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Review

Access and benefit sharing from biological resources and associated traditional knowledge in the HKH region - protecting community interests

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After the Convention on Biological Diversity (CBD) came into force in 1993, access to genetic resources, fair and equitable sharing of benefits from the use of biological resources and traditional knowledge become an important agenda. All the Himalayan countries are party to CBD and are in different stages of developing access to genetic resources and benefit sharing (ABS) policies and laws. There are ongoing debates on the need for institutional mechanisms to regulate the ABS agreements, defining ownership of genetic resources and associated traditional knowledge. In the region, local communities have retained traditional knowledge in managing their biological resources. Getting benefits from such traditional knowledge and genetic resources is new to the region. In the globalised context this has became even more complex as communities seek to assert their rights over their traditional knowledge which can be used when accessed outside as base line knowledge for future innovations. Some legal arrangements for protecting the community rights over biological resources and associated TK are emerging, in practice however, it is not clear on how local indigenous communities will benefits from bioprospecting. This article analyses on the key issues and debates on emerging Access and Benefit Sharing (ABS) mechanisms in the Himalayan countries and examines their efforts towards protecting rights over biological resources and associated traditional knowledge. It also assesses, the potential challenges and the fate of ABS regime for the future in the region.

Key words: Access and Benefit Sharing, traditional knowledge, ownership, genetic resources, bioprospecting, traditional institutions.

INTRODUCTION

The ratification of Convention on Biological Diversity in 1993, brought forwards the agenda of access and benefit sharing (ABS) from the use of genetic resources. As this concept is entwined with the concept of fair and equitable sharing of benefits from the use of biological resources, it has become crucial matter of debate in the conservation and development of biological resources. Previously, intellectual traditions of free exchange of biological/ genetic resources and traditional knowledge (TK) by the indigenous and local communities to the outside world was viewed differently, but after the Convention, perceptions have changed. The reason being, the convention's article 8(J), 10 (c) 15, which focuses on respecting traditional knowledge, customary rights of the indigenous local communities, fair and equitable sharing of benefits with prior informed consent and mutually agreed terms of the holders of resources by the users(Secretariat of Convention on Biological Diversity, UNEP (2001). Hand book of the convention on biological diversity. Part 1.Earthscan Publication limited. 120, Pentonville road, London, UK) The specific articles concerning the fair and equitable sharing of benefits from the use of biological resources have been analyzed and debated for the last 16 years, in which only 10% of the Parties to the Convention (COP) have adopted any regulatory measures or practices(Young T. R. (2008). The Challenges of New Regime: The Quest for Certainty in "Access to Genetic Resources and Benefit Sharing". Asian Biotechnology and Development Review. Vol.10:3. Pp..113 -136. D.K. Fine press Ltd. Lodi Road. New Delhi). At the 5th COP

meeting, it was realized that a functional ABS system was essential that was lacking. A need to develop guidelines detailing the procedure for the implementation ABS agreements was felt important. The COP 6th meeting adopted the Bonn guidelines to facilitate the process of developing legal procedures among the parties (Secretariat of the Convention on Biological Diversity, (2002). Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization. Montreal: Canada). This however has not been enough. Many complex issues on the ownership over resources and benefit sharing are yet to be clear. Contracting parties need to understand the mechanics and structure of development and implementation of ABS policy and legislation. Therefore, the development and implementation of ABS policy and legislation in the Himalayan countries have been slow. So far, only two countries, India and Bhutan in the Himalayan region have developed ABS legislation while others are in the process of developing it.

The delay in the development of ABS policy and law however, have not prevented in raising awareness among the government civil society groups and to the local community. The challenges, during intellectual deliberations, is to convince communities to understand access and benefit sharing (ABS) and link policy makers into methodologies of biological and genetic resources trade. For a common man, ABS seems to be a simple agreement. For example one natural person (user) obtains the biological/genetic resource from another natural person/ entity/ country (provider) and in exchange offers benefits. The common people and communities in the Himalayan region consider, that “access” for them means privileges sanctioned by the government/ community leader, to enter into the forest areas, wetland sites, protected areas to collect forest litter, fodder leaves and some non timber and aquatic products for their day to day needs. While majority of policy makers engaged in this area consider that access to biological resources is simply to allow pharmaceutical or other companies to gather primary natural products from the source of origin through legal means for bioprospecting. Unfortunately, this simplistic view is not what the CBD means and it is far too complex for practical and legal reasons. The central aim of the CBD is to regulate the access and benefit sharing mechanism through appropriate legal instruments. The third objective stated in the CBD, “of fair and equitable sharing of benefits from the utilization for genetic resources is rather vague and thus lacks clarity of its implementation in context to the Himalayan region.

Although debate on this complex issues of ABS is going on at the local/ national/ regional and international level, the flow of biological resources from the mega diverse countries in the Himalayan region is still continued though at a restrictive peace. The benefit to the community through accessing biological resources has not been vernalized to meet the objectives of CBD (Sharma, D (2005). Selling Biodiversity: Benefit Sharing is a Dead Concept..In; **The Catch: Perspectives in Benefit Sharing. Beth** Burrows eds. The Edmonds Institute 20319-92nd Avenue West Edmonds, Washington 98020 USA. pp. 1-14). Therefore, it is unclear on the benefits and how the development and enforcement of ABS policy and legislation will bring benefit to the mountain community at large. This article analyses the current scenario of the Himalayan countries and how this region is facing challenges, furthermore it thrusts on the third objective of the CBD, its implementations and how it will benefit local communities, keeping in mind the challenges and paths that lie ahead in the future.

What are the key ambiguities on ABS mechanism?

For the practical implementation of CBD and its third objective" fair and equitable sharing of benefits arises from the use of genetic resources", the difference between biological resources and genetic resources needs to be clearly understood. In the CBD, the definition of biological resources includes, genetic resources or parts thereof(CBD article 2. Use of terms), thus, the Indian biodiversity Act 2002 and other draft laws (Nepal ABS law) in the region have adopted the same definition.

There is underlying indistinctness between biological and genetic resources among the policy makers and the communities. Traditionally biological resources such as seed, or any parts of plants or animals are freely commercialized which contain genes. This means accessing biological resources naturally accesses genetic resources. How genetic resources can be accessed separately from biological resources is not clear. Because of this it has become ambiguous this notion has limited the value of developing meaningful ABS policy and legislation in the region. Further access practice of the Himalayan countries historically emanates from free access to biological resources and associated knowledge, therefore the attitude of people and community is still to allow free access to knowledge and resources.

With the enforcement of CBD and as the practice of free access to biological resources and knowledge drew close, new policies and laws for conservation of biological resources such as community forestry, collaborative management of protected areas, their buffer zone management and joint forest management emerged to transfer usufruct rights over biological resources use to the local communities. In addition, there are policy and laws governing access to biological resources by default. ABS legislations are also emerging, which are not harmonized. In the emerging ABS laws there is no legal certainty on who owns the genetic resources and who should be the rightful person to legally sign the ABS contract if resources are under community management. In the countries, there are separate legislations governing the ownership of land, private property, common proper-

ty, intellectual property and other forms of intangible properties defining definite and detail rules including rights and duties. In the emerging ABS laws, it is not clear on how genetic resources and traditional Knowledge under such situation can be owned or accessed? Access to a sample of biological resource to identify genes and access to one such gene/genes contained within the biological resource for commercialization or research. The fundamental uncertainty seems to be related to the ownership over genetic resources.

Most of the Himalayan countries have adopted ABS provisions of the CBD(Article 15 and Article 8(J) of CBD) in their policy frame work. ABS provision of the laws (be they in draft form or promulgated) have caused many controversies and is debated at the provincial, district, local community, indigenous people, marginalized people and the government. The question that affects both the users and providers is the legal certainty in tracing the rightful owner of the resource when it comes to bioprospecting. The ABS system at the national level seems to be regulated by the National Biodiversity Authority (NBA), a government agency. There are legal arrangements for the benefits flow, but the communities are not yet sure on how benefits will flow to them from the BAS process. The civil society organizations at different levels have supported awareness rising on ABS, but they have also raised confusion with bioprospecting as corollary to bio piracy. In addition, the expectation of local communities has been raised by explaining the potential value of their biological resources, however, this may not be true and expectations could be misleading. This further confuses local communities on the access of their resources. There are a number of questions that arises among communities such as; the sale of farm or forest products in the market and uncertainty during proceedings. Will the implementation of ABS regime prevent their routine business as they are dealing with the collection and sale of their bio resources? Will this process be accessing their genetic resources in disguise? In essence, they will be selling the genes contained within the bio resources to the markets. Do the ABS laws prevent this, or are there other arrangements? The above factors have aroused a sense of suspicion amongst the local communities on the ownership over genetic resources and potential benefits that they hope to reap from bioprospecting.

Furthermore, the question of who can be identified as indigenous has become an important issue when it comes to the use of biological resources. The Himalayan region is the confluence of Indo-Aryans and Mongolians migrants; some arrived earlier than the others with their distinct language and culture. Through this mixing, a mongrel culture is developing. Looking at the century old history, the migration of mountain people has been quite dynamic and so has the ownership of people over resources. Defining indigenous and non indigenous people in the laws and regulatory framework are therefore a major problem as compared to USA, Canada, Australia and New Zealand. These imperfections generate setbacks and thus impact the ownership and use over biological resources and getting benefits from such resources and Knowledge.

While the ownership over biological resources in the region is very complex and recklessness over biological resources is pervasive, the legal and policy situation is complex and not resource –efficient. Due to the lack of legal instruments and irregular enforcement mechanism the ability to address such issues is not easy. However, there are two keys to address the ownership issue from a conceptual perspective of the ownership and sovereignty in the Himalayan region.

Sovereignty and ownership over genetic resources

The CBD recognizes states' sovereignty over genetic resources - not ownership; ownership of biological resources, including genetic resources, is determined by national law (e.g. forests could be state property, communal, municipal, private, etc; but the use of forest genetic resources are subject to national policy and regulations). If the government grants lands and resource ownership to the certain state within the union territory of a state, it does not affect federal/ national sovereignty over genetic resources; it continues to pertain to the federal/ national government. However, the federal government can also grant administrative powers to the state government to develop and implement rules/ regulations that ensure such sovereignty. If such a decision existed with regard to genetic resources, the provincial state may in fact become the implementer of national sovereignty.

The second key is precisely the distinction between genetic and biological resources. There is often confusion between these two. Biological resources (e.g. the trees or the forests, microbes etc) are subject to ownership through legislation and regulations; genetic resources ("Genetic resources" means any material of plant, animal, microbial or other origin containing functional units of heredity, of actual or potential value), basically means the gene themselves. The physical genetic material taken from the particular specimen and information existing at the level of molecules, cannot be owned by anybody in particular, because it would be like "owning the DNA" of a particular species of tree. The law doesn't define the legal status of this, the kind of property of the gene and the type of rights the genetic resources are, or should be. What the national government has said, by way of its sovereignty over biological resources, is the right to regulate access to biological samples containing such DNA, if the plants, animals or microbes or others are in their territory (Figures 1, 2). This has nothing to do with ownership of the trees or biological resources; the only connection is through the rules/regulations, in the sense

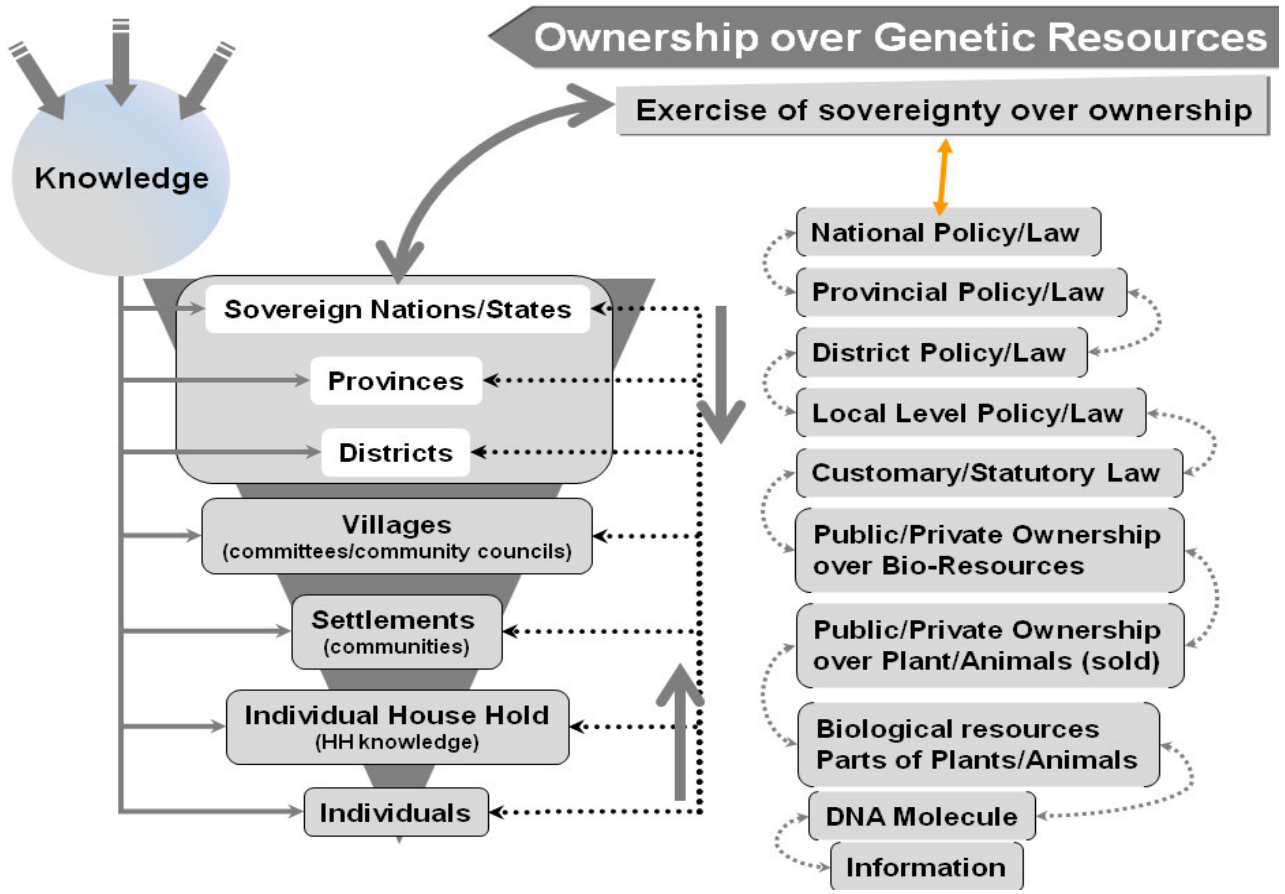

Figure 1. Ownership over genetic resources and traditional knowledge.

that these rules/regulations may establish procedures such as Prior Informed Consent (PIC) of the owner of the biological material (the trees' owner), Mutually Agreed Terms (MAT) for collecting parts of the tree, as well as benefit sharing with the trees' owner if/ when the resulting product produces benefits.

Even with PIC and MAT, it is unrealistic that the expected benefits could occur to the holder of genetic resources and traditional knowledge. For example, Rajmirchi (*Capsicum annuum*) found in the Northeastern states of India is hottest in the world (New scientist (2007). 22-29 Dec, ,p.46). It contains capsaicin which is used for the treatment of gastric, intestinal cancer, arthritis and used as cream in skin (ibid). The traditional *Jhumias* of northeast India used this in their food which prevents them from such disease and also saves them from their face pigmentation. This knowledge of *Jhumias* and seeds of rajmirchihas been appropriated (Personal Communication with Vengota Necro at Kohima). The physical control of this biological resources and traditional knowledge is still with the *Jhumias*, but once it was taken out it no longer became secret. Once any user gets the genetic material/ TK with or without compliance of ABS, it is difficult for the source country to prevent from conducting research or what the user knows about it. Legal systems to own such property as genetic resources was never there before the enforcement of CBD. Thus, long before CBD, TK and genetic resources have been dispersed both within and outside the place of origin and such resources are being used commercially without the benefits of the holder of such resources and knowledge. Even with the ABS agreements regulating access is very difficult as trade, researchers and tourists can bring resources and knowledge in conceal.

Countries that have formally adopted ABS laws in the region have not clarified under which property classification genetic resources will fall as mentioned in earlier section. In these laws definition of genetic resources is unclear. For example both the Indian Biodiversity Law 2002 and its Rules 2004 and Protection of Plant Verities and Farmers Rights law 2001 and Rule 2003 definition are unclear. Therefore countries are struggling to establish ownership over genetic resources. Communities will have no clue in such understanding. Therefore, to understand and establish the ownership over genetic resources, property rights classification is important. This will create conducive environment for benefit sharing from such resources.

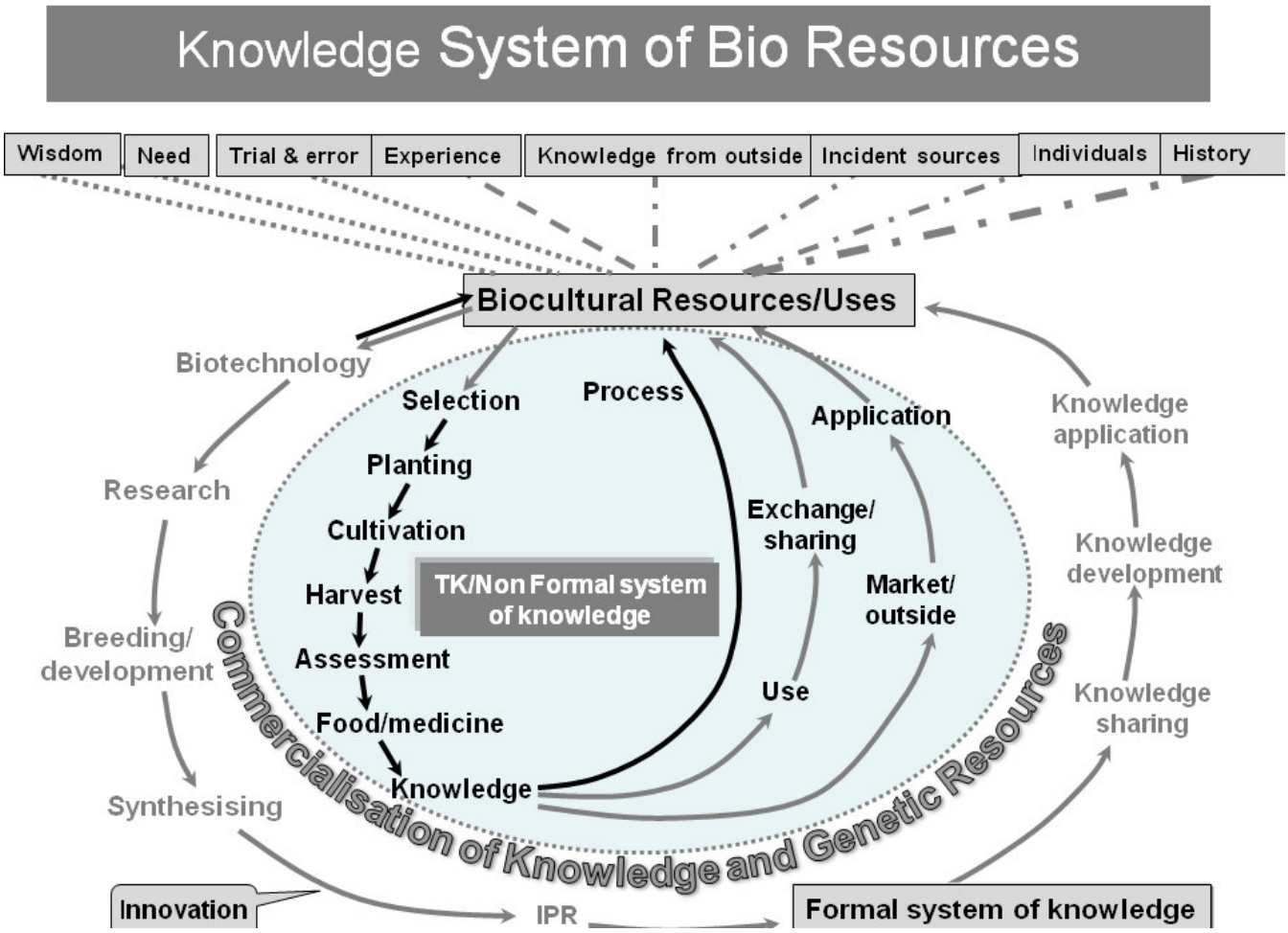

Figure 2: Knowledge system of biocultural resources.
Source: Author

Traditional knowledge Associated to biological and genetic resources

For the upward mobility of indigenous and local community in the Himalayas, the progression and use of TK that they hold is very important. If TK and the process of getting benefits from it are not defined by the law as property, it is difficult for community to benefit from it and further increase knowledge in the globalised world. Therefore, legal frame work to ensure access and benefit sharing from TK is important.

In the main sector of food and health, TK has been the mainstay for continued existence of the mountain communities. TK protection has however been defenseless. Some of the emerging legal instruments have aimed for protection, while many are vague and still struggling on what mechanism should address to protect TK and treat it as holder's property rights. For example, Bhutan Biodiversity law has vested the rights over TK to the holders while the Indian biodiversity law is not clear in establishing the rights of holder on TK. China has established a relatively perfect IPR system but TK is not protected(Biodiversity Clearing house Mechanism of China. Protection of TK.http://English.biodiv.gov.cn/rdwt/200603/t20060323_30678.htm (accessed on 29.07.2008). Other countries drafting the ABS law are struggling on how the rights over TK be established in their laws. Protection of TK has become more uncertain with the development of modern communication where traditional knowledge is melted/ appropriated faster than the bio-resources. This has led to claiming patents on products derived from TK and yet refusing to acknowledge its economic value and ownership to the holders(Sahai, S (2003). Indigenous Knowledge and its protection in India. In; Trading in Knowledge. Development perspectives on TRIPS, Trade and Sustainability. Bellmann, C Dutfield, G and Ricardo Melendez – Ortiz (Eds). Earthscan Pub.Ltd. London. Sterling, VA.pp166 -183).

Despite growing concern on the protection of TK for benefits, tracking down the creator and holder of TK is difficult in the Himalayas. Even if TK holding community

is identified, that knowledge may already have been dissipated among the other communities and members through migration and other means. Thus useful knowledge is transmitted rapidly to a large number of community and institutions both within and outside the country. This is why those countries are facing challenge to establish legal mechanism to identify holders and protect TK to benefit from.

TK associated with the biological resources in a given geographical area is dependent on the distribution and availability of natural resources. For example Turmeric, Ginger and other food, medicinal plants and animals found in Himalayas are common, so is the traditional knowledge associated with these resources. Article 15 of the Convention stipulates that in country where species is found *in situ* has sovereign rights over it. Same species and associated knowledge can also be found in other country which has their sovereign rights. Therefore determining ownership over associated knowledge becomes difficult even within the same country as the species and knowledge can be found within different communities, when it comes to benefits sharing. For example, the knowledge on the location and use of Yarshagumba (*Cordyceps sinensis*) a caterpillar fungus, is known to all the local communities of the Himalayan countries. Community knowledge on harvest, storage, primary processing and uses has been commercialized and exploited by companies. Local people only get meager benefit from the collection and sale of raw material. They are not getting any benefits from their knowledge on the special attributes of the fungus, when the final product is used for treatment in humans as medicine. Similarly in the eastern Himalayas, the traditional knowledge of slash and burn cultivation have preserved some flora species of special economic and ecological values, their recognition however is unnoticed.

Property regime on these complex aspects of traditional knowledge has not been established by any country except the intellectual property rights over inventtions under specified criteria of novelty, inventiveness and industrial applicability. Therefore, countries in the Himalayan region are relying on the physical entities associated with the specimen to define the status of genetic resources and their knowledge on access and benefit sharing mechanism as subject to legal restriction.
Knowledge has been created through efforts of many generations by their wisdom, trial and error, their own experiences, bringing from outside, through history, individuals interest and flash incidents and by their cultural practices. As shown in Figure 2. In the context of CBD, knowledge is considered as intangible matter which can be commercialized through different legal mechanisms. Not all the knowledge accumulated by the community can be traded. In the traditional societies of the Himalayas, over 90% of the poor people's basic livelihood needs are based on direct use of biological resources and associated TK for food, shelter and medicine. Around 70% of the Indian population depends on land based occupations, forests, wetlands and marine habitats and are thus dependent on local ecosystems for their basic subsistence requirements with regard to water, food, fuel, housing, fodder and medicine(Milind Wani and Ashish Kothari (2007). Conservation and People's Livelihood Rights in india. Final Report of a Research Project Conducted Under the UNESCO Small Grants Programme.. Kalpavriksh, Pune/Delhi (with inputs from Vasundhara and Foundation for Ecological Security). They manage this through their traditional knowledge; in the Himalayan region, this accounts for over 210 millions of people livelihoods. Such non formal knowledge system in selecting plant varieties, medicinal plants and other use has been ongoing for centuries and new ways of working, combining cultural diversity and biological diversity with the modern knowledge system have also been developed.

As shown in figure 2, the products of such knowledge are used, not only by the community involved in its creation, but by outsiders as well. The product including the knowledge has been marketed freely, and has been on- going for centuries. This has been the biggest contribution of traditional people to the service of the human community at large which is inherited by them.

In recent years the development of advance biotechnology, molecular biology, new knowledge on the use of biological resources are created and is being commercialized (Figure 2). If modern knowledge can be commercialized, the linkages of benefits from traditional knowledge to the underprivileged and marginalized traditional communities in the mountain are a major challenge.

Basis of the design: Based on the study and experiences of knowledge systems in the Himalayas

The figure above can be operationalised in number occasions including in linking different processes in the knowledge generations process and benefit sharing which are not regularly known by the general people. The knowledge on the use of biological resources (that is, food, medicine or other purposes), are the efforts of individuals who contributed for the well beings of their community and society. Gradually, this knowledge percolated under the community's domain and became community knowledge as the creator's demised. Communities hold this knowledge as their heritage. How benefits from such knowledge can be provided to the holders is a challenge. This traditional non formal knowledge over time remains within the community under their ownership which over period of time has been turned into public knowledge (Figure 3). Public knowledge can be used by the general people, as it has become common to all. The question that arises is, which knowledge that is different from public knowledge should be commercialized, or can

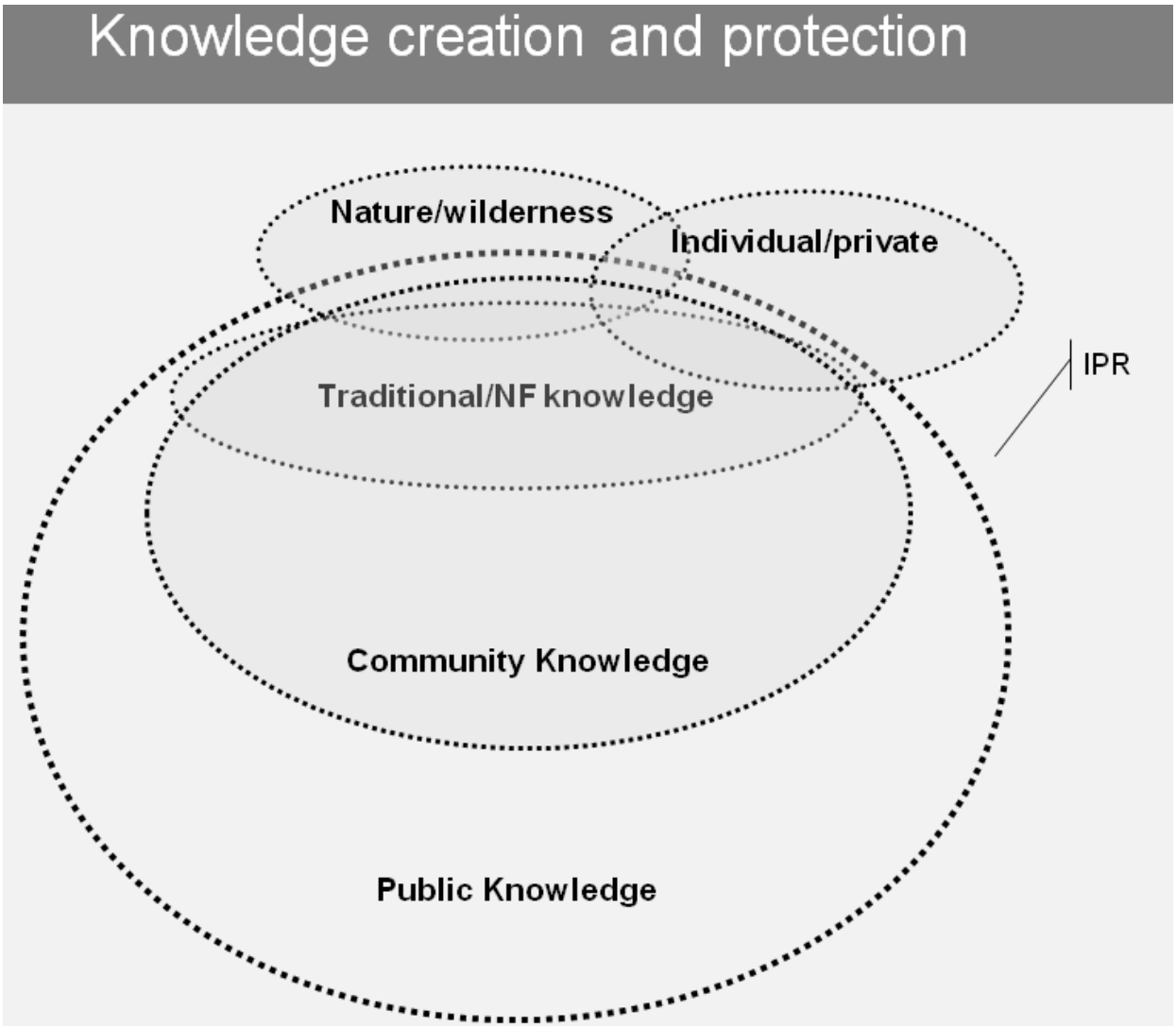

Figure 3: Domain of knowledge – creation and protection.
Source: Author

gain benefits when bioprespecting takes place. Whether, Knowledge holders are different from community or public knowledge. Is community knowledge really different from public knowledge? How can the beneficiaries adapt new knowledge and use this to benefit? In recent years, traditional knowledge on resources management became inadequate to cope with the modern form of agricultural development and benefits from their knowledge has not been returned to them. An assessment to examine the impact of International Maize and Wheat Improvement Center (CIMMYT) on maize germplasm was carried out in Gaungxi province in Southwest China. The findings were: there was systematic separation between the formal and traditional seed selection system. This resulted in inadequate variety development, poor adoption of formally bred modern varieties, an increasingly narrow biological base for breeding and a decrease in biological biodiversity in farmers' field(Ronnie Vernooy, Yiching Song and Jingsong, Li (2007). Local Agricultural Innovation in China. Ensuring a fair share and rights and benefits for farming communities. In: Tech Monitor. p 30). Rights related to TK have also been controversial and there has been accusations of biopiracy and unauthorized appropriation of TK in the form of patents(Krishna Ravi Srinivas *(2007)* Intellectual Property Rights and Traditional Knowledge: The Case of Yoga. *Economic & Political Weekly, Vol. 47, No. 27-28, pp. 2866-2871)*. For example communities in the Indian Subcontinent Name; Margosa Tree (Eng.) *Azadirachta indica,* Kalo Marich; Black Pepper (Eng.); *Piper nigrum,* Sarson; Mustard (Eng.) *Brsassica compestris, Turmeric and Zinger* for their day to day life which is inherited from their ancestor. Such knowledge has been pirated and patented in USA (http://www.organicconsumers.org/

Patent/ uspatsys.cfm). Many of them have now been revoked including against Monsanto's patent on the Indian variety of wheat? Nap Hal/(<http://www.organicc-onsumers.org/articles/article_8463.cfm. Accessed on 30.07> 2009.) and trademark infringements (China Piracy Report (2000). Copyright 2009, InterLingua.com, Inc. editor@chinapiracyreports.com).There are reports that patents on Yoga had been granted by U.S. Patent and Trade Mark Office (PTO) which was later denied. Patents on accessories, devices that enable practice and teaching of Yoga have been granted. Similarly many trademarks related to Yoga have been granted. Yoga with origins in Indian Subcontinents has become part of global consumer culture and has been transformed into what is called as 'transnational yoga'(Ibid, p.1.).

Dispute over such surmounts, public knowledge has often been used for private gains through legal protection such as trade marking of traditional knowledge under public domain(Viliailuk Tiranutti (2007). Trade marking Traditional Knowledge. Lesson from the *Ruise Duttan* Case. http://www.techmonitor.net/techmon/07mar_apr/tm/tm_home.htm). Other than Intellectual Property (IP) rights protection form of protection of knowledge (which are designed to protect commercial inventions and mostly grant individuals and exclusive rights), the trade marking of traditional knowledge carries no novelty and is simply a form of plagiarism of knowledge and names that have long been widely available in the public domain. For example Rusie Duton (Hermit Body Twist) is a traditional Thai yoga exercise which has a long history in Thailand. Japanese called Masaki Furuya took this knowledge from Thailand and applied for trademark registration for his services under the trademarks of Rusie Dutton in Japan. Similarly in India over 40 Indian names and sciences have become registered trademarks of private enterprises. For example Bastu, Veda, Ayurveda, Gyatri has been registered as trade marks by private companies in Germany(2002. Veda, Ayurveda registered as trademarks in Germany. Cecan herald, Dec 29. http://www.iprlawindia.oerg/catagory05/3559). It was found out that the term vastu is a registered trademark in Germany and under the World Trade Organization rules, companies in other countries cannot use the word *vastu* in any commercial venture. (http://www.rediff.com/news/2002/dec/26vastu.htm.Vastu - a registered trademark in Germany). In the case of word *Vastu* the problem came to light when a German Vastu scholar Marcus Schmieke was taken to court by a German based company, Samhita for using Vastu as his academy name. Schmieke later had to change the name of Bastu Academy to Vasati. These processes clashed with community values of their common ancestral heritage and free sharing/ open access which sustain livelihoods and biodiversity and there is a fear that these will replace these common values with private property values.

From the above review, it is apparent that even after 16 years of the commencement and enforcement of CBD, legal and procedural aspects over ownership of traditional knowledge has not been established. TK is still treated as free good by communities and accessible to the researchers. In this case, the challenge is to find mechanisms to legally institutionalize TK which will reap to be fruitful for its beneficiaries.

Traditional institution versus modern institution

Apart from the ownership over TK, it is important to establish institutional arrangement for the regulation of access to genetic resources, as TK is a major challenge in the Himalayan region. In theory, today all parts of terrestrial resources belong to some country within their political boundaries and are governed under the law of land. With a view to ease the governance system, governments have enforced constitutions that also respect customary legal arrangements. While customary legal arrangements respect the aspiration of the indigenous, marginalized people the implementation of it in the Himalayan countries is extremely weak. For example the constitution of India provides various degrees of self governance system (Panchayati Raj) under article 244 through the fifth and sixth schedules providing scope for the development of a self determining, self governing systems based on customary arrangements. In the north eastern states of Nagaland and Mizoram, Article 371 A and 371 G of the Indian constitution have special provision that recognizes the customary rights. According to this constitutional provision, no act of parliament in respect to their customary law and procedure, administration of civil and criminal justice involving decisions to customary law, ownership and transfer of land and its resources shall apply unless the legislative assembly of the said states so decides. This strongly ensures the protection over the traditional communities' rights. Similarly under the Panchayat (Extension to Schedule Areas) Act of 1996 for the 4th schedule, in India, for the first time, there is a clear direction that the legislature of a State shall not make any law that is not in consonance with the customary law, social and religious practices and traditional management practices of community resources(clause, 4a). Though the law is there, none of the states with fifth schedule area have passed the legislation in conformity with the provision of the Act.

India's Schedule Tribes and other Traditional Forest Dwellers (recognition of Forest rights) Act 2006, concerning the rights of access to biodiversity and community rights to intellectual property and traditional knowledge related to forest biodiversity and cultural diversity is very progressive for the protection of rights of marginalized people. In Nepal, the Forest Act of 1993 and draft Access and benefit sharing Act and Bangladesh draft Biodiversity and Community Knowledge Protection

Act and decentralized governance Act 2002 of Nepal are all geared towards protecting community rights over the use of biological resources. Despite such legal development, however new alien political and judicial systems are gradually penetrating in the traditional communities based on the traditions subverting the constitutional provisions (Bijoy, 2007). Access and Benefit Sharing from the Indigenous Peoples Perspective: The TBGRI- KANI model... 3/1 Law, Environment and Development Journal.p.1. Koimbatore, Tamil Nadu-641044, India).

As the modern form of governance evolved, so did the fundamental changes in their institutional administering mechanisms. The traditional systems used to be governed by, either clans, leadership or, through collective leadership where community must abide by the customary rules or, else find alternative ways to get harsh punishments. The constitutions in regional member countries of the Himalayas, makes statements for respecting the customary arrangements. In reality, this system has been replaced by the elected system of leadership that substituted the traditional authority and replaced the customary arrangements by the statutory legal arrangements.

Indian biodiversity Act has established Biodiversity Management Committees (BMC) at the local level. According to the Biodiversity Rules, the chair person of BMC is elected from among the committee members of the local body (section 22 of the regulation). Local body is elected by the community and it is a local level political body representing political objectives of their concerned political party. Because of vested interest of parties, members who are not in their party will be easily alienated. However, it is interesting to learn in some states of the eastern Himalayas, the customary system has also been respected. Despite this however, the community ownership over resources has also been appropriated by the state for example by establishing protected areas and biosphere reserves. There is virtual moratorium to access to such areas. This means community traditional knowledge to use such forest resources is lacking. Therefore; the issue at stake is whether such system of institutional development really represents the interest of local community and indigenous groups at the time of bioprospecting.

Hybridization of customary institutional arrangements with the statutory one at the local level has not been practically effective due to frequent changes in political governance systems and evolution through mutation has been barred by the politics for sustained development of institutions at the local level. This has weakened the functioning of local level institutions negatively impacting on the resources governance system). This has denied the marginalized community rights over governing their resources in many mountain areas.

The emerging biodiversity laws have established a new institutional mechanism responsible for bioprospecting. For example, the Biodiversity management committee at the local level in case of India as explained above. The situation is grossly similar in countries in the region. Therefore, the incentive to the traditional and marginalized communities to protect their system and culture, and get benefits from their knowledge and resources is in threat. This legal dilemma has created a state of uncertainty among the local traditional communities.

The policy and legal arrangements made so far focus towards benefits arising in the field of agriculture and pharmaceutical industries and their applications. Most of these benefits are expected to be generated in the industrialized urban centers. The truth is, the biological diversity and traditional knowledge associated with it are found in rural areas, where production of such resources is in the hands of local community and they bear very little state power and authority to resource governance and are devoid of any advanced technological development and communication. Therefore conservation and sustainable use and benefit sharing from biological resources and TK are a challenge at the community level.

What is the status of Himalayan countries in protection of biological resources and associated traditional knowledge and benefits sharing?

Hindu Kush Himalayan (HKH) region is home to over 7% of the total population in the 8 member countries with over 750 ethno linguistic groups in which over 300 language groups are threatened to extinction. Most of them live in the mountain areas with their own beliefs, practices despite the influences of modern living. Their source of living is their land immediate to them. Modern development pressure is one of the major challenges faced by these people. Despite this, the modern society considers their richness on biological resources and traditional knowledge. The fundamental basis for defending the mountain community rights of the HKH countries is their constitutions.

When bioprospecting commences through legal process, any bioprospector who wants access to biological resources and associated knowledge should take Prior Informed Consent (PIC) and agrees to Mutually Agreed Terms (MAT) to ensure equitable benefit sharing arrangements. Indian Biodiversity Rule section 20, Bhutan draft biodiversity rule -section 5, Pakistan draft Act on access to biological resources and community rights, article 5 protect the community rights over access and benefit sharing. Section 19(8) of Indian Biodiversity rule stipulates where biological resources or knowledge is accessed from a specific individual or a group of individuals or organizations, the biodiversity authority ensures to directly pay to the concerned through the district administration. In case such is not identified, the monitory benefit shall be deposited in the National Biodiversity Fund. Nepal draft law on access and benefit sharing from biological resources protects the rights of

communities. Provision for benefit sharing has been clearly mentioned. For example, if the resources and knowledge is under the community ownership, 50% of the proceeds goes to the community while if the owner of the resources is the government, 30% to the community and 50% to the government. Similarly, the Bangladesh draft law Biodiversity and Community Knowledge Protection Act of section 7, 8, 9 and 10 strongly protects the community rights over biological resources and associated TK.

Section 37(1) of the Indian biodiversity Act empowers the state government to notify an area as bio cultural heritage site. This offers a means to protect community knowledge *in situ*, recognition of collective land rights, biodiversity and knowledge, strengthens cultural and spiritual values strengthens local economics. It also gives responsibilities to the local marginalized community to conserve their heritage and transmit to future generations. Formal examples are not yet available in the region; however the biodiversity hotspot areas in north east India, parts of Bhutan, CHT areas in Bangladesh, shifting cultivation areas in Myanmar could easily be brought under such legal arrangements, where community rights can be protected in benefits from conservation and accessing biological resources and associated TK could be gained. Successful example of such initiatives can be cited from the Andes (Peru). The Andean Potato Park is such an example where the indigenous communities have developed common bio cultural register. Use of collective trademarks to bicultural products, an agreement for repatriation of and reciprocal access to potato varieties with gene banks (the international potato center) and an inter community agreements for equitable sharing of benefits have been based on customary laws(For more information, See Graham Dutfield'. The potato park as *sui generis* system for the protection of traditional knowledge" See also reports from the Project, Protecting community Rights over traditional Knowledge' http;//www.iied.org/NR/agbioliv/index.html).

Apart from the Biodiversity Acts, other statute legal arrangements are also emerging in Himalayan countries. For example Geographical Indications (GI) of Goods (registration and protection Act 1999) of India, provisions for the Protection of Products of Geographical Indication, promulgated by the general administration of quality supervision, inspection and quarantine of the People's Republic of China on 2005, amendment of her Patent Law, Trademark Law and Copyright Law and formulation of other IP laws and regulations including regulations on the protection of new plant varieties and the layout designs of integrated circuits to bring China's laws and regulations in line with Trade Related Aspects of Intellectual Property Rights (TRIPS agreement of the WTO, are some of the examples towards protecting community rights over their products and goods produced in specific region within the country. These legal arrangements of GIs provide a possibility for community members, peasants engaged in individual production and those who lack the funds and capabilities to originate trademarks, to share the brand benefits without setting up a brand and without mass production. In these countries a range of policies to promote the use of GIs as a means both of "accelerating the empowerment of local communities and areas construction" and developing international trade are emerging which protects the rights of community on access and benefit sharing.

Similarly trade mark laws are enacted for the purposes of improving the administration of trademarks, protecting the exclusive right to use trademarks and of encouraging producers and operators to guarantee the quality of their goods and services and maintaining the reputation of their trademarks, with a view to protecting the interests of consumers, producers and operators and to promoting the development of the market economy. Copy rights protection is another way of strengthening the position of traditional healers by including them as coauthors in the social research.

In a move to protect the traditional knowledge associated with the genetic resources, one defensive approach (documentation of biodiversity and TK Registers) to protect such knowledge and benefits to the community has been initiated by the mega bicultural countries like India and China in the Himalayan region. This defensive protection is aimed at preventing misappropriation of TK by private sectors by preparing data base which allows the national authorities to investigate prior art(. http;//www.ciel.org/publication/Prior art Manuel Ruiz_ Oct 02.pdf). Such registration helps to identify the community holding the knowledge entitled to benefit sharing. India and China for example have created their digital library on their TK under public domain. In the community documentation, the traditional knowledge holders may publish the information and as a result of publication, the knowledge becomes the state of prior art. This reduces the chances for future patents by others related to this knowledge. Although this process has benefits, it is not immune from shortcomings. Identification of beneficiaries of the benefit sharing from public knowledge is an important issue explained in the earlier section. Knowledge is passed on from generation to generation without recording on who actually owns the knowledge and genetic resources. Such process cannot guarantee the use of community or other knowledge by the prospectors. Secondly registration puts the community knowledge under public domain which can increase access to the private sectors thereby enhancing access to TK by the third party.

The most important area to protect the community rights is how traditional knowledge can be rewarded; protected and collective community intellectual property rights (CIPR) can be established under the existing IPR regimes. Instead of rewarding communities for their knowledge, IPR protection is granted to specific innovations made by distinct persons, based on the commu-

nity TK. Section 10 of the Indian Patent Act 1970 and its amendment 2005 addresses several aspects of disclosure of sources of origin and geographical areas of biological resources used in invention while applying for patent. However there is no connection for the protection of efforts of community and indigenous innovators on the use of TK and its benefits.

Literature on this area begun to appear after the CBD came into force. For example, the knowledge of Hoodia gordonii, a juicy desert plant which was used to suppress hunger and thirst, during long hunting trips was with the San indigenous people in South Africa. With long litigation procedure in asserting the rights over this knowledge, the San community and Council for Scientific and Industrial Research (CSIR) are entering into a joint bioprospecting agreement, in terms of which the CSIR will assist the San to record their traditional and medicinal knowledge in a private database and the CSIR will use their scientific expertise to research and develop possible products. Any intellectual property in products developed from this information will then be jointly shared between CSIR and San(The International Institute for Sustainable Development (IISD) and Jorge Cabrera on behalf of the State Secretariat for Economic Affairs SECO – Swiss Confederation (2007).ABS-Management Tool Best Practice Standard and Handbook for Implementing Genetic Resource Access and Benefit-sharing Activities. pp. 78). Though such arrangements are nonexistent in the Himalayas, however this case could serve as an example that the community knowledge can be protected and benefit can be gained.

In addition to the existing IP systems which are not in favor of protecting the community rights over biological resources, a new IP tool has been suggested to meet the needs of the indigenous and local community and people. A special system of IP protection for traditional knowledge called Sui generic system has been advocated (Posey. Outfield, G.,(1998). Plants Patents and traditional Knowledge: ethical concerns of indigenous and traditional peoples. In: Van Overwalle, G. (Ed), Patent Law, Ethics and Biotechnology.Bruylant, Brissel, pp.112 -126) (Leistner, M. (2004). Traditional Knowledge. In: Von Lewinski, S. (Ed).Indigenous heritage and Intellectual property. Kluwer Law, The Hague, pp63 – 64). In the HKH countries such legal instruments, are evolving by different names. India has for example the protection of Plant Verities and Farmers Rights Act (2001), the Geographical Indication (GI) Act of 1999 in India mentioned above and the Rights to Information Act 2005. Nepal has drafted Plant Variety Protection Act; Bhutan has Plant Variety Protection rule under the biodiversity Act 2003. Despite these developments, however, enriching community knowledge with formal researchers on food crops medicinal plants and others has not been taken in the region. Instead large numbers of landraces are improved by the breeders using communities TK as a basis of their research but the knowledge suppliers "the communities" have not yet exercised the rights of IP protection. This means the local communities would not be entitled to benefits arising from the use of their knowledge and from their participation in research and innovation developed incrementally and collectively. This runs counter to the purpose of ABS and has negative consequences on the conservation of biological diversity.

Most of the ABS systems in the HKH region focus on biological resources and associated TK. Article 8j of CBD have been taken into consideration in these laws. Prior informed consent, mutually agreed terms and benefit sharing from access to biological resources and associate TK are the key components in these laws. The potential difficulty however lies on how these laws can represent the community interest during implementation are yet to be examined. For example in the HKH countries, the mutual agreement is a simple agreement between the supplier of biological resources and the bio prospector. This can run positively as long as the parties stand on equal footings on understanding at the time of negotiation. In general the agreement is on research on biological resources which are based on material transfer agreement. Such agreements do not appreciate the actual and potential value of biological resources under the agreement. Similarly the PIC requires that the provider of resource and knowledge must fully understand the nature of resource being used, potential value before accessing.

Challenges of ABS regime in HKH

Though legal arrangements for protecting community rights over biological resources and associated TK are emerging in the Himalayan countries and some are being enforced, in practice however the enforcement of the laws have not yet been clear on how communities will benefit from bioprospecting. This is because genetic resources cannot be owned and the knowledge holders on the use of resources are difficult to identify and trace and most knowledge are under collective ownership. For example in the eastern Himalayas, a study to ascertain the status of traditional knowledge is under way.

Preliminary findings suggest that major part of the knowledge is under public domain and collective extending to more than one country. What the medicinal practices have been used by the traditional communities is documented either in Ayurvedh, Unani or in Chinese Pharmacopeias. The holders of knowledge have learnt from someone who was familiar with the knowledge in the ancient documents under public domain. With the exception of few traditional communities, the knowledge available in the entire Himalayan region is common in plant breeding, medicinal practices and use of animal parts. Knowledge on design on fabric, buildings and endemic biological resources are location specific whose potential for marketing might be very high.

In addition to the problem in determining the ownership over genetic resources and knowledge, sources of knowledge, conflict of interest among the same ethnic groups in benefit sharing have also been reported. Benefit sharing is particularly important in the contexts in genetics: access to non-human genetic resources and associated traditional knowledge, In the Himalayan region, access to biological resources and associated traditional knowledge under ABS regime has not been granted as yet. Biological resources are still taken out of the country for bioprospecting under the standard material transfer agreement through the government and research centres. Benefit sharing with the indigenous and local communities under such agreements, are non existent. The few benefit sharing agreements that have been signed to date have been widely criticized.

For example in India, the Tropical Botanical Garden Research Institute (TBGRI) and Kani Tribe model of access to knowledge and benefit sharing has been much touted as one of the best known community benefit sharing mechanism from the use of biological resources and associated TK in the region. The knowledge informers for the formulation of Jeevani drug who were members of Kani tribe in Kerala south India, themselves violated customary rights of the Kanis by not obtaining the free and prior informed consent either of knowledge holders of their traditional chiefs or obtained consent of the community. Kani tribes in another state of Tamil Nadu also claimed the right over the knowledge(Bijoy, C.R. (2007). Access and Benefit Sharing from the Indigenous Peoples Perspective: The TBGRI- KANI model... 3/1 Law, Environment and Development Journal.p.1. Koimbatore, Tamil Nadu-641044, India. p 18). Benefit sharing is therefore very complex. Hence, there are confusions and uncertainties in identifying a specific knowledge associated with a particular genetic resource. Perhaps the endemic culture and tradition, practices and process of using endemic species, patterns having traceable traditional and private knowledge can gain benefits to the traditional societies directly and easily, while benefits from knowledge under community and public domain will benefit to the larger communities within the country.

Another set of difficult issue is that, the knowledge and genetic resource providers have very less knowledge on the market value of biological resources, which directly impacts the benefit sharing mechanism. The users have knowledge on market value of the resources, but are not transparent to the providers. Once the biological resource is accessed, it is uncertain that it will not be sold to the third party. The providers will have very little information on the benefits that their resources will bring especially if the agreement has been undertaken with the community.

This is mainly because of the laws drafted and implemented so far, consider biological resources as physical substances at the time of accessing, and are treated as a property of the accessing country and treated as patentable information when the user obtains a patent for his work with them(Nyasha Chishakwe and Young T.R. (2003).Access to biological resources and sharing the benefits of their use: International and sub regional issues. Workshop paper for the Southern Africa biodiversity programme. IUCN, ROSA). Same situation applies in the Himalayan region. Such legal provision provides “exclusive rights” to the buyers of biological resources and associated TK. This restricts the benefits flowing to other countries having the same biological resources and knowledge. National laws so far developed have not given due attention to this issue.

Further sharing benefits from the knowledge that is available in the Himalayan region under public domain is difficult This requires common regional arrangements of establishing the trust fund from where countries can get their share and redistribute to their community. Determining the knowledge and common biological resources and establishing the ownership over knowledge and such biological resources is therefore a major challenge in the Himalayans countries.

Although the development of ABS policy and law and their enforcement is urgently required for the conservation of biological diversity and getting benefits from it, in the region, this has not received priority as many countries are indulged into their internal political process, conflicts and nation building process. Their priority agenda is poverty reduction, infrastructure development the ABS agenda has been in less priority.

In countries, where ABS laws are in place, reaching into agreement and negotiating with the government and indigenous community within the stipulated time and financial resources is also major challenge. There are many mountain areas with biological resources that are devoid of communication and with illiterate indigenous communities who do not know about ABS. The same community members are spread over vast transnational areas. Therefore, getting PIC and making MAT with the indigenous community poses a major challenge. Support for institutional development to effectively regulate ABS regime is very poor. Therefore the illicit traditional bioprospectors continue their business as usual due to lack of proper and effective surveillance. Such groups do engage neither in the disclosure nor with the PIC process.

Today climate change is considered a major driving force that shapes the future availability of biological resources and the knowledge that builds on it. The knowledge on climate change and its impacts on biodiversity resources are incomplete and uncertain; therefore it is difficult to foresee how it will impact access and benefit sharing from biological resources. In general, agro biodiversity and many non timber forest products seems to be more susceptible to climate change. Today’s agriculture is like huge inverted pyramids – globally, it rests on a precariously narrow biological base. Less than 3% of the 250,000 plant varieties available to agriculture

are in use today (Ronnie Vernooy, Yiching Song and Jingsong, Li (2007). Local Agricultural Innovation in China. Ensuring a fair share and rights and benefits for farming communities. In: Tech Monitor. P 27 – 33). Globally 643 mammalian and 47 avian are reported to be extinct (FAO (2007). The state of the world's animal genetic resources for food and agriculture, FAO. Rome. p.69) . Sources of biodiversity will further narrow down so will the associated TK. Therefore Himalayan countries dependent on their agro biodiversity accessing such resources and getting benefits out of this will be more vulnerable. Countries that have their large share of GDP from agro biodiversity will be directly affected. Therefore the legal mechanism related to access and benefit sharing may not function or will take a reverse gear. Under such situation great consideration has to be given on the evolving ABS regime in the context of climate change.

Secondly, the development of synthetic biology (the design and construction of new biological parts, devices and system and the redesign of existing natural biological parts for useful purposes) in the technologically rich west will increase. There will be increased use of synthetic biological products and applications which potentially can generate whole new biological system. More reliance on genetically modified plant and animal varieties will lead to increased dependency of producers that leads to loss of traditional knowledge, practices and innovation and the Himalayan countries will depend for access to such resources to the developed countries. Existing laws and mechanisms such as IPRs will be unsuitable for protecting TK because they protect individual rights not the collective rights and will be exclusively for commercial purposes. A reverse situation of access and benefit sharing and knowledge base will be developed. This will lead to unsustainability on natural biodiversity and its benefits including the loss of livelihoods of many people. Because of this, improved property rights, access and benefit sharing may limit the current and future activities of many stake holders in the region. Science and technology will be used in generating biodiversity. Poor Himalayan countries currently rich on natural biological resources and TK will be further get impoverished as many of the natural ecosystems will have been completely changed.

Conclusion

Access and benefit sharing from biological resources and associated traditional knowledge are new concepts in the Himalayan region. Several complexities have been seen for the development of policy and laws in the region. India is a pioneer in making and enforcing the ABS law in their country while other countries are at different stage of promulgating their laws. There are other legal arrangements, to some extent that are regulating the access of biological resources which are still incomplete. The biggest problem faced by the policy makers and many stakeholders is on the benefit sharing arrangements, defining rightful owners group who can give consent and receive benefits of biological resources and TK that may become available and access procedure. Bonn, guidelines have eased the process but many issues are still at stake.

Several, legal community rights protection and related legal instruments are emerging in the region. In spite of such new laws, guidelines, implementing rules and regulations, and the enactment of subsequent laws and rules, to rectify the limitations and shortcomings of previous laws, there are still implementation challenges regarding genetic resources, access and benefit sharing, and traditional knowledge especially when it comes to IPRs.

The Himalayan region, being one of the world's repositories of diverse biological resources in terms of plant and animal species and TK, has an immense potential in the production of medicines and food. If only this can be developed and utilized using proper contract and monitoring systems, substantial benefits will accrue to benefit national food and medical security, while preserving biodiversity and lead to improvements in the lives of local and indigenous peoples. The area is very sensitive to climate change, the impact of which can be extremely precarious to the local communities dependent on natural resources.

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