

Prior Informed Consent and Traditional Knowledge Systems : Equitable Benefit Share over Biocultural Diversity of Northeast India

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ABSTRACT

The primary objective of this paper is to implement prior informed consent (PIC) and explore the opinion of Adi, Monpa and Khasi communities of Northeastern India over the terms and conditions regarding benefit shares accruing from indigenous knowledge relating to local biodiversity. Study was conducted among purposively selected study areas, community and traditional knowledge holders (TKH). Personal interview method was used primarily to record the data from TKH, The village, regional and state level workshops were organized complementarily to cross validate the data recorded from TKH. The results indicate that women TKH were more competent in preparation of medicinally important foods, beverages, preservation of foods, ethnomedicines and local agricultural practices, while male TKH were experienced comparatively more in ethnomedicines for human and animals and agricultural practices. TKHs belong to high altitude surrounded by rich forest biodiversity, posses high level of ethics in using and conserving local biodiversity and share the probable benefits with community members. In general, the male knowledge holders were in opinion to mange and use the benefits of traditional practices through Panchayat while female were interested to process it through their indigenous institutions like Kejang, Darbar, Chhoppa, etc. Materialist and non-materialist two major types of incentives were identified to the TKH. At the initial stage of benefits accruing from traditional knowledge, giving non-materialist benefits to knowledge holders was found to be more important. TKH living in rich biodiversity areas at high altitudes opinioned to get more benefit percentage towards the welfare and conservation of community-based biodiversity.

Traditional knowledge (TK) is the information that people in a given community, based on experience and adaptation to a local culture and environment, have developed over time and continues to develop (Singh and Sureja, 2005). This knowledge is used to sustain the community and its culture and to maintain the genetic resources necessary for the continued survival of the community (Hansen and Van-Fleet, 2003; Singh and Sureja, 2005). The 1992 Convention on Biological Diversity (CBD) is an international treaty resulting from the Earth Summit in Rio de Janerio where world leaders agreed on a comprehensive strategy for sustainable development. The rapid depletion of environmental

resources and the need to reward both users and providers gave rise to CBD which for the first time formally acknowledged the value of indigenous knowledge systems. The CBD established a framework for providing access to genetic resources, maintain world's biological diversity and fair and equitable sharing of the benefits arising from indigenous knowledge (Hansen and Van-Fleet, 2003). The Convention on Biological Diversity declares the obligation to obtain prior informed consent for access to genetic resources (Prakash, 2000). The Bonn Guidelines (2002) further linked genetic resources with traditional knowledge in the obligation to acquire prior informed consent. Prior informed consent is the approval

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in advance for the use of one's genetic resources and any associated TK. It is the norm under CBD and PIC that sufficient information should be provided to a community, either by the intellectual property office or other parties regarding the aims, risk or implication of using the knowledge, including its potential commercial value (Prakash, 2000; WIPO, 2002 and Hansen and Van-Fleet, 2003).

The new Biodiversity Act, 2002 of India is a first step in ensuring implementation of CBD at the domestic level in India; it is far from perfect as it fails to provide adequate provisions to ensure proper benefit sharing and access to biological diversity (Gupta, 1991a; 1991b; 1997 and Sagar, 2005). There are very less number of empirical studies on PIC of traditional knowledge holders in India and its implication. In recent years some scholar has started of working on it (Gupta, 1991a; 1991b; 1997; Gupta, et al., 2003 and Singh, 2008), however more replications are required to build theories on knowledge and shares of benefits. Looking to the emerging needs about what really the knowledge holders think, perceive and argue regarding the benefits and other associated dimensions has necessitated in designing this study on PIC and IPR.

METHODOLOGY

In this study, it has not only been ascertained the opinion of traditional knowledge holders (TKH) about benefit sharing related to traditional practices, but also learned many unknown issues which are still seldom touched in the academic fields. Looking to the nature of study, qualitative methods were chosen to learn with traditional knowledge holders how they use, perceive, conserve and value the environment and natural resources based on their years of experiences. The qualitative approach of learning with TKH allowed the researcher to discover the means and considering the choice of methods for this study (Kaplowitz, 2000 and Reyes-Garcia et al., 2003). This approach was chosen to depict the issue of PIC and TK in story form and more open and ended type. Basically, the TKH were the part of this study from different socio-cultural backgrounds and ethnicity of Arunachal Pradesh and Meghalaya. TKH have been selected purposively as sample of study and were belonging to diverse climatic ecosystems. These knowledge holders were from chosen from purposively selected communities viz. Monpa (living in temperate and sub-temperate climates), Adi (sub-tropical climate) and Khasi (sub-temperate climate) tribes. TKH have been explored from different villages of Tawang (Tawang

district), Dirang (West Kameng district), Pasighat (East Siang district) and Ri Bhoi circles (Ri Bhoi district) of Arunachal Pradesh and Meghalaya, respectively for their known and well-practiced indigenous knowledge relating to human health, agriculture, ethnoveterinary practices, ethnic foods and technologies/practices and biodiversity conservation. The total sample size of the traditional knowledge holders was 360 including workshops participants. One hundred twenty (60 male & 60 female) TKH were explored from each community, thus, total male TKH were 180 and female TKH were also 180. In the sample, the person who was locally recognized as knowledgeable and also those who know but do not practice indigenous knowledge in reality, were integrated to have the wide range of response over the issues of benefit sharing on TK.

To know the different types of response towards various aspects of PIC and IPR towards traditional knowledge and indigenous biodiversity, they have been interviewed individually with open ended set of questions. A principle help was taken from the document of CBD and NIF to develop the interview schedule (Hansen and VanFleet, 2003; Secretariat of CBD, UN, 2005; NIF, 2006). The responses of interview taken from TKH were further placed in village and state level workshops to develop general consensus on PIC and TK benefit share. In these workshops, both community leaders and TKH from different remote and transformed villages of varying age were invited to participate and discuss the issues related to tangible and intangible benefits arising from traditional knowledge systems. Before processing the interview and workshops, the consent of local community has been taken as per the guidelines of ISE code of ethics, 1988 and 2008 while discussing and exploring traditional practices pertaining to ethnic foods, human healthcare and agricultural practices.

Frequency, percentage and mean have been used as descriptive statistical tools to deal with the qualitative data and draw inference from the study.

RESULTS AND DISCUSSIONS

1. Benefit sharing over community knowledge and traditional practices

Numerous contributions by academics, NGOs and governments have considered the need to provide some forms of protection to indigenous knowledge systems. However, significant divergences exist as to whether IPRs should be applied and, if that were the case, what will be the rationale and modalities of protection?. First, it is

necessary to understand the importance and scope of TK – which includes its widespread use in traditional medicines, ethnic foods, agriculture and ethnoveterinary practices as is described in Section 1 of CBD, along with the question of its definition. The starting point for any discussion about possible forms of protection should then be to clarify why there is a need to protect it, and what kinds of ways and means are required to achieve this target. To achieve this target and before handling the issues of IPR, our attention comes about the prior informed consent of traditional knowledge holders which allows further process of IPR for equitable benefit sharing arises from the traditional knowledge.

There are three kinds of knowledge systems in vogue among the communities viz. private knowledge developed or created by an individual that may be traditional or modern both in nature, second a moderated practices or knowledge based on informal research or experiences and third knowledge is a quite traditional which is known/practiced by the entire community, called community knowledge. The rights and benefit share over these three knowledge systems vary from each other and according to the gender also. The majority of women (85.98 per cent) possesses great amount of knowledge than men (27.84 per cent) in traditional foods, beverage making, preservation of surplus traditional foods and ethnomedicines used for human being, while majority of male (73.45 per cent) were competent in knowing practices more on ethnoveterinary and agricultural practices than women (42.34 per cent) (Fig. 1.). The benefits arising from the community based knowledge/practices/medicines and that are plant based should not be less than 50 per cent as reported by 95.5 per cent of the traditional knowledge holders (Table 1). The major ethic of keeping this proportion of benefit share arising from community knowledge was to give major thrust for conservation of natural resources from where a particular plant is accessed. Whereas in case of a private knowledge based on plant products, the proportion of benefit may be kept 25.0 % as evident by the 92.5 per cent response of respondents.

It was a matter of great debate that refinement and validation of community based traditional practices are required to make it more popular among other non-user group. In this regard, they felt (85.0 %) that it need more cost for which minimum 10.0 per cent benefit share can be given. The reason behind this amount of share was that since the practices are used and appreciated by whole community and are lying in public domain, therefore after refinement, it can easily be transferred to a similar kind

of situation without much effort and external interventions. In the case of any improvement/modifications done by a person in the existing community based practices, of course ethically the modifier/innovator holds the right for more share of benefit for his creativity evolved to improvise the efficacy percentage of a particular practice as indicated by 90.0 per cent respondents. Also, simultaneously they would be interested to share the remaining benefit with community members only, because directly or indirectly it is the part of public domain from where the required plant part product or genetic materials are accessed in formulation of medicines or practice.

To see the variability in response pattern and proportion of benefit sharing arising from community knowledge, the whole respondents have been divided into two broad categories viz. transitional and remote villages. The traditional knowledge holders belonging from the remote villages living in rich biodiversity areas were of the opinion (87.24% response) to provide maximum benefit share (75.0%) for the community fund from where that can be utilized for various purposes of promoting a particular indigenous practice and conserving the related biodiversity. While, the respondents from the transformed villages and living distantly from biodiversity, wanted comparatively more percentage of benefit share for their own. Here, it is inferred that still the major portion of biodiversity is conserved and used sustainably by the real custodians who are living near and within the biodiversity areas and are ethically strong towards biodiversity conservation rather than economic gain (Gupta, 2002; Gupta and Sinha, 2003; Gupta et al, 2003 and Singh and Sureja 2005).

2. Benefit sharing over the private knowledge and traditional practices

With regards to distribution patterns of benefit share arising from private knowledge/practices a great variety of differences have been observed in the response percentage among the respondents represented from various geographical locations (Table 2). The traditional knowledge holders, belonging from the remote villages have comparatively higher motives of benefit share of TK than the respondents from the transitional villages for the conservational aspects of natural resources from where they access a particular plant/product under individual practice or medicines. They have indicated that the proportion of benefit share for the concerned community the share should be of 25.0 per cent (83.0 % response) while to conserve the particular related biodiversity it may be 35.0 per cent (87.0 % response). The remaining

benefits can be shared among the other stakeholders like innovation promotion fund, researcher who add the value and institutional overheads. The knowledge holders from transitional village were different in their motives and they (80.0%) wanted to have 45.0 per cent benefit share for a particular knowledge provider, while for the community and conservation of biodiversity, it may be 20.0 per cent for each as indicated by majority of them (70.0 and 79.0 %, respectively).

The reasons for providing more percentage of benefit share to the community and conserving biodiversity mentioned by the traditional knowledge holders of remote village living in rich biodiversity areas was that, it will significantly enrich the social systems and provided a sense of equitable rights among the community members over natural resources. It will also inculcate the sense of cooperation and moral rights among members of society through the benefit sharing of individual practices, which are directly or indirectly part of the whole community. The differences in the opinion between these two communities with regards to benefit share from individual traditional practices might be on account of the differences in geophysical and cultural ethics. Many a times, traditional knowledge holders living near rich biodiversity areas are poor in economic status but are rich in their knowledge due to a high level of their ethics and affection with nature in conserving natural resources. It indicates that whether a particular traditional practice held in private property or public domain, does hardly matters, but the important issue is the social system and cultural ethics, which makes the difference over biodiversity use and related benefit share. Similar findings were reported by the earlier scholars also (Gupta, 2002; Gupta and Sinha, 2003; Gupta et al, 2003 and Singh and Sureja 2005).

3. Mediation and conditions over benefits & information sharing over traditional practices

Regarding present concerns over biopiracy (unauthorized use and profit-making) for many plant based knowledge systems and products, of the traditional knowledge holders (23.5%) from Khasi and Adi tribes who were more informed about these issues were asking about the credibility of the institutions involved in documenting and using the traditional practices. Initially the participants were in a dilemma and hesitated to give their opinions as to whether their indigenous practices could be pursued through the National Innovation Foundation (NIF) or not, raising the question of reliability and trustworthiness of this agency. It took some time to inform these people about the history of NIF and its

record of credibility. In this process, the knowledge holders who had already been rewarded for participation in the workshops and meetings played a key role in explaining to their peer knowledge holders how the agency operates. Finally, after the address by community leader to the traditional knowledge holders a consensus agreement was made and about 80.0 per cent of the traditional knowledge holders gave their consent in leadership of community leader to pursuing the use and dissemination of their community and individual practices through the NIF.

The great majority (97.0% male; 89.95% female) of the traditional knowledge holders agreed that it would be permissible for those indigenous practices having potential for product development to be transferred to the third party for this purpose (Table 3). Similarly, in terms of technological development, 70.9 per cent of the male and 30.4 per cent of the female respondents thought that the knowledge could be transferred to a third party and 89.0 per cent male and 96.3% per cent female knowledge holders agreed that intellectual property right protection could be pursued through the NIF.

There was great difference in between the TKHs of various communities with regards to the conditions of sharing TK related to indigenous biodiversity (Table 4). Five major conditions could be explored i.e. (i) only on commercial basis, if the interested party is willing to pay for it, (ii) at no cost for individual use, but on commercial basis for larger use, (iii) after further research on it, if possible (iv) for time being without cost, but longer use with some cost and (v) on exchange basis with no cost. Under all five categories the percentage of response of TKH varied according gender and community (Table 4).

4. Indigenous knowledge systems and current intellectual property rights regime

Floral and faunal diversities of the Northeastern states, and the dependence of people on natural bioresources for sustenance, have resulted in a rich indigenous knowledge system. A contributing factor to this richness in the IKS is the ethnic and cultural diversity associated with the demography of this region (Singh and Sureja, 2005). These systems have played a pivotal role in the conservation of the unique biodiversity over the centuries. The complete dependence of the traditional communities on bioresources for their livelihood has helped them to use such resources more efficiently (Singh, 2004). It is imperative that this ethno-medicinal knowledge base of the ethnic groups in NE region especially Arunachal Pradesh is documented. In spite of rich

biodiversity in Arunachal, its rich biocultural knowledge is under threat due to the ineffective Intellectual Property Rights (IPR) regime that exists currently (Singh and Sureja 2005 and Singh, 2008). Owing to Arunachal's strategic location in the eastern Himalayan range, the rich biodiversity can be harnessed for the development of the State. The present IPR regime is inadequate to provide economic support and benefit to the communities that hold the traditional knowledge (Singh, 2008). The State has a rich germplasm pool and traditional communities are the custodians and perpetuators of the many biodiversity (Haridasan, et al., 1987). The Government has to ensure adequate protection to the community rights over wide varieties of crops, useful plants and animal species as well as adequate protection for the traditional knowledge base relating to the use of these life forms.

The hastening pace of developmental activities in the last three decades, and the improvement in the communication network, has meant increased access to genetic resources (Haridasan, et al. 1987)). Road building has established communication but, the blasting process involved has meant the loss of valuable habitat. The rapid

monetization of the barter economies has meant increased trade in timber (Singh, 2008). The urbanization process has meant the destruction of the forest cover adjacent to the new townships that have come up (Singh and Sureja, 2005). Another significant threat to the fragile ecosystem and biodiversity of the State is the shortening of the jhum cycle, and introduction of commercial plantation due to ever-maintaining population and modernization. In addition, there is the illegal trade of forest products such as timber, medicinal plants, orchids, animal hide, musk gland, and birds, which are smuggled out of the State by poachers, as reported by many community members. Biopiracy is a new challenge manifested in a number of ways. Sometimes, the operators enter the State develop contacts, and smuggle out valuable species, mainly of flora, without the knowledge of the Government (Singh and Sureja, 2005; Shrivastava, 2008). In such situations, making aware to the people and imparting training to the grassroots workers and government official will make a safeguard to not only conserving the biodiversity, but also to provide the equitable benefit share to the knowledge holders.

Table 1. Benefit sharing of community based practices (herbal, NRM practices, ethnic foods and agriculture)

Particulars	Mean response of participants in %	Proportion of benefit out of 100
Community/village	95.5	40.0
Innovation promotion fund	85.0	20.0
Researchers who add value	75.4	5.0
Institutional overheads	89.0	10.0
Conservation of natural resources	92.5	25.0

Table 2. Benefit sharing of individual practices (modification in traditional or newly discovered) (herbal, NRM practices, ethnic foods and agriculture)

Particulars	Transitional villages		Remote villages	
	Mean response of participants in %	Proportion of benefit out of 100	Mean response of participants in %	Proportion of benefit out of 100
Traditional knowledge holder	80.0	45.0	92.0	25.0
Community/village	70.0	20.0	83.0	25.0
Innovation promotion fund	95.0	5.0	76.0	10.0
Researchers who add value	81.0	5.0	88.0	3.0
Institutional overheads	87.0	5.0	91.0	2.0
Conservation of natural resources	79.0	20.0	87.0	35.0

Table 3. Mediation for traditional knowledge and benefit sharing

Particulars	Percentage of response (Male)	Percentage of response (Female)
Developing business plan by third party	80.00	87.89
Product development	97.88	89.95
Intellectual property rights protection	88.98	96.34
Technology of transfer to third party	70.86	30.45

Table 4. Conditions of sharing the traditional knowledge related to indigenous biodiversity

Particulars	Monpa tribe		Khasi tribe		Adi tribe	
	Male	Female	Male	Female	Male	Female
Only on commercial basis, if the interested party is willing to pay for it	45.7	18.6	55.6	67.5	86.74	57.32
At no cost for individual use, but on commercial basis for larger use	78.5	67.8	70.7	68.5	78.09	69.42
After further research on it, if possible	95.5	85.5	70.0	89.5	85.78	89.68
For time being without cost, but longer use with some cost	70.5	89.0	45.8	53.4	78.7	65.3
On exchange basis with no cost	89.0	96.5	85.0	90.0	86.8	69.6

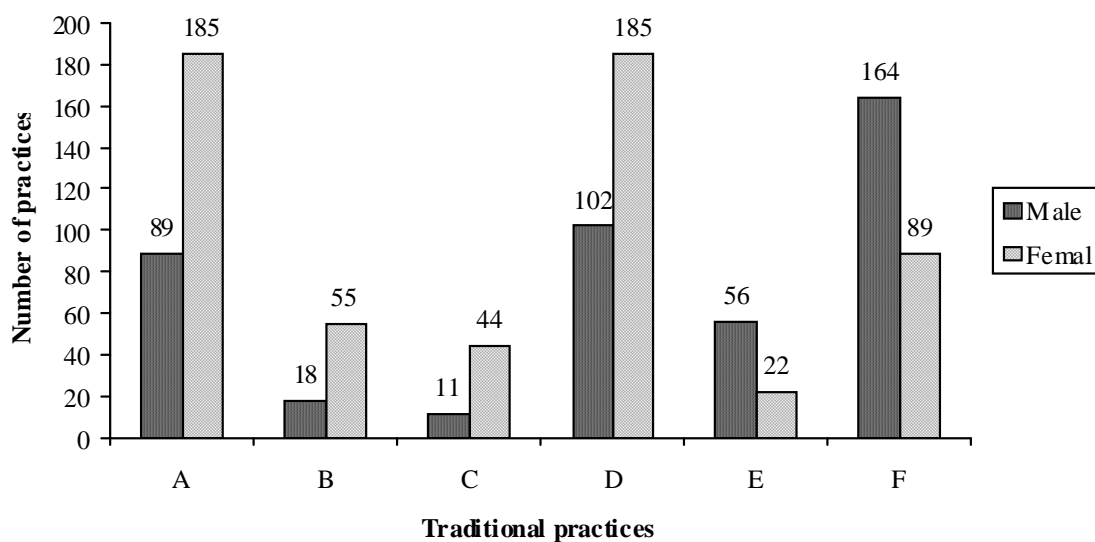


Fig. 1. Gender difference in traditional knowledge on various practices

A= Traditional foods, B= Traditional beverages, C= Preservation of surplus traditional foods, D= Ethnomedicines for human, E= Ethnomedicines for animals, F= Traditional practices on agriculture

CONCLUSIONS

From foregoing learning with TKH, it has been recorded that male TKH wants benefit share to be distributed through Panchayat (69.48%) while female were interested to process it through their indigenous institutions (78.98%) like Kebang, Darbar and Chhoppa. Materialist and non-materialist two major types of incentives were identified to both the TKHs. Male were more interested in materialistic benefits (like money and other terms of kinds) while female were more interested in non-materialistic like honor, respect, acknowledgement in publication and media, etc. Female (65.78%) were also interested gaining respect in society through delivering their knowledge on TKs among school children. Economic development in the regions has often been accompanied by a decline in biodiversity as perceived by the TKH (89.98%), but the distribution of the gains among different stakeholders generated through added value obviously needs immediate attention of the institutions concerned.

It is being realized that the role of non-monetary incentives may sometimes be more important to acknowledge the source of traditional knowledge. Not all the traditional practices may be considered as the disclosure for PIC and IPR. A certain scale to qualify the outstanding standard of IPR must be made clear at the time of taking PIC. The norm of acknowledgement of local knowledge has not become of professional value among the professionals and scientists, as majority of traditional knowledge holders perceive that today it is needed to acknowledge their wisdom (Gupta, 2002). A rational combination of monitoring and non-monetary incentives would be the optimal for a particular kind of knowledge system under institutional arrangements that can be made clear in the PIC itself. Developing the vertical learning network of traditional knowledge holders with education system and permitting them for lecturing in schools and concerned public forum may act as good non-materialistic incentives to preserve and diffuse the indigenous knowledge systems from one generation to another. In Northeast India still the customary law of tribal people are recognized as authentic source and used for processing the concerned problems related to biodiversity and natural resources. So the rights over both biological and genetic resources are subject to customary law rights which also must be made clear at the time of taking PIC so that in future there should not be any conflict between formal and informal constitutions and its effect on the rightful benefits to the TKHs (Brendan, 2004; Anne and Oliva, 2005).

The situations like geographical locations, socio-cultural backgrounds and the exposure to the modern materialistic world are such factors which decide the ethics and level of motives of traditional knowledge holders regarding the benefits share from local knowledge. The publication of local knowledge exhausts IPRs on one hand and may deprive the knowledge provider any benefit that arise from value addition in local knowledge to the individual or community or nation concerned (Gupta, 2002 and Gupta et al., 2003). Every applicant related to traditional knowledge should be required to disclose that material, information or any other knowledge used in the patent application that has been obtained lawfully and rightfully via PIC. Indeed, it will not only facilitate the equitable benefit sharing but also maintain transparency of Sui generis system under which the indigenous genetic materials are to be transferred by the traditional knowledge holders to the willing parties (WIPO, 2002; Prakash, 2000). A tremendous amount of indigenous knowledge in Northeastern India is available only in oral form but has not yet been capitalized properly. It needs immediate attention to characterize and validate for sustainable development of the region.

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REFERENCES

- Anne and Oliva, M. J. (2005). Prior informed consent and access to genetic resources. Dialogue on Disclosure Requirements: Incorporating the CBD Principles in the TRIPS Agreement On the Road to Hong Kong WTO Public Symposium, Geneva, April 21 2005 :http://www.ciel.org/Publications/PIC_PerraultOliva_Apr05.pdf>3-11-2005.
- Brendan, T. (2004). Customary law as the basis for Prior Informed Consent of Local and Indigenous Communities. International Expert Workshop on Access to Genetic Resources and Benefit Sharing III. Specific Issues for consideration in the elaboration of the IR: Indigenous

- Peoples-Community-level PIC for accessing TK and genetic resources. <http://www.canmexworkshop.com/documents/papers/III.4.1.pdf>>3-11205.
- Gupta, A. K. (2002). Empowering Conservators of Biodiversity and Associated Knowledge Systems: An Intellectual Property Based Framework. Working paper No. 2002-05-02, Indian Institute of Management, Ahmedabad, pp. 3-19.
- Gupta, A. K., Sinha, R, Koradia, D., Patel, R. Parmar, M, Tohit, P, Patel, H, Patel, K, Chand, V. S. James, T. J. Chandan, A, Patel, M, Prakash, T. N. and Vivekanandan (2003). Mobilizing grassroots' technological innovations and traditional knowledge, values and institutions: articulating social and ethical capital, *Futures*, 35 (2003), 975-987.
- Gupta, A. K. (1991a). Why does poverty persist in regions of high biodiversity?: A case for indigenous property right system. Paper presented in the International Conference Property Right and Genetic Resources, Sponsored by IUCN, UNEP and ACTS at Kenya, June 10-16, 1991.
- Gupta, A. K. (1997). Building upon what poor are rich in: Honey Bee Network liking grassroots innovations, enterprise, investments and institutions. Paper presented at the 22nd World Conference on "Which Globalization: Opening spaces for Civic Engagement" in Santeago de Copmpostela, Spain, May 21-24, 1997.
- Hansen, S. A. and VanFleet, J. W. (2003). Traditional Knowledge and Intellectual Property, A Handbook on Issues and Options for Traditional Knowledge Holders in protecting their Intellectual Property and Maintaining Biological Diversity. American Association for the Advancement of Science (AAAS), Science and Human Rights Programme, AAAS, Washington, D.C.: 3-53.
- Haridasan, K., Beniwal, B. S. and Deori, M.L. (1987). "Bamboos in Arunachal Pradesh: Distribution and Utilization--a Preliminary Appraisal," *Arunachal Forest News*, 5.1.
- Kaplowitz, M. D. (2000). Identifying ecosystem services using multiple methods: Lessons from the mangrove wetland of Yucatan, Mexico, *Agriculture and Human value*, 17:169-179.
- NIF (National Innovation Foundation) (2006). Prior informed consent of traditional knowledge holders. www.nifindia.org.
- Reyes-Garcia, V., Byron, E., Vadez, V., Godoy, R., Apaza, L., Limache, E. P., Leonard, W. R., Wilkie, D. (2003). Measuring culture as shared knowledge: Do data collection formats matter? Cultural knowledge of plant uses among Tsimane' Amerindians, Bolivia. *Field Methods*, 15(2):1-22
- Sagar, R. (2005). Intellectual property, benefit sharing – How effective is the Indian Biological Diversity Act, 2002?, *The Journal of World Intellectual Property*, 8 (3), 383.
- Shrivastava, R.. C. (2008). RET (Rare, Endangered and Threatened) Species of Arunachal Pradesh. Personal Communication on 26-27th April, 2008.
- Singh, R. K. (2004). Agrobiodiversity: Conserving Diversity and Culture - Pem Dolma. *Honey Bee*, 15 (3), 12-13.
- Singh, R. K. and Sureja, A. K. (2005). Community Knowledge and Conservation of Natural Resources: Learning from Monpa Tribe of Arunachal Pradesh. Paper presented at National Conference on Arunachal Pradesh: Tradition in Transition, Linking Ecology, Economics and Ethics, NERIST, Nirjuli, Itanagar, Arunachal Pradesh, September, 13-16, 2005.
- Singh, R. K. (2008). Implications of prior informed consent for the conservators of indigenous biological diversity of Northeast India, *Indian Journal Of Traditional Knowledge*, 7(4):655-665.
- WIPO (World Intellectual Property Organization) (2002). Elements of a Sui Generis System for the Protection of traditional Knowledge, World Intellectual Property Organization (WIPO), Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore, 3rd Sessions., 2002, WIPO/GRTFK/3/8.