

9 RMLNLUJ (2017) 146

Role of Trips in Transfer of Environmentally Sound Technologies to Developing and Least Developed Countries

by
Mohammad Umar^{*}

PREFATORY

Environment degradation and climate change are the burning issues of the present world. Various studies have shown the devastating effect that climate change can have on the global population. Especially, the developing and least developed countries (LDCs) stand most vulnerable to any harm that can ensue out of the unplanned rush for development at the cost of environment.¹ This is mainly because any effort to pull out the poor communities out of poverty is necessarily resource and energy intensive. However, with the scientific and technological advancements a sustained growth can be expected in poor countries without any compromise with the pace of their development. It is an established fact that the "technology plays a pivotal role as means of implementation in efforts to address contemporary global challenges and to move towards sustainable development."² In fact, as far back as 1972, Principle 18 of the Declaration of the United Nations Conference on the Human Environment (Stockholm



Page: 147

Declaration) proclaimed that science and technology can and must be used to the identification, avoidance and control of environmental risks for the common public good.³ It was seen as means to achieve the Principle 3 objective that espoused maintenance of earth's capacity to produce vital renewable resources.⁴

Today, statistics show that most of the environmentally sound technologies (ESTs) patented under the Patent Cooperation Treaty ⁵(from 2008-2010) belong to governments and multinational corporations (MNCs) of the developed countries.⁶ Therefore in the milieu of ongoing churning regarding environment protection at a global level it becomes crucial to analyze the ramifications of Intellectual Property Rights (IPR) regime⁷ on the fair transfer of technology (TOT) which is often stipulated as an important clause in most of the major multilateral environmental agreements (MEAs).

Most of the issues that arise out of the friction between the TRIPS Agreement and ordinary TOT extend *mutatis mutandis* to the Transfer of Environmentally Sound Technology (TOEST). It is just that TOEST has got more impetus in the recent times due to the global push for green technology sharing to meet the growing challenges of the climate change. There are more than eighty international agreements and legal instruments⁸ which have a bearing on TOT/TOEST and a general need to facilitate TOEST so as to aid in the fulfillment of the requirements of developing countries of getting technical, institutional and financial assistance to address climate change consequences has been reiterated in various extremely important MEAs such as — Montreal Protocol,⁹ the United Nations Framework



Page: 148

Convention on Climate Change (UNFCCC),¹⁰ Convention on Biodiversity,¹¹ Agenda 21 of Rio Conference,¹² Kyoto Protocol,¹³ outcome document of United Nations Conference on Sustainable Development¹⁴ etc.

Also, there are special arrangements made as a follow up to these agreements which are aimed at facilitating TOEST amongst the agreeing nations. Establishment of Green Climate Fund,¹⁵ Technology Transfer Framework,¹⁶ Climate Technology Centre and Network¹⁷ etc. are the classic examples of efforts made by the countries (developing and LDCs in particular) towards making the process of availing TOEST in a more easier and affordable way.

So much done, yet there has been a surprising silence in these negotiations about the direct role of TRIPS as a global IPR regime in hindering the purported method of TOEST. The focus has been more on government actions such as "fair trade policies, removal of technical, legal and administrative barriers to technology transfer, sound economic policy, regulatory frameworks and transparency etc.",¹⁸ and less on commitments and flexibilities envisaged in TRIPS. IPR issues are roped in to the extent of balancing the rights and obligations of the patent holder and acquirer but it does not go beyond that.

The paper shall briefly discuss the real meaning of TOT (which is substantially same for TOEST) and then move on to discuss the role of TRIPS in TOEST and issues involved therein. Finally, the paper shall end with



conclusions and suggestions which shall include role of institutions as well as desirable normative adoptions in the TOEST debate.

I. MEANING OF 'TRANSFER OF TECHNOLOGY'

TOT should not be assumed as a physical transfer of the equipment only. It has much nuanced connotations to it. A general consensus has been that any workable definition of technology transfer must be functional rather than formal.¹⁹ To that effect United Nations Draft International Code of Conduct on Transfer of Technology, 1985 defines TOT as — "the transfer of systematic knowledge for the manufacture of a product, for the application of a process or for the rendering of a service and does not extend to the transactions involving the mere sale or mere lease of goods."²⁰ When we specifically talk about TOEST, Chapter 34 of Agenda 21 which was one of the documents adopted in the United Nations Conference on Environment and Development, 1992 has following to offer—

*"Environmentally sound technologies are not just individual technologies, but total systems which include know-how, procedures, goods and services, and equipment as well as organizational and managerial procedures. This implies that when discussing transfer of technologies, the human resource development and local capacity-building aspects of technology choices, including gender-relevant aspects, should also be addressed. Environmentally sound technologies should be compatible with nationally determined socio-economic, cultural, and environmental priorities."*²¹ (Emphasis supplied)

Thus, it becomes clear that TOT/TOEST does not happen in an instance, rather it is a process that starts with an intention to share the technology and ends at-least with capacity building of the acquiring country. Unfortunately, as we shall see when TRIPS and TOT interact, capacity

building stands utterly compromised in the clamor of the exclusive rights of patent holder.

II. SHRINKING SPACE FOR NON MARKET MECHANISMS

Non-market or informal mechanisms of acquiring technology are those which are not based on — trade in capital goods or technological inputs, foreign direct investment and sharing of technology licences between different companies for different objectives. They are mainly informal and involuntary transactions which do not necessarily accrue any incentive to the patent holder. Two of the most commonly deployed non-market mechanisms are *imitation*²² and *reverse engineering*²³. Mostly developing countries and LDCs use these mechanisms to bypass the cost of technology transfer given their weak bargaining power when they are put to directly negotiate with the powerful MNCs. Though, the unfortunate part is that these countries are losing the policy space for exercising these non-market mechanisms due to the increased expansion and adoption of TRIPS.²⁴ It happens because TRIPS does not allow the needy countries to have a freedom to use these options that the developed countries had themselves previously used to utilize the technological learning and adaptation of foreign technologies during their transitional period of development and industrialization.²⁵

In this background, a look at the recent past becomes critical so as to map the technological development of most of the developed nations in the absence of TRIPS. Two arguments flow from here — firstly, TOT with less stringent patent norms is not something that developed countries are obliged to do as a matter of charity, rather, it is a form of compensatory justice extended to the formerly colonized territories by the colonizers;²⁶ secondly, as pointed out in the previous paragraph, before the advent of TRIPS developed countries deployed non-market mechanisms extensively in their technological growth. If we consider East Asian nations' transition from

developing to developed nations we have two classic examples of Japan and Korea, who by pursuing liberal IPR policies till late 1990s grew exponentially from crude imitators to creative imitators and finally as knowledge-based innovators.²⁷

Also, the vocabulary of the non-market mechanisms related to TOT/TOEST is deeply problematic. Imitation and reverse engineering in their literal sense suggest something unethical and devoid of good faith. This has led to a parallel perception that such practices are not legally sound. For instance, imitation suggests a sort of counterfeiting which it is not essentially so; rather, it is mainly a method of absorbing technological innovations which every country adopts at different stages of development.²⁸ Unfortunately, since it has become a custom, changing the vocabulary is not possible now. However, perception can be worked upon and sooner we realize that imitation and reverse engineering are not 'bad' per se better it is for the international community.

Next, the question arises that why do developing countries and LDCs need non-market mechanisms to 'catch up' with the developed world?²⁹ Answer to this lies in two capacity theorems of — 'affordability' and 'absorption'. Socioeconomic conditions in an LDC or a developing country often render it incapable of affording highly priced

technologies owned mainly by MNCs incorporated in developed world. Also, in deals like 'turn-key packages' wherein no opportunity is given to the recipient country to select only the parts of the package that they actually need, countries end up paying a severe price.³⁰ Due to the fact that foreign firms retain the full responsibility for all the activities ancillary to TOT/TOEST like 'conducting the feasibility studies, providing consultation, project design, project construction, equipment installation, commissioning, operation and maintenance', recipient countries stand totally uninvolved in the process and such non-participation of local staff in the technical aspects lead to zero development of local capabilities and skills.³¹

Given the fact that principles of international environmental law have it in their fundamentals that states should work mutually towards the cultivation of endogenous capacity building that leads to 'improving scientific



Page: 152

understanding through exchanges of scientific and technological knowledge, and by enhancing the development, adaptation, diffusion and transfer of technologies, *including new and innovative technologies*',³² and that developed countries are obliged to 'take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies and know-how to other Parties, particularly developing country Parties',³³ it becomes imperative for us to weigh, more than the binding (ness) of the agreements (TRIPS and environmental conventions/agreements), the sacrosanctity of them. Going by the objectives underlying the principles enshrined in global environmental conventions the reasonable way to realize those objectives appears to be that of allowing informal mechanisms to continue at-least till the leveled indicators of growth are achieved.

Therefore, it is submitted that non-market mechanisms form a very crucial method of technological development for developing countries and LDCs. Pushing towards formal mechanisms when these countries are not in a position to operationalise them may lead to a prejudiced situation of technology transfer which may only serve the interests of the countries or MNCs owning advanced technologies. Having said this, the idea is not to propose a complete dis-incentivisation of the patent holders. It is right that in today's world royalty is a norm and it is so much internalized that we cannot afford to go back in those times when researchers accepted grants as 'necessary evil' and any demand of royalty for technology development was considered a taboo.³⁴ The idea in fact is to balance the rights and obligations of the recipients and the transferors; and this balancing is not too difficult provided we have a collective will to arrive at a consensus. This bridging forms a substantive text of many multilateral environmental treaties including UNFCCC,³⁵ Agenda 21 of the Rio Conference,³⁶ Kyoto Protocol,³⁷ Montreal Protocol,³⁸ Copenhagen Accord³⁹ etc. In a sad travesty however (for the reason that TRIPS is not substantially roped in any of the multilateral environmental negotiations related to or having a bearing on TOEST) objectives of TRIPS as articulated in Article 7 of its text strikes the finest



Page: 153

balance between the IPR rights and needs of the developing countries and LDCs. It says—

"The protection and enforcement of intellectual property rights should contribute

to the promotion of technological innovation and to the *transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations.*"⁴⁰ (*Emphasis supplied*)

It thus becomes clear that the motive of TRIPS is not to be biased towards a particular group of international community; rather it aspires to maintain the right balance between the interests of the parties. Article 8.2 further accentuates this philosophy when it provides explicitly for 'appropriate measures' that can be taken to deal with any sort of abuse of intellectual property rights by the patent holder that leads to adversely affect the international TOT.⁴¹ The problem however lies in ambiguities of the scope and content of some of its other key provisions, misconstruing of which leads to an anomaly of unfair method of TOEST. The paper shall now discuss the issues related to those provisions and also the tacit concepts underlying them.

III. TRIPS PROVISIONS — IMPACT AND ANALYSIS

A. Article 66.2


If Article 7 (discussed above) sets the goal for TRIPS, Article 66.2 purports the manifestation of those goals by stipulating that the — 'developed country members *shall* provide incentives to enterprises and institutions in their territories for the purpose of promoting and encouraging technology transfer to least-developed country members in order to enable them to create a sound and viable technological base'. By a plain reading of Article 66.2 it becomes certain that the word 'shall' does not imply any optional choice of not abiding by the provision. Nevertheless, until the happening of Doha Conference in 2001 the provision remained inoperative due to the lack of specific monitoring and implementation guidelines. Doha Conference mandated the TRIPS Council to devise a mechanism for the implementation

 Page: 154

of Article 66.2⁴² subsequent to which on 19th February 2003 the Council adopted a decision stating that — 'developed country Members shall submit annually reports on actions taken or planned in pursuance of their commitments under Article 66.2'.⁴³ However one of the studies commissioned by United Nations Conference on Trade and Development (UNCTAD) and International Centre for Trade and Sustainable Development⁴⁴ made some critical observations regarding the practice of reporting by the developed nations. Along with pointing out the irregular submission of reports, the study pointed out that the reports submitted 'do not provide sufficient evidence' to assess whether the incentives have been additional and beyond 'business-as-usual'.⁴⁵ Also, out of the several programmes and policies reported only 31 percent specifically targeted LDCs and even out of that one third programmes do not actually promote TOT.⁴⁶

Apparently so, it can be deduced that Article 66.2 has multiple shortcomings as far as its implementation is concerned.⁴⁷ Ritualistic and non serious approach of the developed world towards the compliance with this particular provision has received flak from LDCs and developing countries alike. Moreover, what intrigues most of the scholars of this field is the direction that this debate has assumed. For some the current plank and pace of concerted efforts towards operationalising Article 66.2 is the ultimate solution while for others it is insufficient and they go to the extent of enquiring about the possibilities of the application of Global Administrative Law for its enforcement.⁴⁸ Amidst all these suggestions however, it is important to point out a

very critical linkage of TRIPS with the currently outmoded UNCTAD Draft International Code of Conduct on the Transfer of Technology, 1985(COC).⁴⁹ It will not be an exaggeration if we say that this COC formed the 'conscience' of the fair process of TOT. Though not discussed in specific applicability, its rationale extends to present times' TOEST as well. It was a product of long drawn negotiations between G77 and OECD countries in which G77 succeeded in identifying some crucial restrictive trade practices that MNCs till date continue to follow. Grant back


 Page: 155

provisions, provisions requiring the acquiring party to refrain from challenging the validity of patents, exclusive dealing, restriction on research, price fixing, restriction on adaptation (of the imported technology to local conditions or introducing innovations in it) etc. were categorically identified within the COC to put a check on then ongoing 'technological colonization' as some scholars called it.⁵⁰ Unfortunately though, the spirit of COC was gradually lost because of its non-binding nature and the arguments of OECD countries during the time of negotiations continued to prevail as norms of the practices governing TOT/TOEST. The only place where COC spirit is still to an extent reflected is in the text of the outcome documents of international environmental conferences. But, the tragedy of non inclusion of TRIPS in TOEST debate perpetually revives the chauvinistic cannons of negotiations like 'freedom of contract', 'freedom of choice of law and forum' etc.⁵¹ It is no genius to construe that by any analysis these cannons are detrimental to the interests of developing countries and LDCs because of a much weaker bargaining chip that they possess.

B. Compulsory Licensing under TRIPS: Can Generic Drug Analogy Apply to TOEST?

Compulsory Licensing (CL) is one of the most contentious yet most frequently invoked flexibilities under the TRIPS agreement. Through CL, member countries within their domestic jurisdiction can allow someone other than the patent holder to produce the patented product or process without the consent of the patent owner.⁵² It thus opens the door for employment of non-market mechanisms like imitation and reverse engineering. This is deemed justified on the grounds of public need and is backed by the rationale that government intervention to break the shackles of monopoly is legal if the IPR holders do not make technologies available in the public interest.⁵³ Pharmaceuticals are one such public interest area in which Article 31⁵⁴ (from which legality of CL is derived) is frequently invoked by the developing countries and LDCs.

However, the luxury of invoking Article 31 is available only to those countries which can afford to adopt non-market mechanisms of developing generic drugs. For those who are incapable of that, Article 31 stands

 Page: 156

meaningless. For them, the only option (other than parallel imports) that remains is of importing generic drugs from the countries where compulsory licence is already granted. Before 2003, the countries practicing CL who were sought to export generic drugs by the needy countries could not export because they were bound by Article 31 (f) which allows the issuance of compulsory licence only if its 'use shall be authorized predominantly for the supply of the domestic market' of the member country.⁵⁵ This left needy countries totally helpless because they could not render basic generic drugs

at affordable rates to meet the health needs of their population. To deal with this, on 14th November 2001, Doha Declaration on TRIPS Agreement and Public Health instructed TRIPS Council to 'find an expeditious solution to this problem' and report to General Council.⁵⁶ It came to be known as 'Paragraph 6 issue' because of its placement in the text of the declaration. General Council thereupon, in 2003 Cancun Ministerial conference came up with a decision that Article 31(f) obligations shall be waived for the export of pharmaceutical products produced under a compulsory licence to the developing countries and LDCs.⁵⁷ Though initially this decision was interim and provisional, nevertheless, it was agreed to be made permanent in 2005 General Council meeting.⁵⁸

The intriguing question that arises after this discussion is that whether the rationale of making generic drugs available to needy countries by way of TRIPS amendment can be extended to TOEST as well?⁵⁹ The handicap of 'incapability' of developing countries and LDCs in manufacturing generic drugs applies in equal proportions to TOEST also. Now since Article 31(b) of TRIPS allows CL 'in the case of a national emergency or other circumstances of extreme urgency or in cases of public non-commercial use',⁶⁰ it can be debated whether environment, which has wide ranging effects on human health and overall well being and which is degrading with dangerous pace, can qualify as 'a national emergency or other circumstances of extreme urgency'?⁶¹ Also, by further extension, can needy countries avail the export of ESTs from the countries where compulsory licence is granted? The debate has just started to pick up and is at a very nascent stage but



it will be interesting to see how it takes shape in times to come. It is still a long way to go before we bring TOEST under the ambit of CL; nevertheless, it will be requiring another TRIPS amendment which is not a very easy feat to achieve.

CONCLUSIONS AND SUGGESTIONS

Few certain conclusions can be drawn from the foregoing discussion. Firstly, the process of TOEST is more vitiated in comparison to ordinary TOT for the reason that the impact of the TRIPS Agreement is hardly discussed in multilateral environmental forums and thereby, it all leads to a flawed perception that well drafted inclusions of TOEST obligations for developed countries within the outcome reports of global conferences would suffice. Secondly, TRIPS already applies to all the developing countries and will eventually apply to all the LDCs as well and this will ensure that non-market mechanisms of TOT/TOEST are scuttled to become negligible. These mechanisms are life savers for the countries whose socioeconomic conditions render them incapable to enter into a direct contract with the patent holder of green technology given their weak bargaining power and restrictive trade practices of the patent holder. This coupled with the fact that they are often also incapable to develop the technology indigenously and unlike pharmaceuticals they cannot waive Article 31 (f) of TRIPS to avail the relevant EST from an exporting country with compulsory licence, makes the situation worse. Thirdly, Article 7 read with Article 66.2 and Article 8.2 clearly gives us an impression that TRIPS should not necessarily be taken as a boon for technology developers only. Rights of the technology acquirers are also respected equally in the philosophy of TRIPS. Nevertheless, lack of sophistication in negotiations and collective-will render these provisions soft and regime strengthening provisions hard and operational. A good manifestation of it can be seen in an uneven reporting system that has been formulated to deal with the crucial issue of TOT/TOEST

to LDCs.

In this backdrop, following are the few suggestions which can serve towards strengthening of the voice of developing countries and LDCs in matters related to both ordinary TOT and TOEST—

1. *Desired role of UNCTAD* — UNCTAD 2011 report⁶² pointed out that a range of important issues like technology transfer and restrictive trade practices which directly concern the interests of developing countries and LDCs 'have fallen down the negotiating agenda at the international level or disappeared altogether'. Further, the latest report of UNCTAD on Trade and Development emphasized that 'the IPR regime should allow as much margin as possible for the



Page: 158

absorption and diffusion of acquired technologies'.⁶³ These observations coupled with the fact that it was UNCTAD only which led the drafting of COC gives us a sense that it still remains one of the strongest voices of the poor countries in international arena. However in the recent times some scholars have increasingly voiced a concern that UNCTAD is losing its direction and spirit as a guardian and defender of the development principle and perspective and in a way trying to 'mature' into an agency seeking 'consensus'.⁶⁴ Trade and environment interaction and reviving and making the COC binding in nature remains two largely vacant areas waiting to be seized by a leader. UNCTAD can be that leader and this hopefully will ensure a fairer mechanism of TOEST.

2. *Sound TOEST within the TRIPS framework*— It should be realized that environment today is as crucial as health. Pharmaceuticals have already made their way to find an exception in Article 31(f) of TRIPS. It is only a matter of time when environment will be taken equally seriously and flexibilities that are extended to pharmaceuticals will be available for ESTs as well. Also, there is a crying need for effective implementation of Article 66.2. As Carlos Correa puts it in one of his researches for UNCTAD — 'The concept of 'transfer of technology' for the purposes of compliance with article 66.2 must be clarified by WTO, so as to make clear that developed countries' governments must provide incentives for the transmission of IPRs and non-IPRs protected technology...'.⁶⁵
3. *Inclusion of TRIPS debate in Multilateral Environmental Agreements* — This is one of the most urgent things to do. As already pointed out, in MEAs IPRs are included very vaguely in the context of 'balancing rights and obligations' of the right holder and developing or least developed countries. No concrete reference to TRIPS is made when it comes to the issue of TOEST.⁶⁶ This makes it as ineffective as Article 66.2 of TRIPS itself. In upcoming Conference of Parties Meeting in Paris in 2015, it can be hoped and expected that while the countries will look for a binding instrument on climate change, issue of TOEST and TRIPS ramifications on it will not be left out.

* Assistant Professor, Galgotias University, Delhi <mdumar2417@gmail.com>

¹ See generally— Climate Change: Impacts, Vulnerabilities and Adaptation in Developing Countries, United Nations Framework Convention on Climate Change (UNFCCC), (Mar. 29, 2017, 10:05 AM), <http://unfccc.int/resource/docs/publications/impacts.pdf>; N.H. RAVINDRANATH AND JAYANT A. SATHAYE, *Climate Change and Developing Countries* 2-5 (Kluwer Academic Publishers, 2002); Samuel Fankhauser and Thomas K.J. McDermott, *Understanding the Adaptation Deficit: Why are Poor Countries More Vulnerable to Climate Events than Rich Countries?*, Centre for Climate Change Economics and Policy, London School of Economics and Political Science, Working Paper No. 150, (Mar. 29, 2017, 10:30 AM),

<http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2014/02/WP134-Understanding-the-adaptation-deficit.pdf>; Background Paper on Climate Change and the Most Vulnerable Countries: The Imperative to Act, United Nations General Assembly, (Mar. 30, 2017, 10:15 AM), <http://www.un.org/ga/president/62/ThematicDebates/ccact/vulnbackgrounder1July.pdf>; Technologies for Adaptation to Climate Change, UNFCCC, (Mar. 29, 2017, 10:25 AM), http://unfccc.int/resource/docs/publications/tech_for_adaptation_06.pdf.

² Development, Transfer and Dissemination of Clean and Environmentally Sound Technologies, Proposal by the United Nations Industrial Development Organization (Mar. 29, 2017, 10:25 AM), <http://sustainabledevelopment.un.org/content/documents/1946UNIDO.pdf>.

³ In the Action Plan for the Human Environment, adopted at the same conference, Recommendation 56 laid down the foundation of the issue discussed in this paper, i.e. fair international technological support to the developing countries. It was stated that — “appropriate United Nations bodies should make efforts to assist the developing countries by, inter alia, providing adequate information for each country on the technology for preventing present or future environmentally adverse effects...” See Report of the United Nations Conference on the Human Environment, A/CONF.48/14/Rev.1.

⁴ *Ibid.*

⁵ The Patent Cooperation Treaty, 19 June 1970 (Mar. 19, 2017, 10:30 PM), <http://www.wipo.int/pct/en/texts/articles/atoc.htm>.

⁶ OECD Science, Technology and Industry Scoreboard: Innovation and Growth, Organisation for Economic Co-operation and Development 155 (2013), <http://www.oecd.org/sti/scoreboard-2013.pdf>.

⁷ *World Trade Organization's Agreement on Trade-Related Aspects of Intellectual Property Rights*, Annex 1C, 1869 UNTS 299; 33 ILM 1197 (1994).

⁸ United Nations Compendium of International Arrangements on Transfer of Technology: Selected Instruments, 2001 UNCTAD/ITE/IPC/Misc.5 (Feb. 24, 2017, 1:00 PM), <http://unctad.org/en/docs/psiteipcm5.en.pdf>.

⁹ *Montreal Protocol on Substances that Deplete the Ozone Layer*, 1522 U.N.T.S. 3, 26 I.L.M. 154 (1987).

¹⁰ UNFCCC, 1771 U.N.T.S. 1a07 (1992). Recently, on 22 April 2016, 175 members signed the Paris Agreement under the UNFCCC, aiming to reduce the pace of climate change and striving towards low-carbon future so that the Sustainable Development Goal-13 (as formulated by the United Nations in 2015) can be achieved. The Agreement exhorts the signatories to facilitate the “enhancement of enabling environments for and the addressing of barriers to the development and transfer of socially and environmentally sound technologies.” See The Paris Agreement, art 68(d), FCCC/CP/2015/L.9/Rev.1(2015).

¹¹ Convention on Biological Diversity, 1760 U.N.T.S. 143 (1992).

¹² United Nations, *Agenda 21: Earth Summit — The United Nations Programme of Action from Rio*, 2 UN Doc A/CONF. 151/26/Rev. 1 (1992). Although, Agenda 21 has an entire chapter dedicated to TOEST, para 34.6 of the document specifically attaches a qualification by stating that any TOEST must be given effect “without prejudice to specific commitments and arrangements on transfer of technology to be adopted in specific international instruments.” This qualification is crucial, as we shall see in further discussions, in context of the role of TRIPS in TOEST to the developing and least developed countries.

¹³ Kyoto Protocol to the United Nations Framework Convention on Climate Change, 2303 U.N.T.S. 148 (1997).

¹⁴ The Future we Want, United Nations Conference on Sustainable Development, A/CONF.216/L.1.

¹⁵ Laura Drummond, *UNFCCC Green Climate Fund Created*, 11 *Sustainable Development Law & Policy*, no. 2, 69-70(2011).

¹⁶ Technology Transfer Framework, UNFCCC Technology Executive Committee (Mar. 19, 2017, 11:30 PM), http://unfccc.int/ttclear/templates/render cms_page?TTF_home.

¹⁷ Technology Mechanism, UNFCCC (Mar. 20, 2017, 9:30 PM), http://unfccc.int/ttclear/templates/render cms_page?TEM_ctcn.

¹⁸ *Supra* note 16.

¹⁹ David M. Haug, *The International Transfer of Technology: Lessons that East Europe can Learn from the Failed Third World Experience*, 5 Harv. J. Law Technol. Spring 212 (1992).

²⁰ Draft International Code of Conduct on the Transfer of Technology, 1985(version), UNCTAD/ITE/IIT/28. Hayden added to this definition of TOT saying- “the important factor [in defining technology transfer] is that the recipient acquires the capability to manufacture itself a product whose quality is comparable to that

manufactured by the technology supplier.” See Eric W. Hayden, *Technology Transfer to East Europe-U.S. Corporate Experience*, UN/ECE, Proceedings of the UN/ECE Seminar on The Management of the Transfer of Technology Within Industrial Co-operation, Geneva 23 (1976).

²¹ *Supra* note 12.

²² Imitation implies using technology secrets without due authorization of the patent holder and it is usually done through the product or patent inspection from patent database.

²³ Reverse engineering happens when a product is dismantled and analysed for its components that helps create a competitive product domestically.

²⁴ Developing countries were subject under the TRIPS Agreement to the same standards of protection applicable to developed countries, subject only to transitional periods that have already expired. The same treatment was conferred to the LDCs with longer transitional periods which were renewable upon request. As a result, LDCs are assumed to apply the same standards of IPRs as soon as the transitional periods expire or they graduate as developing countries.

²⁵ Khorsed Zaman, *The TRIPS Patent Protection Provisions and Their Effects on Transferring Climate Change Technologies to LDCs and Poor Developing Countries: A Critical Appraisal*, 3 Asian J. Int. Law 144 (2013). [hereinafter Zaman].

²⁶ See generally TAGI SAGAFI (ET AL.), *CONTROLLING INTERNATIONAL TECHNOLOGY TRANSFER: ISSUES, PERSPECTIVES AND POLICY IMPLICATIONS* (Pergamon Press, 1981).

²⁷ *Supra* note 25; See generally LINSU KIM, *Imitation to Innovation: The Dynamics of Korea's Technological Learning* 21-23 (Harvard Business School Press, 1997); Mariko Sakakibara and Lee Branstetter, *Do Stronger Patents Induce More Innovation? Evidence from the 1998 Japanese Patent Law Reforms*, 32 RJE 77 (2001).

²⁸ *Supra* note 25.

²⁹ See generally JANG-SUP SHIN, *The Economics of the Latecomers: Catching-Up, Technology Transfer, and Institutions in Germany, Japan, and South Korea* (Routledge, 1996).

³⁰ See the case study of Kuwait in David Bennett, *Innovative Technology Transfer Framework Linked to Trade for UNIDO Action*, UNIDO, 8 (2002), http://www.unido.org/fileadmin/import/userfiles/hartmany/wssd_tech_transfer.pdf.

³¹ *Ibid.*

³² Principle 9, Rio Declaration on Environment and Development adopted at The United Nations Conference on Environment and Development, 2 UN Doc A/CONF.151/5/Rev.1 (1992).

³³ *Supra* note 10 art. 4.5. See also artcls.4.1(c), 4.3, 4.5, 4.7, 4.8 and 4.9 of UNFCCC; Bali Action Plan, 2007, para. 1(d), FCCC/CP/2007/6/Add.1 (2008); See also *Supra* note 14 at para. 58(f), (i) and 73.

³⁴ Kelly G. Hyndman (et al.), *Technology Transfer: What India can Learn from the United States*, 10 Journal of Intellectual Property Rights 400 (2005).

³⁵ *Supra* note 10.

³⁶ *Supra* note 12.

³⁷ *Supra* note 13 art. 10(c).

³⁸ *Supra* note 9.

³⁹ Copenhagen Accord, Conference of the Parties, UNFCCC, FCCC/CP/2009/L.7 (2009).

⁴⁰ *Supra* note 7; See also the preamble of TRIPS Agreement which categorically says that the intent of the agreement is- 'to ensure that measures and procedures to enforce intellectual property rights [including patents] do not themselves become barriers to legitimate trade'.

⁴¹ *Ibid.*

⁴² Doha Ministerial Conference of WTO, Implementation Related Issues and Concerns, para. 11.2., WT/MIN (01)/17 (2001).

⁴³ TRIPS Council Decision IP/C/28 (2003).

⁴⁴ Suerie Moon, *Does TRIPS Art. 66.2 Encourage Technology Transfer to LDCs?*, Policy Brief Number 2., (2008), http://www.ictsd.org/downloads/2008/12/policy_brief_2.pdf.

⁴⁵ *Ibid.*

⁴⁶ *Ibid.*

⁴⁷ See generally Dominique Foray, *Technology Transfer in the TRIPS Age: The Need for New Types of Partnerships between the Least Developed and Most Advanced Economies*, International Centre for Trade and Sustainable Development, 9 (2009), http://www.iprsonline.org/New%202009/foray_may2009.pdf.

⁴⁸ Andrew Michaels, *International Technology Transfer and TRIPS Article 66.2: Can Global Administrative Law help Least Developed Countries Get What They Bargained for?*, 741 Georgetown J. Int. Law 224-225 (2009).

⁴⁹ *Supra* note 20.

⁵⁰ *Supra* note 20 chapter IV; See also David Silverstein, *Sharing United States Energy Technology with Less-Developed Countries: A Model for International Technology Transfer*, 12 Journal of International Law and Economics 363,388 (1978); *Supra* note 19 at 218.

⁵¹ Ton J.M. Zuijdewijk, *The UNCTAD Code of Conduct on the Transfer of Technology*, 24 McGill LJ 571 (1978).

⁵² Compulsory Licensing of Pharmaceuticals and TRIPS (Apr. 29, 2017, 10:45 AM), http://www.wto.org/english/tratop_e/trips_e/public_health_faq_e.htm.

⁵³ Zaman, p. 153; *Supra* note 25 art. 8.1.

⁵⁴ *Supra* note 7.

⁵⁵ *Ibid.*

⁵⁶ Doha Declaration on the TRIPS Agreement and Public Health, para. 5(b), WT/MIN(01)/DEC/2 (2001).

⁵⁷ Decision of the General Council of 30th August, WT/L/540 and Corr.1, (2003).

⁵⁸ General Council Meeting of 19-20 October, (2005), http://www.wto.org/english/thewto_e/gcounc_e/meeting_oct05_e.htm. Only recently TRIPS has been formally amended to officially incorporate this principle. See WTO IP rules amended to ease poor countries' access to affordable medicines, (Apr. 15, 2017, 11:45 AM), https://www.wto.org/english/news_e/news17_e/trip_23jan17_e.htm.

⁵⁹ Zaman, pp. 155-158; *Supra* note 25.

⁶⁰ *Supra* note 7.

⁶¹ The term 'the planetary emergency of global warming' was first used by former US Vice-President Al Gore. See generally AL GORE, *An Inconvenient Truth: The Planetary Emergency of Global Warming and What We Can Do About It* (Rodale, 2006).

⁶² As cited in Trade and Development Report-2014 of UNCTAD, UNCTAD/TDR/2014.

⁶³ *Ibid.*

⁶⁴ Tetteh Hormeku, *NGOs critical of UNCTAD's investment and pro-business approach*, TWN (Mar. 27, 2017, 10:30 AM), <http://www.twinside.org.sg/title/probu-cn.htm>.

⁶⁵ Carlos Correa, *Intellectual Property in LDCs: Strategies for Enhancing Technology Transfer and Dissemination*, The Least Developed Countries Report, UNCTAD Background Paper, (Apr. 25, 2017, 11:45 AM), http://unctad.org/sections/ldc_dir/docs/ldcr2007_Correa_en.pdf.

⁶⁶ Even a recent UNEP report deals at length with the 'technology gap' but fails to identify TRIPS as one of the major escalators of it. Adaptation Gap Report, UNEP, (Apr. 18, 2017, 12:45 PM), http://www.unep.org/climatechange/adaptation/gapreport2014/portals/50270/pdf/AGR_FULL_REPORT.pdf.

Disclaimer: While every effort is made to avoid any mistake or omission, this casenote/ headnote/ judgment/ act/ rule/ regulation/ circular/ notification is being circulated on the condition and understanding that the publisher would not be liable in any manner by reason of any mistake or omission or for any action taken or omitted to be taken or advice rendered or accepted on the basis of this casenote/ headnote/ judgment/ act/ rule/ regulation/ circular/ notification. All disputes will be subject exclusively to jurisdiction of courts, tribunals and forums at Lucknow only. The authenticity of this text must be verified from the original source.