs to build human capital and technical skills, ensure flexible factor markets, and liberalize restrictions on international trade and investment."[191]

The history of patents evidences that it is dynamic in nature. It evolves and develops to meet new needs and address new challenges. It may be possible to say that the patent system is one of the policy instruments of techno-economic development. At present, the international patent system is in the process of evolving to deal with various problems that arose from the increase in volume and type of inventions as well as the growing importance of securing valid patent protection in many countries with little cost as early and smoothly as possible. This would require streamlining of national or regional laws and functions of national, regional and international patent authorities. To meet this need negotiations are underway to harmonize procedural and substantive requirements of patent laws under the auspices of WIPO.

There is a serious concern that the future international patent system will be designed in line with the national patent laws of developed countries that will not only deprive the flexibility available in the existing international patent treaties but also impose new burdens on the developing countries. On the other hand, there is a strong desire on the part of the developing countries that the international patent system that would evolve in the future addresses their specific needs as well as deal with issues relevant to them such as protection of traditional knowledge.

The concern and desire of developing countries can be addressed by taking part actively in the evolving process of the international patent system. However, the importance attached to patents at the national level in the developing countries such as the majority of African countries, is low. Furthermore, the participation of developing countries in the international standard setting has been very limited hitherto. As a result, developing countries were forced to play a game, the rules of which were set mainly by developed countries. This should be changed. The involvement of developing countries should increase both in quantity and quality. This in turn requires clarity on the issues that are being discussed as well as capacity to meaningfully participate in international negotiations. With respect to clarity of the issues WIPO and Regional Patent Organizations may play crucial role in sponsoring concrete case studies and stimulating discussions within developing countries. Indeed the reason behind the low level of participation in the negotiation and international standard setting may also relate to inadequate technical and financial capacity.

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[191] Maskus, *supra* footnote 59, at p. 232.

Devising a strategy as well as coordinating negotiating positions at different levels may help to deal with this problem.

The ongoing harmonization is and future harmonization will be the reflection of the world's techno-economic reality It seems that no one can change the wheel of history. Moreover, different countries may have different interests in the process. It is impossible to accommodate the interest of each and every nation. International undertakings are based on a win-win approach. Every party gets something, but not necessarily equal. Therefore, for developing countries the best option in the move towards a harmonized global patent system is neither being bystanders nor staying out of it. The best option to these countries is to follow the development critically, join the movement and exert all possible efforts to influence the developments so as to accommodate their interest. Developing countries are the majority in WIPO and this numerical advantage should be exploited. In relation to this, there is a need to build up negotiating capacity and strengthen bargaining position to meaningfully participate in the process and influence it. The need to strengthen their bargaining power by streamlining positions at regional and international level should also be underlined. The experience at the WTO Ministerial meeting held in Doha in 2001 evidences that if developing countries act together, they can obtain concessions.

Developed countries should also recognize the position of developing countries and the need to leave room for the latter to fit into the international patent system while at the same time catering to their specific national needs and situations. The future international patent system should not deprive developing countries the opportunity to make use of the patent system as a tool for development.