

Contested Domains, Fragmented Spaces: rights, responsibilities and rewards for conserving biodiversity and associated knowledge systems¹

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Administrative or legal boundaries make little sense while understanding the evolution of nature, its diversity, complexity and simultaneity. And yet we live in a world in which most decisions have to be taken along these boundaries. Obviously, fragmentation of landscapes, eco-systems, and biospheres along artificial boundaries does impair our ability to let the socio-ecological interactions be monitored or managed in a most sustainable manner. But then one should not let the best solution become the enemy of the better. It is necessary thus to understand how property rights over natural resources and also the associated knowledge systems help in dealing with contested domains of knowledge, resources, and related rights and responsibilities. Rewards for these rights holders may help in modifying the incentives for conservation.

In this paper, we first explain the conceptual framework of contested domains among private, community and public domain of knowledge and resources in part one. We present the summary of the discussion in the recent meeting of Intergovernmental committee on Intellectual Property and genetic Resources, Traditional Knowledge and Folklore (April 30 to May 3, 2001, held at WIPO, Geneva in second part. In part three we conclude by identifying certain lessons from Honey Bee network to help knowledge rich economically poor people in conserving and augmenting biodiversity without having to remain poor with specific reference to knowledge or intellectual property rights related issues.

Part I : Contested Domains, Fragmented Spaces

A bird flies across the sky over a private home garden, community forest, public forest and the sea beyond. So do fish or other wild life move across different resource regimes. Can we conserve wildlife only by conserving protected areas and biospheres. Ramakrishna (2001) discusses how the interconnections among different parts of ecosystems influence the way we perceive the environment and its components. The ecological indicators have been used by the communities from time immemorial to interconnect various biological, meteorological, edaphic and aquatic resources and information. In the western Hudson Bay, local Cree and Inuit communities forecast weather and seasonal characteristics by looking at the behaviour of birds, clouds, winds etc., This is a complicated knowledge system in which biodiversity based knowledge system are produced in conjunction with other kinds of knowledge. In a recent conference to discuss criteria and indicators of sustainability, the issue of local

¹ This paper draws upon collective insights of colleagues in SRISTI and Honey Bee network , too many to be mentioned individually here. But suffice to say that the credit for ideas if any belongs to the Honey Bee network while responsibility for the inadequacies in presentation rests with authors. Comments can be sent at anilg@sristi.org or Riya@sristi.org

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knowledge and indigenous indicators emerged quite strongly (Gupta 2001). Within biodiversity, the complexity is no less. The taxonomists have named hardly 1.4 million species out of estimated 10-100 million species in the world (WCMC 1992). Even among the known species, certain regions and certain categories are far more researched than others. Different stakeholders value different species variously and thus have asymmetric interest in their conservation (Koziell, 2001, Gupta 1995, Suthersanen 1999: 72-77). Pimental et al (1992) estimate that about only 35-40 per cent of total 30,000 species in Germany were found in protected areas. Even the boundaries of most protected areas have not been drawn rationally on conservation ground. A mismatch has also been noted among some of the protected areas and hot spots. They therefore argue and rightly so, that while protecting the 'islands of biodiversity', we should also protect the 'sea' in between. Ramakrishnan (2001) has also suggested that one ought to take a more comprehensive approach to conservation while focusing on even protected areas. The situation becomes more complicated when we look at the role of communities living in and around the protected areas. The multi-stakeholder framework in a co-evolutionary perspective suggests how conservation goals could be met by involving local communities in evolving and implementing conservation plans and policies. In this paper we will not deal with all aspects of conservation but focus on only one specific aspect concerning local ecological and technological knowledge systems. The socio-cultural and institutional knowledge systems are extremely important and have been discussed elsewhere (Gupta, 1995a, 2000, 2001). There is no doubt that technological knowledge exists in an institutional context. What kind of rules govern the evolution of knowledge and its dissemination are therefore important to determine the typology of incentives that will nurture or impair the processes of knowledge production and reproduction. The generation of creative and innovative solutions for local problems will also be influenced by these incentives. Therefore, the interaction among three sets of knowledge domains is important to understand the complexity of knowledge systems.

Contested Domains of Local Knowledge: private, community and public

The knowledge could be produced (see figure 1) by individuals, and or groups alone or in combination. Some of this knowledge may diffuse only locally to be characterised as community knowledge while other may diffuse widely among various communities in a region and some time across regions and countries to become public domain knowledge. Within the community knowledge, there may be elements which are restricted in scope or in terms of accessibility while others may be in public domain. Similarly, individuals may also produce knowledge, which they may share widely with the community and outsiders in a manner that the knowledge might become public domain. However, some of the knowledge produced by the individuals may be kept confidential and accordingly may be accessed only with restrictions.

Table – 1 Contested domain of Knowledge

a) Private individual knowledge inherited from forefathers	K1
b) Acquired the skill to practice it faithfully without modification or with modification	K1-wm K1-m
c) Individual rights to use the modified and unmodified knowledge according to same rules Or different rules	K1-sr K1-dr
d) Knowledge known to the community	K-2
e) Knowledge practiced by individuals if known to individuals	K1-l

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|---|-------|
| f) Knowledge practiced by individuals if known to community | K2-l |
| g) Knowledge practiced by community if known to community | K2-c |
| h) Knowledge practiced by community even if details known to individual/s | K1-c |
| i) Known to community but not practised by individuals or community | K2-n |
| j) knowledge known to community and accessible to outsiders | K2-a |
| k) Knowledge known to community and not accessible to outsiders | K2-na |
| l) Knowledge known to wider public through documentation or otherwise | K3 |
| m) Knowledge known to wider public and practised by only few individual | K3-l |
| n) knowledge known to wider public and practised by wider public | K3-P |
| o) Knowledge known to wider public and not practised by any one | K3-n |

(Own Compilation, Adapted from Gupta, 1999)

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Contested Domains of Local Knowledge

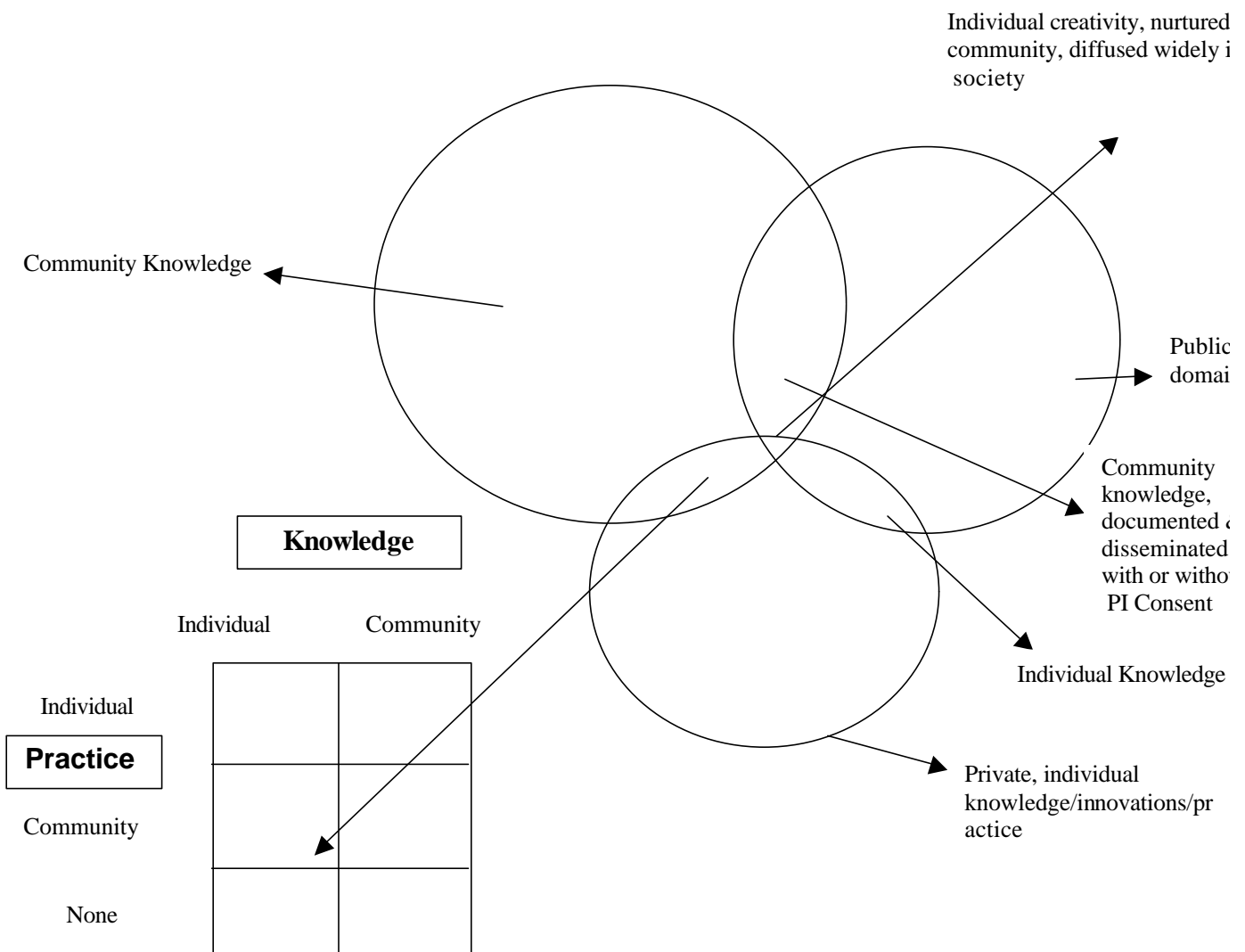


Figure 1. Source: Gupta 2001

The three subsets in figure 1 thus refer to three overlapping domains of knowledge. The contestation emerges when the producers and users of knowledge have unequal access, ability and assurances (Gupta, 1995) about the resources and the benefits emerging out of commercial or non-commercial usage of the resources with or without value addition. The private individuals may have knowledge which they may have inherited from their forefathers (K1), and they may have acquired the skill to practice it faithfully without modification or with modification (K1-wm or m, see table one). The individual contribution in modifying traditional knowledge may be treated according to the same rules as the non-modified knowledge is used, or its use and dissemination may be governed by different rules (K1-sr, K1-dr). Knowledge may be known only to individuals (K1) or to the community (K2) and may be practiced by individuals (K1-I, K2-I) or by the community (K1-C or K2-C), or by none (K1-n or K2-n). In the last case the knowledge because of discontinued use may still be effective or may not be effective. When individual knowledge is shared with the community, its practice may still be restricted to individual experts. There are healers who know how to calibrate the dose and combination of herbal drugs according to the condition of the patient. The general relationship between the plants and their uses in some cases may be known to the community. The experts who produce knowledge and also the contingency conditions under which this knowledge should be used may be free to share their knowledge or may not be free to share their knowledge. Emmanuel and Weijer (2001) provide example of Amish community which may restrict the right of individual members to give consent to participate in a research process. This is not an uncommon case. The communities may circumscribe the conditions under which individuals may or may not be able to share their expert or other knowledge with outsiders or even with other members of the community. There is a famous case in Australia where an art piece designed by a native individual was printed on a currency note by Reserve Bank. The community objected to such use because it argued that the individual did not have rights to assign even individually designed work to outsiders without community's permission since the art work was conceived after rituals and taboos sanctified by the community (Blackney, 2000). There are also taboos implying that a particular remedy might lose its effectiveness if revealed to others. Such a taboo leads to erosion of knowledge when such a knowledge expert dies without ever sharing the secret. The incentives for such knowledge experts to share their knowledge will bring down the transaction costs of external users now or even among the future generation to find such leads for developing various products. But if we argued about the logic of rewarding current generation for knowledge that might have been partially or completely developed by previous generation, we might win the argument and lose the knowledge.

Further, community knowledge may or may not be accessible to outsiders (K2-A and K2-NA). Different communities may have varying capability to produce, reproduce and practice the knowledge for individual or common good. Wider the sharing, greater is the probability of feedback coming from larger number of people and thus improving the knowledge. At the same time the incentives for individuals to improve such knowledge may go down because such individuals in view of widespread awareness cannot extract

the rent. *Some communities govern the access to biodiversity resource by different rules than the access to knowledge about such resources.* The knowledge within a community is therefore not distributed symmetrically. The variability not only influences the power differentials but also the extent of efficiency gains that different members of a community make by using the same knowledge differently. The communities benefit from the individual knowledge and thereby revere the local knowledge experts or healers. But this reverence may not be the sufficient motivator to encourage young people, to acquire this knowledge and take it forward with or without improvement. There may be other factors also such as public policy, media exposure, life style changes etc., which may affect the incentives for younger people to acquire particular knowledge. However, the point remains that the existing set of incentives may need to be modified if traditional knowledge has not only to be conserved but also augmented.

The third set of knowledge system includes public domain knowledge (K3) which may be practiced by individuals, or wider public or not practiced by any one (K3-I, K3-P, K3-n). Ethno biologists, other researchers and firms may document individual and community knowledge and bring this into public domain. Some people have argued that even the community knowledge known only to the members of a village community should be considered public domain knowledge. However, in our view this is not a proper interpretation. From the point of view of protection of intellectual property rights, the knowledge, which is reasonably accessible, can only be considered public domain knowledge and part of prior art. Most of the time the knowledge of people is brought into public domain without the consent of concerned individuals or communities. It is obvious that this way of dealing with people's knowledge is neither fair nor just. What is even more disturbing is the dominant tendency on the part of outside researchers not to share what they have learnt from people back with the same community after value addition in local language. Honey Bee network has tried to counteract this tendency of making people anonymous by insisting that knowledge providers, producers and reproducers must be acknowledged explicitly and attributed as authors and communicators of the specific knowledge. We should also ensure that whatever is learnt from people is also shared with them in local language so that people to people linkages can also be established. In addition, the Honey Bee philosophy (see <http://www.sristi.org> and sristi.org/knownetgrin.html) also requires sharing by outsiders of any gain that may accrue to them from commercial or non-commercial dissemination of the raw or value added knowledge provided by the communities or individuals. Honey Bee newsletter for last 12 years has tried to propagate this philosophy through SRISTI (Society for Research and Initiatives for Sustainable Technologies and Institutions) in India and 75 other countries. We strongly believe in the need for protecting intellectual property rights of knowledge rich economically poor individuals and communities. However, to provide such a protection one would have to characterize such knowledge in the manner that the novelty and non-obviousness can be established. This would mean a comparison with available formal scientific knowledge. The present instruments of IPR can provide limited help in this manner. However, with modifications these instruments can indeed go a long way in protecting the intellectual property of individuals as well as communities. The greatest advantage of this system would be that the people will have incentives to disclose their traditional and contemporary knowledge and make it available to others for learning purposes. Once this knowledge becomes a basis for livelihood, conservation, lateral learning and social networking, a knowledge society starts emerging. Once this happens the public domain provides incentives and not disincentives for individual and communities to share their knowledge after due information.

Time Frame for knowledge production and reproduction

There are different triggers which may lead to evolution of the solution. It could be a concurrent need, a continuing inefficiency or an episodic need which manifest only in the period of crisis. Various triggers can generate solutions that have emerged recently i.e. in last two years, long ago i.e. several decades ago or over generations. In a complex knowledge system, blending of knowledge produced through different triggers over varying periods continually takes place. It is important that while developing intellectual property systems we recognize the fact that disclosure by people of their knowledge in recent past should not pre-empt their rights to have protection. This will require evolving a special grace period, may be of 5 years, for traditional knowledge. So that communities do not suffer for having communicated with outside researchers and institutions.

Right regimes and knowledge domains

We can understand the relationship between different kinds of property right regimes governing biodiversity resources and different kinds of knowledge domains (Figure 2). The knowledge of individuals would be based on plants in his or her backyard or biodiversity in the common land or common pond or biodiversity in public or state owned resources or in open access areas. The interaction between different knowledge domains and resource regimes needs to be studied carefully so that different kinds of incentives for conserving different resource right regimes are compatible with the incentives in various knowledge domains. In some cases new kinds of contextual and actual relationships will have to evolved. Situations becomes more complicated when users from one country access resources in another country. The discussions in the inter-governmental panel on traditional knowledge and IPR at WIPO provides a detailed understanding of the tensions existing among different countries on the issues of access and benefit sharing. However, the more difficult and challenging issue of providing incentive within the country for different kind of resource regimes and knowledge domains has not been adequately pursued so far.

Resources: Right Regimes and Knowledge Domains

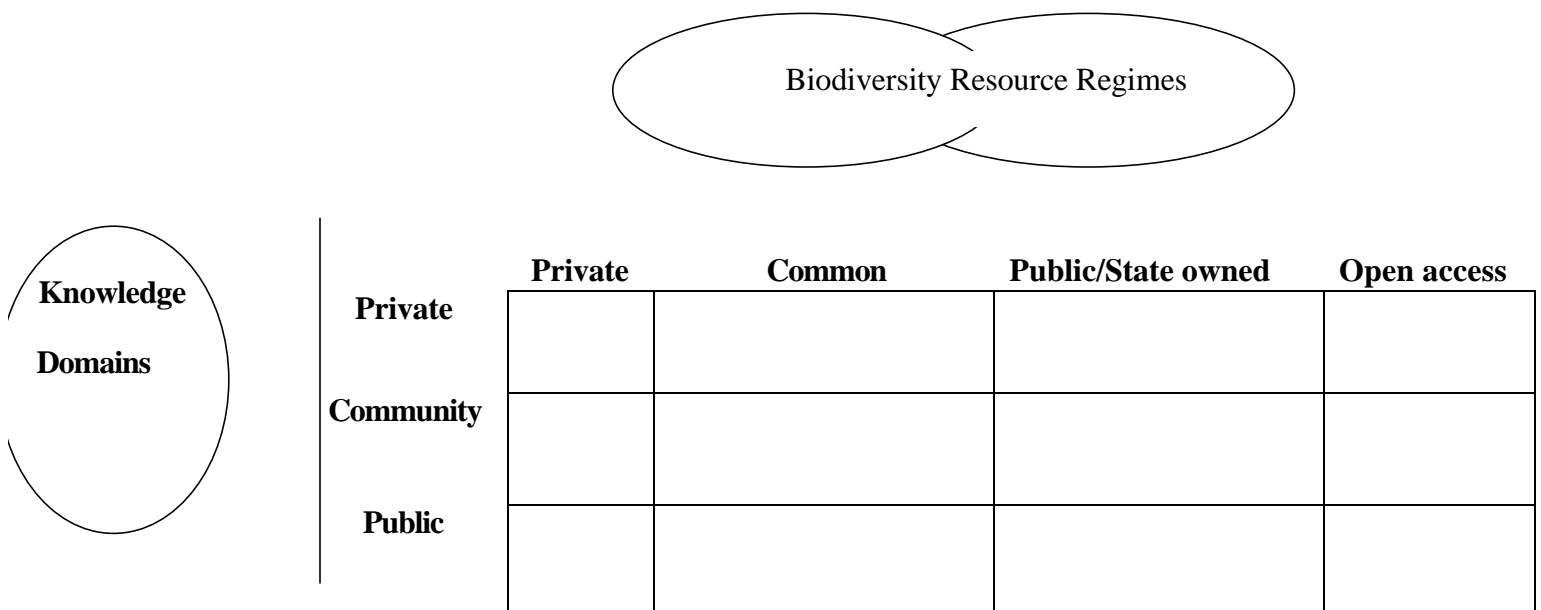


Figure 2. Source: Gupta 2001

Transition from natural capital to intellectual property

The natural capital has provided the spur for economic progress all through the history, though its role has varied. The natural capital can be governed by social capital, some of which is also ethical capital (Figure 3).

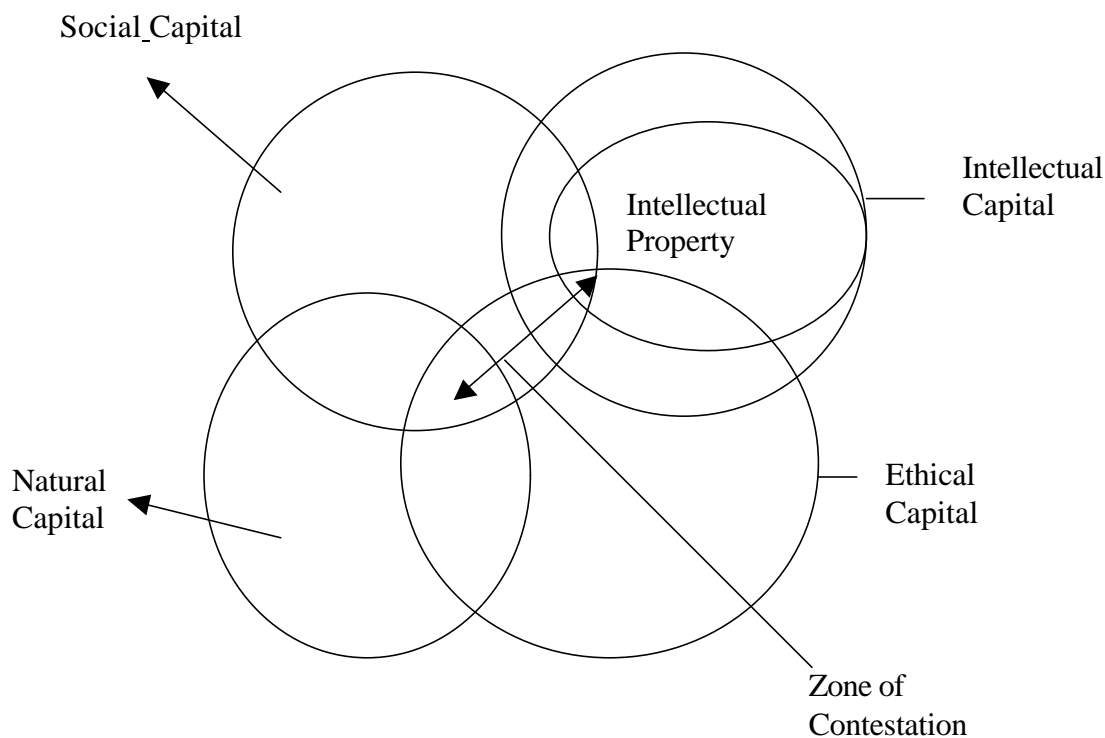


Fig 3. : Source: (Gupta 2001 own compilation)

The social capital could be defined as community based institutional arrangements which help in conservation and reproduction of natural capital. It is essentially a trust based community capital. The ethical capital is essentially such investments and institutional arrangements that may be governed by ethical norms of accountability, transparency, reciprocity and fairness to both human and non-human sentient beings. Some of the ethical capital is a sub-set of social capital. When common property institutions follow ethical values, then the intersection of social and ethical capital takes

place. Knowledge about natural capital as well as other kinds of technological and social interactions constitute the intellectual capital which is embodied in literature, data bases, folklore and other kinds of formal and informal sources of wisdom. Part of the intellectual capital constitutes intellectual property from which the knowledge producers can exclude others for a given period of time from commercial exploitation.

The purpose of this discussion is to emphasize that intellectual property is only one means of conserving and augmenting natural resources and associated knowledge systems. Since in the absence of this kind of property it is unlikely that private sector would invest resources to add value to traditional knowledge, the discussion becomes relevant. It is not our contention that private investments can alone help in conserving resources and the knowledge systems. In fact, there is considerable evidence that expansion of market institutions has led to erosion of biodiversity as well as associated knowledge. It is more due to the fact that the traditional knowledge was not valued properly within and outside the communities than due to expansion of market alone. Once a commodity becomes valuable, the bidders would try to appropriate it. Some critiques suggests that commoditization of traditional knowledge is contrary to the local culture and ethical values. This may well be true. However, one has to appreciate that every commodity that local communities and individuals have to buy from the market place has to be paid for. It is an ironical situation that the critics see no impropriety in commoditization of rest of the market in which local communities have no comparative advantage. But in resources in which they are rich, the commoditization is supposed to be disruptive. It is also ignored many times that the concept of intellectual property is not inconsistent with community wide sharing of knowledge for self-use. It is only when somebody tries to enrich oneself at the cost of the community or individual innovator that the protection could help. Therefore the communitarian spirit, which has helped conserve resources and generate respect for nature, has to be nurtured. Our contention is that this spirit will give way when options for survival require deforestation or other resource degrading livelihood options because the resource conserving options are not available. *The knowledge based approach to livelihood, and conservation of biosphere regions can indeed be evolved without causing any injury to the local institutions that have helped in conservation so long.*

Part II: International space: local knowledge

World Intellectual Property Organization based in Geneva held the first meeting of Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (April 30-May 3, 2001) which went into various issues related to the contested domains, resource right regimes and emerging conflicts among nations. The background document (WIPO 2001) identified three shared characteristics of traditional knowledge, genetic resources and intellectual property: (a) the concept of common heritage was applied to genetic resources, traditional knowledge and folklore. However, ever since appropriation of the common knowledge has started generating private intellectual property, 'the public domain status of the material has been called into question' (b) genetic resources, traditional knowledge and folklore, "constitute subject matter which transforms and evolves beyond the logic of individualized human intellectual activity. Since genetic resources can self-replicate as living resources and traditional knowledge and folklore also evolves across individuals and generations, the intellectual property model suitable for

individual creativity and intellectual property may not be suitable. Hence the suggestion for new and specific intellectual property standards, (c) each theme cuts across a range of formal and informal innovations and creative situations. The feeling has emerged that without creating cognate rights for informal innovations or similar subject matter, the formal innovations could not be protected. The concept of farmers right under FAO and plant breeders right under UPOV have tried to tackle these seemingly contradictory urges. Given the fact that much of the biotechnological research draws upon biodiversity, the tensions between different system of knowledge are inevitable. The Background Note acknowledges the ongoing innovation and creativity within the traditional knowledge systems. In some cases the customary law protects the traditional knowledge with or without sanction of the state. The Background Note identifies contractual arrangements as the most common legal route for regulating access to genetic resource and benefit sharing. The Material Transfer Agreements are used in various sectors for exchange of genetic resources. These MTAs include process dealing with intellectual property such as (a) utilization allowed for research purpose only, (b) obligation not to file patent applications (c) provision to share intellectual property rights, (d) provisions to share royalty from intellectual property rights, (e) progeny and derivative material also covered under the MTA conditions, (f) grant back licences obliging the recipient of genetic resources to give a non exclusive royalty free licence to the provider of genetic resource if it patents any technology derived from the provided resources, (g) obligations to defer publications till patents have been filed.

The Background Note identified the task (A1) to develop guidelines for contextual practices and model intellectual property clauses for access to benefit resources and benefit sharing, task (A2) to pursue legislative, administrative and policy measures to regulate access to genetic resources and benefit sharing, task (A3) multilateral system for facilitating access to genetic resources and benefit sharing. The ongoing revisions of the International Undertaking on Plant Genetic Resources for Food Agriculture are supposed to provide a mechanism for the same, task (A4) protection of biotechnological inventions, task (A5) to pursue the improvement of management systems of genetic resources by exploring methods by which the genetic resources obtained from the protected varieties are integrated into the overall plan for biodiversity conservation.

With regard to traditional knowledge several tasks were identified dealing with the more precise definition of the traditional knowledge, the use of existing intellectual property instruments for protecting traditional knowledge, to compare and access the extent to which intellectual property rights have been obtained on traditional knowledge, identify the revision of existing criteria of integrating traditional knowledge with searchable prior art and enforcement of the rights in traditional knowledge.

The draft report³ (WIPO/GRTKF/IC/1/13/PROV, May 3, 2001) provides a rich overview of the contestation that took place in the Committee meeting on the subject. The European Community view represented by the delegation of Sweden stated that it was prepared to engage, in a positive manner, in discussions on the question of disclosing and sharing information about the

³ This part has been abstracted from the WIPO draft report (WIPO/GRTKF/IC/1/13 Prov.), Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore, First Session, Geneva, April 30 to May 3, 2001, pp 1-74 (excluding the annexures)

geographic origin of biological material within the framework of the patent system. With regard to the issue of Traditional Knowledge, the delegation believed that a broader scope of protection, including elements of particular interest to a number of countries, and in particular traditional knowledge, would improve confidence in the international intellectual property system.

The delegation of Malaysia on behalf of the Asian group stated the terms of reference of the Committee should be drawn as broadly as possible to enable policies, plans and mechanisms for regulatory access and benefit-sharing to be developed. The delegation underscored that the intellectual property rights regimes were, generally, intended to grant exclusive rights for a certain period of time to new knowledge created by an individual or corporation, while traditional knowledge, on the other hand, tended to evolve incrementally over time, was passed on orally and was improved over generations. It is often held collectively by one or several communities. They emphasized the need to study the relationship between customary protection of traditional knowledge and intellectual property rights systems. The delegation further stated that it was often the case that traditional knowledge holders do not possess the economic and other resources necessary to file and contest intellectual property rights claims in their own as well as other countries, and that, therefore, practical solutions to this problem should be developed. The delegation also stressed the need to explore international mechanisms for the protection of traditional knowledge and indicated cases where traditional knowledge had been inappropriately patented in foreign countries. Such inappropriate patents were most likely to be granted in those countries where prior art did not include non-written disclosures or use outside the national territory. Ideally, national searches on prior art should not discriminate between the use in the home country and abroad.

Lastly, the delegation stated the importance of documenting traditional knowledge that is in the public domain and making it available in an easily searchable manner to patent offices all over the world so as to form part of the prior art. In this context, WIPO was urged to continue supporting the development of a "traditional knowledge digital library."

The delegation of India acknowledged the convertibility of knowledge into wealth and social good through the process of innovation. It would determine its future and help reduce the knowledge gap between the developing and the developed world through mutual cooperation. The delegation referred to some initiatives which India had undertaken. The first related to the Government of India's approval for setting up a Traditional Knowledge Digital Library (TKDL), namely an electronic database of traditional knowledge in the field of medicinal plants. The delegation cited the provisions in the Biodiversity Bill providing for the protection of knowledge of local people relating to bio-diversity through measures such as registration of such knowledge and development of a *sui generis* system. Further it was implied that to ensure the equitable sharing of benefits arising from the use of biological resources and associated knowledge, it was necessary to receive prior approval from the National Biological Authority (NBA) before access was allowed.

The delegation stated that in order to protect bioresources, the Patents (Second Amendment) Bill 1999, contained provisions for mandatory disclosure of source and geographical origin of the biotechnological or biological material used in an invention.

To prevent the granting of patents based on knowledge, which was not necessarily documented, provisions had been incorporated to include the

anticipation of inventions made available via local knowledge, including oral knowledge, as one of the grounds for opposition and revocation of patents, if granted.

They stated the contribution of the Plant Varieties Protection and Farmers' Right Bill 2000 which takes into consideration the amount of benefit-sharing linked with the extent and nature of the use of genetic material of the claimant in the development of the variety. The commercial utility and demand in the market of the variety was also taken into account while estimating the benefit sharing claims.

The delegation of Brazil felt that whenever appropriate, it would be open to consider the development of provisions that ensure consistency between intellectual property rights and the objectives of the CBD. Further, it added that another valuable contribution WIPO could make would be in the development of databases for the protection of genetic resources and traditional knowledge, as suggested by the delegation of India.

The delegation of Singapore suggested that the Committee would need to examine existing intellectual property concepts in order to see where it could work within existing concepts, where it would need to adapt these concepts, and where it might have to think of new concepts.

The delegation of Indonesia emphasized that the Committee should deal not only with individual rights, but also community rights. Viewed from this perspective, it explained that the issues concerned involved other disciplines within a country's jurisdiction and involved the systems and values of a society, as well as progress in community development.

The delegation of Iran suggested that WIPO could formulate a comprehensive legal protection scheme to enhance all the different forms and aspects of the traditional knowledge, specially in the handicrafts area.

The delegation of China provided the example of traditional Chinese foods, which had been known for a very long time and were protected by trademarks and appellations of origin. It furthermore stated that traditional Chinese medicine, which had a long historical development, was protected thanks to a patent law since 1993. The delegation specified that at the end of 1998, traditional Chinese medicines were the subject of 1,900 patent applications. It added that traditional knowledge and technological know-how were included as trade secrets as part of protection against unfair competition. On the subject of folklore, the Delegation pointed out that copyright in China has explicitly included expressions of folklore in its scope of protected subject matter

The Japanese delegation stated that many factors were related to the issue of access and benefit-sharing and that intellectual property was only a part of the issues to be considered. For benefit-sharing systems they shared ideas other than those which were intellectual property-related for example, technical cooperation, human resource development, an 'access fee' and so forth

The delegation stressed that discussions on traditional knowledge should not pre-empt the established expression of new intellectual property systems for the protection of traditional knowledge. With reference to the concerns on patent rights being obtained for subject matter covered by traditional knowledge of third parties found under the patent laws of many members, including Japan, the delegation stated that not only inventions which had been described in documents, but also inventions which have been publicly known or are used

elsewhere in the world prior to the filing of the patent application, constituted prior art.

The delegation of the United States of America stated there were so many different expectations, goals and native systems for approaching ownership and the transgression of ownership that a useful, enforceable global system would be virtually impossible to create. The delegation noted that many of the goals of indigenous and local communities in “protecting” their traditional knowledge, medicine, folklore, etc., stemmed from their concern for self-determination, health, justice, cultural heritage and land issues. It emphasized that these were serious interests that must be examined fully within the appropriate national and international contexts, but that these were not issues with which WIPO or intellectual property offices had competence. The delegation further elaborated on the provision of technical and legal assistance, where applicable, to holders of commercially-valuable traditional knowledge. For example, development of means to exploit traditional knowledge the application of current intellectual property tools such as certification marks, collective marks, licensing, etc., as well as the law of copyright for works of original authorship, where relevant. In USA, approximately 15% of patent applicants were individuals or “independent” inventors. To encourage the creativity of these independent inventors, the USPTO had a special office devoted to the needs of individual or “independent” inventors. The delegation aggressively promoted Internet electronic filing systems for patents, copyrights and trademarks. It also drew attention to their extensive public information system and on-the-ground outreach and assistance. The goal of such an approach was to enhance the bargaining power of independent creators worldwide by giving them access to the same information as corporations worldwide.

The delegation of Ethiopia explained that a permit was required for locating, dispatching, improving or exploiting any biological specimen or sample and that engaging in any of these activities without securing a permit would constitute a criminal offence. It further stated that the cultural policy of Ethiopia acknowledged the importance of folklore, but there was no law that protected expressions of folklore. It noted that consequently a new proclamation that amended the existing copyright law and provided for the protection of folklore had been drafted and submitted to the Government for approval.

Part III : Implications for change in the policy and instruments for recognising intellectual capital and property of communities and individuals

As is apparent, the intellectual property is a subset of intellectual capital, which may draw upon social, natural and ethical capital. The interface between natural, social, ethical and intellectual capital is given in figure two. Societies can sometimes innovate technologies and institutions, which may not necessarily be illuminated by ecological ethics. And therefore, the need to distinguish that. The intellectual capital is a broad based knowledge system including the cultural,

technological and ecological knowledge of local communities and individuals⁴. Only some part of this intellectual capital is amenable to be considered as intellectual property. It is this part which will form the substance of changes in the policy and TRIPS hereafter. It is useful to mention here that property rights in knowledge are generally defined by one's ability to exclude others from commercial utilisation of the protected knowledge for a given period of time. The property right does not necessarily give a right to use that knowledge. In the classical IP sense, the right to use will be determined by other laws obtaining in a country such as food and drug administration or pollution control or mining, etc. It may be useful to mention here that every society has had traditions of intellectual property rights protection in different ways. It is a not new construction as is often assumed. Many people may not know that King Shahjahan who built Taj Mahal in memory of his deceased wife was very keen to protect the design of the monument. He got the thumb of right hand of all the workers cut so that they could never build another Taj Mahal. Likewise, there is an old tradition of textile popularly known as 'patan silk' sarees in Patan region of north Gujarat. There are only three families left maintaining this tradition involving use of vegetative dyes. Some of them reportedly do not share their trade secrets with the daughters who are supposed to go to another family after marriage. Only daughters-in-law are inducted into the tradition. A community in northern Bengal had a tradition of sending an offering of a famous variety of mangoes to the king. They punctured the seed of these mangoes with a very thin needle to ensure that nobody could grow these mangoes without their permission. There are healers who maintain that their knowledge of herbal medicine might lose its effectiveness if shared with anyone. They maintain it as a kind of trade secret. All these examples show that the concept of drawing boundary around the knowledge and resource including biological resource is not a new one. However, there are obvious problems when we use the current IPR instruments for dealing with the creativity, knowledge and innovations produced by small, dispersed individuals or communities dependent upon natural resources for their survival. It is to this problem that we turn to next.

A Genetic Resources and Associated Knowledge Conserved by a Community

Tribal and/or farmer communities conserve various kinds of genetic resources. Many of these resources provide very useful inputs into seed, biotechnology and drug and dyes industry. There are five issues which need to be tackled while revising TRIPS : (i) the land races need to be protected through a registration system at national and international level so that there are incentives for local communities to disclose various properties that they have identified in these plant varieties or local herbs; (ii) the community knowledge should be subject to protection by the communities represented by the village councils or their federation considered for the purposes of the property rights as body corporates; (iii) in cases where the land races and/or the local plants have been documented and incorporated in the national or international gene banks, the responsibility of the biodiversity users to share part of the benefits must be acknowledged so that incentives for conservation are available to the communities. It should be

⁴ This section drawn upon an earlier paper by Gupta, Anil K et al 2001, Building upon Grassroots' Innovations: Articulating Social and Ethical Capital, Paper invited for presentation at the World Social Forum Workshop in Brazil during January 25-30, 200, P.9

recognised that *ex-situ* gene banks do contribute to the cause of conservation but these cannot be substitute for *in-situ* conservation. The biodiversity in the cultivated or uncultivated patches or lakes is under constant selection pressure through socio-cultural interactions. In the absence of any incentives, the rate of erosion of genetic diversity has been quite high. Indian Plant Variety and Farmers Rights Bill has an interesting provision for a gene fund to share benefits with the conservators of agro biodiversity. It also has a provision for registration of extant varieties by the farmers or NGOs on their behalf; (iv) the new uses of existing diversity should be subject to registration and availability of 'use' patents. Many countries do not permit 'new use' patents. They should reconsider their position if they want to empower local communities to draw benefits from this provision; and (v) the duration of protection for land races so far as the right to share benefits from commercial use is concerned, one could consider a longer duration than twenty years.

The flip side of the coin is that the public sector breeding which has relied on access to the collection in gene bank may get affected if every user had to take prior permission from the community where from the germplasm was originally collected. In many cases, this may not be even feasible. The passport data sheets in gene banks do not include in a large number of research institutions, any information about the village or the local community from where the seeds were collected. In addition, the communities themselves have been having lot of exchanges of genetic material for their own use. Unless all exchanges for public purpose as well as local self-use are excluded from the requirement of any need to take permission from the originating community, the crucible of creativity and conservation may get damaged.

B. Modification in the Implementation of TRIPs

- i. The Asian countries must recognise that 'first to invent' system as used in US is far more favourable to small, scattered and disadvantaged innovators than the 'first to file' system. It is necessary to review this provision and ensure that we provide such opportunities to small innovators.
- ii. Every patent applicant must declare that claimed invention is based on material/ knowledge obtained lawfully and rightfully ensuring due compensation to the providers. The 'lawful' implies compliance with the laws of the country from where the knowledge/resource is accessed. The 'rightful' implies moral duty to have prior informed consent of the provider ensuring equitable benefit sharing, even if the law of the country did not require it.
- iii. The community or individual knowledge which is not reasonably accessible, i.e., which has not been coded and/or catalogued in publicly accessible databases should not be considered prior art. Such knowledge should also be considered a patentable subject so long as it meets the novelty criteria.
- iv. Grace period. The traditional knowledge shared in good faith by the local healers and herbalists after 1995 should be considered patentable subject by providing a special grace period for the purpose. Generally, only one year grace is provided in US in case the innovation has been published or disseminated.
- v. The public domain traditional knowledge be put in a digital library by every country in the region so that issuance of patent to third parties on knowledge already in public domain is avoided. India has already started TKDL (Traditional Knowledge Digital Library) project to avoid issuance of frivolous

patents. The US Patent Office has in fact written to Dr.R.A.Mashelkar, Secretary, DSIR (Department of Scientific and Industrial Research), Government of India, requesting for access to such a database so that USPTO can avoid issuing patents on materials like turmeric.

- vi. Just as collective management systems have been developed for protecting IP in music, songs, performances, etc., institutional innovation is required for collective management of individual product and process patent applications on behalf of small innovators, tribals, local communities so that their transaction costs for seeking such protection can be reduced.
- vii. International registry is required as suggested by SRISTI (Society for Research and Initiatives for Sustainable Technologies and Institutions) either as INSTAR described earlier or some other format with the provision of short-term protection. The emphasis should be on disclosure rather than examination of novelty or non-obviousness. If an innovation is not worthwhile, nobody would license it. A lesson can be learnt in this regard from the practice in Swiss National Patent System.
- viii. A national innovation patent system should be developed on the pattern of Australian proposal. In this small innovations are given eight to ten years protection, with maximum five claims, a small fees of less than ten dollars and protection granted within three months. A product patent in this framework may stimulate linkage between innovation, investment and enterprise.
- ix. Local language databases on traditional knowledge and patents need to be developed so that local communities can also track any usurpation of their knowledge. In addition, such databases will promote horizontal learning among people. Honey Bee multimedia multi language database provides one kind of template for such a mechanism. Likewise, one can think of decentralised IT kiosks for searching as well as filing applications.
- x. National Innovation Foundation as done in India needs to be set up in every country to provide a platform to the small innovators and traditional knowledge experts. Such a Foundation can help in building up national register of innovations and inventions, file applications and provide other micro venture capital support for converting innovations into enterprises.

Geographical indications, trade mark protection, sacred marks protection and many other changes will be necessary to ensure that larger civil society in Asian region sees an opportunity for better livelihood in the emerging IP regime. At this moment, the popular notion is that IP is not for small people. The experience of GIAN (Gujarat Grassroots Innovation Augmentation Network) in India and SRISTI which has filed patents on behalf of grassroots innovators and licensed technologies to generate new wealth in the hands of innovators shows a promise, still be to be realised in most developing countries.

Lessons from Honey Bee

Honey Bee does what we, intellectuals, don't do. It pollinates the flowers and takes away the nectar of flowers without impoverishing them. The challenge was, to define the terms of discourse with the people in which they will not complain when we document their knowledge, they will have the opportunity to learn from each other through local

language translations, they will not be anonymous and they will get a share in any wealth that we may accumulate through value addition or otherwise. Honey Bee Network has brought lots of volunteers together who share this philosophy partly or completely and who want to link up with an immense source of energy and inspiration available with the grassroots innovators.

The asymmetry in relative weight which contemporary society places on this resource of grassroots innovations and informal knowledge vis-à-vis formal knowledge and technologies in devising developmental options almost always is skewed in favour of formal science, technology and other linked knowledge systems.

Some evidence of this bias and also few lessons from Honey Bee Network.

a) poverty because of generosity, and consequent knowledge erosion

Unethical exploitation of the local knowledge continuing for centuries leading to capital accumulation in the formal sector without any reciprocity, can not continue for long. Since many of the grassroots innovators conserve nature particularly biodiversity despite remaining poor themselves, share their knowledge with outsiders generously and do not assert their rights, an anomaly has emerged. The youth in the same societies do not want to emulate in the footsteps of their elders. They do not want to be penalized because of superior ethics of their elders who shared their knowledge and remained poor. If some thing was given, it was accepted but a payment for services was not demanded. There are several consequences. One, the erosion of knowledge is taking place at a very rapid rate, the building block of healing and herbal traditions are getting lost. Many plants are becoming weeds. Just as one cannot locate a book in a library if the catalogue is lost or misplaced, likewise if the knowledge about the plants, their place in nature and uses is lost, one cannot accord them the value they may deserve. There are several other forces accentuating the knowledge erosion such as loosening links between grand parent and grand children generation. But the crucial issue is the loss of respect for this rich source of traditional knowledge. It is taking place precisely because younger generation, exposed as it is to media, and every day news of upward mobility of some ordinary people, does not perhaps want to remain poor because of their superior ethics.

b. Ecological ethics

There are several ways in which ecological ethics has been articulated in the Honey Bee Network constituting ethical capital. Our first encounter with this phenomenon took place seven years ago when we were making a small film on grassroots innovations and outstanding traditional knowledge with the help of Indian Space Research Organization. The photographer and the director of the film, Jayantibhai had accompanied us to a village in north Gujarat to meet a herbal healer namely, Karimbhai. He was extremely poor economically but was very rich in his knowledge and ethical values. When Jayantibhai plucked a particular plant on the road side growing abundantly and asked Karim Bhai to hold it in his hand facing the camera, Karimbhai suddenly became upset. He asked as to why was this plant plucked when there was no immediate need for using it. He could have held this standing plant in his hand. We realized importance of the notion that even a road side plant (which was not endangered or scarce) should not have been plucked unless there was a need for it. This was the value unknown to us till that time. Likewise, we have had many examples of ethical capital manifesting in our network. In drought prone regions, a large number of villages have institutions to collect grains from every household to feed the birds. Despite the fact that birds attack the

crops and cause loss, we have never come across farmers killing the birds by poisonous baits or shooting. On the contrary they would rather sit on a raised platform under the scorching sun and scare the birds to save their crops. Variety of birds scaring devices have been developed by the farmers but the taboo on killing birds is widely prevalent. Occasionally, one does come across a single dead bird hanging on a pole to scare the other birds but killing the birds in general does not happen, though there are other tribal communities which do kill the birds and eat them.

There are fishing communities which have common property institutions to ensure that nobody would use a gillnet of mesh size smaller than four inches. This is done to ensure that small sized fishes don't get caught. All these examples indicate that institutional innovations help in articulating ethical values and accumulating ethical capital in societies trying to live in harmony with nature. It is obvious that this capital base is narrow as evident by the extraordinary serious situation with regard to environmental externalities and many irreversible damages caused by human actions. So long as there remains a hope through continuing living wisdom, one is challenged to explore opportunities for expanding such capital base.

- c. Technological innovations to overcome inertia and improve efficiency at grassroots

Honey Bee Network (Gupta, 1991,1995a, 1997a,b, c, 1999,2000,) has documented more than ten thousand innovations either of contemporary origin or based on outstanding traditional knowledge primarily from India but also from all parts of the world. Many of these innovations are extremely simple and can improve efficiency of farm workers, women, small farmers, artisans and others a great deal. However, the diffusions of these innovations across language and regional boundaries has been extremely slow despite the fact that Honey Bee newsletter has been coming out in six languages for a decade or more. The result is that young people often grow with assumption that technological solutions to their problems would come from outside and generally from west and rather than evolving from within. The defeatist mentality and pervasive cynicism add to the problem. The lack of micro venture capital prevents transition of small innovations into enterprises. The incentives therefore, remain limited for those who innovate. While micro finance facilities are now available around the world, micro venture finance for small innovations has almost been totally absent. This institutional gap shows the lack of appreciation by the global as well as national public policy institutions of the potential that grassroots innovations have for generating employment, overcoming poverty and conserving biodiversity. The lack of intellectual property protection through specific instruments and legal frameworks designed for helping small innovators may also inhibit the articulation or sharing of innovations.

Despite all these reasons, innovations have indeed been scouted, documented and disseminated by Honey Bee Network and SRISTI (www.sristi.org) over last twelve years. Innovations such as a modified pulley to draw water, a gum scrapper to enable women to gum from thorny bushes or tress, or large number of small machineries, herbal pesticides, veterinary medicines, new plant varieties, agronomic practices or other products have been developed by the unsung heroes of our society without any outside help.

- d) Linking innovation, investment and enterprise: Micro venture promotion fund

As a follow up of first International Conference on Creativity and Innovations at Grassroots held in January 1997 at IIMA, a regional fund was created in collaboration with Gujarat state government to convert innovations from Honey Bee database into

enterprises. GIAN (Gujarat Grassroots Innovation Augmentation Network, www.gian.org) was set up in 1997 to link innovations, investment and enterprise. GIAN has filed patents on behalf of grassroots innovators, incubated several innovations into products, and licensed some of the innovations to entrepreneurs on district wide basis with the license fee going to the innovator (even when patents for the licensed innovation have only been filed and not granted). While Honey Bee Network is experimenting with the use of information technology through multi media multi language databases accessible through touch screen kiosks, we are conscious of the limitation information technology has at the current level of infrastructure in making major impact on society.

e) National and International Register for Innovations and a Clearinghouse for Horizontal Networking and Innovation Market

The transaction costs for innovators around the world to learn from each other and thereby improve the livelihood options, are very high. The popular media and other channels of communication do not pay attention to this source of creativity. Unless we have a clearinghouse in multiple languages and easily accessible in remote areas through internet as well as radio, it will be very difficult to create horizontal networks of grassroots innovators. A step in this direction was taken in India recently. National Innovation Foundation (NIF, WWW.nifindia.org) was set up in March 2000 with a corpus of US 5 million dollar by Indian Department of Science and Technology at Ahmedabad essentially to scale up the Honey Bee model all over the country. NIF is developing a national register of inventions and innovations, linking innovation, investment and enterprise, connecting excellence in formal and informal sciences, setting up incubators and helping in changing the mindset of the society to ensure respect, recognition and reward for the grassroots innovators. SRISTI has moved a proposal for Global Innovation Foundation primarily to create multi language multi level clearinghouses for networking innovators. However, one of the problems that remain is the protection of intellectual property rights. It will be impossible for traditional knowledge experts and contemporary innovators to pursue standard patent protection where the average cost is about 15 –20,000 dollars per international patent. The cost of validating the patent in each country every year is extra. There is a provision in the TRIPs as a part of WTO that an international negotiation be initiated to develop a global registry of wines. Obviously, it was done to persuade France to sign the GATT treaty. There is no obvious reason as to why international registry should be restricted only to wines. It should be considered possible to develop track two system of intellectual property protection. Under this, any inventor from any part of the world should be able to register one's innovation or traditional knowledge and get at least 8 to 10 years protection with 3 to 5 claims at a very nominal cost to be paid in national currency at the national IP office. This registry will provide incentive to the millions of knowledge rich, economically poor people to disclose.

Summing up

We have shown in this paper that fragmentation of knowledge space is one consequence of contestation among various knowledge domains. Once the fragmentation of knowledge space takes place, the fragmentation of ecological and cultural space cannot be far behind. The conservation strategy for biosphere

reserves has focussed far too much on biological and ecological means of conservation. These are important and must continue. But these are obviously not sufficient in keeping local communities involved and motivated to conserve local biodiversity. There are conservation managers who argue that if economic development of tribal population was allowed to proceed rapidly, the destruction of environment was certain. Logically therefore they plead for keeping people poor to conserve biodiversity. Such a perverse logic fails to notice that livelihood pressures over such communities are taking a heavy toll of their traditional conservation ethics. We have to identify ways of recognising, respecting and rewarding local knowledge, innovations and practices of communities as well as individuals (Gupta, 1991, 1995). In this paper we have taken the earlier discussion of identifying material and non material incentives for individual as well as collective creativity and conservation contributions forwarded by identifying the contested domains of private, community and public domain knowledge systems. We have also argued that reformed intellectual property right systems can indeed provide one, and we repeat just one, more way of generating incentives for conservation and augmentation of local knowledge and resources.

We obviously can not conserve biodiversity by keeping people poor and punishing them for their superior ethics.

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