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Protecting Traditional Knowledge: Can Intellectual Property Rights Help?

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ABSTRACT

Traditional knowledge (TK) is the intellectual creativity of indigenous peoples and local communities developed over generations through close observations of nature and experimentation. In essence it is the knowledge, know-how, skills and practices that have been developed, sustained and passed on from generation to generation within a community, and the people in the community are so deeply and completely imbedded in that milieu that it is forming their cultural and/or spiritual identity. It is so completely encompassing the lives of the people that it can be found in a wide variety of contexts, including: agricultural, scientific, technical, ecological and medicinal knowledge as well as biodiversity-related knowledge. TK of indigenous civilizations provides enormous benefits for life-style management, preventive health care systems and state-of-the-art technology for humanity as a whole. Unfortunately, legal systems have not recognized TK and not given due respect for its direct and indirect contributions to the development of modern science and technology so far. This paper unfolds various dimensions in which TK is sought to be protected under the modern legal and economic systems. It probes into the possibilities of TK being protected under intellectual property rights or alternative mechanisms yet to be created. This paper also analyses the provisions of Convention on Biological Diversity, Nagoya Protocol and the exclusive involvement of World Intellectual Property Rights Organization (WIPO) to protect genetic resources, TK and traditional cultural expressions.

Keywords: *Traditional knowledge, ecological, medicinal, ancient science, ancient wisdom, indigenous people, benefit sharing, intellectual property*

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Introduction

Indigenous peoples and local communities dwelling in diverse demographic domains and culture spread around the world possess immense resources for accessing indigenous or traditional knowledge (TK) based on ancient methodologies, and culturally evolved innovations and practices. TK is the repository of collective knowledge developed over many thousands of generations all around the world. It evolves from careful study and understanding of natural ecosystems and their unique functions established by the ancient civilizations. There were cultures such as the *Mohenjo daro and Harappa*, part of the Indus valley civilization or even the *Kumari Kandam* (Tamil-based civilization) that came from the south of India were highly civilized several thousand years ago [1]. These civilizations invented several striking scientific concepts related to a vast number of modern phenomena such as gravity, origin of the universe [2], energy particles [3], the rotation of earth, solar system and constellations and many more such innovations that may not have a modern word to word translations due to language and cultural diversity. They have also invented many scientific equipments and methods to

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accurately interpret planetary motions and their impact on human beings and they formulated into astronomy, astrology and time and season calculations. They also developed thousands of techniques for agriculture alone, and mature systems of medicine like Ayurveda [4] that are used in modern world. These knowledge systems operate in multifarious fields such as traditional medicine, agricultural innovations, food technology, biodiversity conservation, climate change mitigation, coastal area adaptability, astrophysics, architecture, marital arts, physical exercise and healthy lifestyles adapting nature.

According to World Intellectual Property Rights Organization (WIPO), TK refers to "tradition-based literary, artistic or scientific works; performances; inventions; scientific discoveries; designs; marks, names and symbols; undisclosed information; and all other tradition-based innovations and creations resulting from intellectual activity in the industrial, scientific, literary or artistic fields" [5]. This is a broader definition attempting to incorporate the infinite dimensions of TK. Figure 1 captures some of dimensions of TK, traditional cultural expressions and genetic resources. However, the dominant modern Cartesian or western/European worldview eclipses the TK and wisdom of innumerable generations of indigenous and local communities. The major problem today for the inaccessibility of the TK is that the predominant discourses on current knowledge in science undermines traditional knowledge and creates a bias thus exploiting the Cartesian/modern model worldview [6]. This leads to a standstill in accessing benefits from the traditional knowledge with authenticity.

For instance, traditional medical knowledge in Ayurveda [7], Siddha, Marma, Acupressure [8], and Acupuncture were not accessible to people easily, similar to the accessibility of modern education. If this knowledge was made available without any modification during redaction, the whole world would have been benefited by these non-invasive and holistic medical technologies and we could have prevented the allocation of lump sum funds and unlimited resources for corporate medical systems that did not pay back to humanity so far as expected. In fact, much complicated medical treatments such as plastic surgery were also performed in India around 3000 years ago by Sushruta [9]. These ancient medicinal practices are widely and continuously being practiced in many countries as well. Yet, the modern medical science shows least interest to recognize the traditional medicinal practices as an effective stand-alone science rather it tries to undervalue them and view them through the lens of the modern Cartesian axiom. In fact, the ancient medicinal systems are the original and time tested

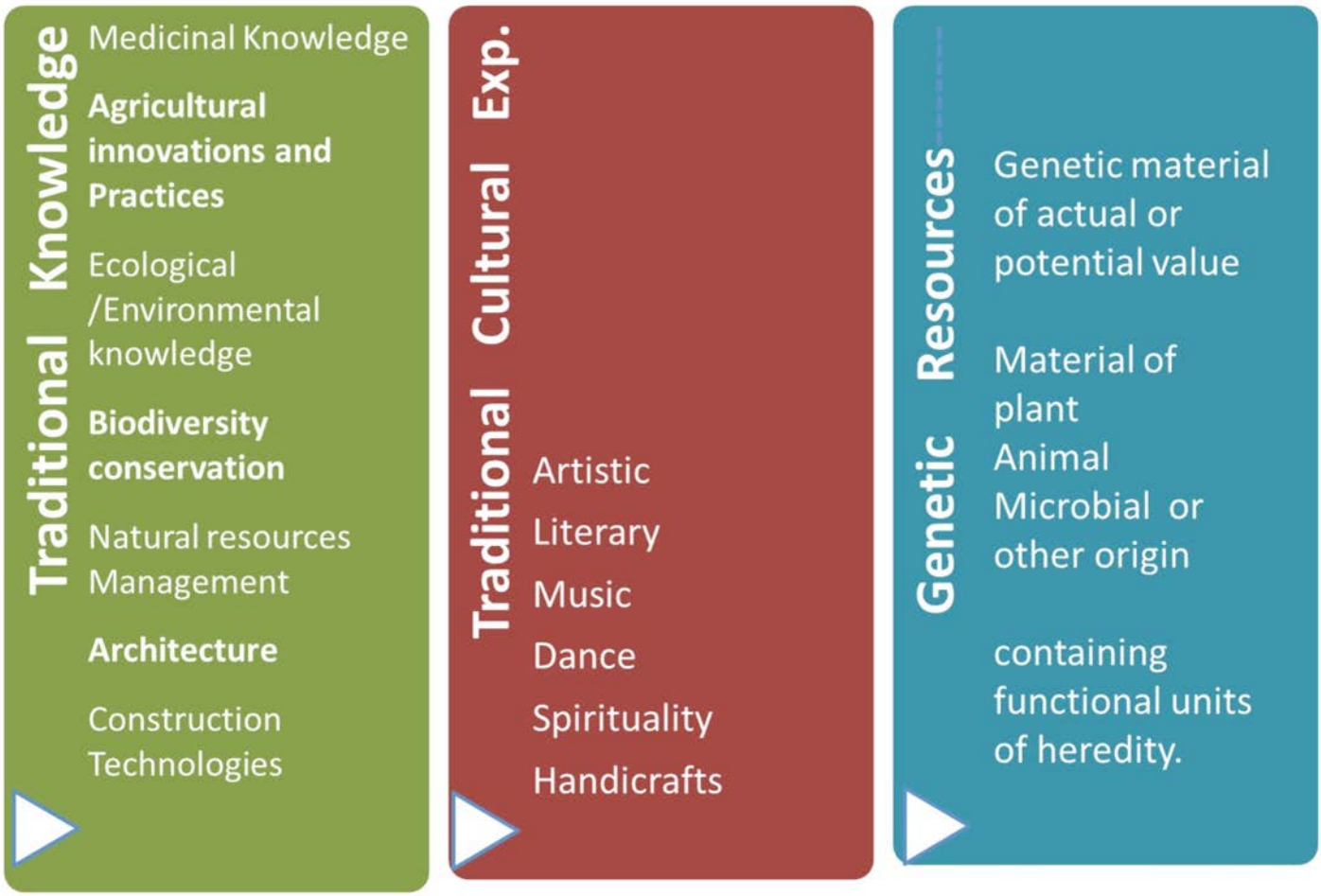

Figure 1: Illustration of traditional knowledge, traditional cultural expressions and genetic resources.

medical cures for the people around the world as they have been in practice for at least a few thousand years. Ironically these medical systems are referred to as alternative medicines instead of calling them mainstream medicine due to a cultural bias by the modern society. However, it is imperative to understand that in countries like India traditional wisdom and medicines are practices by about 50 to 60 per cent of people in one way or the other, exclusively without incorporating modern medical practiced. In Africa, more than 80 per cent of population depends on traditional medicines.

Modern medicine can incorporate humongous attribute of ancient wisdom from these traditional medicinal practices and provide effective medical cures to mankind. Many modern researchers and pharmaceutical industries have been making use of TK and genetic resources to produce novel pharmaceutical medicines and offering to the world as modern inventions. However, the paradigm shift in the axiomatic construct is very important in understanding functioning of Ancient Medical Science and Technology [10]. It has to be understood that each culture has different expressions of their own science and that one kind of practice in a culture is connected to the development of a technology and science that is unique. There is a need to bridge the foundational gap between ancient science and modern science in order to develop a grand unified theoretical framework for solving modern societal problems [11].

Even though, the term "traditional" indicates the past, TK is neither static nor primitive; rather it is highly civilized, dynamic and evolving in nature. It traces back to its origin in the past, however, it is constantly fine-tuned or improved to meet the needs of successive generations. It can be clearly identified through common knowledge that all these traditional knowledge systems are continuously in use and upgraded [12] by every other generation. It should be clearly mentioned that TK is not frozen in time and it cannot be limited to the contributions of past generations alone [13]. According to Russel L Barsh [14], what is 'traditional' about TK is not its antiquity, but the way it is acquired and used. Barsh states that much of this TK is actually quite new, but has a social meaning, and legal character, entirely unlike the knowledge gained by civilizations that have colonized and settled down. Generations of people continuously contribute to these innovations, practices and knowledge thereby renewing and enriching the ancient and modern living. TK holders and their products are not rewarded or compensated for their indirect and direct contribution to the development of modern science and technology. This paper examines the ways in which TK can be protected under the modern legal and economic systems. The paper addresses the question whether TK can be protected under intellectual property rights or through any other alternative mechanisms. It also analyses the provisions of Convention on Biological Diversity, Nagoya Protocol and the efforts of World Intellectual Property Rights (WIPO) organization to protect TK.

Acknowledging Traditional Knowledge

Modern legal systems, particularly, the property laws and intellectual property regimes provides legal protection in terms of copyrights and disclosures to even trivial inventions in modern science, in the form of patents, trademarks, copyrights, industrial designs, etc. However TK and ancient scientific inventions do not receive any such effective protection under these legal regimes. Since 1980s, international community has been striving to create respect and recognition for TK with the help of various organizations such as Food and Agricultural Organization (FAO) of the United Nations and its Commission on Genetic Resources for Food and Agriculture, International Union for Conservation of Nature (IUCN), United Nations Environment Program (UNEP), Convention on Biological Diversity (CBD) and the World Intellectual Property Organization (WIPO). Many legal scholars have explored different international approaches for protecting TK within and outside the existing intellectual property system [15-24] As identified by Sampath et al [25], there are three levels of interests to protect TK: 1) At the supra-national level, there is a long term interest in conserving genetic resources and traditional knowledge 2) at the national level, there is an interest of source nations who host genetic resources and TK to regulate access for the purposes of conservation and benefit sharing and 3) at the local level, compensation for indigenous and local communities in the form of benefit sharing through their local customary laws. There is also an overall interest in global scientific research, universal knowledge exchange and international trade.

TK of the indigenous cultures are considered primitive and lack of reference (author) by the modern legal systems. Due to this reason, TK has become a key issue for discussion in terms of free riding, abuse and biopiracy. The most inconvincible and unfair part of this is that TK and biological resources are utilized for developing modern biomedical research and pharmaceutical products without any authorization or consent from the TK holders and conservers. The end products produced out of TK and genetic resources are patented in many developed countries without any recognition or compensation to TK holders – the people who conserved the genetic resources in the underdeveloped and developing countries. Examples include the neem patent case, basmati patent case, turmeric patent cases and many more [26]. The hoodia patent case [27-29] and rosy periwinkle case [30] also clearly demonstrate how the TK is utilized for developing modern medicines without the consent of the TK owners and patented in different countries. It needs to be understood that biopiracy and unauthorized utilization of TK does not benefit the people who possess knowledge and who conserve the biological resources for many generations. It is very important to note that there is a major shortcoming in the current legal system that does not consider compensating the actual inventors or discoverers who put significant effort in conserving genetic resources and value addition for generations. This promotes inequity and injustice in the current global legal system.

In this phenomenally advanced knowledge age aided by information technology, even sky is not the limit for human development. Yet, inequity, poverty, misappropriation and unjust enrichment rule the world. Economic growth and human development should be equitable and justice based. Utilization of genetic resources and TK knowledge should be backed by appropriate reward and recognition. Justice demands equitable distribution of knowledge and resources for the benefit of all without any deprivation or misappropriation. Legal mechanisms need to be created for attaining this goal. As advocated by Schroeder and Pisupati [31]; Schroeder and Pogge [32] and Stumpf [33], justice in exchange (fairness and equity in transactions), distributive justice (distribution of available resources equitably), corrective justice (liability and redress through judicial process) and structural justice (reforming legal and institutional mechanisms do deliver justice for the needy) are quintessential for global development and global justice. Figure 2 illustrates this point.

Regulated Access and Benifit Sharing

The Convention on Biological Diversity (CBD) for the first time in 1992 recognized the value of TK and the efforts of local people in conserving genetic resources. CBD paved way for regulated access to genetic resources and TK. Article 8(j) of the CBD mandated that the countries should respect, preserve and maintain knowledge, innovation and practice of indigenous and local communities that are relevant to the conservation and sustainable use of biological diversity. It also required that wider application should be provided to TK with the prior consent of knowledge holders and to provide for equitable benefit sharing for the utilization of genetic resources and associated knowledge [34]. Article 15 of the CBD required that access to genetic resources from any country should be based on such prior informed consent and mutual agreement between concerned parties backed up by benefit sharing. These provisions introduce a new mechanism in the member

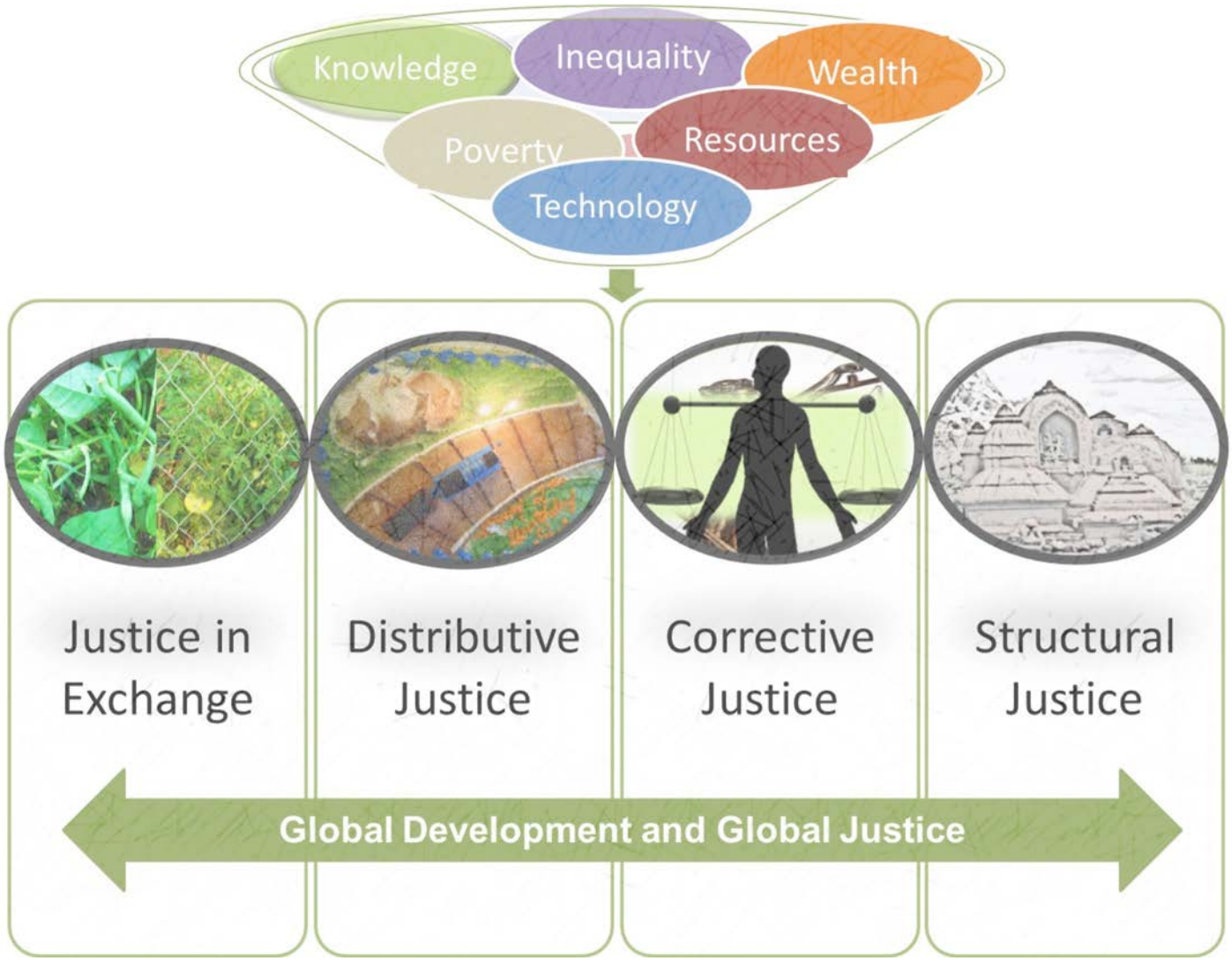

Figure 2: Illustration depicting justice-based global development through justice in exchange, distribution, legal remedies, and supportive legal structures.

countries of CBD for obtaining TK and genetic resources. Some member countries have established national competent authorities to regulate access to TK and genetic resources. Whenever TK and genetic resources were accessed for research or commercial purposes, the users are mandated to obtain prior approval from the national competent authorities. While granting approval, the national authorities are expected to ensure prior informed consent and mutually agreement of the indigenous and local communities for providing TK or genetic resources. As a quid pro quo, the users are expected to share a portion of benefits with the indigenous and local communities. The provisions of CBD, though provides a mandate for access and benefit sharing, it does not prescribe implementable guidelines or procedures which raises challenging questions such as: What is the proportion of benefit sharing? With whom will the users negotiate? How to share the benefits? And With whom the benefits be shared if the TK holder could not be identified? The Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization, 2002 was adopted to provide guidance in implementing the CBD. The Bonn Guidelines provided detailed procedures for access to genetic resources and TK and benefit sharing. Nevertheless, it is a voluntary and non-binding guideline. It did not make big impact in implementation of access and benefit sharing.

Nagoya Protocol on Access and Benifit Sharing

The Nagoya Protocol (hereafter the Protocol) on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits arising from their Utilization under the Convention on Biological Diversity was adopted in 2010 to meet the long felt need for having a legally binding international instrument relevant to this issue [35]. The Nagoya Protocol provides much better international rules and procedures for access and benefit sharing.

This Protocol applies to genetic resources within the scope of Article 15 of the CBD and to the benefits arising from the utilization of such resources. The protocol also applies to TK associated with genetic resources within the scope of the CBD. This indicates that the scope attempts to realize the contents of the Article 15 and 8(j) of the CBD. Articles 5 and 6 of the Protocol reflect the CBD's approach to access and benefit sharing based on the principles of Prior Informed Consent (PIC) and Mutually Agreed Terms (MAT).

Salient Features of the Protocol

1. Access to genetic resources shall be subject to the PIC of the Member countries providing such resources that is the country of origin of such resources or a member country that has acquired the genetic resources. This will be proceeded according to the domestic access and benefit-sharing legislation or regulatory requirements of the Member country.
2. TK associated with genetic resources held by indigenous and local communities shall be accessed with the PIC or approval and involvement of these indigenous and local communities. This will be in accordance with the domestic law.
3. PIC is not mandatory to regulate access to genetic resources. It is up to the Member countries, whether or not, to provide for PIC procedure via domestic legislation.
4. If a country decides to regulate access to genetic resources subject to PIC, it has to enact a domestic law. It must also provide a mechanism for PIC or approval system with the help of a Competent National Authority. The mechanism must have legal certainty, clarity and transparency and should possess fair and non-arbitrary rules and procedures for accessing genetic resources.
5. Access to genetic resources and TK shall be based on MAT, in addition to PIC or approval and involvement of the indigenous and local communities who hold such knowledge.

In order to ensure proper compliance with the domestic legislation on ABS, the Protocol obligates the Member countries to designate National Focal Points, Competent National Authorities and Check Points. The checkpoints are designated for the purposes of tracking and monitoring the flow of genetic resources and TK beyond national jurisdictions.

Monetary and non-monetary benefits

The Annex to the Protocol suggests monetary and non-monetary benefits as benefit sharing.

The monetary benefits include:

- Access fees per sample collected.
- Up-front payments.
- Milestone payments.
- Payment of royalties.
- License fees in case of commercialization.
- Special fees for conservation and sustainable use of biodiversity.
- Salaries and preferential terms where mutually agreed.
- Research funding.
- Joint ventures.
- Joint ownership of relevant intellectual property rights.

The non-monetary benefits include the following:

- Sharing of research and development results.
- Collaboration, cooperation and contribution in scientific research and development programmes, particularly in biotechnological research activities.
- Participation in product development.
- Collaboration in education and training.
- Admittance to ex situ facilities of genetic resources and to databases.
- Strengthening capacities for technology transfer.
- Research directed towards priority needs, such as health and food security, taking into account domestic uses of genetic resources.

Compliance mechanism

The countries that ratify the Protocol should ensure that the

provider country laws are complied with when the genetic resources and TK are utilized within its domestic jurisdiction. The domestic laws should also contain provisions for penalty or sanctions to address the cases of non-compliance.

Evaluation of Nagoya Protocol

Nagoya Protocol's mandate of sharing genetic resources and TK through prior informed consent and benefit sharing for national and international ventures will significantly help development of new drugs and other cosmetics, health care and food products. People around the world will get increased choice of products with better quality. It will safeguard the interests of both providers and users of genetic resources and TK. Benefit sharing may provide equitable remedy for the efforts of indigenous peoples and local communities. This may also facilitate horizontal development and global justice. Figure 3 demonstrates this point.

In order with make the Nagoya Protocol function effectively, the countries need to enact binding legal mechanisms and regulations, with simple and non-arbitrary procedures. It will safeguard the interests of both providers and users of genetic resources and TK and will enable increased utilization of TK and genetic resources in a transparent and equitable manner. The countries should also take appropriate measures to document their available TK.

The Nagoya Protocol requires ratification of fifty countries to enter into force. It has already secured ratification from 51 countries and will become effective on 12th October 2014. The advantage of the Nagoya Protocol is that it will establish a new international practice for accession of genetic resources and TK from the indigenous people and local communities with the help of their consent and mutually agreed terms. It will ensure sharing of monetary and non-monetary benefits to them. However, the Protocol does not prevent unauthorized use or misappropriation while developing new inventions or patenting protocols in different countries. The Protocol also does not provide any property or intellectual property rights to the intellectual contributions of local people. It only provides a partial compensation or sales right while exchanging genetic resources or TK. Checkpoints will have pivotal role to play. If the checkpoints in a provider country could not detect the flow of TK or genetic resources or if a user country does not have legal mechanisms to implement the Protocol, benefit sharing may become challenging and meaningless.

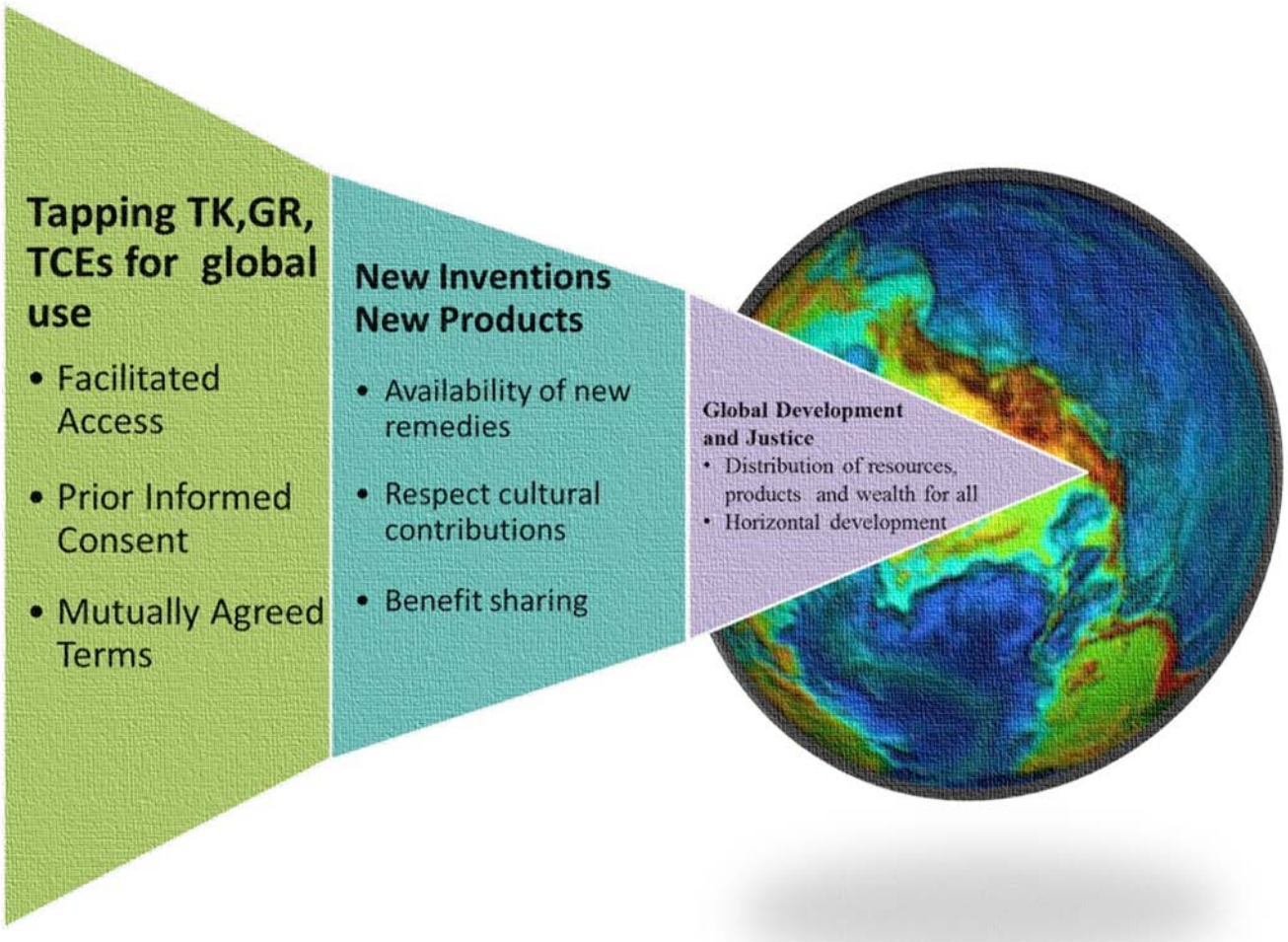

Figure 3: The approach to equitable global development and justice.

Can Intellectual Property Rights Help in Protecting TK?

For most of the indigenous peoples, the concept of property itself is an alien notion, not to mention about intellectual property. However, in the modern world, when their knowledge is misappropriated by others outside the community and protected under intellectual property systems, the question arises, why not the indigenous peoples themselves acquire that right in the first place?

The Trade Related Intellectual Property Rights Agreement of the World Trade Organization (WTO-TRIPS) and other intellectual property laws happen to provide insufficient recognition to TK and contributors of ancient science [36]. Cottier and Panizzon [37] argue that TRIPS agreement in its present form largely favors the needs of developed countries only. Hence, there arises a need for innovations in intellectual properties catering to the needs of developing countries as well to do justice to the existing WTO system. It will also ensure equity and justice in international trade and intellectual property involving TK and genetic resources.

As it is already discussed, TK is an intellectual creativity of the indigenous peoples and local communities. TK is developed by the people over several generations through observational research and experimentation of nature [38]. In the words of Sunder [39], "TK is cultivated, not discovered. The concept of TK, too, is a modern invention". This perspective on TK further substantiates and supports the urge for legal protection of the same; as TK is an intellectual creation, it can qualify for intellectual property protection.

When the modern inventions are recognized under intellectual property laws, there is a strong case for equal protection of TK in an appropriate manner. TK can be protected either under the existing TRIPS Agreement or through a new legal system (*sui generis* model). Even though the modern parameters of patents may not favor protection of TK under the existing intellectual property systems, innovative and flexible criteria have to be formulated to recognize TK around the world. This will promote rule of law in the intellectual property regime without any bias on traditional knowledge systems and ancient wisdom. Intellectual property protection to TK will economically help millions of indigenous peoples and local communities living in acute poverty in many developing and underdeveloped countries. This also will put an end to biopiracy around the world.

Efforts of WIPO to Protect TK

The World Intellectual Property Organization (WIPO) has recognized the need for protection of TK. The WIPO-Intergovernmental Committee on Traditional Knowledge, Genetic Resources and Traditional Cultural Expressions has been active since 2000 based on a mandate to develop appropriate international legal instruments to protect TK. More than a decade has passed, yet the member countries of WIPO are struggling to identify an acceptable definition for 'TK' as well as consensus to finalize the daft provisions. The key reason for this stagnation could be attributed to the complexity involved in TK while defining ancient systems that has evolving body of wisdom of indigenous and local communities. Most often, it is a collective creation of indigenous and local communities living in a particular demographic region. Nonetheless, this theory may not be true in all cases; there are individuals and small families that possess TK for several generations effectively.

WIPO-Intergovernmental Committee has been considering two options of providing positive and defensive protection to TK. Positive protection signifies granting of intellectual property rights like patents or sui generis registration model to the communities possessing TK. Similarly, defensive protection will try to prevent misappropriation of TK by the patent regulatory authorities while granting patents [40-41].

In its 26th and 27th Session of negotiations in 2014, WIPO-Intergovernmental Committee has developed three working drafts that have potential to shape into international legal instruments, they are (i) Consolidated Document relating to Intellectual Property and Genetic Resources; (ii) Draft Articles for the Protection of TK; and (iii) Draft Articles for the Protection of Traditional Cultural Expressions. In the recently concluded 28th Session held during July 7-9, 2014, the member countries considered the cross-cutting issues pertaining to TK, traditional cultural expressions and intellectual property. The drafts will be transmitted to the September 2014 session of the WIPO General Assembly to consider convening a Diplomatic Session for finalizing international Instruments.

WIPO Draft Articles on the Protection of Traditional Knowledge

Among the three draft articles developed by WIPO, the draft articles on TK brings forth significance to our present discussion [42]. According to Article 1, the subject matter of protection is traditional knowledge which may be in codified, oral or in other forms. It may be dynamic as well as evolving. This provision identifies TK with three qualifiers:

(a) It is created and maintained in a collective context by the indigenous peoples and local communities or nations irrespective of whether it is widely spread or not.
(b) It is directly linked or distinctly associated with the cultural and/or social identity and cultural heritage of indigenous peoples, local communities or nations.
(c) It is transmitted from generation to generation, whether consecutively or not.

To determine the criteria for eligibility, the draft requires that the TK should have been used for a term as determined by each Member State but should not be less than 50 years. This

appears to be a difficult proposition. The obvious challenging questions are; a) How to determine the origin of a TK to decide the period of its usage? And b) How to account for the period of usage or transmission of TK if it is not consecutive?

Article 2 of the Draft, identifies the following as the beneficiaries of TK.

(a) The indigenous peoples and local communities and/or nations who create, hold, maintain, use and /or develop TK.
(b) If a TK is not claimed by specific indigenous people or local communities despite reasonable effort to identify them, the Member States may designate a national authority as custodian of the benefits/beneficiaries.
(c) Details of the national authority established by the Member State should be communicated to the International Bureau of the WIPO.

The scope of protection is one of the most contested Articles in the negotiations. The biases endowed on developing and developed countries still need to be addressed. Article 3 of the draft addresses the criteria or scope of protection of TK into three parts.

(a) Closely held TK that is sacred, secret or otherwise known within the indigenous people or local communities.
(b) Publicly available TK which is neither widely known, sacred nor secret.
(c) Publicly available TK which is widely known and available in the public domain.

Other Important Features of the WIPO Draft Articles on TK

1. The draft provides exclusive and collective rights to the indigenous peoples and local communities with the powers of authorizing or denying access to TK.
2. The TK holders have to give prior informed consent before arriving at mutual agreement and benefit sharing.
3. Even after benefit sharing, the use of TK has to properly acknowledge or attribute TK to its beneficiaries.
4. The cultural rights and moral rights of the beneficiaries have to be respected during the use of TK.
5. If the TK is publicly available, widely known and in public domain, it has to be protected under national law based on user fees or attribution.
6. The national law or customary law should provide development and use of voluntary codes of conduct. Such law should discourage the disclosure, acquisition or use of knowledge by others without the consent of the beneficiaries, provided the knowledge is secret and reasonable steps have been taken to prevent unauthorized disclosure, and the knowledge has value. The downside is that this provision creates many loopholes and creates uncertainty in the law. The voluntary codes will not have sufficient leverage to regulate the conduct of the parties accessing TK.
7. The Member States will be obligated to put in place enforcement procedures, dispute resolution mechanisms, ensure border protection, and implement punishments and remedies through domestic laws to deal with violations.

Disclosure Requirements

Disclosure requirements are covered under Article 4bis. The patent and plant variety intellectual property applications involving TK are required to provide information on the country (providing TK) from which the applicant has collected or received the knowledge and the country of origin of TK if the providing country is different. The application should also contain details of whether prior informed consent or approval and involvement of indigenous peoples to access and use of the TK have been obtained. If these details are not known to the applicant it is required that information about the immediate source from which the applicant received the TK be mentioned clearly. Rules will bar processing the application until the applicant provides accurate information. If the applicant fails to provide these details within the stipulated time, the application will be rejected by the intellectual property office.

Development of TK Databases

1. As per the national or customary law, the Member States are required to develop national TK databases for defensive protection of TK to prevent erroneous grant of patents and to promote transparency, certainty, conservation and transboundary cooperation. Some states are developing such databases. Traditional Knowledge Digital Library (TKDL) of India is a good example for this.
2. The Member States are required to encourage creation, exchange and dissemination of databases of genetic resources and TK associated with genetic resources and providing access to such database. It would be a mammoth task for the individual Member States to create such database for genetic resources and TK. But if it takes place it would contribute not only to implement this instrument, but also for biodiversity conservation and advancements in botanical and zoological research globally. The national law or the customary law should provide rights to the third parties to dispute the validity of a patent in the opposition proceedings by citing prior art.
3. If a TK is not uniquely held by a country, cooperation with other States is solicited in developing TK databases. If a protected TK is included in such a database, sharing of such information with other State can be initiated with prior informed consent or approval and involvement of the beneficiary.
4. International cooperation for making the database available to the intellectual property offices should take into consideration efficiencies required to include information that can be used to refuse a grant of patents and should not include protected TK.
5. The intellectual property offices should ensure that the

Table 1: Criteria for and scope of Protection of TK (based on article 3 of the WIPO Draft Aticles on TK)

Type of TK	Scope of Rights	Remarks
I. Closely held TK Sacred, secret or otherwise known within Indigenous Peoples and local Communities (IPLC)	(a) ***Exclusive and collective rights*** - to *create, maintain, control and develop* TK	Exclusive rights Collective rights
	- **Authorize or deny** ***access*** -discourage unauthorized *disclosure or use*	Yes/No to access
	• ***Be informed of access*** to TK through *disclosure mechanism in IP applications* which may require evidence of compliance with	Disclosure mechanism
	• ***Prior informed consent*** (PIC)/ approval and involvement of beneficiaries; and	-PIC -MAT
	• ***Benefit sharing*** **(BS).**	-BS
	(b) ensure / encourage users to	
	• ***Attribute*** TK to the beneficiaries	Attribution
	• Fair and equitable ***benefit sharing*** / *compensation* based on ***mutually agreed terms*** (MAT)	
	• **Utilize the TK** in a manner that ***respects cultural norms and practices*** and the ***inalienable, indivisible and imprescriptible nature of moral rights*** associated with TK.	Respect to culture Moral rights
II. TK held by IPLC and publicly available which is neither widely known, sacred nor secret	(a) **Attribute and acknowledge** the beneficiaries as the source of TK (unless the beneficiaries decide otherwise, or TK is not attributable to a specific IPLC)	Attribution and Acknowledgement
	(b) **Fair and equitable benefit sharing**/compensation based on MAT	BS, MAT
	(c) Utilize TK in a manner that **respects cultural norms and practices** and the *inalienable, indivisible and imprescriptible nature of moral rights* associated with TK.	Respect to Culture Moral rights
	(d) Be *informed of access* to TK through ***disclosure mechanism in IP applications*** which may/shall require evidence of compliance with	Disclosure mechanism
	2. *prior informed consent* (PIC)/approval and involvement of beneficiaries; and	-PIC -MAT
	3. *benefit sharing* (BS).	-BS
III. Publicly available TK which is widely known and in public domain, Protected under national law	(a) **Attribute** to the beneficiaries	Attribution
	(b) Utilize TK in a manner **that respects *cultural norms and practices*** and the ***inalienable, indivisible and imprescriptible nature of moral rights*** associated with TK.	Respect to Culture Moral rights
	(c) Where applicable, deposit User Fee in the **Fund constituted by the State.**	User Fee
	ALTERNATIVE METHOD PROPOSED	No protection
	No protection to TK • widely known • used outside the community for a reasonable period of time in public domain • protected by IP right	No Protection
	generally known principles, rules, skills, know-how, practices, learning	

information made available to them through the databases shall be maintained in confidence except for the reasons of citing the information as prior art while examining a patent application.

Penalties and Remedies

Article 4 of the draft deals with sanctions, remedies and exercise of rights. The beneficiaries will have the right to legal remedies if their rights are violated. The draft proposes that the sanctions and remedies should reflect the type of sanctions and remedies that the indigenous peoples or local communities use. In case of disputes, the matter may be referred to an independent alternative dispute resolution mechanism recognized by the international or regional body. If both the parties are from the same country, the national law that is most suited for the holders of TK should be applied.

The WIPO draft articles tries to combine both positive and defensive protection. It is much likely that the intellectual contributions of indigenous and local communities will be respected and recognized in future; and their knowledge and resources may not be misappropriated while applying for patents and other forms of intellectual property rights.

Conclusion

Human race is in a desperate strive to attain sustainable development with the help of complex and cost-effective modern technologies. TK, innovations and practices based on Ancient science may offer solutions that can be astonishingly effective. Instead of supplementing modern science with ancient wisdom, shortsighted negligence of TK and ancient science has brought irreparable loss to ecosystems and people's health. To remedy the situation, it is much desired that greater number of scholars and scientists should conduct research on ancient wisdom and bring out its values to the world. It is self evident that every country and/or group of people in a self sustaining community have their own time tested ancient practices that ought to be incorporated in school curriculums, so that younger generations are trained in their own native wisdom and cultural strength and precious knowledge is preserved, in addition to learning modern science.

In this knowledge driven era, intellectual property plays a major role in human development and economic growth. Recognition of TK and intellectual property protection for the intellectual creations of indigenous peoples and local communities will phenomenally uplift their position in the world. Primitiveness will attain prominence in sharing wisdom with fellow humans on healthy food, holistic medicine, meaningful education, value rich entertainment, and economy with ethics.

Intellectual property protection for TK will encourage more innovations in TK and at the same time trigger many new modern inventions based on it. Intellectual property protection will also help preserving fast dying TK in many countries. It will also ensure respect for indigenous peoples and their ancient knowledge systems and it will further prevent misappropriation of their knowledge by others.

The WIPO negotiations to develop draft articles have chosen *sui generis* model of protection for TK. The WIPO Draft Articles on TK; and the Consolidated document relating to Intellectual Property and Genetic Resources, as they stand now, prescribe disclosure mechanisms to prevent misappropriation of TK. Disclosure alone will not bring out justice to TK holders, even though disclosure requirement itself is not acceptable for many countries. Recognition of TK as a class of intellectual property on its own merit would be the long term solution for indigenous peoples and local communities. It might take time, but efforts have to be put in this direction to device new approaches to accord intellectual property protection to TK.

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