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TOPIC

**CAN THE CURRENT WTO LEGAL FRAMEWORK FOSTER TECHNOLOGY
TRANSFER TO DEVELOPING COUNTRIES?**

BY

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APPROVAL FORM

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DECLARATION

I, **TARIRO SAMANTHA MAWONERA**, do hereby declare that this dissertation is the result of my own investigation and research, except to the extent indicated in the acknowledgements, references and by comments included in the body of the research, and that it has not been submitted in part or in full for any other degree to this or any other University.

STUDENT'S SIGNATURE

DATE

DEDICATIONS

To all the Mawoneras and Maoneras out there, especially Kumbirai Ethan Maonera (bhudhie), each time I would come home you reminded me of my responsibilities as a big sister - leading by good example.

In loving memory of my sister Wintana Varaidzo Mawonera who died four days before I defended this dissertation topic.

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CHAPTER 1

General introduction to the study

1. INTRODUCTION

Economists have long recognized that the transfer of technology (TT) is at the heart of the process of economic growth.¹ As such, they argue that the progress of both developed and developing countries depends on the extent and efficiency of such transfer.²

TT itself is a mechanism for the shifting of information across borders and its effective diffusion into recipient economies. This can include the technology itself, trade terms and intellectual property rights, and policies of technology exporting countries, investment, and competition issues that can affect the terms of access to knowledge.³ Thus, TT involves numerous complex processes, ranging from innovation and international marketing of technology to its absorption and imitation.⁴

Particularly important to this dissertation is the fact that a number of provisions in the agreements presided over by the World Trade Organisation (WTO) mention the need for the transfer of technology to take place between developed countries and developing countries.⁵ This is the backdrop against which a group of developing

¹K. Ramanathan, An Overview of Technology Transfer and Technology Transfer Models, http://www.business-asia.net/Pdf_Pages/Guidebook%20on%20Technology%20Transfer%20Mechanisms/An%20overview%20of%20TT%20and%20TT%20Models.pdf (Accessed 13 April 2015).

²Ibid.

³K.E Maskus, 'Encouraging International Technology Transfer,' UNCTAD-ICTSD Projection IPRs and Sustainable Development, Issue Paper No. 7, 2004 <http://www.iprsonline.org/unctadictsd/projectoutputs>. (Accessed 28 March 2015).

⁴Technology Transfer - South Centre <http://www.southcentre.int/category/issues/intellectual-property-and-innovation/technology-transfer/page/2/> (Accessed 9 April 2015).

⁵ See the preamble, Articles 7, 8, 40 and 66.2 of the Trade Related Aspects of Intellectual Property Rights (TRIPS); Article 9 of the Agreement on the Application of Sanitary and Phytosanitary (SPS) Measures; the

countries submitted a proposal in 2001⁶ for the establishment of a working group to study the inter-relationship between trade and transfer of technology. In this vein, it is the purpose of this dissertation to explore whether the current WTO legal framework fosters technology transfer to developing countries.

1.2. BACKGROUND OF THE STUDY

The value of TT has long been recognised in international relations generally.⁷ In international trade however, the movement toward encouraging TT is traceable to the late 1970s, when many developing countries sought a Code of Conduct to regulate technology transfer under United Nations (UN) auspices.⁸ Since then, TT has been developed to be a feature of various WTO agreements in order to facilitate technology flows between developed and developing countries.

For instance Article 66.2 of the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) obliges developed countries to provide incentives to enterprises and institutions in their territories for the purposes of promoting and encouraging technology transfer to least developed country WTO members in order to enable them to create sound and viable technological bases. The same Agreement makes it clear, as its objective, that the protection of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology.⁹

preamble, Articles 11.3 and 11.5 of the Agreement on Technical Barriers to Trade (TBT); Article IV and Article XIX (2, 3) of the General Agreement on Trade in Services (GATS).

⁶ WT/GC/W/443 18 September 2001 https://www.wto.org/english/thewto_e/minist_e/.../wt_gc_w443.doc (Accessed 9 April 2015).

⁷Technology transfer, especially to developing countries, has been recognised in over 80 international instruments and numerous sub regional and bilateral agreements contain measures related to transfer of technology and capacity building. For example article 1 of WIPO assumed the obligation to take appropriate action to promote creative intellectual activity and facilitate the transfer of technology to developing countries.

⁸ S. Patel, P. Roffe and A. Yusuf (2000), *International Technology Transfer: The Origins and Aftermath of the UN Negotiations on a Draft Code of Conduct*, Kluwer law International.

⁹ Article 7 of the TRIPS agreement.

Similarly, the Agreement on Sanitary and Phytosanitary (SPS) Measures provides for a commitment by developed countries to facilitate the provision of technical assistance to developing countries, including in areas of processing technologies.¹⁰ Further, the General Agreement on Trade in Services (GATS)¹¹ provides conditions in which there will be an increase in the participation of developing countries in TT. Other agreements which deal with the aspect of TT include the GATS Annex on Telecommunications, the Agreement on Technical Barriers to Trade (TBT Agreement)¹² and the Agreement on Agriculture.¹³ From the above, there is clear evidence in WTO instruments of intent to facilitate TT between developed and developing countries emanating from the provisions and central role of TT.

1.3. PROBLEM STATEMENT

Despite the extensive provisions relating to transfer of technology in WTO law, the actual process of generating, accessing, transferring and disseminating technology is neither a simple nor a costless one.¹⁴ It requires, *inter alia*, appropriate skills, institutions and policies.¹⁵ There is need for a friendly international environment and international rules that facilitate the transfer of technology, most commonly, from the developed to the developing countries. Preferably, such technology would be non-obsolete and eminently environment friendly, that is to say, green technology. Further, this technology would enhance productivity as well as minimize waste generation, contamination and environmental risks resulting from the production of goods and services. However, the provisions in the WTO instruments for facilitating TT fall short in explaining how the transfer of such technologies should take place.

¹⁰ Article 9 SPS.

¹¹ Article IV and Article XIX (2,3) of the GATS.

¹² See the preamble to the agreement, also Article 11.

¹³ Annex 2 to the Agreement; Article 6 and 16 of the same agreement.

¹⁴ International Centre for Trade & Sustainable Development (ICTSD) Switzerland, <http://www.ictsd.org/> (Accessed 29 March 2015).

¹⁵ K.E. Maskus, Encouraging International Technology Transfer, (2003) http://www.iprsonline.org/unctadictsd/docs/Maskus_TOT_December03.pdf (Accessed 8 April 2015).

1.4. RESEARCH OBJECTIVES AND AIMS

- a) To examine the relevant provisions in the WTO agreements that govern the transfer of technology from developed countries to developing countries.
- b) To critically assess the capacity of the current legal framework to facilitate transfer of technology.
- c) To explore the best possible approach for securing technology transfer and make recommendations.

1.5. LITERATURE REVIEW

A review of the relevant literature suggests that there has been recognition of the fact that there is inadequate technology flow between developed and developing countries. For instance, Maskus¹⁶ identified that there was little evidence to suggest that developing countries have been benefiting from technology transfer and diffusion. Importantly, it is apparent in the literature that there are three problems which have played a role in leading to inadequate technology transfer from developed to developing countries.

The first problem is asymmetric information. This arises where technology suppliers cannot fully reveal their knowledge without destroying the basis of trade, while buyers cannot fully determine the value of the information before buying it. To this end, Hoekman *et al*¹⁷ argue that the problem can lead to large transaction costs and, it can stifle technology flow. As a result TT will not take place because some developing countries lack capacity and resources to get the asymmetric information. Similarly, Arora *et al*¹⁸ argue that in the international context, information and contract enforcement problems may be severe, in the sense that the consumers of

¹⁶Maskus (n 15 above).

¹⁷B.M. Hoekman, K.E. Maskus and K.Saggi, (2005) 'Transfer of Technology to Developing Countries: Unilateral and Multilateral Policy Options', <http://www.betsaonline.com/SystemAnalysis/TransferTechnology.pdf> (Accessed 8 April 2015).

¹⁸ A. Arora, Fosfuri, A. and Gambardella, A. Markets for Technology: The Economics of innovation and corporate strategy (2001) http://earchivo.uc3m.es/bitstream/handle/10016/13391/markets_fosfuri_ISSJ_2002_ps.pdf?sequence=1 (Accessed 8 April 2015).

technology are not willing to part with their money unless they are convinced that the technology enhances or facilitates trade in what way.

The second problem is in respect with the aspect of rights holders and licensing. Owners of new technologies typically have substantial market power resulting from lead time and intellectual property rights (IPR). Making this point, Maskus¹⁹ argues that the end result of owners of technologies having substantial market power is that, the price of technology will exceed its marginal cost. This is a view shared by Hoekman *et al*²⁰ who argue that this exclusivity allows developers to profit from innovation and it reduces the static national welfare of those importing technologies. This means there is need for market policies to expand welfare by adjusting the incentives of private enterprises to participate in TT.

The third problem is that of incentives for domestic innovation which need to be increased. Externalities arise if the costs and benefits of technology exchange are not internalised by participants. The complexity of the issue was ably captured by Saggi²¹ when he stressed that a major share of benefits to recipient countries of TT is likely to arise from uncompensated spill-overs. He reinforced that at the same time, technological information is diffused into the wider economy and the technology provider cannot extract the associated economic value. To this end, Hoekman *et al*²² pointed out that these market failures support the potential for policies to increase welfare by altering the incentives of private agents to engage in international transfer of technology. This can be addressed by increasing access of local buyers to the international stock of knowledge and improve the ability of technology owners to signal the true value of their inventions to buyers.²³

¹⁹Maskus (n 4 above).

²⁰Hoekman (n 18 above).

²¹ K. Saggi. (2004) International Technology transfer to Developing Countries: Economic paper 64, Commonwealth Secretariat <https://my.vanderbilt.edu/kamalsaggi/files/.../vita-ksaggi-jan-20123.pdf> (Accessed 7 April 2015).

²²Hoekman (n 18 above).

²³Ibid.

Despite the reasons above, these difficulties do not mean there cannot be TT. On the contrary, TT is possible under the right conditions and context. For instance, making this point, Roffe and Tesfachew²⁴ argue that successful technology transfer involving partners from developed and developing countries requires financing. In addition they reinforced that, above all, TT requires home and host country policy measures to stimulate the transfer and local adaptation of technology.²⁵ This is the background in which they emphasised multilateral efforts to increase flows of technology to developing countries. These, among others, include the need to create conditions conducive to fostering transfer of technologies by international firms whose collaboration is vital to make it effective.

In addition if countries are uplifted to cater for the issue of capacity building, TT is not impossible. Here, it is useful to note that Henry *et al*²⁶ argue that the absorptive capacity and technical efficiency of a country is a critical factor in its ability to “catch up” with countries at the technological frontier and for developing countries this is even more of an imperative. Thus TT is possible if there is increase in incentives for domestic innovation.²⁷

1.6. RESEARCH METHODOLOGY

The research is based on a descriptive approach and doctrinal analysis, that is to say, the writer will evaluate the adequacy, and provide a systematic exposition, of the rules and legal framework governing transfer of technology under international trade law. In addition, an analysis of the relationships between the legal frameworks shall also be carried out, explaining areas of difficulty. More so, the writer shall try to predict future developments by means of giving recommendations on the subject

²⁴ P. Reffo and T. Tesfachew, (2002) Revisiting the Technology Transfer Debate: Lessons for the New WTO Working Group, <http://www.iprsonline.org/ictsd/docs/RoffeTesfachewBridgesYear6N2February2002.pdf> (Accessed 7 April 2015).

²⁵ *ibid*.

²⁶ M. Henry, R. Kneller and C. Milner, Trade, Technology Transfer and National Efficiency in Developing Countries, (2003) GEP Research paper series 2003/50. <http://www.nottinghampublications.com/gep/documents/papers/2003/03-50.pdf> (Accessed 8 April 2015).

²⁷ Hoekman (n 18 above).

area concerned.²⁸ Given that TT has been employed and utilised in other fields of international law, the writer will also adopt a comparative analysis. This shall be done by relying on experiences in fields such as international environmental law as comparators in the analysis of how TT is being facilitated therein.

1.7. CHAPTER SYNOPSIS

Chapter one provides an introduction to the study, the background, problem statement, research objectives and aims, the literature review of the subject matter, the research methodology and the synopsis of chapters. This is followed by chapter two which examines the relevant provisions under WTO and trade related agreements which regulate transfer of technology from developed countries to developing countries in order to understand what they provide for and the commitments made.

Chapter three critically assesses the capacity of the current framework to facilitate TT from developed to developing countries. This will include taking into account real world experiences and expose reasons why TT seems to have been faltering. The concluding chapter involves analysis of experiences in other fields and explores how best TT can be achieved under the WTO framework.

²⁸ This research method is succinctly defined by Pearce D, Campbell E and Harding D, Australian Law Schools: A Discipline Assessment for the Commonwealth Tertiary Education Commission 1987 <http://www.lawteacher.ac.uk/docs/hitchinson-and-duncan.ppt> (Accessed 28 March 2015).

CHAPTER 2

Examination of relevant provisions that govern transfer of technology in WTO agreements.

2.1. INTRODUCTION

It is a fact that TT is a central goal of many international instruments, especially in agreements involving developing countries. The Marrakesh Agreement²⁹ that established the WTO recognizes the need for special efforts which are designed to ensure that developing countries, in particular the least developed among them, secure a share in the growth of international trade commensurate with their needs of economic development.³⁰ One of the ways in which this objective can be achieved has been identified as bringing down the technological gap between developed and developing countries. It is for this reason that TT is a legal concept that is provided for in various existing multilateral trade agreements.

This chapter will do two things. First, it will highlight how central WTO agreements make provisions for TT. However, it would be impractical to explore the provision for TT in every agreement. Hence attention will be paid to central traits that are common with respect to the TT-related provisions in selected, and premier WTO agreements notably; the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS)³¹, the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS)³², the Agreement on Technical Barriers to Trade (TBT)³³ and the General Agreement on Trade in Services (GATS).³⁴ Second, it analyses certain themes in the manner in which TT is provided for in the Agreements.

²⁹ Signed in 1994 and came into force on 1 January 1995.

³⁰ WT/GC/W/443 18 September 2001 https://www.wto.org/english/thewto_e/minist_e/.../wt_gc_w443.pdf (Accessed 22 July 2015).

³¹ Articles 7, 8, 40 and 66 and the Preamble.

³² Article 9.

³³ Preamble and Article 11.

³⁴ Article IV and XIX.

2.2. FEATURES OF TT IN WTO AGREEMENTS

In seeking to establish central traits of the manner in which TT is provided for in WTO agreements, it is useful to note that the manner in which TT is provided for in these agreements differs based on the objectives of the agreement. For example, the SPS agreement is concerned with application of food safety, animal and plant health regulations whereas the TBT agreement tries to ensure that regulations, standards, testing and certification procedures do not create unnecessary obstacles to trade. Despite this, it is quite apparent that all agreements aim at promoting access to technologies and paying most attention to developing countries and LDCs. Against this backdrop, it is apparent that the selected agreements noted above share three common traits with respect to their provision for TT namely, determination of needs and special treatment; commitments and standards.

2.2.1. Determination of needs and Special treatment

Identifying the needs of developing countries is of great significance for focusing on the issue of TT. For this purpose in 2005³⁵ the WTO Council for TRIPS took a decision in which it asked the developing countries to give as much information as possible on their individual priority needs for technical and financial cooperation to assist them to take steps necessary to implement TRIPS. To this end a main quality of WTO agreements with respect to the provision of TT and capacity building is that they distinguish between categories of recipients, specifically between developed, developing countries, and LDCs. For instance, the TBT and the TRIPS recognize, in their respective preambles, the special situation and needs of developing countries.

Within this framework, technology is typically expected to be transferred from countries with strong capabilities (developed countries) to countries with low capabilities (developing countries but more particularly to LDCs). For example, the

³⁵See part II, Extension of the Transition Period under Article 66.1 for Least Developed Country Members: Decision of the Council for TRIPs of 29 November 2005, WTO reference IP/C/40.

TRIPS agreement³⁶ in which specific reference is made to TT to developing countries and/or LCDs.

2.2. 2. Commitments

There are comprehensive and prolonged schedules of commitments made by individual countries which can be noted from the agreements. For instance, the SPS agreement³⁷ provides that, “members agree to facilitate the provision of technical assistance to other members, especially developing country members”. Under the GATS, the commitments state how much access foreign service providers are allowed for specific sectors and they include services where individual countries say they are not applying the “most favoured - nation” principle of non-discrimination.³⁸ Correspondingly, particular account of the serious difficulty of the LDCs in view of their special economic situation and their development, trade and financial needs is taken into account thereof.³⁹

2.2.3. Standards

Another common trait among the agreements is the aspect of “standards” to be met when transferring and disseminating TT. For example, the TBT⁴⁰ recognizes the contribution which international standardization can make to the transfer of technology from developed to developing countries. Standard setting agreements in one way or another, attempt to provide a balance between rights and obligations of the creators and potential users of technology.⁴¹ For example, the TRIPS denotes criteria and objectives concerning the contribution that the protection and

³⁶Article 66.2.

³⁷Article 9.1.

³⁸Article XIX (2).

³⁹Article IV (2).

⁴⁰Article 11.

⁴¹In this circumstance, under the intellectual property rights system, creative works and inventions become commodities which may be transferred by commercial transactions. For example leased or sold, thus have their utilization and diffusion facilitated through investment, licensing and other transfer arrangements.

enforcement of intellectual property rights (IPRs) should make to “the promotion of technological innovation and to the transfer and dissemination of technology”.⁴²

2.3. ANALYSIS

What is apparent is that there is provision for TT in various WTO agreements. In addition, such provisions are there to ensure technology flows from developed to developing countries and to LDCs. However, there is also little done by way of directing how this should be done in a practical sense. For instance, The TBT Agreement merely recognizes the contribution which international standardization can make to the transfer of technology from developed to developing countries⁴³ and conveys the issue of technical assistance on developing in order to establish regulatory bodies, or bodies for the assessment of conformity with technical regulations and the methods by which their technical regulations can best be met.⁴⁴ It does nothing by way of directing TT, remarkably the provisions lack the means or methods of underpinning the idea of effective TT.

Similarly, The SPS Agreement merely provides that the WTO members agreed to facilitate the provision of technical assistance to developing countries, either bilaterally or through the appropriate international organizations in the areas of processing technologies, research and infrastructure, technical expertise, training and equipment among others.⁴⁵ It lacks censoring procedures to ensure full realization of the aspect of TT.

Quite separately, but in a similar vein, The TRIPS Agreement merely provides that, appropriate measures which are consistent with the agreement may be needed to prevent the abuse of intellectual property rights by right holders or the resort to practices which unreasonably restrain trade or adversely affect the international TT.⁴⁶ However, it does nothing by way of directing TT because it is not clear on how

⁴²Article 7.

⁴³See the preamble to the TBT.

⁴⁴Article 11.3 of the TBT.

⁴⁵Article 9 of the SPS.

⁴⁶Article 8 of the TRIPS.

the needed measures may effectively come into force regarding that, the right holders enjoy exclusive rights over their technologies.

2.4. CONCLUSION

Summarily, the technology-related provisions in the SPS, the TBT, the TRIPS and the GATS complement each other in achieving the same goal of enhancing TT through providing obligations and commitments. Correspondingly, one can note they all focus on the needs of the developing countries particularly the LDCs placing an obligation on developed countries to facilitate TT. However, despite the fact that the agreements have technology - related provisions, these provisions also have their limitations with respect to providing for how effectively TT can be achieved. Against this backdrop, the ensuing chapter will critically assess the capacity of the current WTO framework to facilitate TT taking into account real world experiences.

CHAPTER 3

Assessment of the capacity of the current WTO legal framework to foster transfer of technology to developing countries.

3.1. INTRODUCTION

What is clear from the preceding chapter is that the WTO agreements in existence simply prescribe responsibilities which member states have to comply with or carry out in order to facilitate TT. However, that which can be gleaned from the foregoing is that the instruments do not prescribe how that is to be done practically. Instead, there is the presumption in WTO agreements that the sheer imposition of an obligation to transfer technology will motivate, and inspire, such transfer. This chapter explores the extent to which this approach has led to the practical realisation of TT.

3.2. MEASURING CAPACITY TO FACILITATE TT

In measuring the capacity of the WTO agreements to facilitate TT from developed to developing countries and LDCs, there is need to apply a test or measure to that effect. In constructing such a measure or test, it is useful to be guided by established measures or indicators of whether TT will succeed drawn from experience with TT in trade and other fields. To this end, three measures are particularly useful. First, whether developing states have the capacity to comply with the requirements enunciated in the various WTO agreements. A second measure is the extent to which practical incentives are utilised to facilitate TT. A third, and final measure considers the extent to which factors such as accommodating the interests of rights holders and the need for TT have been balanced, for instance, through licensing.

3.2.1. Capacity to comply

The capacity of countries is crucial in transfer, dissemination, absorption of technology and compliance with the requirements enunciated in the various WTO

agreements. 'Capacity' can mean different things which, among others, include interpretation, resources and technical expertise. In a practical sense, without capacity there will be no TT from developed to developing states and LDCs. In those instances where recipients of TT lack capacity to absorb technology, there will be a need to build capacity.

Importantly, WTO agreements acknowledge the aspect of capacity-building but not adequately. It is not adequate because there is failure to account for all things that affect capacity. For instance, costs and resources. Against this backdrop, the trade-related provisions in practice have culminated in difficulties in order to facilitate TT because there is inadequate provisions for building capacity. TT seems to be faltering because evidence from past experiences show that there are various factors which result in the inflow of foreign technology. This, to a certain extent makes it difficult for developing countries to comply with the enunciated requirements in WTO agreements. These include costs for international technology transactions and the challenges associated with the expansion of national markets. In assessing the costs of TT a point to note is the geographical distance between developed and developing countries especially LDCs. As Krishnchar⁴⁷ noted, geographical distance is not only a hurdle to the inflow of foreign technologies in the first stage but also, is a factor impeding the effective absorption of technology later in the second stage. It infuses additional trade costs in physical moving the knowledge embedded products (between distant locations) and in effective transfer of all information, monitoring and policy matters associated with the TT.⁴⁸

To this end one can note that, firms in remote places incur big costs on both the purchase of imported ideas and their sales to foreign markets. As such, developing

⁴⁷N. Krishnchar; Impediments to International Transfer of Technology –A Developing Country Perspective. http://www.law.nyu.edu/sites/default/files/upload_documents/krishncharpaper.pdf (Accessed 21 September 2015).

⁴⁸Ibid.

states have less value added available to remunerate the domestic factors of production.⁴⁹

Importantly, it appears that the LDCs will not be able to comply with the enunciated provisions of the WTO agreements because their access to finance or capital is limited. Also this can be in the sense that the availability of foreign direct investment (FDI) is limited and unevenly distributed around the world.⁵⁰ Some developing states have no, or poor, resources and they lack expertise to use technological information which is an impediment to the expansion of their markets. For example, some developing states will not be in a position to take full advantage of the suppleness of the SPS agreement since they lack expertise to evaluate the value of the imported products under the SPS agreement.

Similarly, most developing countries have, in general, poor access to information.⁵¹ This does not mean that the technology to disseminate information or even information itself is not available. However, recognition of the need to disseminate information in WTO agreements does not necessarily mean the same as to gain access to the information because there is a distinction between gaining access to information, and ensuring that such information is disseminated to potential users or buyers. Thus LDCs lag behind in the world-wide web of information since information is transforming rapidly as a service or commodity traded by them for they lack resources. One may argue that LDCs lack information because they also lack infrastructure and skilled human resources to that effect. In making this point Greene and Hallberg⁵² stated that, in assessing information, it requires developing countries to strengthen their linkages with the rest of the world by investing in the infrastructure needed to receive and transfer information. At this point it is worth highlighting that, in order to strengthen their infrastructure, LDCs need capital which as discussed

⁴⁹S. Redding and P. Schott, Distance, Skill Deepening and Development: Will Peripheral Countries Ever Get Rich? Discussion Paper Series No 3739 February 2003. Centre for Economic Policy Research-
<http://www.princeton.edu/~reddings/pubpapers/GeogSkillsJDE2003.pdf> (Accessed 22 September 2015).

⁵⁰Methodological and Technological Issues in Technology Transfer, available at
<http://www.ipcc.ch/ipccreports/sres/tectran/index.php?idp=202> (Accessed 21 September 2015).

⁵¹Greene and Hallberg cited in (n 45 above).

⁵²Ibid.

earlier as one impediment of TT. According to Bruce Girard⁵³ 95% of computers all over the world are in the developed nations, ten developed nations; accounting for only 20% of the world's population have three quarters of world's telephone lines. As such, some developing countries lack the capacity to comply and gain access to information. This is because there is poor supply chain at market levels and the protective foreign policies (excessive government intervention in technology trade) further extends the time lag and reduce the productivity of the technology.⁵⁴

3.2.2. Incentives

The world operates in a manner of *quid pro quo* and the same applies to trade practices between WTO member states. Thus, there is need for pragmatism to ensure that TT can effectively take place from developed to developing countries. As such, being pragmatic entails the use of incentives to induce developed countries to be more open towards facilitation of TT. The importance of incentives has seen some WTO agreements making provisions which relate to the need to facilitate TT. However, one can argue that the absence of agreements which guarantee appropriate flows of incentives has a negative impact on developed countries because WTO member states will not be encouraged to ensure TT takes place. The major question which always arises from developed countries is what is the benefit for complying with TT? In other words a *quid pro quo* approach enhances the capability of developed countries to harbor an interest in the process of ensuring TT. As long as incentives are lacking the developing countries will continue to lag behind.

To this end, the TRIPS Agreement lays down that, "developed-country members shall provide incentives to enterprises and institutions in their territories for the purpose of promoting and encouraging technology transfer to least-developed country members in order to enable them to create a sound and viable technological

⁵³ S. Arunachalam in "How the Internet is failing the Developing World" <http://www.abc.net.au/science/slab/infopoverty/story.htm> (Accessed 21 September 2015).

⁵⁴(n 42 above).

base”.⁵⁵ This was a positive obligation placed on developed countries to provide incentives to their enterprises and institutions to disseminate and foster TT to developing countries. In reality, the majority of new technologies are under the control of private firms or corporations and they are moved by better markets, and profit making opportunities, than by some limited government sponsored incentives.⁵⁶ It is understood that the markets for technology and products in LDCs are not so well developed and hence private investments in technology transfers to LDCs are also not favored.⁵⁷ Moreover, governments also cannot coerce the private firms to act upon the incentives to transfer technologies.⁵⁸ In this vein, one can note that the effectiveness of the incentive-related provision depends on how far the developed countries make the incentives attractive to private firms. Thus, the aftermath of this provision if other factors like capacity building are not taken into consideration is that there will be no momentous proliferation in TT.

Of concern, the TRIPS` article concerning incentives⁵⁹ is not clear on what it is that constitute incentives for TT. Consequently, a combination of inadequate incentive structure and institutional and policy weaknesses has led to technology being inaccessible to billions of people.⁶⁰ The incentives regimes described in developed country reports are rarely specific to LDC’s and are mostly a citation of general development assistance programs rather than those generally provided to developing countries in technological terms.⁶¹

3.2.3. Rights holders and Licensing

This is closely related to the issue of incentives discussed above. Realism in terms of rights holders and licensing means those who have ideas should be rewarded for

⁵⁵Article 66.2 of the TRIPS.

⁵⁶(n 42 above).

⁵⁷(n 42 above).

⁵⁸Ibid.

⁵⁹(n 50 above).

⁶⁰ Transfer of Technology and knowledge sharing for development Science, technology and innovation issues for developing countries http://unctad.org/en/PublicationsLibrary/dtlstict2013d8_en.pdf (Accessed 1 September 2015).

⁶¹(n 48 above).

their creativity. Nevertheless, a point to note is that, that system of reward should ideally not defeat TT. The way IPRs are protected and the operation of licensing therefore should not detract from TT in practice. The TRIPS Agreement for example lays down that, appropriate measures which are consistent with the agreement may be needed to prevent the abuse of IPRs by right holders or the resort to practices which unreasonably restrain trade or adversely affect the international TT.⁶² Arguably, this provision poses a restriction in the sense that such channels should fall within the boundaries of the agreement's provisions. However, the Article is not clear on how the needed measures may effectively come into force regarding that, the right holders enjoy exclusive rights over their technologies. Further, in the TRIPS agreement members agreed that some licensing practices or conditions pertaining to intellectual property rights may impede the transfer and dissemination of technology.⁶³ This Article establishes that members have an obligation to assess such practices and conditions thereof to ensure transfer and dissemination of technology. However, there is no record of actual use and the provision has not afforded any assistance to developing countries in dealing with restrictive practices in TT transactions.⁶⁴

The need to comply with IP regulations means that there is an additional cost which has to be paid by developing countries who seek to utilize technology coming from developed countries. In other words, unless developing countries commit to paying more license fees required for them to use certain technologies, they will not be allowed to utilize the technology. So the costs of licensed technology usually deter developing countries from procuring the most recent and modern of technologies and this means TT does not take place at the expected rate. In sharing the same views, Falvey and Foster⁶⁵ submitted that;

“Results suggest that while stronger IPR protection can ultimately reap rewards in terms of greater domestic innovation and increased technology diffusion in

⁶² Article 8 of the TRIPS.

⁶³ Article 40 of the TRIPS.

⁶⁴ (n 48 above).

⁶⁵ R. Falvey and N. Foster; The Role of Intellectual Property Rights in Technology Transfer and Economic Growth: Theory and Evidence, <http://www.viniti.ru/download/russian/INNOV/pubintelprop.pdf> (Accessed 23 September 2015).

developing countries with sufficient capacity to innovate, it has little impact on innovation and diffusion in those developing countries without such capacity and may impose additional costs. There is a considerable incentive, therefore, for countries at different stages of development to use the flexibilities in the TRIPS agreement to maximize its net benefits for their development”

In light of the above, it would appear that greater IP protection detracts from TT. Developed countries benefit more from IPR protection, as long as their technology is secured or licensed they will ensure it is transferred to developing countries at a cost that they deem acceptable. Hence if the economies of developing countries are weak they will not afford to buy new technologies, thus TT is reduced. Findings also imply that the LDCs, with little capacity to imitate and innovate their own technologies, benefit from an implementation of a stronger IPR regime, but the available evidence is not clear as to the exact channels which the LDCs may benefit: a stronger IPR regime is found to have little positive impact on many technology diffusion channels, including trade, FDI and licensing.⁶⁶

Thus, TT is faltering due to strong IPR mechanisms which are in place, which tend to put developed countries at an advantage. If you cannot afford the patented technology, it means you are affected by trade deficit. However, strong IPR protection can encourage TT depending on the circumstances of a particular developing state but evidence suggests no guarantee returns.

3.3. CONCLUSION

The foregoing analysis shows that despite the fact that there are ample provisions for TT in WTO agreements, measures taken to secure TT through capacity building, incentives, IPRs and licensing are not enough and in many cases do not exist. Importantly, this has meant that the capacity of the WTO agreements to facilitate TT has been limited. Having noted this, the ensuing chapter will establish how best TT can be achieved by giving proposals on measures that can address the current shortcomings of the WTO framework in facilitating TT.

⁶⁶(n 60 above).

CHAPTER 4

Exploring best approach for securing technology transfer and Recommendations.

“No king’s way, as usual but two roads diverged in a wood, I took the one less traveled by and that has made all the difference.”⁶⁷

4.1. CONCLUSION

The preceding chapter has established that there is ample recognition of the value of TT. This is cemented by ample provision for TT. Despite this, the current TT framework has flaws and these flaws are rooted in failure to: account for capacity; define incentives; and over protection of IPRs. Following from this, this chapter recommends how the flaws in the WTO framework may be attended to.

4.2. RECOMMENDATIONS

In crafting possible recommendations, it is necessary to consider the reasons for the identified flaws, these being lack of capacity to comply, the inappropriate use of incentives and lastly the overprotection of intellectual property rights. Importantly, the manner in which these issues have posed difficulties for TT is not unique to international trade. Instead, it is a phenomenon experienced in other fields in which TT has been pursued/undertaken. Thus, the recommendations to be tailored toward addressing the problem issues in international trade in this chapter will be informed by experience in trade and other fields of International law.

⁶⁷From the road not taken by Robert Frost (1874-1963) in Johng-lhlLee, Technology Transfer and Capacity Building for Enhancing Access to Energy. http://www.unosd.org/content/documents/115UNOSD_Lee%20Johng-lhl.pdf (Accessed 1 October 2015).

4.2.1. Capacity

Central issues in capacity are knowledge, resources and geographical locations. To the extent that capacity is an issue in facilitating TT, there is need to foster prospects for capacity-building and international cooperation in development and research with an aim of enhancing TT and trade from developing and LDCs.

The first thing to do therefore is to provide for capacity building explicitly in WTO agreements. Here, this is attainable through facilitating the attainment of operational capacity-building provisions which clearly enumerate what constitutes capacity building. There is also need to establish ways of handling capacity building in WTO agreements. Notably, the means and methods of effecting capacity building should be crafted in a manner which benefits all member states but with particular attention to developing countries and LDCs. Experience suggests that such approach may work in trade because in environmental law it succeeded. For example, the Cartagena Protocol on Biosafety to the Convention on Biological Diversity⁶⁸ clearly defines capacity building and postulates guidelines on how to address the aspect of capacity building.⁶⁹ This is an effective way of getting around the issue of building capacity in the WTO framework so as to encourage and promote TT.

Beyond this, there are at least three other feasible ways for getting around the issue of capacity in relation to exchange of technology, geography and resources. First, the WTO needs to come up with a new and transparent mechanism in its framework which caters for effective exchange of technology through directing how TT provisions should be implemented in a practical sense. A similar approach has worked with respect to Transboundary effects of Industrial Accidents⁷⁰ where guidelines criteria and standards for exchange of technology are postulated.⁷¹

⁶⁸Cartagena Protocol (2000): International Legal Material, Volume 39, Number 5, September 2000; and http://www.iprsonline.org/unctadictsd/docs/ToT_selected-inst_UNCTAD1.pdf(Accessed 5 October 2015).

⁶⁹Article 22.

⁷⁰Industrial Accidents Convention (1992): International Legal Materials, Volume 31, Number 6, November 1992; http://www.iprsonline.org/unctadictsd/docs/ToT_selected-inst_UNCTAD1.pdf(Accessed 5 October 2015).

⁷¹Article 16.

Similarly, Rio Declaration on Environment and Development⁷² provides that states have an obligation to cooperate so as to strengthen endogenous capacity-building for sustainable development by improving scientific understanding through exchanges of scientific and technological knowledge, and by enhancing the development, adaptation, diffusion and transfer of technologies, including new and innovative technologies.⁷³ As such, effective and workable procedures are needed to ensure full realization of the aspect of TT in WTO agreements.

Second, to the extent that geographical distance poses a challenge to TT, this can be accommodated and accounted for through greater international cooperation and explicit provisions for cooperation in WTO agreements. Indeed, as Krishnachars⁷⁴ pointed out, it is obvious that countries cannot be moved physically closer to the global economic and technological centers but, with international co-operation it is possible to induce global economic activities to expand and include peripheral economies in to its ambit in purely commercial interests.⁷⁵ That such cooperation could be provided for in this manner is apparent when it is considered that, under the Basel Convention on the Control of Transboundary Movements of hazardous Wastes and their Disposal⁷⁶ for example, the structure entails that cooperation enhance TT from developed to developing countries.⁷⁷

Third, to the extent that capacity is also threatened or limited by inadequate resources to invest in some technologies, this could be addressed through adopting new provisions which finance TT appropriately in WTO agreements. Since most developing countries do not have capacity to invest in some technologies

⁷²Rio Declaration on Environment and Development (1992): International Legal Materials, Volume 31, Number 4, July 1992.http://www.iprsonline.org/unctadictsd/docs/ToT_selected-inst_UNCTAD1.pdf(Accessed 5 October 2015).

⁷³ Principle 9.

⁷⁴ (n 42 above).

⁷⁵ Ibid.

⁷⁶Basel Convention (1989): UNEP (1999). Basel Convention on the Control of Transboundary movements of hazardous wastes and their disposal, SBC No. 99/001, http://www.iprsonline.org/unctadictsd/docs/ToT_selected-inst_UNCTAD1.pdf(Accessed 5 October 2015).

⁷⁷Article 10.

Humphreys⁷⁸ suggestion that there should be means to make technologies available at low or no cost should be considered. This is not unattainable. Evidence from other international regimes shows that it can be achieved. For instance, the United Nations Conference on Environment and Development: Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of all Types of Forests⁷⁹ provides that; capacity can be enhanced in three ways namely, provisions in law, cooperation and financial assistance.⁸⁰

4.2.2. Incentives

The use of incentives to motivate people to act in a positive way is a commonly applied technique which could also address the problem of poor TT. It is even a feature of some existing WTO agreements such as the TRIPS Agreement, and, it is a technique which should become a more established and pronounced feature of the WTO framework. However, experience has shown that if incentives are to work, two things are necessary for an incentive based approach to work.

First, incentives should be recognised at law and assume an economic and market-based form. Thus, it is necessary to amend the incentive-related provisions in WTO agreements particularly the TRIPS agreement so that it defines what clearly constitutes incentives. This can facilitate TT from developed to developing countries to a certain extent. Secondly, there is need for establishment of a regular forum which monitors or ensures that the issue of incentives is being implemented so as to enhance TT to developing countries.

⁷⁸ S. Humphreys, *Perspective: Technology Transfer and Human Rights: Joining Up the Dots*, Sustainable Development Law & Policy, Spring 2009, 2-3.

⁷⁹Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of all Types of Forests (1992):International Legal Materials , Volume 31, Number 4, July 1992. http://www.iprsonline.org/unctadictsd/docs/ToT_selected-inst_UNCTAD1.pdf (Accessed 5 October 2015).

⁸⁰Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of all Types of Forests (1992):International Legal Materials , Volume 31, Number 4, July 1992. http://www.iprsonline.org/unctadictsd/docs/ToT_selected-inst_UNCTAD1.pdf (Accessed 5 October 2015).

An important point to note however, is that, the utilization of incentives should be done in a pragmatic way. To this end, WTO incentive-related provisions should be designed in a way which reinforces rather than forces developed countries to transfer technology. In theory, economic incentives should produce greater dynamic efficiency; that is, they should encourage more technological and managerial innovation than command-and-control regulation.⁸¹

4.2.3. Rights/licenses

Pragmatism dictates that clever people should be rewarded for their ideas and efforts. This necessarily means that while TT is desirable and should be fostered, this should not deprive those who come up with ideas of the opportunity to benefit from this. Importantly, experience seems to suggest that there are two ways in which a balance can be achieved between facilitating TT and rewarding clever people.

First, such balance can be achieved through a charitable approach and equitable remuneration. For example, as illustrated by Maonera and Chifamba⁸² there may be a role for a new generation of charitable organizations that focus on promoting the use of public domain technologies to solve tropical problems in fields such as health, agriculture, environment and energy. One option that could be considered is the creation of charitable institutions that hold intellectual assets that could include patents of relevance to the developing countries.⁸³

Second, a balance can be attained between rewarding clever people and TT through accepting that there is a risk that intellectual property rights slow the movement of technological capability to developing nations, suggests that harmonization efforts might most wisely consider one common standard for developed nations and a

⁸¹S. Hoffmann and J. Boyd, Environmental Fees: Can Incentives Help Solve the Chesapeake's Nutrient Pollution Problems? <http://www.rff.org/RFF/Documents/RFF-DP-06-38.pdf>. (Accessed 4 October 2015).

⁸²F. Maonera and T. Chifamba, Comesa study on Public health. 108 <http://www.acp.int/content/comesa-study-public-health-felix-maonera-and-tadeous-chifamba> (Accessed 28 September 2015).

⁸³Ibid.

different one for developing nations."⁸⁴ This can be mitigated following Gollin's⁸⁵ approach, albeit one formulated in the context of environmental law, in terms of which he argued for harmonization of trade laws and laws of other facets of international law. A practical illustration of this can be found with respect to the Convention on Biological Diversity⁸⁶ which postulates that the need to protect intellectual property rights does not limit or impede the implementation of the Convention. Similarly, Agenda 21⁸⁷ crafted the issue in more precise ways; as such it inspires the need to enact measures to prevent abuses of such rights, including compulsory licenses with the provision of "equitable remuneration" to the right holder.⁸⁸ The same stance can also be noted in Article 19.1 (h) of the Energy Charter.⁸⁹

4.3. FINAL WORD

While efforts have been made to secure TT in various WTO agreements, efforts to secure TT have faltered because of inadequate provisions relating to capacity building, use of incentives and overprotection of IPRS. This dissertation argued that this can be addressed through revisiting technology-related provisions in WTO agreements; this would address the reasons why TT has failed through the current WTO framework. WTO member states could adopt a common TT policy within the international realm which would specifically address the aspects that fall within the remit of capacity building, incentivizing and rights holders and licensing. The structure of the current WTO framework ought to be designed in a more mandatory nature to effectively enhance TT. This is based on the idea that, it is not about how many obligations exist for the success of the TT, binding and non-binding, but rather

⁸⁴Barton, 1999, p. 15 In C. Correa, Review of the Trips Agreement: Fostering The Transfer Of Technology To Developing Countries <http://twm.my/title/foster.htm> (Accessed 30 September 2015).

⁸⁵ M. Gollin. (1991). 'Using Intellectual Property to Improve Environmental Protection'. Harvard Journal of Law and Technology, 4, 193-235.

⁸⁶ Article 16.5 (n 69 above).

⁸⁷ Article 34.14 (b).

⁸⁸ Article 34.18 (e).

⁸⁹ The Energy Charter Treaty (1994): The Energy Charter Conference (1995). Final Act of the European Energy Charter Conference (Document AF/FECH/en 1); The Energy Charter Treaty (Document EECH/A2/en 1); and http://www.iprsonline.org/unctadictsd/docs/ToT_selected-inst_UNCTAD1.pdf (Accessed 5 October 2015).

on how international obligations are structured around ground realities of technology acquisition and use processes.⁹⁰

Developed countries should agree to take the need to transfer technology as a binding norm if progress is to be made. TT has to be viewed as a duty rather than a sort of interest that is applied or conveyed or produced when one country feels there is need. In response, many national, regional and international measures have been initiated. However, in the absence of a guiding international framework, these measures have failed in the effectively transferring technologies to the resource poor nations.⁹¹ Here, it is important to note the failure of the world community to agree on an international code for regulating the transfer of technologies.⁹² A legal framework for the access and disseminating of TT within the regional market should clarify and strengthen the diverse routes that are available for protecting and promoting TT from developed to developing countries as a whole.

⁹⁰ G. S. Padmashree and P. Roffe; (2012); Unpacking the International Technology Transfer Debate: Fifty Years and Beyond; ICTSD Programme on Innovation, Technology and Intellectual Property; Issue Paper No. 36; International Centre for Trade and Sustainable Development, Geneva, Switzerland, <http://www.ictsd.org/downloads/2012/11/unpacking-the-international-technology-transfer-debate-fifty-years-and-beyond.pdf> (Accessed 16 August 2015).

⁹¹ (n 42 above).

⁹² Ibid.

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