

Ensuring longevity of Traditional Knowledge Associated with Biodiversity to Address Climate Change

M Padmavati[†]

Rajiv Gandhi School of Intellectual Property law, Indian Institute of Technology Kharagpur, Kharagpur, 721 302, India

Received: 5 March 2018, accepted: 3 May 2018

Traditional Knowledge is integrally linked to human welfare. The necessity to harvest traditional knowledge is being increasingly realized due to a multitude of reasons. Definitional considerations, protection and enforcement mechanisms related to traditional knowledge have been a part of the continued deliberations in international and national fora. Climate change has arguably brought the urgent need for its rapid inclusion. The protection of traditional knowledge (TK) associated with the use of bioresources and human practices for livelihood sustenance are an important reference point for its inclusive approach. Among the mega-biodiverse nations, India has a rich source of TK with varied communities and cultural contexts. The present study analyses the post Nagoya context in relation to emerging perspectives for TK protection and India's commitment post the Nagoya Protocol.

Keywords: Nagoya Protocol, The Convention on Biological Diversity, TRIPS Agreement, Doha Declaration, WIPO, Intergovernmental Panel on Climate Change (IPCC), Intergovernmental Committee on Genetic Resources

The inseparability of traditional knowledge (TK) associated with biological resources and the need for including the experiences of humankind has been recognized under Article 8(j) and Article 15 of The Convention on Biological Diversity (CBD). The Working Group on ABS's long years of work comprehensively identified the issues related to traditional knowledge of the indigenous or local communities associated with genetic resources. The 1990s represent an important timeline for two parallel developments in international negotiations; The Convention on Biological Diversity, 1992 and the TRIPS Agreement of 1994. The former introduced the global mandate of common responsibility of countries to conserve and preserve biological diversity and the latter the mandate of IP as a global obligation and a tradable good respectively. During the negotiations of the TRIPS Agreement the need for review of Article 27.3 in light of protection of plant varieties was agreed by the TRIPS Council. Ethical and moral issues with respect to patenting of life forms were a concern. Intellectual property protection may interfere with agriculture which is a mainstay for many countries and potential effects of food availability may arise. Many developing countries (including India) proposed arguments against the motion.¹ The countries

suggested that Article 27.3 (b) should be amended to prohibit the patenting of all life forms. On the other hand, CBD insisted member countries to protect life forms by conserving and sustainably utilize them (Article 1, CBD). One common feature between the discussions at CBD, TRIPS Agreement and further on the Doha Declaration on TK were the developing countries concerns for formal recognition and protection of TK internationally.^{2,3} Paragraph 19 of the 2001 Doha Declaration brought in the need for understanding the complementarity between TRIPS Agreement and CBD, the protection of traditional knowledge and folklore.

The need to raise TK to the status of one of the intellectual property rights (IPRs) during the TRIPS Agreement is justified from the stand point that this represents a large body of the intellectual creations of the human mind with maximum public good character among the forms of IP. This also represents the IP that generations have not only accepted but also most effectively used and disseminated. Today, what we know as the identity in relation to culture, tradition, traditional medicine, healing practices, artistic creations, community practices etc., are TK.⁴ According to the WIPO Report⁵ 'traditional knowledge comprises: "tradition-based literary, artistic or scientific works; performances; inventions; scientific discoveries; designs; marks, names and

[†]Email: mpadma@rgsoipl.ittkgp.ernet.in

symbols; undisclosed information; and, all other tradition-based innovations and creations resulting from intellectual activity in the industrial, scientific, literary or artistic fields'. Based on nine Fact Finding Missions an elaborate report was prepared on the multilateral institutions and initiatives, customary laws and protocols already available. Further, in terms of regional considerations and differing expectations, nine different regions including all continents were thoroughly studied for the IP needs and expectations of TK holders. This report forms the first elaborate report of TK from different regions and the protocols, IP aspects and mechanism of protection and its sharing. As part of the communication, in 2006, many countries suggested the mandatory requirement for the disclosure of origin of biological resources and/or associated traditional knowledge used in inventions for which intellectual property rights are applied.⁶ The inalienable nature of TK, vast scope, inaccessibility, informal nature, collective possession inherently disallow TK to be fit into the IP paradigm. Nature of TK as IP, hence, has been the centre of continuous international debate.

Community practices have always been relevant to understand adaptation to changes. Climate change is global and its management present serious challenges with a need to understand the interplay of several indicators. The Intergovernmental Panel on Climate Change (IPCC) Report of 2014 has some grave pointers; anthropogenic role has hastened climate change, unprecedented sea level changes and alarming increase in CO₂ levels.⁷

Understanding the role of biodiversity and associated TK in climate change mitigation is imperative. One must remember the birth of the two important multilateral agreements as outcome of the Earth Summit in Rio: the CBD and the Framework Convention on Climate Change (FCCC). Identifying how TK associated with biodiversity and its use can help provide solutions to climate change adaptation/climate change mitigation. It is from this context that the study attempts to analyse the evolution of the TK and climate change from the CBD and FCCC and the Nagoya Protocol and the Post Nagoya Period. The study draws inferences from TK implementation in India, one of the mega-biodiverse nations, from the post Nagoya perspective.

Climbing Together: Climate and TK

The multidisciplinary nature of climate change is leading several organisations to address cross cutting

issues in relation to information on climate change impacts and the available adaptation measures. Further, climate change effects are not going to be equal across geographies. Particular attention is required for those in regions of high vulnerability and low adaptability. Addressing climate change is a multi-pronged approach. There is an increased involvement of various countries to enhance TK discussions and use it to understand climate change mitigation.

Traditional resource rights are best understood in the case of indigenous and local communities where livelihood is intricately linked to biodiversity and associated traditional knowledge.⁸ This is as such recognized under the purview of Article 8(j) of the CBD which provides for the *in situ* conservation of biological resources by recognizing the role of traditional practices of indigenous communities in conservation.

Each contracting Party shall, as far as possible and as appropriate: Subject to national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge innovations and practices.

Encouraging customary uses is laid out in Article 10 (c) of CBD... 'Each Contracting Party shall, as far as possible and as appropriate... *protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements*'. Further, Article 15 recognizes that access of genetic resources must be 'for environmentally sound uses', 'countries of origin' need to be identified and 'prior informed consent' need to be taken into consideration.⁹ Article 17 and 18 elaborate the need for the exchange of information that should be facilitated by contracting parties which brings the context of using publicly available sources including indigenous and traditional knowledge.

The negotiations in relation to traditional knowledge related to genetic resources were taken up by WIPO under the Intergovernmental Committee on Genetic Resources, Traditional Knowledge and

Folklore (IGC). The IGC was established by the WIPO General Assembly in October 2000 (document WO/GA/26/6) as an international forum for debate and dialogue concerning the interplay between intellectual property (IP), traditional knowledge, genetic resources, and traditional cultural expressions. It highlighted the resolve of many countries on including mandatory requirements related to traditional knowledge access as well as building transparency in relation to IP rights. The Standing Committee on Patents (SCP) was created in 1998 to serve as a forum to discuss issues, facilitate coordination and provide guidance concerning the progressive international development of patent law. In 2001, developing countries and many other members argued for the need for amendments to the TRIPS Agreement under the purview of Article 71.1. In 2002, the WIPO recognized that the IP system is in direct conflict with traditional practices and lifestyles. TK holders face a dichotomy of the need to continue their own customary regime on one hand and the IP system administered by governments in another. In 2006, in the 8th Conference on Parties to the CBD in Brazil highlighted the necessity for reform of domestic and global IP regimes to ensure proper protection to traditional knowledge.¹⁰ A consolidated document 'Glossary of key terms to Intellectual Property and Genetic resources' (prepared in relation to WIPO/GRTKF/IC/31/INF/7, 2016) for discussion at the 31st Session at Geneva. Further, list of references for resources relevant to TK, TCEs and genetic resources are also tabled along with submissions of further reference materials in this regard (WIPO/GRTKF/IC/31/INF/2 REV, 2016).

Under the Development Agenda the recent work of the IGC's indicates to the commitments to work out an international legal instrument in relation to IP. The aim was to ensure balanced and effective protection of genetic resources, traditional knowledge and traditional cultural expressions. In this regard, some major considerations have been to develop a commonly accepted definition for misappropriation, beneficiaries and subject matter (genetic resource, traditional knowledge etc.). The outcomes of the cross cutting issues in this areas through sectoral seminars is expected to lead to a possibly unified basis of understanding of these aspects. A significant outcome of the draft framework document developed in late 2017 is the commitment of reaching of an agreement on an international legal instrument(s) relating to IP which will ensure full, balanced and

effective protection of genetic resources, TK and traditional cultural expressions (TCEs). Beginning October 2018 upto October 2019, several meetings (IGC 37 to IGC 41) are scheduled to undertake negotiations on TK/TCEs for the purpose.¹¹

The Traditional Knowledge Information Portal at the CBD represents an important development to promote awareness and enhance access by indigenous and local communities to information on TK, innovations and practices relevant for CBD goals. The Capacity Development Programme on the national arrangements on traditional knowledge for achieving the Target 18 and contribution to Target 16 of the Strategic Plan for Biodiversity 2011-2020 provides an inclusive approach (with the four regional workshops) of identifying the best practices at national and local levels for the protection and promotion of traditional knowledge.^{12,13}

Climate change has positive as well as negative impacts on the Arctic ecosystem. The sharing of the research at the TK information portal is hoped to provide a collective understanding of approaches to tackle climate change.¹⁴ For instance, in 2008, the indigenous and local community representatives of the Arctic region provided their responses to climate change. In an information document that was submitted to the 9th meeting of the COP to the CBD in 2008 many important observations were made. More than 400,000 indigenous people inhabit the Arctic region. The report recognized that traditional ecological knowledge of the communities is a key component of adaptation and the changes to Arctic biodiversity affecting livelihoods has been recognized.¹⁵ The indigenous communities in Alaska and Russia have developed necessary measures to mitigate climate change. Hunting only once a year in Alaska instead of twice not only is a climate change but also a safe option. The Chukchi reindeer herding community of Nutendli provides its children the effects of climate change such that knowledge and traditional livelihoods can survive. Another thrust area is impact on oceans and marine biodiversity. This is emerging out to be a focus area for large scale studies. Rapid changes in the abundant biodiversity of oceans and seas, changes in species, migration, resilience of marine ecosystems, impact of anthropogenic pressures are beginning to be understood in relation to marine biodiversity.

The Working Group II dealing with the impacts, adaptation and vulnerability for the Fifth Assessment Report of the IPCC 2014 emphasized that

“Indigenous, local, and traditional knowledge systems and practices, including indigenous peoples’ holistic view of community and environment, are a major resource for adapting to climate change, but these have not been used consistently in existing adaptation efforts. Integrating such forms of knowledge with existing practices increases the effectiveness of adaptation”. The Nairobi Work Program is an important deliberation that led to the development of tools and methods to deal with climate change risk reduction. It was adopted to assist the developing, least developed and small island developing countries enhance knowledge on impact assessment, vulnerability and adaptation and be able to take informed decisions on adaptation steps and measures to respond to climate change based on current as well as future climate change and variability. In the tools and methods outlined for the Programme, exchange of traditional knowledge on observed climate change impacts by stakeholders

was emphasized. In the most vulnerable countries integration of traditional knowledge for disaster risk reduction will be necessary. Based on work done in relation to climate related risks and extreme events one important outcome is the availability of Traditional knowledge information via the UNFCCC’s local coping strategies database. A reference to the recommendations from the joint efforts of the Adaptation Committee and the Nairobi Work Program in 2014 is relevant here. The major discussions included the need for both indigenous and traditional knowledge and practices for adaptation and adoption of gender sensitive adaptation actions, challenges related to governments approach to taking participation of indigenous communities and adoption of modern styles leading to changes in the communities. The key issues discussed in relation to use of indigenous and traditional knowledge and practices for adaptation are represented in the diagram below.

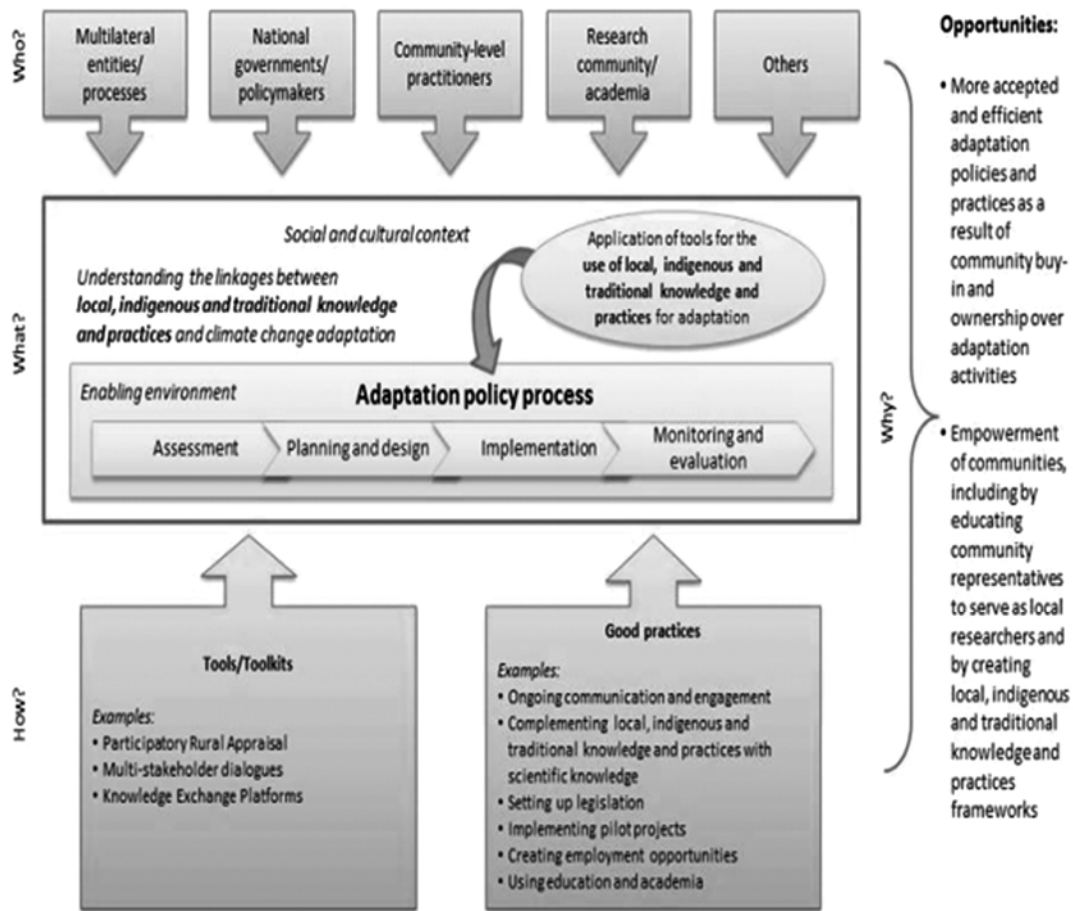


Fig. 1 — Use of indigenous and traditional knowledge for climate adaptation.

Source: <https://unfccc.int/resource/docs/2014/sbsta/eng/inf11.pdf>

One of the significant development of the COP 7 meeting of the CBD is the AkweKon Voluntary guidelines for the conduct of cultural, environmental and social impact assessment which could impact sacred sites traditionally occupied or used by indigenous and local communities. These guidelines are an important source for consideration of biodiversity related aspects into environment impact assessment legislation and in strategic environment assessment processes (Fig. 2)

These guidelines outline how views and concerns, right to revoke access, identification of support mechanism and legal measures, monitoring, compensatory mechanisms and access on mutual benefit terms need to be considered in decision making. The Metsahallitus Heritage Services, a state agency that manages all protected areas on state owned land in Finland, serves as an example for the implementation of the Guidelines. A pilot work revealed interesting aspects of the role of the indigenous Saami people for assessment of the cultural, environmental and social impact, in protected area management and natural resource planning. The work also identified how establishment of governance mechanism and respecting culture and local traditions have fostered the Saami community.¹⁶

The COP meeting in 2016 discussed mainstreaming the contribution of TK, innovations and practices across, agriculture, fisheries, forestry and tourism sectors for the conservation and sustainable use of biodiversity for well being and utilizing the participation of the local or indigenous community

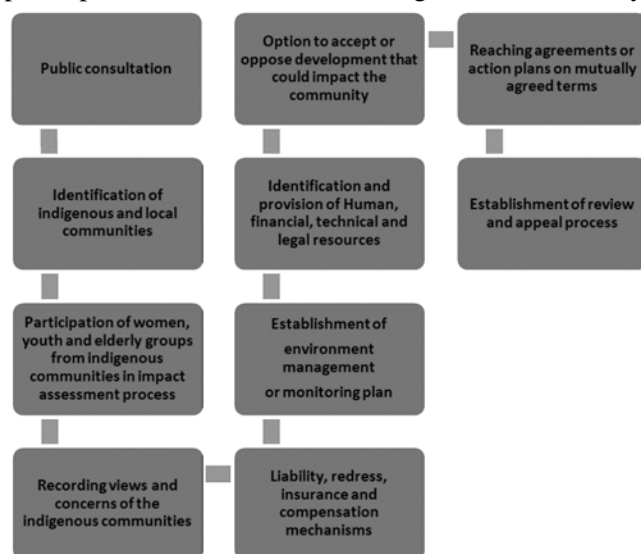


Fig. 2 — AkweKon guidelines

mandatory in any decision making process that involves their interests. A set of 20 global targets under the strategic plan for biodiversity 2011-2020 were developed and grouped into five strategic goals. One of the targets, Target 18 indicates that by 2020 ‘TK innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, is respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the convention.’

The Decision XIII/4 on biodiversity and climate change recognized the need for synergies provided by the 2030 Agenda for sustainable development, Sendai framework for Disaster Risk Reduction 2015-2030, Strategic plan for Biodiversity 2011-2020. It also emphasized on the relevance of biodiversity related Articles (5, 7 and 8) of the Paris Agreement.¹⁷ The need to address social, environmental and economic impacts associated with climate change and disaster, consider ecosystem approaches to climate change adaptations and mitigation, promote integration of climate change and adaptation best practices, strategies and methodologies were emphasized.

One of the significant developments as part of the ongoing implementation in relation to TK are the MootzKuxtal Voluntary Guidelines. In relation to Article 8(j) and related provisions, Decision XIII/18 outlined the basis of adoption of the MootzKuxtal Voluntary Guidelines. These guidelines are organised into two parts; the Purpose and Approach and General Principles. The guidelines emphasize the need to develop, ensure prior and informed consent, ‘free and prior informed consent’ or ‘approval and involvement in the development’ for accessing traditional knowledge innovations and practices. The relevance of community protocols and customary law of indigenous communities and local people was highlighted for access to traditional knowledge.¹⁸ Noteworthy is the development of definitions in relation to the types of consent for the first time under the fore of CBD as given in Table 1.

Traditional Knowledge Protection in the Context of Nagoya Protocol and Post Nagoya

The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is a supplementary agreement to the Convention on

Table 1 — MootzKuxtal guidelines as a key for consultation with indigenous and local communities

Type of consent	Scope of participation
Prior consent	Consent or approval in advance of any authorization to access TK taking into consideration of customary decision making processes
Informed consent	Information needed to be provided on purpose of access, duration and scope, need for a preliminary assessment including potential risks, procedures for access and benefit sharing arrangements
Consent or approval	Agreement of indigenous and local communities or the competent authorities representing them to grant access to TK including the right not to grant consent
Involvement	Complete participation of indigenous and local communities in decision making process and consultation in relation to access of TK

Biological Diversity (*herein after referred as Protocol*). It provides a transparent legal framework to member states for the effective implementation of one of the three objectives of the CBD i.e. the fair and equitable sharing of benefits arising out of the utilization of genetic resources.¹⁹ The Protocol provides the mechanism for both providers and users of genetic resources keeping view the goals of conservation and sustainable use of genetic resources. To ensure the effective implementation of protocol the contracting parties are required to take relevant measures for prior informed consent from the communities. Further, for fair and equitable benefit-sharing of bioresources and associated TK a need to take into consideration community laws, procedures, customary use and also their consistency with the national laws is spelt out in Article 6 of the Protocol- *...subject to domestic access and benefit-sharing legislation or regulatory requirements, access to genetic resources for their utilization shall be subject to the prior informed consent of the Party providing such resources that is the country of origin of such resources or a Party that has acquired the genetic resources in accordance with the Convention.*²⁰

In addressing traditional knowledge associated with biological resources the Protocol sets out three main obligations– Access obligations, benefit sharing obligations and compliance obligations. The establishments of national focal points (NFPs) and competent national authorities (CNAs) that shall serve as contact points for information, grant access or cooperate on issues of compliance (Article 13, Nagoya Protocol) define the domestic implementation process. Clearing-House Mechanism is an important aspect of the Protocol. Based on a country's self-assessment of national requirements and priorities, capacity-building support in the form of in-country research capability, negotiating mutually agreed terms, technology transfer, awareness raising, financial mechanism and other relevant perspectives

necessary in the implementation of the protocol have been considered (Article 22, Nagoya Protocol).²¹

In relation to the Nagoya Protocol, the relevance of the development of a global multilateral benefit sharing mechanism to address fair and equitable sharing of benefits based on genetic resources and associated TK is an important aspect of the inclusive approach in relation to benefit sharing. Information submission has been requested from Governments, indigenous peoples and local communities in relation to *in situ* or *ex situ* genetic resources and associated traditional knowledge where it is not possible to grant or obtain prior informed consent (Decision 2/10).

The draft Rutzolijirisaxik Voluntary Guidelines for the Repatriation of Traditional Knowledge (TK) relevant for conservation and sustainable use of biological diversity have been finalized by the Ad Hoc Open ended Working Group on Article 8(j). This spelt out the voluntary glossary of terms and concepts with regard to Decision XIII/19, adoption of the in depth dialogue on thematic areas and other cross cutting issues and recommendation to the UN Permanent Forum on Indigenous People. The six recommendations adopted in the meeting conducted in December 2017 are (a) the Rutzolijirisaxik Voluntary Guidelines for the Repatriation of Traditional Knowledge Relevant for the Conservation and Sustainable Use of Biological Diversity, (b) glossary of relevant key terms and concepts within the context of Article 8(j) and related provisions(c) ways and instruments for achieving full integration of Article 8(j) and provisions related to indigenous peoples and local communities in the work of the Convention and its Protocols, with full and effective participation of indigenous peoples and local communities and aiming at enhancing efficiencies, coherence and coordination; (d) resource mobilization: assessing the contribution of collective actions of indigenous peoples and local communities and safeguards in biodiversity financing mechanisms,

(e) an in-depth dialogue on thematic areas and other cross-cutting issues and (f) recommendations from the United Nations Permanent Forum on Indigenous Issues to the Convention on Biological Diversity

With reference to the recovery of TK relevant for the conservation and sustainable use of biological diversity 'publicly available' TK is a consideration. In this context of TK 'repatriation' has been defined as 'the return of knowledge, innovations and practices of indigenous peoples and local communities to where it originated or was obtained for the recovery, revitalization and protection of knowledge on biological diversity'. The good practices for implementation of the Rutzolijirisaxik Voluntary Guidelines take into consideration the procedural aspects, special considerations, mechanism that may assist in repatriation of TK. The glossary defines relevant key terms such as traditional knowledge, customary sustainable use, indigenous and local communities' cultural impact assessment, cultural heritage, impact assessment, customary law, EIA, sacred sites, social impact assessment and strategic environmental assessment.²²

Post Nagoya Protocol Implementation on TK in India

After the announcement of the Nagoya Protocol in 2010 and in the current implementation period many countries are developing ABS policy and legislation. As domestic regulation on ABS is being developed, including conservation and protection of TK aspects need to be addressed for effective protection under the ABS regime. Recording of TK information may, antithetically, lead to loss of TK. Biopiracy, public and private TK issues, transboundary aspects still need to be addressed and pose challenges to its implementation in the post Nagoya regime.²³ Identifying monitoring mechanisms for TK as well as enforcement of compliance in relation to consent principles as well as enforcement under domestic legislation is necessary.

While there many legislations in India that provide for TK protection indirectly, the Biological Diversity Act 2002 is the legislation which provides for specific protection of TK. Extensive recording of People Biodiversity Registers has been undertaken by the various State Biodiversity Boards as well as institutions.²⁴ Section 36 (5) of the Act has an enabling provision wherein Central Government take measures "to respect and protect the knowledge of

local people relating to biological diversity, as recommended by the National Biodiversity Authority through such measures, which may include registration of such knowledge at the local, State or national levels, and other measures for protection, including sui generis system".

The UNEP-GEF-MoEFCC ABS project has successfully been conducted in many states in India and has assisted the State Biodiversity Boards in implementing the ABS mechanism.²⁵ It is expected that mandatory disclosure requirements in case of IP filing will be strengthened in India in the post Nagoya period. The development of the TK repository by the National Biodiversity Authority will consolidate TK information of the country. This will serve as an important guidance for urgent conservation measures of TK. The increase in workshops being conducted for traditional knowledge holders is a step towards promoting TK protection.²⁶ The ABS guidelines announced in 2014 are being given effect from the point of view of implementing user and access measures. Adoption of community protocols, community conservation centers, TK healer workshops and biodiversity education and training in recent years have encouraged biodiversity and TK conservation. A few TK centers have been operational and it is expected that in future there will be more TK centres which would impact training in conservation of TK. The announcement of sacred groves and TK rich regions as Biodiversity Heritage sites will go in a long way to help in *in situ* conservation of TK.

The internationally recognized certificate of compliance is one of the major innovations of the Nagoya Protocol to improve transparency in relation to the access and benefit-sharing system. In relation to the implementation of the Nagoya Protocol, the first internationally recognized certificate of compliance was deposited on 1 October 2015 by India, following a permit made available to the Access and Benefit-sharing (ABS) Clearing-House. The permit was issued by India's National Biodiversity Authority, the competent national authority under the Nagoya Protocol. The certificate constituted through the ABS Clearing-House serves as evidence of the decision by India to grant access to ethno-medicinal knowledge of the Siddi community from Gujarat to a researcher affiliated with the University of Kent in the United Kingdom. Practicing TK will go in a long way to preserve TK. Further, it may be worth to use technical solutions to preserve TK. Many languages are fast

vanishing and it is possible that a whole lot of TK may be lost. While general approaches to recording and conservation and enforcement of TK are relevant, specific approaches may need to be undertaken due to the ‘amenability’ of TK.

Conclusion

TK represents an important body of knowledge that needs to be fostered. Indigenous and local communities hold the key to ensure TK longevity. They have developed capabilities of dealing with changed environmental circumstances. Building climate resilience is a large part of the international effort to understand and address climate change. Monitoring and utilization of traditional knowledge has implications in the national as well as international context. An ecosystem approach is imperative for protection of TK as there are many non-human and human factors essential in the process. That ‘TK is a shared goal’ is demonstrated by the deposition of TK information by India to the ABS-CH. While a uniform ABS policy is necessary, there are adequate differences in customary aspects of TK which will pose huge challenges to TK conservation and access. Strengthening the local community consent procedures and participation will help address some aspects. TK is a commitment and ensuring TK longevity can be done only by preservation and fostering TK.

References

- 1 TRIPS Council Secretariat Note IP/C/W/369/Rev, 2006.
- 2 Doha Ministerial Declaration WT/MIN(01)/DEC/1, https://www.wto.org/english/thewto_e/minist_e/min01_e/mindecl_e.htm#par19.
- 3 Gervais D, TRIPS, Doha and traditional knowledge, *Journal of World Intellectual Property*, 6 (3) (2005) 403-419.
- 4 Subramanian S M & Balakrishna P, *Traditional Knowledge in Policy and Practice. Approaches to Development and Human Well-Being*, United Nations University, 2010.
- 5 Intellectual property needs and expectations of traditional knowledge holders, *WIPO Report of 2001 on Fact-Finding Missions on Intellectual Property and Traditional Knowledge (1998-1999)*, http://www.wipo.int/edocs/pubdocs/en/tk/768/wipo_pub_768.pdf.
- 6 WT/GC/W/564/Rev.2/TN/C/W/41/Rev.2/IP/C/W/474 (2006) Doha Work Programme- The outstanding implementation issue on the relationship between the TRIPS Agreement and the Convention on Biological Diversity.
- 7 IPCC Report on Climate Change 2014, <http://www.ipcc.ch/report/ar5/syr/>
- 8 Posey D A & Dutfield G, *Towards Traditional Resource Rights for Indigenous Peoples and Local Communities*, In: Beyond Intellectual Property, International Development Research Centre. (1996).
- 9 Implementation of the ABS in relation to access of TK includes the joint reading of Article 8(j) and Article 15.
 - (a) Recognizing the sovereign rights of States over their natural resources, the authority to determine access to genetic resources rests with the national governments and is subject to national legislation.
 - (b) Each Contracting Party shall endeavour to create conditions to facilitate access to genetic resources for environmentally sound uses by other Contracting Parties and not to impose restrictions that run counter to the objectives of this Convention.
 - (c) For the purpose of this Convention, the genetic resources being provided by a Contracting Party, as referred to in this Article and Articles 16 and 19, are only those that are provided by Contracting Parties that are countries of origin of such resources or by the Parties that have acquired the genetic resources in accordance with this Convention.
 - (d) Access, where granted, shall be on mutually agreed terms and subject to the provisions of this Article.
 - (e) Access to genetic resources shall be subject to prior informed consent of the Contracting Party providing such resources, unless otherwise determined by that Party.
 - (f) Each Contracting Party shall endeavour to develop and carry out scientific research based on genetic resources provided by other Contracting Parties with the full participation of, and where possible in, such Contracting Parties.
 - (g) Each Contracting Party shall take legislative, administrative or policy measures, as appropriate, and in accordance with Articles 16 and 19 and, where necessary, through the financial mechanism established by Articles 20 and 21 with the aim of sharing in a fair and equitable way the results of research and development and the benefits arising from the commercial and other utilization of genetic resources with the Contracting Party providing such resources. Such sharing shall be upon mutually agreed terms. <https://www.cbd.int/convention/articles/default.shtml?a=cbd-15>.
- 10 COP 8 Meeting, <https://www.cbd.int/meetings/COP-08>.
- 11 WIPO Intergovernmental Committee on IP and Genetic Resources, *Meeting Reports*, <http://www.wipo.int/tk/en/igc/>.
- 12 Target 18: By 2020, the traditional knowledge, innovations, and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities.
- 13 Target 16: By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.
- 14 Online forum for Traditional Knowledge, <https://www.cbd.int/tk/cb/onlineforum.shtml>.
- 15 International Peoples and Traditional Knowledge related to Biological Diversity and responses to climate change in the Arctic region, <https://www.cbd.int/doc/publications/tk-cc-arctic-en.pdf>.

- 16 Hogmander J & Leivo A, General principles for sustainable nature tourism in protected areas administered by Metsähallitus, Finland, *Working Papers of the Finnish Forest Research Institute*, 2004, <http://www.metla.fi/julkaisut/workingpapers/2004/mwp002-49.pdf>.
- 17 The Paris Agreement, https://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf.
- 18 Article 5 calls upon Parties to take action to conserve and enhance sinks and reservoirs of greenhouse gases.
- 19 Article 7 recognizes the role of adaptation in protecting livelihoods and ecosystems.
- 20 Article 8 relating to loss and damage, including resilience of livelihoods, communities and ecosystem.
- 21 MootzKuxtal guidelines, <https://www.cbd.int/doc/decisions/cop-13/cop-13-dec-18-en.doc>.
- 22 Nagoya Protocol on ABS, <https://www.cbd.int/abs/background/default.shtml>.
- 23 Article 6 of Nagoya Protocol <https://www.cbd.int/abs/text/articles/default.shtml?sec=abs-06>.
- 24 Wan IzatulAsma Wan Talaat, Protection of the associated traditional knowledge on genetic resources: Beyond the Nagoya Protocol, *Procedia Social and Behavioral Sciences*, 91 (2013) 673-678.
- 25 Rutzolijirisaxik guidelines, <https://www.cbd.int/doc/c/abac/df3/cf7857d8eb8ee17654/wg8j-10-02-en.pdf>.
- 26 Rabitz F, Biopiracy after the Nagoya Protocol: Problem structure, regime design and implementation challenges, *Journal of the Brazilian Political Science Association*, 9 (2) (2015)30-53.
- 27 Manchikanti P, Traditional knowledge register of India: Techno-legal issues, *International Journal of Intellectual Property Management*, 5 (3/4) (2012) 254-265.
- 28 UNEP-GEF-MoEFCCABSProject, <http://nbaindia.org/unep-gef/>.
- 29 2nd National Workshop on TK and ABS 2-4 May, 2015, <http://nbaindia.org/unep-gef/telanganaevent.html>.