

CHAPTER 7: CONCLUSION, RECOMMENDATIONS AND SUGGESTIONS

A BACKGROUND OF TECHNOLOGY TRANSFER, INTELLECTUAL PROPERTY AND ITS SIGNIFICANCE IN THE DEVELOPING WORLD

The world believes in the power of technology to be the biggest and the most resourceful harbinger of change in the society. After all, technology is a driving force behind trade and economic development. More the advancements in technology, speedier will be the process of overall development and growth⁵⁰⁵. Embracing and leveraging technological advancements shall result in increased productivity, innovation, global market access, and sustainable growth, positioning countries/business entities at the forefront of economic progress in the interconnected globalized world. Technology sure has made the society dependent on it in a lot of ways. Readiness towards acceptance and adoptions of new technologies would increase the chances of a society or a nation to benefit from it. It helps generate a better response to the changing market conditions and opportunities along with helping build a better damage control system enabling faster recovery from crisis and developing greater resilience against economic shocks.

These advancements foster progress in more ways than one can imagine, especially in contemporary times. From technology driven startups stimulating entrepreneurship and creating employment opportunities to green technology playing a key role in sustainable development by addressing the major concern of climate change and proposing renewable energy solutions with resource efficient processes to minimize environmental impact, technology most certainly has proven to be a savior while touching upon every single aspect of human life. The growing popularity of e-commerce and digital trade revolutionizing the way business engages in cross border transactions is just another example.

While there are divergent opinions on whether technology may be able to substitute/overpower humans, technology driven economies shall always require a skilled workforce with expert technological competencies in order to best utilize technology. Globalization has facilitated trade and encouraged technological

⁵⁰⁵ SCIENCE AND TECHNOLOGY IN ECONOMIC GROWTH (B. R. Williams ed., 1973)

advancements particularly the telecommunications and the transport sector reducing barriers and distances for the flow of goods and services including knowledge and information. Businesses have flourished and grown multiple times as they are now able to access international markets more easily.

All of this has opened up a plethora of opportunities for nations worldwide. The countries which can benefit the most from such opportunities appear to be the developing and the least developed countries (LDCs). The problems of these countries are widely known. To overcome the issues of inadequate standards of living and low economic growth rate these nations are trying their best to not only make ends meet but also to progress with technological advancements as a means to secure economic development.

Having discussed the importance of intellectual property rights (IPRs), more so in the contemporary world, developing countries that see technology transfer as part of the lucrative offer made to them by the developed nations during the time of entry into force of the TRIPS Agreement⁵⁰⁶, understand well that in order to attract and support transfer of technology need to build a technology supportive environment. To attract importation of foreign technology and to make possible its adaptation, creating such a favorable technological environment commands the enforcement of a strong intellectual property protection⁵⁰⁷. This coincides with the ultimate aim of the TRIPS Agreement that rooted for a common understanding and appreciation of intellectual property globally. Maybe one of the rationales behind the negotiations of the Agreement was preemption of technology and knowledge flows to the developing countries that went ahead with the idea of giving due legal recognition to its intellectual property. What would result from the enforcement and implementation of provisions in the laws or treaties is something very difficult to predict, but providing the signatories with an assurance that a healthy and fair competition would sustain by means of an intellectual property regime was foremost in the agenda of the negotiations that preceded the agreement.

⁵⁰⁶ Trade Related Aspects of Intellectual Property Rights, 1995.

⁵⁰⁷ Roy F. Waldron, *Intellectual Property: Facilitating Technology Transfer for Development*, 4 WORLD BANK LEGAL REV. 89 (2013).

By merely regulating the rights of the technology developers and owners through IPRs, the developing countries can promote economic development through ways that the State may consider most beneficial.

The most preferred way to achieve the same is by fostering local research and development (R&D) and fuelling it if it is at a naïve stage- Building on native and local research base and alliances is always beneficial in the efficient use of technologies. Development of technology is supported in this case in the home country itself and also helps mould and adapt to imported technologies. Strengthening the local research cannot be ignored even in the instance where a foreign technology is transferred⁵⁰⁸ while it may primarily be utilised in pushing for innovation. When technological inventions are developed in one's own nation, it saves the cost spent on royalties that are usually paid as consideration for the licensed technology from outside. While this cost saved may not amount to a lot of saving as investment on R&D for development of technology may cost approximately the same or sometimes even more. However, states feel that development of technology even requiring a little more capital should be the preferred method as it provides greater flexibility of making changes to the technology to suit the local needs as compared to technology borrowed from outside. Chances of higher expenditure on development of technology exist, but if successfully developed and run, the technology may turn out to manifest a breakthrough which when desired by other nations, be exported by the home country.

The technology would also incorporate the use of local raw materials which can result in an equally efficient foreign alternative leading to lesser dependence on the developed world⁵⁰⁹. There may be situation where some amount of dependence on developed countries exists. A country may have limited manufacturing capacity or may have the capacity to manufacture but the R&D generation couldn't be enough to map out the start to end of the idea of innovation. Hence foreign technology may be desired for copying purposes and subsequently locally manufactured.

Initiatives in this regard have been taken in some developing countries like India and Mexico. Mexico practices its intellectual property legislations in a manner that supports

⁵⁰⁸ Geoffrey Kransdorf, *Intellectual Property, Trade, and Technology Transfer Law: The United States and Mexico*, 7 B. C. THIRD WORLD L. J. 277 (1987).

⁵⁰⁹ *Id.*

local innovation and prefers it above foreign imported technology. India too, on the guidelines and markers of minimum standards as provided by the TRIPS Agreement has its Patent laws drafted in ways that support and protect innovation (even technology transfer). Section 83 (c) and (f) of the Patents Act⁵¹⁰ on the lines of the spirit embodied in Article 7 and 8 of the TRIPS⁵¹¹ states “that the protection and enforcement of patent rights 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”; and “that the patent right is not abused by the patentee or person deriving title or interest on patent from the patentee, and the patentee or a person deriving title or interest on patent from the patentee does not resort to practices which unreasonably restrain trade or adversely affect the international transfer of technology”, respectively.

Above this, the Government of India has taken certain initiatives as policies and schemes at the national and state level to boost innovation and research including-

- a. Amendment of existing acts and rules [including the Patents (Amendment) Act of 2005 and Patent Amendment Rules of 2020⁵¹², 2021 and developments in 2022⁵¹³]
- b. During the period from 2010 to 2020, Prime Minister Manmohan Singh designated it as the "Decade of Innovation," recognizing the imperative to integrate science, technology, and innovation (STI) to elevate India's standing among the leading scientific powers. In alignment with this objective, several STI policies were implemented during this period.⁵¹⁴
- c. Initiatives such as the ‘Make in India’, launched in 2014 by Prime Minister Narendra Modi. This initiative primarily aimed at fostering innovation along with protecting intellectual property more efficiently. It also focused on skill

⁵¹⁰ Patents Act 1970, https://ipindia.gov.in/writereaddata/Portal/IPOAct/1_31_1_patent-act-1970-11march2015.pdf

⁵¹¹ *Supra* Note 12 and 13, 5.

⁵¹² Arun Babu, Kochhar & Co., India: Patent Law Updates-August 2022 (Aug. 25, 2022) <https://www.mondaq.com/india/patent/1224750/patent-law-updates---august-2022>

⁵¹³ *European Union v. Union of India*, Delhi High Court (May 31, 2022)

⁵¹⁴ Scientific Policy Resolution 1958, Technology Policy Statement 1983, Science and Technology Policy 2003, Science, Technology and Innovation Policy 2013. The last STI policy is the policy of 2020 brought around the time of the covid-19 pandemic.

development and proposed construction of local manufacturing infrastructure in India.

Under the ‘Make in India’ initiative, the government in 2020 held the event ‘Defence Expo (DEFEXPO)⁵¹⁵’ in the city of Lucknow where the idea of establishing India as a Defence Manufacturing Hub was floated. This included discussions on devising strategies for export of defence products and sharing the technology with other nations (something particular to transfer of technology). The government has also come out with a report for the management of Intellectual Property Rights in Indian Defence sector. The government also under the initiative has provided for strengthening laws on intellectual property and lay focus on its enforcement including patents, copyrights and trademarks.

- d. Modernisation of IP offices is another successful effort now that the intellectual property infrastructure and its functioning are considered one of the key components of economic infrastructure. The legislations govern IP rights and the IP holder’s responsibilities but the human resources at the IP offices play as crucial a part in the process of grant and post grant as the legislation itself. The legislations also duly provide for such offices and the records that need to be maintained at such places in this regard. The IP offices are an important place for management of intellectual property including their scrutiny and examination process, storage of data, maintenance of records, and providing training. This setup of the offices may vary from one country to another⁵¹⁶. The government implemented a planned scheme named “Modernisation and Strengthening of Intellectual Property Office (MSIPO) in the 11th Five Year Plan (March, 2008) which continued in the 12th Five Year Plan. The objective of this scheme lay in strengthening the capabilities of the IP offices in India. The agency behind implementation of the scheme was identified as the Controller General of Patents, Designs and Trademarks (CGPDTM).”

⁵¹⁵ DEPARTMENT OF DEFENCE PRODUCTION MINISTRY OF DEFENCE, Outcome Report on India: The Emerging Defence Manufacturing Hub DEFEXPO18, Government of India, April 2018.

⁵¹⁶ Vadali Rambabu, Modernisation of Intellectual Property Offices in India: Ideas from the experience of the Japan Patent Office (2007) (Report submitted to the Tokyo Institute of Technology in fulfilment of the long-term Fellowship sponsored by the Japan Patent Office) (available at: <https://ipindia.gov.in/writereaddata/images/pdf/report-tambhu-vadal-march-2007.pdf>)

- e. Technology Transfer Promotion Programme (TTPP) is one of a kind programme that provides a platform for research institutions and industry partners to come together and collaborate on technology projects and help in the development of new technologies. This also provides an opportunity to the industry partners to invest in technologies that appear to be emerging, only to encourage further technological growth.

Mexico too, has in its efforts towards strengthening intellectual property, conceived the IP legislations in a way which showcases that the major beneficiaries of the law will be the foreign investors who wish to transfer technology. The Mexican IP laws cater more to public consideration when compared with other developed countries IP laws like U.S.⁵¹⁷ and attempt to balance the local interests with the need and desirability of attracting foreign investment.

The other method of fostering technological advancement to boost one's economy, remains, technology transfer from other developed nations- Countries who find difficulty in gathering resources to meet the ends of technological innovation, are left with the option of transferring technology and suitably adapting it thereafter. Not that the countries do not have an option of avoiding technology transfer (or not engaging in it willingly) but the reason it is considered as the other available option is the fact that if a country does not have ample resources to develop technology or borrow it to be able to be up to date with the ways that the society is changing, it shall be left far behind in terms of development. The developing nations or transition economies are called so, as they strive towards reaching the levels of development of the developed nations every day.

The ways in which technology transfer happens may differ. It may as discussed under the methods and mechanisms of transfer⁵¹⁸ of technology take any form- by import of foreign products (finished or intermediate), foreign direct investment, licensing of patents and many other. The motives behind transfer of the transferor and the transferee may also be completely different. While one may be more bent towards profits derived from the transfer and subsequent commercial exploitation of the technology the other

⁵¹⁷ See, *The United States and the North-South Technology Transfer: Some Practical and Legal Obstacles*, 2 WIS. INT'L L.J. 205 (1983).

⁵¹⁸ *Supra* Note 262, 112.

may be centred towards solidifying one's local technical capabilities and fostering research in innovation.

However the fact that intellectual property has a strong role to play in the transfer process is undoubtedly true. With both possibilities of technology (the subject matter of transfer) being patented or not patented existing, the question still remains- **which is a better route to transfer technology? Is the transfer process more likely to be successful if the transfer involves an intellectual property protected technology or without it? Just as import restrictions or tariffs are seen as barriers to the process**⁵¹⁹ and which may sometimes preclude the entire transfer, should IP also be seen under the same lens?

Discussing if technology transferred with intellectual property protection is a better pathway to development or not is a moot problem which may seem ineffectual. When the subject matter of transfer is a technology or the technology resulting in a product, the same is usually protected by patents under IP law as patents protect inventions which are judged on a three step criteria of novelty, non-obviousness and industrial application⁵²⁰. Although maintaining confidentiality about the technology or the finished product embodying the technology is difficult as the law demands complete disclosure of the invention as part of the application process⁵²¹ which is then published and examined by the patent offices, patent protection still remains the preferred mode of IP protection for technology not only due to the subject matter protectable under patents but also the twenty year monopoly period granted to the owner as term of protection⁵²².

Thus in order for the transferor (licensor) to want the transferee (licensee) to keep a part of the invention secret which has previously not been let out, a Non-Disclosure Agreement (NDA)⁵²³ would have to be concluded in addition to the license agreement

⁵¹⁹ Feinrider, *UNCTAD Transfer of Technology Code Negotiations: West and East Against the Third World*, 30 BUFFALO L. REV. 753-759 (1981).

⁵²⁰ Section 2(j), Patents Act 1970.

⁵²¹ Section 9, Patents Act 1970.

⁵²² Section 53, Patents Act 1970.

⁵²³ *Supra* Note 254, 107. "An NDA is a contract in which the parties to the contract promise to protect the confidentiality of any secret information disclosed to them. The contract creates a confidential relationship. The NDA can be mutual, in which both parties are exchanging secrets, or it can be a one-way agreement, such as when you disclose confidential information to an employee in order to grow your business or develop a product."

for technology upon transfer. On the occasion of a violation of any clause contained in the NDA, legal damages would ensue under the domestic contract law.

There may, in another situation, although rare, be a case where the technology or the technological product is not protected by means of a patent for any reason whatsoever. Sometimes the technology may be protected as a trade secret instead of a patent for want of keeping it under covers (as patent requires disclosure). Even when the technology has not been applied for a patent, the technology (invention) may have certain inherent rights that may be the subject matter of other intellectual property protection. Inherent as some other forms of IP may not require registration for the grant of monopoly. In this situation the technology will have inherent trade secret protection without registration, provided the essentials of keeping information secret are met⁵²⁴. If the technology is not patented, but it is still proprietary in nature the transfer of the same shall happen through a contractual agreement and a series of NDA's for upkeep of the confidential information or trade secret.

Since non-proprietary technologies can be found in public technical literature or as part of records that are publically available, the transfer issues of those do not arise. They form the base for reproduction, copying or reverse engineering production methods. A case of non-proprietary technology can also be once the patent has expired and the technology falls in the public domain. In such a scenario the technical know-how would still have copyright⁵²⁵ or trade secret⁵²⁶ protection which can be relied upon for making transfers. Since the technical know-how is mostly written or documented it qualifies as subject matter of protection under copyright in the form of literary work; the reason why some technology developers may consider protecting it under copyright.

Transfer of technology has variations and can be seen to exist in parts. There can be just a plain transfer of technology (a process or a finished product as a physical

⁵²⁴ That the knowledge:

1. is secret in a way that it is generally not known to people except those who normally deal with such information;
2. has an economic value attached to it because of the secrecy; and
3. significant measures have been taken by people who are generally in control of such knowledge to maintain secrecy of the information.

⁵²⁵ Term of copyright: "Life of author plus sixty years from the year following the year in which author dies."

⁵²⁶ A trade secret does not have a fixed term of protection and can be protected till eternity. A trade secret loses protection upon disclosure or if it is discovered or if legally acquired by another entity to be communicated to the public.

manifestation of the technology), or a transfer of technical know-how⁵²⁷ or transfer of technology accompanied with a transfer of technical know-how that is considered an integral part of the technology and something which if not transferred along with the technology may make the process of transferring technology redundant. In certain circumstances for example, it may so happen that the transferee may not be able to make use of the technology transferred to him as part of the subject matter of agreement governed by its terms and conditions unless, there is transferred alongwith the licensing agreement, the technical know-how through contract/NDA concerning the operations and functioning of the technology.

Thus, picturing a scenario where transfer of a technology or product takes place which in no way has any intellectual property attached to it is difficult. There would not be much difference in the landscape of technology transfer involving a process to transfer technology which is not patented. Based on the kind of agreement (a licensing agreement or a non-disclosure agreement), only the nature of right changes.

Typically, a technology can be better assessed and subsequently transferred when it is protected by intellectual property rights. The reasons for the following can be:

- Valuation of IP: IP valuation is done based on market forces and provides a rough estimate on what the intellectual property should be worth when commercialised in the market. If the technology/product is patented, the transferor shall have in mind the value of his invention at the time of effectuating the transfer. This may also help in the determination of royalties.
- Systematic Process: The protection of technology by IPRs may offer a smooth and a systematic formal process of transfer by limited but known mechanisms to transfer technology. In the absence of well-defined guidelines, rules or legislation on technology transfer in nations as parties to the transfer, intellectual property may provide clarity on how to transfer the patent (where transfer of protected technology is the transfer of patent on the technology), assigning or licensing the technology.
- Public Interest: Almost all IP come with a term of protection which is usually provided for keeping in mind the public interest. Public interest is catered to

⁵²⁷ Commissioner of Customs Vs. M/s. Parasampuriah Synthetics Ltd., 2001(133) ELT 9 (SC)

when the IP loses protection and public gets total access to the intellectual property without having to pay extra in the nature of royalties which is the reward of the monopoly enjoyed by the holder. Public interest is better considered with the transfer of a patented technology where both transferee and the transferor know that the agreement holds valid so long as the patent exists. Once monopoly rights extinguish on the expiration of a patent, the transferor would have no ownership rights to be able to transfer any right related to the technology and the same would anyway form part of the public domain ensuring access to everybody.

Transfer of an unpatented technology by means of a contract may or may not address issues regarding public interest. However, this holds true only with patent and copyright protection which have fixed terms of protection. Technology or technical know-how protected as trade secrets owing to the nature of secrecy will keep public aloof from its access (although copyright too has a very lengthy term of protection).

- Nature of Rights: There would be an ease in assigning or licensing the rights to a protected technology on transfer as owing to IP protection there would be enough clarity on the nature of rights that are transferred with the technology. Intellectual property with its right to exclude others has rights to using, selling, reproducing, offering for sale, distribution and many other depending upon the nature of IP. In transfer of an unprotected technology, with consensus among parties the nature of rights may be included in the transfer agreement upon transfer. If seen from the other perspective, transfer of unprotected technology can provide greater flexibility on the agreement of transfer of rights.
- Well-drafted legislations: As far as IP is concerned, almost all nations developed, developing and least developed have IP legislations in place, barring a few on the world map. In pursuit of the enforcement of intellectual property the TRIPS Agreement has been a very encouraging factor. These IP legislations set out rules which govern intellectual property come in handy in the event of a dispute relating to rights and obligations whereas for technology transfer except for a few developed nations like the U.S., majority of the developing nations do not have legislations on transfer of technology. Thus in the absence of any laid

down law or proper guidelines, it becomes difficult and rather confusing to pan out the source of legal remedies for the enforcement of rights.

These remedies would be an easy go-to in case of any violations or rules regarding the transfer of technology that shall bind both the parties to the transfer. In the absence of such guidelines, the parties usually agree to be bound by common law tort or contract remedies⁵²⁸ for breach of confidence/contract.

Thus it appears that the technology transfer route with intellectual property is more likely to lead to a successful transfer. Over and above these reasons, intellectual property can generally help and facilitate technology transfer in a number of ways:

- **Through Disclosure:** As patent applications require the inventor to fully disclose his invention in the application⁵²⁹, the disclosure to the public (on publication) acts as a means of sharing of detailed knowledge which can become the basis for further innovation. It also makes it easy for others to understand and replicate the technology.
- **Incentives for Transfer:** As IPRs provide monetary incentives and a term of monopoly for the intellectual property, there is a general motivation to create more. These incentives drive the technology owners/inventions to create and share more by transferring, as transfer with an aim of commercialisation reaps more benefits.
- **Collaborations and Partnerships:** IPRs serve the means of connecting technology owners and potential companies which help exploit the technology commercially through licensing agreements. This results in the formation of partnerships and collaborations between people from different fields. For e.g. university-industry partnership. International and cross-border collaborations also are able to occur often because of intellectual property legal protection in international contexts.
- **Reduction in unauthorised use:** Since IPRs legally protect intellectual property and provide for restraints against unauthorised use with specified repercussions for infringement, technology as a property is generally protected. Inventors also

⁵²⁸ Specific Relief Act, 1963.

⁵²⁹ *Supra* Note 17, 6.

wish to have IPR protection for their creations owing to the reduction in risk of technology leakages and unauthorized commercialization.

Intellectual property also helps budding industries where technology is a key driver of growth, to take part in technology transfer operations successfully.

GUIDELINES ON TECHNOLOGY TRANSFER AND LACK OF LEGISLATION

With transfer of technology, the biggest concern remains that there is no law on Technology Transfer in India. Having a legislation on transfer of technology is the need of the hour for developing countries like India. A well codified law is basically needed to standardise the dealings and procedural aspects for future claims and disputes which may arise on those claims. Technology like how it is being transferred today has its own limitations and restrictions. Transfer of technology usually takes place through transfer of technology agreements and general contracts⁵³⁰ which limits the parties with the remedy of that of general contract only. If a *sui generis* system is enacted to regulate the working of technology transfer it would offer a given set of suitable remedies which may be infringement appropriate. In doing so, help from such developed nations could be taken which already have a law on technology transfer in place. This way, the understanding on common issues arising out of the technology transfer process between the parties would be much more effective and there is likely to be more consensus on the terms and conditions of the transfer.

Technology transfer should not be seen only from the perspective of it benefiting the developed, transition or the least developed economies. It is evidently clear that both developed and developing nations need to cooperate for common problems trying to find solution which can work out for both of their “common benefit” and technology is seen as one of these areas for cooperation.

The governments of the developing nations must also do a lot to bringing an appropriate and a suitable legal framework which regulates and governs technology transfer. An unquestionable fact is that for developing countries like India, Brazil, Mexico,

⁵³⁰ *Supra* Note 252, 106.

Kuwait⁵³¹ and the like, having enactment of laws and regulations on technology transfer in order to enhance indigenous capabilities, is the need of the hour. The legislation will not just regulate and provide for the process of transfer but will also help establish a favourable environment for research, development and transfer of emerging technologies for economic transformation⁵³².

The reasons for the developing nations to formulate policies are not just limited to its overall economic development and technological transformation, but also extend to enriching its own technological base to support development of technologies. Many a times, these nations benefit from successful technology transfer agreements by receiving the technology they desired for, but the technologies as transferred (in the same form) may not turn out to be appropriate to the receiving nations local conditions and needs. This makes the developing nations feel that they are at a disadvantage to not be able to work on the technology to be able to make it need specific due to certain economic factors. Thus, having resources to spend on the research and development of the technologies is as important as having a law in place and of these two, one may influence another. For e.g. if the government decides to spend on research it may feel that there is a need to enact a law too or if there is a law in force, it may feel motivated to gather resources for technological research to be able to give effect to the provisions contained in the law.

The technological development inferiority of the developing nations makes the developed nations feel at a position of superiority even though the situation may be one of “mutual benefit” (all situations in a way are of mutual benefit only unless the technology is being transferred gratuitously). This attitude has to and should change. Not once should the developed nations overlook the obligations laid down in the international agreements⁵³³ which they themselves very confidently rooted for in order to boost their trade.

Some limitations that the developing nations face by being on the receiving end of the transfer process as regards technology can be stated as:

⁵³¹ Salahaldeen Al-Ali, *Laws and Regulations on Technology Transfer to developing countries*, 18(5) SCIENCE AND PUBLIC POLICY 295-300 (1991).

⁵³² UNCTAD, *Handbook on the Acquisition of Technology by Developing Countries* (United Nations, 1978).

⁵³³ The TRIPS Agreement, 1995.

- Grant-back provisions⁵³⁴ where the recipient nations are required to transfer back the rights to transferor for the improvements that they made on the acquired technology.
- Exclusive dealing which may sometimes require the party acquiring the technology to enter into agreements of manufacture or sale for similar or competing technology or products only. It limits the use of the borrowed technology into totally different domain.
- Tying arrangements where the acquiring party is forced to accept and pay for additional technologies (along with the desired technology) which it did not even want.
- Restrictions may also sometimes be put on the usage of the technology and know-how once the agreement expires in the instance of lack of clarity regarding the same in the transfer agreement.

Bargaining positions and “unpackaging of technology”

The governments of the developing nations are being encouraged to act on the issue of balance of payments issue which may arise due to economic reasons. Guidelines by the United Nations in its draft Transfer of Technology (ToT) Code which was negotiated under the auspices of United Nations Conference on Trade and Development between 1976 and 1985⁵³⁵ focused on how the bargaining positions of the transferring country (mostly developed) and the recipient country (developing) should be appropriately balanced in light of the “mutual benefit” that both derive from the process and that developed countries do not use their “stronger position” to dominate the terms and conditions of the transfer. It should be made sure by the governments of both the countries that there should be no abuse of dominant position and that both the countries reach the agreement on mutually satisfactory terms.

In addition to this, the UNCTAD recommended certain pointers which may be kept in consideration during negotiation process and those which may be consistent with a “regulatory approach” to technology transfer. These points are-

⁵³⁴ *Supra* Note 405 and 406, 164.

⁵³⁵ UNCTAD, *Draft International Code of Conduct on the Transfer of Technology*, (1985); UNCTAD, *Legislation and Regulations on Transfer of Technology: Empirical analysis of their effects in selected countries*, report by the UNCTAD Secretariat (August 28, 1980).

- “Unpackaging” of technology- Governments should also ensure that in light of the special needs of the developing countries, “unpackaging of technology” is promoted and suitable arrangements are made for the same. Unpackaging of technology was a term given by the United Nations referring to the appropriate information about the various elements and sub parts of the acquired technology that the developing countries would require for “technical, institutional and financial evaluation” of the transaction and to utilise the technology fully and most efficiently. Such information has to be transferred as well along with the technology.
- Specifications of restrictive business practices- A limitation on business practices pertaining to the production, selling and importing of the technology or related product which is not anti-competitive and which ought to be obliged by both parties may be specified to be refrained from beforehand by the parties in order to avoid disputes relating to claims in the future.
- Establishing rights and responsibilities is essential in the absence of specific legislation on technology transfer. It involves defining a set of rules that outline the rights and duties of the parties involved, considering their legitimate interests and recognizing disparities in their bargaining positions.

Technology Transfer Regulations in India

At present, the IP legislations in India like the Patents Act 1970, The Copyright Act 1957 and the Trademarks Act 1999 to name a few, govern and regulate protection granted to intellectual property in India along with its exploitation and use. All of these legislations in extending protection to IP, contain provisions which specify procedures for transferring IPRs relating to the property and the same is interpreted as provisions pertaining to transfer of technology when the transfer relates to the transfer of a patent with respect to the protected technology⁵³⁶.

As technology today has gained such paramount importance that it is considered as “the medium of transforming an idea into reality”, laws on transfer become equally important. Even though India could not come out with a clear legislation, it still made efforts to come out with rules. An initiative in the form of Technology Transfer Commercialisation Rules 2020 was conceptualised which through which various

⁵³⁶ *Supra* Note 67, 20.

mechanisms like licensing, agreements and joint ventures could transfer technology successfully, however, it could not be codified. The Department of Space, Government of India in the year 2020 as an initiative by Indian Space Research Organisation (ISRO), came out with Revised Technology Transfer Policy Guidelines⁵³⁷ and called for public comments and recommendations on it from policymakers. The department which is the concerned administrative authority in respect of space activities decided to issue appropriate guidelines from time to time as desired in respect of transfer of technology for the development of the nation. ISRO discusses the technology transfer organisations at ISRO, how the groups and committees that are formed in this regard, work and the various sponsored research programmes by the organisation with academia and industry partners.

Apart from these policy and scheme initiatives by the government, generally the technology transfer process is regulated by the Indian Patent Office which not only reviews and examines applications for patent but also look after the transfer of IP rights leading to transfer of technology. The Patent Office has also come out with guidelines on Technology Transfer and Intellectual Property Rights⁵³⁸ which are to be followed by institutions which receive funded projects by the Department of Biotechnology, Ministry of Science and Technology.

The relevant provisions of the IP legislations on transfer are thoroughly interpreted. Apart from the IP legislations, some other laws containing provisions relating to technology transfer can be interpreted to address the regulation of transfer process in India. A summary of the following is as follows:

- **Intellectual Property Rights:** According to the Patents Act, the particulars of assignments and licenses of the patent shall be registered and documented in the register of patents at the patent office along with details/particulars of “any such matter affecting the validity or proprietorship of patents”. This record shall be maintained under the control and management of the Controller of Patents⁵³⁹.

⁵³⁷ See, *Technology Transfer Policy Guidelines 2020*, Capacity Building Programme Office, Indian Space Research Organisation, Department of Space, Government of India, C.19013/131/2015-Sec.3 (December 02, 2020) <https://sarinlaw.com/wp-content/uploads/2021/09/Tech-Transfer-Guide-Dec-2020.pdf>

⁵³⁸ See, *Instructions on Technology Transfer and Intellectual Property Rights*, Annexure V, DBT Ministry of Science and Technology, <https://dbtindia.gov.in/sites/default/files/AnnexureV.pdf>

⁵³⁹ Section 67, Patents Act 1970

A mark registered as a valid trademark under the Trademarks Act or even an unregistered mark, is assignable and transmissible with or without the goodwill of the business and can even be licensed out to third parties. This transfer also must be registered as evidence to ownership⁵⁴⁰.

The Copyright Act also enables the author (who is also the first owner⁵⁴¹) to grant his rights to third party by means of assignment and licensing with regard to his intellectual work which must be in writing and signed by the assignor⁵⁴².

These transfers specify the nature, extent and duration of rights along with any other affiliated rights that may be transferred.

- **Indian Contract Act, 1972:** Technology Transfer Agreements are commonly in the nature of a general contract. If the technology is protected by IPRs the nature of dealing may find its mention in one of the IP laws and which is normally followed. However if unpatented, the course of effectuating the transfer is through different kinds of agreements. An agreement enforceable by law is a contract. Some amount of enforceability is included in these agreements by which one can hold the other party liable for what has been promised in the agreement. The most comprehensive legislation governing contracts is the Indian Contract Act of 1972. Applicable rules are tailored out to suit the nature of agreement. Owing to the nature of agreement as a general contract, rules from the Contract Act may help as yardsticks to incorporate similar provisions in the transfer agreement.
- **Foreign Exchange Management Act:** Some rules of the Foreign Exchange Management Rules 2000 can be interpreted to be pertaining to foreign technology agreements. One of the rules⁵⁴³ states that the Government of India (Ministry of Commerce and Industry) must first validate the withdrawals of foreign currency that are to be paid as royalty payments as consideration for technical collaborations and partnerships with foreign firms. The approval would be required in cases where “the royalty payment exceeds 5% on domestic sales and 8% on exports and the lump-sum payment exceeds USD 2 million⁵⁴⁴.”

⁵⁴⁰ Section 37, Trademarks Act 1999

⁵⁴¹ Section 17, Copyright Act 1957

⁵⁴² Section 18 and 30, Copyright Act, 1957

⁵⁴³ Rule 4 of the Foreign Exchange Management (Current Account Transactions) Rules 2000

⁵⁴⁴ Item 8 of Schedule II to the Foreign Exchange Management (Current Account Transactions) Rules, 2000

It also provides instances where mentioned⁵⁴⁵ banks may authorise withdrawals to be paid as royalty for technical partnership agreements involving transfer of technology without the consent of the Ministry.

➤ **Competition Act, 2002:** The competition act which was enforced to establish healthy competition in the market and to prevent market failure, contains provisions carving out exceptions for the exercise of intellectual property rights. One major provision in the competition act which relates to IPRs is the section dealing with anti-competitive agreements⁵⁴⁶. Sub clause (5) excludes from the purview of anti-competitive agreements anything that an IP holder does to reasonable restrain a third party from infringing his right. It also states that these rights may be conferred upon the holder under any of the IP legislations. Thus, it can be concluded that a technology owner under such provision is fully entitled to take necessary steps to prevent violation/abuse of the IP rights attached to his technology/technological product in order to safeguard his rights to the IP.

➤ **National Intellectual Property Rights Policy:** The national IPR policy as a policy was approved by the government in 2016⁵⁴⁷ to lay the path for the future prosperity and awareness of intellectual property rights in India. The policy was drafted with the realisation that there is no dearth of creative ideas and innovative thoughts and the same need to be channelized well by means of legal protection. The policy addresses all IPRs and discusses how they are inter-lined and discusses creation of an institutional mechanism for their review, monitoring and implementation. It also strives to achieve and bring the best practices applicable to the Indian context.

The policy outlines seven objectives which are bifurcated into further units in which are addressed the issue of promotion of technology transfer multiple times⁵⁴⁸.

⁵⁴⁵ Category-I banks

⁵⁴⁶ Section 3 (5) (a)-(f), Competition Act, 2002

⁵⁴⁷ See, *National IPR Policy*, Department for Promotion of Industry and Internal Trade, <https://dpiit.gov.in/policies-rules-and-acts/policies/national-ipr-policy>

⁵⁴⁸ “2.3 Undertake studies to assess the contribution of IP content in different industries on the economy, employment, exports and **technology transfer**.

3.4 Pursue **transfer of clean technology and know-how** from developed countries to India, as per the provisions of Article 4 of the UNFCCC, in order to meet the objectives of reducing anthropogenic emissions of GHGs and support activities of climate change adaptation.

The relevant provisions of the above legislations and policies seem to govern technology transfer in India.

If the transfer is between persons/entities from different countries resulting in a cross-border transaction, then a conflict will be a conflict of laws issue, dealt by private international law. Generally countries that have trade agreements have some sort of provision for Transfer of Technology as well containing jurisdiction and applicable law clause in the agreement between private parties. If the transaction is between states or between a state and a private party, then it might become a public international law issue, something for which the parties would have to approach the WTO for its dispute resolution mechanism.

Thus, the importance of having a law on technology transfer is evident. Not only will the dispute resolution be easier but the regulation and governance of technology transfer agreements will become a lot more methodical. India could, in this regard, take inspiration from countries that have a systematic law on transfer of technology.

COUNTRIES WITH LEGISLATION ON TECHNOLOGY TRANSFER

United States of America

U.S. being one of the pioneer developed nations has always focused on research and development for fulfilling its developmental goals. Estimates suggest that U.S. spends approximately \$100 billion for its research activities every year. Congress, in pursuit of the same, enacted a series of legislation concerning technology transfer since the 1980s. All such laws required and encouraged the private sector to most efficiently commercialise technology that was federally funded by transfer of such technology.

The first major enactment was the Stevenson-Wydler Technology Innovation Act of 1980. This law for technology transfer pushed research laboratories to actively participate in technology transfer activities and even draw out a budget to be spent on such activities annually. These federally funded research labs and organisations were

3.9 Examine the **issues of technology transfer**, know-how and licensing relating to SEPs on fair and reasonable terms and provide a suitable legal framework to address these issues, as may be required.
5.2 **Promote** licensing and **technology transfer for IPRs**; devising suitable contractual and licensing guidelines to enable commercialization of IPRs; promote patent pooling and cross licensing to create IPR based products and services.”

to set up offices that could test technology applications and engage in research to be able to coordinate transfer better.

Around the same time the Bayh Dole Act 1980⁵⁴⁹ was passed in order to incentivise and enhance the commercial exploitation technology which was the result of government funded research. It encourages university-industry partnerships and allows university to own patents for their inventors even if it is borne out of government funded research so that these institutions can earn royalties for their creative output.

The U.S. has since 1986 the Federal Technology Transfer Act (FTTA)⁵⁵⁰ enacted by the Congress. This act brings an amendment to the earlier Stevenson-Wydler Technology Innovation Act by improving industry access to federally funded research laboratories. The government inventors can still receive royalties for their patents when they are licensed to a third party. The act was also responsible for establishing a Federal Laboratory Consortium for Technology Transfer, which was a network connecting over three hundred government research agencies and laboratories. These labs had the power to negotiate the license terms of patented inventions made at the laboratory and even conclude one of Cooperative Research and Development Agreements (CRADAs). A CRADA is “a formal written agreement between one or more federal laboratories and one or more non-federal parties under which the government, through its laboratories, provides personnel, services, facilities, equipment, intellectual property, or other resources.” However, federal laboratories providing funds to the non-federal parties was not permitted under the Act.

The Act was followed by the National Technology Transfer and Advancement Act in 1995 that made CRADAs more lucrative to federal laboratories and to private companies as well. The law had provisions promising U.S. companies a robust intellectual property protection provided they were able to successfully commercialise the inventions rising from a CRADA. In general, the law also encouraged the development of new technologies⁵⁵¹. This was followed by the Technology Transfer Commercialisation Act 2000⁵⁵², which created a network of more than seven hundred

⁵⁴⁹ The Bayh-Dole Act or Patent and Trademark Law Amendments Act, 35 USC § 200–212, 1980

⁵⁵⁰ Federal Technology Transfer Act, 15 USC 3710, 1986

⁵⁵¹ See, *Technology Transfer*, United States Patent and Trademark Office, <https://www.uspto.gov/ip-policy/patent-policy/technology-transfer>

⁵⁵² Technology Transfer Commercialisation Act, 2000 15 USC 3701

federal laboratories together with academic institutions and private industries. The law enlarged the scope of technology transfer and promoted the strength of the nation to actively compete in the global market as regards technology and related inventions.

Two more legislations, the America Invents Act, 2011 and The Federal Technology Transfer Legislation and Policy have their roles to play in technology transfer. While the first suggested changes in the patent filing system by moulding the grant of protection to a “first inventor to file” rather than “first to invent”. The technology transfer policy on the other hand was conceptualised by the Federal Laboratory Consortium as related guidelines on advancement of technology and its transfer.

Philippines

The State of Philippines has vowed to promote science, technology and innovation (STI) for essential developmental progress as a developing economy. Realising this, the country gives importance to publically driven research and development and calls for the support and participation of interested stakeholders in the drafting of policies regarding science and technological innovations. With the same thought in mind, the nation came up with the Philippine Technology Transfer Act of 2009⁵⁵³ as a landmark representing STI to be the forerunners of technological advancements, setting the tone for economic development and overall growth. In an attempt to achieve the development, utilisation and transfer of technology, the utilisation and transfer of intellectual property was deemed indispensable and thus the Act lays focus on the protection, transfer and dissemination, management and commercialisation of not just technology but intellectual property along with the knowledge resulting from research and development.

The State has established Research and Development Institutions (RDI) that are funded by the government funding agency (GFA). The goal is to make these institutions fully capable of recognising and tapping the potential of intellectual property rights for their most optimum commercial utilisation. Overall, this national statute significantly impacts the promotion of a national innovation system (NIS), which has gained worldwide recognition in the development sphere. Innovation, as a fundamental aspect, plays a critical role in assessing capabilities, evaluating progress, and shaping the

⁵⁵³ Republic No. 10055. Came into force on March 23, 2010

developmental path of numerous industrialized and advanced nations. Additionally, the role of research and development institutes (RDIs) in developing countries might require adaptation to further support innovation efforts.

Following and building on it as a policy matter the Philippine Constitution of 1987 incorporates within itself provisions⁵⁵⁴ relating to the promotion of scientific temper and innovation⁵⁵⁵. The Department of Science and Technology (DOST) in a study has revealed that though there may be public funded R&D giving rise to new technologies, very few of them have been commercially exploited with only a handful of the private companies that have been licensed the rights to the technology. In short, certain impediments to technology transfer have been raised. To name a few –

- i) Shaky and incapacitated public-private collaborations/partnerships
- ii) Lack of a vigorous and efficient system for technology transfer
- iii) Proprietorship issues on technology and knowledge
- iv) Lack of resources available to be utilised for technology transfer
- v) Weak policies
- vi) Weak IPR protection offered

Inspired by the successful Bayh-Dole Act in the U.S. and its effect on technology transfer in the country, Philippines realised the concerns that it was facing which could take shape of major setbacks for purposeful technology transfer for the country, and enacted Philippines Technology Transfer Act which could help formalise a conducive policy environment where both intellectual property and technology can thrive.

Similar to the legislations in the U.S. this law also provides for retention of ownership of the IP generated by institutions from publically funded research. The RDIs shall also have the authority to make use of the income generated from the commercialisation of IP for research purposes. The law provides for capacity building for RDIs to make them empowered so much so that they can manage and commercialise their own IPs effectively with the help of Technology Licensing Offices and Technology Business Development Offices. In the event of a national emergency or similar occasions of

⁵⁵⁴ Article XIV, Sections 10-13, 1987.

⁵⁵⁵ Albert P. Aquino et. al, *The Philippine Technology Transfer Act*, E-Journal of Food and Fertiliser Technology Centre for the Asian and Pacific Region (November 13, 2018) <https://ap.fftc.org.tw/article/1350>

urgency, the law as a safeguard provision authorises the government to march-in and commercialise the IP without permission of the patent holder⁵⁵⁶.

Nepal

Rising from the status of a least developed country (LDC) to a developing nation, it has been a very long and tiring journey for Nepal. First declared as a least developed country in the 1970s, it is indeed a huge victory for Nepal to have qualified as a developing country in 2021⁵⁵⁷ after having qualified two major parameters of development index. Out of Income Index, Human Assets Index and Economic and Environmental Vulnerability Index⁵⁵⁸, the country the last two indexes which assessed different factors such as health, education, agricultural production, level of hunger/poverty and the country's potential to cope up with natural disasters.

In its battle to win the title of a developing nation, much attention has gone into strengthening the efforts for technological innovation. Nepal enacted The Foreign Investment and Technology Transfer Act 1992 with the end of promoting the inflow of foreign investment into the country, which shall facilitate transfer of technology as a consequence. Understanding that data is the new oil and that it is technology that can predominantly fuel the economy, the law was brought into force to mobilise capital and human resources to the maximum possible as regards innovation to make the economy far more dynamic and competitive.

The act which was enacted in 1992⁵⁵⁹ was replaced by the Act of 2019⁵⁶⁰ which intended to “amend and consolidate laws relating to foreign Investment and Technology Transfer”. The act proposed a growth driven and employment generating economy for its people by means of creation of an environment friendly to research, foreign direct investment, technology development and one leading to increase in productivity. The

⁵⁵⁶ A. P. Acquino et. al, *From Laboratories to the Market: The Legal Regime for the Transfer of Government-funded Research to the Commercial Sector*, 3(2) Policy Brief, Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development- Department of Science and Technology.

⁵⁵⁷ See, Press Release, UN General Assembly graduates Bangladesh, Nepal and Laos to developing countries bloc, PTI, THE HINDU (November 25, 2021) <https://www.thehindu.com/news/international/un-general-assembly-graduates-bangladesh-nepal-to-developing-countries-bloc/article37681442.ece>

⁵⁵⁸ LDC Identification Criteria and Indicators, Economic Analysis, Department of Economic and Social Affairs, United Nations.

⁵⁵⁹ The 2019 Act repealed The Foreign Investment and Technology Transfer Act of 1992 (Section 53).

⁵⁶⁰ The Foreign Investment and Technology Transfer Act, 2019

Act under Section 7 provides for investments made to the country in the form of technology transfer⁵⁶¹. The terms and condition to the transfer may be, as commonly done, specified in the transfer agreement itself which may be concluded between the parties (the foreign investor and the concerned industry). The mechanism for dispute settlement is also provided under the act⁵⁶² wherein the parties shall resort to mutual discussions and negotiations or even arbitration in accordance with the rules of UNCITRAL⁵⁶³.

Mexico

Laws on technology transfer in Mexico have most commonly been integrated with intellectual property laws. Just as the developed nations realise the interrelation between intellectual property and technology transfer, the developing nations too, inspired by the ideology, have framed laws wherein the promotion of technology transfer has been dependent on an efficient code of protection offered to its intellectual property.

Intellectual property related to technology, technological products, or technological knowledge is extensively addressed within the national laws of Mexico and the North American Free Trade Agreement (NAFTA). Recognizing the significance of intellectual property rights (IPRs) as a crucial business asset, efforts have been made to underscore the importance of safeguarding IP in shaping Mexico's trade identity. Similar to the TRIPS Agreement, which establishes minimal standards for IPR protection across its signatories, NAFTA extends these minimum standards to protect IPRs within Mexico, the U.S., and Canada under the Free Trade Agreement. While minimum standards indicate the least amount of protection required, these nations typically go beyond the minimum requirements, providing enhanced protection in practice.

The Federal Law on the Protection of Industrial Property 2020 repealed the earlier Law on Industrial Property 2018. Mexico, by means of the law guarantees complete and swift enforcement of protection to IP along with technology transfer. Infringement of trade secrets have been considered a criminal industrial offence and liable to be

⁵⁶¹ *Id.* Section 7

⁵⁶² Section 40: Settlement of disputes

⁵⁶³ United Nations Commission on International Trade Law.

punished⁵⁶⁴. Infractions of any kind of intellectual property may call for penal actions under the Act.

Mexico also has a law on technology transfer which is also known as the New Mexican Transfer of Technology Law⁵⁶⁵. The initial Mexican technology transfer law⁵⁶⁶ was repealed and replaced by the “New Law on the Control and Registration of the Transfer of Technology and the Use and Exploitation of Patents and Trademarks⁵⁶⁷”. This New Technology law is a fair improvement of the earlier law and provides help with the regulation of selection of foreign technologies to be transferred into Mexico as per the needs and requirements of the country. The law provides for proper documentation of the technology transfer agreements with the National Register of Transfer of Technology (the register). The new law also states that in order to register the agreements, the agreements must meet certain laid down criteria by the government of Mexico. The law also allows the registrability of more types of transfer agreements as well as provides stricter sanctions for violations of the terms as compared to the old law⁵⁶⁸.

Keeping pace with globalisation and heavy industrialisation, Mexico aims to raise its economic standards to be able to provide ample for its people. To have hold of this level of economic security, there is a continuing need for the country to procure technology from outside. It believes a time may come, when the nation can attain independence from foreign capital. As regards technology transfer, Mexico has presented a good case for itself in terms of development and adaptation. Mexico’s efforts in shaping a society open to healthy technology transfer process shows immense amount of dedication of the country in its evolution with technology over time⁵⁶⁹.

⁵⁶⁴ “Article 386, The Federal Law on the Protection of Industrial Property 2020”

⁵⁶⁵ See, Wannell Baird, *The New Mexican Transfer of Technology Law*, 12(1) DENVER JOURNAL OF INTERNATIONAL LAW AND POLICY 107-120 (Jan 1982).

⁵⁶⁶ Law on the Registration of the Transfer of Technology and the Use and Exploitation of Patents and Trademarks, 1972.

⁵⁶⁷ 1982.

⁵⁶⁸ Melanie Trevino, *Regulation of technology transfer: The Mexican experience*, 14 THE JOURNAL OF TECHNOLOGY TRANSFER 46-51 (1989).

⁵⁶⁹ Alan L Hyde, *1981 Mexican Transfer of Technology Law*, 15(1) INTER-AMERICAN BAR ASSOCIATION XXIII CONFERENCE 37-45 (1983)

Argentina

Argentina's enactment of the initial law on technology transfer in 1974⁵⁷⁰, has been a major milestone in helping the economic landscape of the country reach new heights. The law went through a series of amendment whereby a new law was brought into force in 1977⁵⁷¹ and then finally in 1981⁵⁷². As its laws on technology transfer became progressive, so did the nation's economic policies. From the history of Argentina's laws on technology transfer, it can be made out that these laws have shared some relation with the foreign investment statutes. Of course, foreign investment into the country is deemed as one the major mechanism for technology transfer. The law is also considered a small part of the laws that govern foreign currency transactions.

The present law on transfer of technology⁵⁷³ in Argentina has established a legal regime including transfer of intellectual property which is applicable to agreements that concern technology transfer and the licensing of trademarks, patents, copyrights or other intellectual property as the case may be. These agreements may be concluded between resident organisations and non-resident organisations or private companies, whether interrelated or not, by means of which the rights to the technological inventions may be transferred from the non-resident organisation (along with the transfer of IP) to the resident organisation.

The Transfer of Technology Law (22.426) mandates that such agreements be registered with the Argentine Trademarks Office (INPI) so as to help build clarity on the flow of technology transfer, although no strict sanction is made applicable for the violation of this requirement⁵⁷⁴. Consequently, the registration of the agreement with the office has no bearing on the enforceability of the transfer agreement; nevertheless the requirement shall be followed in good faith. Maintaining proper record of the concluded agreements shall always serve a good purpose as regards documentary evidence and establishment of rights or ownership and for other tax benefits⁵⁷⁵.

⁵⁷⁰ The 1974 Argentine Law on Transfer of Technology, 1974 (No. 20.794)

⁵⁷¹ Law on Transfer of Technology No. 21.617

⁵⁷² The Transfer of Technology Law No. 22.426

⁵⁷³ *Id.*

⁵⁷⁴ *See*, Transfer of Technology Law No. 22.426, Translation provided by WIPO (2011) <https://wipolex-res.wipo.int/edocs/lexdocs/laws/en/ar/ar059en.pdf>

⁵⁷⁵ Guillermo Cabanellas, *The Argentine Transfer of Technology Law: An analysis and commentary*, 3(1) HASTINGS INTERNATIONAL AND COMPARATIVE LAW REVIEW 29-103 (1979).

Brazil

The Industrial Property Code regulates intellectual property laws in Brazil. Initially the Act No. 5.772 (The Industrial Property Code of 1971) governed intellectual property, after which the Industrial Property Law- Law N° 9.279, of May 14, 1996⁵⁷⁶ was enforced that continues till this date. The law specifically addresses transfer of technology⁵⁷⁷. It mandates the Brazilian Patent and Trademark Office (also known as the INPI) to register all technology transfer contracts so that they can be implemented with respect to third parties. The INPI has for decades played a very active role in judging the effectiveness of technology transfer through scrutiny of the formal aspects of the license agreements and also the terms and conditions. In addition to this, recently the regulations concerning technology transfer in Brazil have undergone major changes in order to make the process more meaningful.

Two ordinances namely N° 26/2023 and 27/2023 were issued and published by the INPI on July 11, 2023⁵⁷⁸, as a declaration of simplifying the reviewing process of INPI of the legal aspects and technical understandings of technology transfer license agreements with the aim of betterment of the services related to recordal of technology transfer agreements in Brazil. One major change affected the understanding of know-how transfers. From an initial understanding of know-how necessarily permanently transferred with the technology to the INPI providing for permanent and temporary acquisitions of know-how whether protected by intellectual property or not, for the sake of facilitating the production of technological goods.

Brazil has laws regulating INPI giving effect to license agreements, assignment or sale of IPRs or franchise agreements for the transfer of intellectual property rights. The INPI also provides for two ways for the transfer of know-how; one through technology supply agreement and the other through technical and scientific assistance service agreement or invoice.

⁵⁷⁶ See, Brazil Law No. 9.279 of May 14, 1996 (Law on Industrial Property), <https://www.wipo.int/wipolex/en/legislation/details/515>

⁵⁷⁷ Title VI: Transfer of Technology and Franchising, Industrial Property Law- Law N° 9.279, of May 14, 1996.

⁵⁷⁸ Pablo Torquato, *New Guidelines For The Recordal of Technology Transfer and Licensing Agreements in Brazil*, Montauray Pimenta Machado & Vieira de Mello (July 12, 2023) <https://www.montaury.com.br/en/new-guidelines-for-the-recordal-of-technology-transfer-and-licensing-agreements-in-brazil>

For some agreements, registration and recording of those agreements are exempted due to a common presumption that there is no technology transfer in the agreement. Rest the law mandates necessary registration of technology transfer agreements with the INPI (Brazilian Patent and Trademark Office) so as to make it better enforceable against third parties and entitle licensee for tax deductions. The INPI also lays down general and specific rules applicable to parties willing to transfer technology to Brazil and provides a list of documents to be submitted before it for the effective registration of a Technology Transfer Agreement in Brazil.

Vietnam

Although in the bracket of developing countries, Vietnam is nonetheless one of the fastest growing economies. It proves so, with the formulation of policies and laws addressing current issues. Considering the growing need and importance of transfer of technology to Vietnam and from Vietnam to abroad, the National Assembly of the Socialist Republic of Vietnam, pursuant to the constitution, passed the ‘Law on Technology Transfer’ in 2017 to facilitate this transfer⁵⁷⁹. The law is an attempt to provide for a mechanism to permit and implement transfer in and out of Vietnam of technology and technology related goods and services. It lays down the rights and obligations of the individuals, organisations or state involved as party to the transfer, the means through which technology may be transferred, measures taken to promote activities related to technology transfer and provides for how the State should manage technology transfer.

The law properly defines technical know-how, advanced technology, technology transfer- domestic and abroad and commercialisation for better understanding and interpretation of terms. It also provides for state policies for technology transfer, the transferable subject matter, the different forms and methods of transfer, the prohibited acts in technology transfer and the implementation provisions in the end. The law came into effect on July 01, 2018 repealing previous laws⁵⁸⁰ and regulations on technology transfer. The new law brought in significant changes than the one passed in 2006 and has broadened the scope of transferable technologies. Ensuring thus, Vietnam presses

⁵⁷⁹ See, Law on Technology Transfer 2017, Law No.: 07/2017/QH14, The Socialist Republic of Vietnam, Hanoi, June 19, 2017, <https://wipolex-res.wipo.int/edocs/lexdocs/laws/en/vn/vn124en.pdf>

⁵⁸⁰ The Law on Technology Transfer No. 80/2006/QH11

for cognizance to commercialisation of scientific research and technological development results which happens to be the most important aspect of technology transfer.

Nigeria

Yet another developing country making its mark and paving the way up in terms of development is Nigeria. Developing countries like these demand governments to play an extremely important role in delivering an appropriate framework for the elimination of trade restrictions which can further transfer of technology among nations. Helping technology transfer activities to grow will inevitably enhance the indigenous capabilities of the borrower⁵⁸¹.

Technology Transfer in Nigeria is mostly governed by the ‘National Office for Technology Acquisition and Promotion Act, 2004⁵⁸²’. Under the Act, a National Office for Technology Acquisition and Promotion (NOTAP) is established. This body shall work on a similar concept as that of a Technology Transfer Office and scrutinize the transfer of foreign technology to Nigeria. Similar to that of the Brazilian and Vietnamese law, the law requires mandatory registration with the NOTAP of the contracts and agreements through which technology is transferred within 60 days from the execution of the agreement⁵⁸³.

The Act also lays down general requirements to be followed by parties to the transfer. The agreement should include specific provisions concerning the acquisition of the nature of rights of use and exploitation of the technology, the period for which these rights have been granted and the extent of these rights. Provisions for capacity building, tax deductions should be clearly mentioned. The act also clarifies that concepts such as “technical information” and “technical services” comprising of general operational information, should be treated complementary to know-how. In order to give an

⁵⁸¹ Salahaldeen Al-Ali, *Laws and regulations on technology transfer to developing countries*, 18(5) SCIENCE AND PUBLIC POLICY 295-300 (1991).

⁵⁸² National Office for Technology Acquisition and Promotion Act, Cap, N62 Laws of the Federation 2004. See, Emmanuel Ekpenyong et. al, *Nigeria: Legal Framework for Transfer of Technology in Nigeria*, Fred-Young & Evans (July 10, 2017) <https://www.mondaq.com/nigeria/contracts-and-commercial-law/608826/legal-framework-for-transfer-of-technology-in-nigeria>

⁵⁸³ National Office for Technology and Acquisition and Promotion (NOTAP), Revised Guidelines for Registration and Monitoring of Technology Transfer Agreements in Nigeria, February 2020, https://notap.gov.ng/new_dev/wp-content/uploads/2022/03/notap_tech_trans_agreement_revised_guidelines.pdf

impetus to local manufacturing, a deterrent provision has been added in the Act which says that if a company has been sourcing over and around 75% of its raw materials from foreign companies for more than five years without making efforts to enhance local manufacturing base so as to develop such materials locally, then they shall not be entitled to enjoy the enhanced technology transfer fees. The Act provides for registrable contracts under the act and the detailed procedure for their registration. However, despite laid down emphasis on the registration of such contracts, the act safeguards the interests of the parties by laying down provisions that state that a contract which is unregistered with the NOTAP is not a void contract but only affects the payments in consideration.

The examples of such developed as well as developing countries having enacted specific laws on technology transfer sets a brilliant example in front of India to follow suit. While India may be regulating technology transfer by means of different legislations like intellectual property rights, a *sui generis* system on technology transfer is appreciated which eases the process of “development to commercial exploitation” of technology and aids in providing a structured mechanism that may prove to be utmost beneficial in the instance of a dispute between parties to the transfer.

RESEARCH INSTITUTIONS IN INDIA WORKING FOR TECHNOLOGY GENERATION AND TRANSFER

The updated Directory of R&D Institutions published in 2021⁵⁸⁴, by the Ministry of Science and Technology had identified various departments that are responsible for and working towards research in technology and its commercialisation for over decades now; to name a few, “Defence Research Development Organization(DRDO), Department of Space (DOS), Indian council of Agricultural Research(ICAR), Department of Atomic Energy(DAE), Department of Scientific & Industrial Research including Council of Scientific & Industrial Research(CSIR), Ministry of Environment & Forests, Department of Science and technology(DST), Department of Biotechnology(DBT), Indian Council of Medical Research (ICMR),Department of

⁵⁸⁴ Directory of R&D Institutions 2021, Government of India, Department of Science and Technology, Ministry of Science and Technology, National Science and Technology Management Information System, March 2021, <https://dst.gov.in/sites/default/files/R%20%26%20D%20Directory%202021.pdf>

Information Technology, Ministry of New and Renewable Energy(MNRE) and Department of Ocean Development(DOD)” and many more of such organisations.

Strengthening the research base of any nation requires conscious efforts to be taken to improve the awareness and education levels of the society. In addition to the research organisations, the report highlighted existence of more than 300 premier universities and educational institutions of national importance and repute like the IITs (Indian Institute of Technology), IISc (Indian Institute of Science), NITs (National Institute of Technology) and IIITs (Indian Institute of Information Technology) under MHRD, centrally funded universities across India, which have contributed to economic betterment in ways such as collaborations with industry partners and creation of spin-offs. These activities have helped take the technology creation and generation stage to its ultimate commercialisation. There have been situations where the research organisations have with industry collaborations facilitated commercialisation of technology through setting up of own business development groups for this purpose; while in other situations the help of government has been taken to assist commercialisation of technology, for example, the National Research Development Corporation (NRDC) which is a public sector enterprise that has been responsible for executing more than 250 technology transfers from research and development laboratories during the 11th five year plan⁵⁸⁵ (2007-2012⁵⁸⁶).

Examples of research organisations helping generate and commercialise technology are many. DRDO (Defence Research and Development Organisation) has in chasing its motive of technological self-reliance not only helped the Indian Armed Forces with indigenous technologies such as “Agni and Prithvi series of missiles, light combat aircraft- Tejas, multi-barrel rocket launcher- Pinaka, air defence system Akash and a wide range of radars and other electronic warfare systems”; but it has also provided technological amenities for commoners like the installation of Bio Toilets in Indian Railways, many ‘ready to eat’ curries and ‘ready to drink’ juices and other beverages as survival ration, food test kits for detection of adulteration in milk, meat and

⁵⁸⁵ *Supra* Note 192, 73.

⁵⁸⁶ *See*, Chapter-4 Approach and Salient Features of the Eleventh Five Year Plan 2007-12, <https://mpplanningcommission.gov.in/fiveyearplan/VolumeIsep07/Chapter-4-salient%20features%20final.pdf>

pesticides, diagnostic kits for diseases such as dengue, anthrax, chikungunya and swine flu.

The Department of Science and Technology (DST) on similar lines has developed many technologies which are of social utility, meeting the demands and requirements of the people. Recent contributions include the installation of supercomputers under the National Super-Computer Mission (NSM)⁵⁸⁷, initiation of the STUTI (Synergistic Training Program Utilizing the Scientific and Technological Infrastructure) program as an effort to make scientific and technological infrastructure much more accessible across institutions, initiatives to various programs to support women scientists, diagnostic kits for COVID and setting up of Community COVID Resilience Resource Centres (CCRRCs) to strengthen the STI Ecosystem on the occasion of Azadi ka Amrit Mahotsav in the year 2022, automated technology for collection of toilet waste in an attempt to further the *Atmanirbhar Bharat* vision proven to be much cheaper alternative to the bio toilets of the Indian Railways and promotion to clean technologies by production of indigenous power reactors using sustainable sources like sunlight and water, cheaper ways to coat carbon on lithium electrodes for batteries, lead free material that can effortlessly convert waste heat to power small equipment.

In addition, the Indian Space Research Organisation (ISRO) is spiritedly involved in devising technologies that help monitor and mitigate effects of natural disasters like cyclone, flood, landslides and earthquakes. These technologically advanced products use satellite imagery that make accessible information needed for early detection of calamities, sending across warning signals and for disaster management and mitigation.

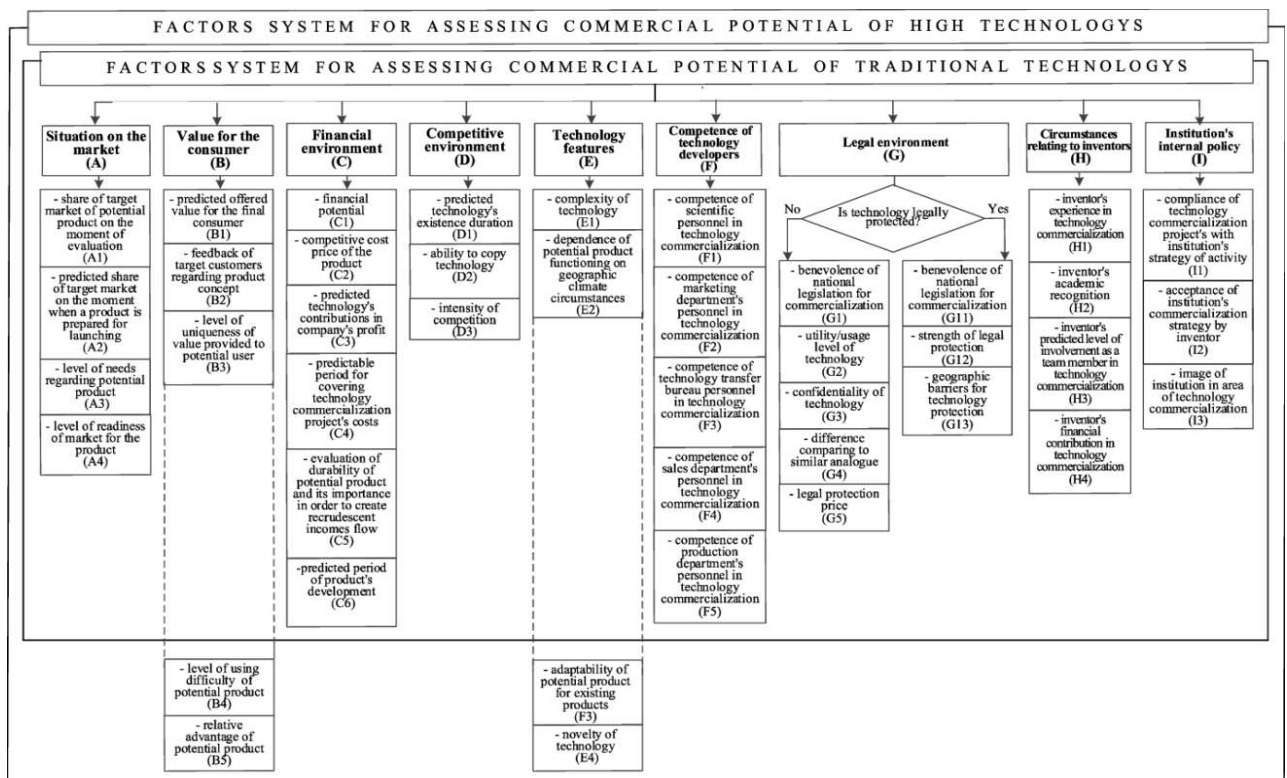
COMMERCIALISATION OF TECHNOLOGY

As much important is the idea of generation of advanced technology, so is the commercialisation part. A technology transfer process would subsequently fail if the technology is not commercialised in the market and for a technology to be commercialised, its commercial viability is to be evaluated first. An innovation will be incomplete if it does not meet the ends of practical application. An innovation such as the light bulb, invented by Edison, was able to dispel darkness in people's home

⁵⁸⁷ See generally, *Major Success Stories of DST in 2021*, DST 1971-2021, Department of Science and Technology, Government of India, <https://dst.gov.in/sites/default/files/Major%20Success%20Stories%20of%20DST%20in%202021.pdf>

because the technology did not remain as an idea on paper, rather it reached the market as a complete product ready to be sold.

This leads to another important point of focus which is the development of technology to a usable state of being. Technology will fulfil its aim of serving social utility when people are able to make use of it. Intermediate goods or raw technology do not qualify as being in the 'usable state of being'. Technology can be commercialised as a finished product and its demand and utility would enhance the commercial potential of the same. Apart from demand, the market situation, technology features, the legal situation of the technology and inventor's circumstances are all relevant factors which may help assess the commercial output of the technology. There are a number of factors on which the commercial potential of a technology may depend. The following chart depicts some of the important ones.



SUGGESTIONS AND RECOMMENDATIONS

The researcher after a thorough study on the understanding of the need of technology transfer in today's time has managed to identify the potential issues that commonly arise in the transfer process and which have been dealt with in detail previously. In response to the same, the researcher proposes certain suggestions and recommendations that may act as yardsticks or implications for policymakers to ensure a smooth hassle free transfer process. In addition to the above, the suggestions from the researcher's end may even help to work out a systematic well-governed structured mechanism for effective transfer of technology.

In the words of Mahatma Gandhi, "the future depends on what you do today". Rightly pointed out, this may seem helpful in setting the future for technology transfer in India. Embracing technological advancements to move ahead with times surely lays the groundwork for a prosperous tomorrow. Not only does technology transfer holds prosperity for the Indian economy but also has new avenues of thought and behaviour allowing transformative change.

An overall change in approach is required to transform India and make it technology ready ensuring more openness towards acceptance of such changes. Some of the major suggestions from the researcher's end have been summarised below-

1. Strengthening intellectual property laws- Technology transfer should not be seen in isolation. The activity cannot exist in the absence of an active political environment. The government of a State should actively be involved to help the nation discover its innovative potential. To elaborate, one such area where this help shall be much acknowledged is law-making. As has already been established in previous discussions, to attract importation of foreign technology and to make possible its adaptation, creating such a favorable technological environment commands the enforcement of a strong intellectual property protection. Strengthening of intellectual property laws thus, is crucial to technology transfer. IP laws also at present govern majority of the technology transfer dealings in the absence of a law on the issue.

2. Building absorptive capabilities- Absorption includes the receiver's capability to adapt to the technology after the same has been adopted. This adaptation to the borrowed technology involves the rightful search for the desired technology, its

acquisition and subsequent commercial exploitation. Building and improving absorptive capabilities hones the receiver entity's technological skills and makes it more capable of benefiting from the transfer. More the recipient learns about the borrowed technology, more it will be able to work on it and develop it according to one's own needs.

3. Development of a strong technological base- In order for technology transfer to effectively work out, developing the technical base of a country is extremely important. This would create a healthy learning experience for the receiver and would fuel indigenous/local manufacturing. Building up better infrastructure that can help make possible the ideals of technology transfer also add up to a better technological base. Without a doubt, a strong and robust technological base furthers more innovations which then become the subject matter of protection under the IPR regime. Howsoever much a borrowed technology may be profitable to a nation, the fact remains that if a country is unable to develop technology on its own, it will never be able to prosper. This is also because even a borrowed technology needs to be moulded suitably. Hence, while technology transfer may benefit with catching up with technical progressions, acquiring the means to build and develop technology shall never lose its importance.

4. Focus on quality- Not that the quality of the technology has much potential to disrupt the transfer process, but it nevertheless has a great impact. The real test is that of the quality of the technology. The quality of the good or service can be the ultimate game changer. The inventor should keep in mind the quality that is ultimately going to reach the consumer. The quality will go a long way in the determination of the commercialisation of the product and the actual sale that it makes in the market. It shall also determine the extent to which a consumer comes back for the same product marking its dependence on the technology. For this, proper quality checks should be performed to check if the technology is performing well and meets majority of the requirements of the receiver country. It is the duty of both the receiver and the donor to ensure that on transfer, the technology is properly received, understood and implemented.

5. Need for legislation- The need for a legislation on technology transfer in India cannot be more emphasized. Having a specific law on the issue would help standardise the general dealings in technology transfer and also provide efficacious remedy in times

of dispute. In addition to the well-defined laws on transfer of technology already in place in developed countries like U.S.⁵⁸⁸, India also has the option to look upto various developing countries like Mexico, Argentina, Brazil, Vietnam and new to the list of developing countries, Nepal for their ardent efforts in framing policies and law on technology transfer. In countries where transfer of technology is legislated, the source of right would be the legislation for remedy. In the instance of a cross border transaction, it would still be of some help if taking help of the prevalent laws the agreements that are concluded between the donor and recipient will provide for jurisdiction and applicable law clauses.

6. Dispute resolution- Establishing a seamless dispute resolution is the cornerstone of any law. The law not only help govern the rights and obligations but also provide for in matters of conflict. Even when there might not be any specific law on technology transfer in India, it nevertheless continues to be governed by other laws. However, in cross border transactions involving technology transfer, dispute mechanism has sprouted as a problem at some occasions. If the transfer is between persons/entities from different countries resulting in a cross-border transaction, then a conflict will be a conflict of laws issue, dealt by private international law. If the transaction is between states or between a state and a private party, then it might become a public international law issue, something for which the parties would have to approach the WTO for its dispute resolution mechanism. Considering the current state of affairs where resurrecting the WTOs Dispute Settlement System (DSS) seems to be the top most priority, dispute resolution in technology transfer cases remains an issue.

Since 2019, the two-tiered Dispute Settlement System (DSS) of the World Trade Organization (WTO) has been inactive. The second tier, known as the appellate body, responsible for hearing appeals from WTO panels, is currently non-operational due to the United States unilaterally blocking the appointment of its members. From its establishment in 1995 until 2019, the appellate body played a crucial role in upholding the international rule of law by holding powerful and dominant countries accountable for violations of international law. However, U.S. has become its most bitter critic and slams it for judicial overreach, exceeding its assigned judicial mandate. With U.S, holding a dominant position in the WTO, its turning hostile towards the DSS could turn

⁵⁸⁸ *Supra* Note 540, 234.

out to be a major problem for the resurrection of the mechanism. However, the recently concluded G20 Summit in September 2023 reiterated the need to pursue reforms in the WTOs functioning envisioning a fully functional dispute settlement board.

7. Guidelines on Pricing- Majority of the issues related to the transfer of technology could be prematurely avoided if there were some existing guidelines on pricing of the technology. High prices or licensing fees of the technologies are a major deterrent for prospective buyers of the advanced technology in the developing countries who may be in desperate need of the technology but may not have the resources to pay for the technology. Understanding that it is ideal and equally important for the inventor to get his due share, some attention needs to go into making the technology available to the buyers at a reasonably affordable price. The price charged for the technology should ideally at least cover the cost incurred by the creator in the development of the technology or more and to the receiver such that he is able to procure. This way technology transfer can mutually benefit both the parties.

8. After use of technology- While technology transfer may be seen to have variations, including the transfer of technology (physical or otherwise), transfer of technical know-how, or a combination of both, there still seems to be some confusion on the after use of the borrowed technology. If it is the physical technology that is borrowed, how should the same be dealt with after it has been exploited, if it is information and know-how that is transferred, what efforts are required to keep the information secret after use and to what extent; are some of the questions that remain. In the opinion of the researcher, proper guidelines on whether the technology after use should be disposed with the right caution or whether it should be returned needs to be specified in the terms and conditions of the contract itself. If the transfer is accompanied with know-how or undisclosed information then separate guidelines on how that information has to be dealt with after it has been used for the intended purpose should be provided for in the agreement. Such know-how is generally confidential and the royalties payable for its confidentiality and efforts made to continue to keep it confidential should be separately specified and cleared between the contracting parties. This shall bring over-all clarity and would reduce the possibility of disputes arising.

9. Healthy co-ordination between the public and private sector- For technology transfer to be successful as contemplated in an ideal situation reaping maximum

benefits to the receiver or the developing world who at present possess high demands for technological advancements, a fruitful, rewarding and prosperous co-ordination between the public and the private players is the need of the hour. True that, today the private multinational companies are behind majority of the world's technology generation. The government and the public sector can fuel this innovation level by providing monetary support. A government of a welfare state should utilize its funds/other resources in R&D for advancing innovation. If the government joins hands with the private transnationals, then with combined efforts what seems unachievable at present may soon seem achievable.

10. Participation of venture capitalists- Not to depreciate the significance of the public sector in any way, the most desirable participation into a technology transfer project would be that of the private company as inventor with government funded support and the contribution of venture capitalists and developing country entrepreneurs to cover for the want of investment for the research project. All of such players can help create a global platform where negotiations for the allocation of resources, investment and technologies can effectively take place.

The suggestions are in no way exhaustive and possess room for small additions in the form of capacity building by enhancing skill development and improving ability of the local workforce to understand and utilize advanced technologies better. Open-source platforms majorly utilized for knowledge sharing should be promoted as these may turn beneficial for joint researchers and development programs. The organizations working to advance technology transfer apart from technology transfer offices like technology hubs and technology incubators where innovation can thrive in a conducive ecosystem should come up more building awareness on the need of transfer of technology more. Lastly, an innovation which results from collaborative efforts, better known as inclusive innovation can change the global scenario for technology transfer if the practice is adopted.

CONCLUSION

A technological revolution is undoubtedly and unquestionably the most powerful and potent way to change the overall social and economic structure of a nation. The country's ability to build new technology or bring innovative reforms in the existing technologies is a strong determinant of the country's ability to compete with other nations internationally and move up the global hierarchy. This realisation is pretty evident, the reason that today all countries give due importance to emerging technologies and have developed acceptance and willingness to adopt the same. Technology transfer facilitates this adoption of new technologies. As much as it help nations to borrow technology, it also motivates nations in general to catch up in the development progression race. This may be achieved by developing one's own technology or borrowing it from others. Transfer of technology helps individuals, private entities, organisations and nations borrow technology. It marks the transfer of technology from one entity (which is usually the creator/inventor) to the other (recipient, the one who is in need).

The transfer of technology can have multiple dimensions. It may be transfer of physical technology or the transfer of know-how and technical information or both. In all of these situations, some amount of technology is being transferred. While the thesis has emphasized on the growing need of the developing countries to borrow advanced technology, it might not always be the case that the developing countries are the recipients of the technology. There are instances of developed countries borrowing a particular technology from other nations and even private companies like Apple in order to grow, acquire companies to borrow and learn their technology.

Thus, the operability of technology transfer is driven more by the concept of 'need'. The individual, organisation or nation that believes itself to be in the need of a particular technology and realises why adopting that technology is essential for them, becomes the eligible recipient to borrow that technology. Of course, eligibility would also imply the recipient having the means to procure the technology but so long as the technology is not put out of the its reach and is available at a reasonably affordable price, the recipient is an eligible one.

Due to swift technological advancements, brief product life spans, and heightened global competition, the acquisition of new technology is essential for firms aiming to

expedite the development of innovative products. Nevertheless, this endeavor is accompanied by expenses and uncertainties. Even companies with substantial financial and technological resources face challenges in conducting independent research and development. Consequently, the capability to leverage external knowledge emerges as a vital element for achieving successful innovation.

The foundation of the patent system, also known as *raison d'être* of the patent system, rests significantly on the diffusion and conveyance of technology. Through the provision of exclusive rights, the patent system seeks to enhance the seamless exchange of knowledge and streamline transactions related to safeguarded technology. It establishes a legal structure enabling technology owners to reveal their inventions to the public, as well as to license or sell their patents, without concerns about unauthorized use. This framework allows a broader community of researchers and engineers to access the disclosed information, potentially fostering additional contributions to the advancement of the technology in question.

In this give and take of technology, intellectual property rights seem to play an immensely important role. The transfer of technology sure becomes easier with the technology being patented but intellectual property seems to offer so much more. International trading became easier and the creation of novel inventions grew as intellectual property warranted legal protection for the creator's work. While trade and intellectual property share a close knit relationship that grew overtime with trade in almost all goods and services that had some kind of IP protection, technology and intellectual property are similarly situated. For the process of technology transfer to sustain, both the donor and the recipient countries need to have strong IP laws accounting for proper implementation of the protection and transfer of technology. Be it telecommunications, health, education or biotechnological sector, the developments made by IP in the respective fields have led to a growth in inclination towards intellectual property protection. The fiscal returns of the trade in IP related goods only added to this inclination.

In the context of transfer of technology, patents and trade secrets are the key players for the management and regulation of technology and its transfer. Copyrights and trademarks too, can play a part depending on what part of the technology the protection extends to. True that, patents and trademarks serve as instruments for managing and

organizing intellectual property rights, both in economic and social contexts, however, they are not effective means for transferring technology, unless interpreted as referring to the finished products of technology. Consequently, if a country aims to enhance its technology building and development, relying on patents or trademarks for technology transfer is not a viable approach. Honest and effective technological development requires the country to cultivate its own technology rather than relying on hired or borrowed technology through patents or trademarks. Even in instances where technology is borrowed, it must be adapted or customized to suit the specific needs of the borrowing nation. It is important to note that technology beneficial in one nation may not necessarily be equally advantageous in another. A convenient access to technology can undermine incentives for local research and development programs, incurring indirect costs both politically and socially. The continual purchase of technology by developing countries risks stagnating their development process, hindering them from catching up with developed or technologically advanced nations. Consequently, a fundamental shift in the perspective on technology transfer is essential for developing countries.

Perennial technological dependence has to be minimised as it may not be ideal for domestic manufacturing leading to disappointment in researchers and local scientists. Instead of devoting themselves to research, their job may only be limited to absorption and internalisation of borrowed technology stifling overall growth. With lesser understanding and knowledge of technology, the nation would be compelled to accept whatever is given to it. Tendencies to transfer outdated technology to developing countries aren't a surprise. Thus, strengthening one's technological base and providing a sound innovative ecosystem are utmost essential for all nations, developing, least developed or developed. This vision if captured fully, befitting the needs of the society upon implementation, leads to the idea of technological self-sufficiency as was encapsulated in the earlier technology policy documents of India, rooting for self-sufficiency⁵⁸⁹ for India as a nation. The same idea has been taken forward to fuel the 'Make in India' initiative today.

⁵⁸⁹ *Supra* Note 5, 2. *Technology Policy Statement*, 1983 aiming for "attainment of technological self-reliance, a swift and tangible improvement in the conditions of weakest sections of the population and the speedy development of backward regions."

Only believing financial strength and investing power of a nation for technological growth is a disagreeable outlook. For this, developing nations should not be blamed as a country does not secure economic and social growth with just monetary resources. Of course, money becomes a game changer, but in the light of technology transfer both investments and productivity assume equal importance. While without resources, a country may not be able to spend enough on research and development leading to poor productivity, investing power on the same hand does not promise R&D productivity. Research and development have to lead to a fruitful result and ensuring the productivity of R&D requires a lot more than investment.

A technological bent of mind, research oriented approach, refined learning and capturing skills, human capital, polished infrastructure facilities and enhanced absorptive capabilities in addition to investments in research can lead to a valuable transfer of technology and its subsequent commercialisation.