G^2G – Grassroots to Global: The Knowledge Rights of Creative Communities[1]

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Honey Bee Network began the struggle for protecting knowledge and resource rights of creative people almost two decades ago. Neither CBD was there, nor TRIPS at that time. It appeared obvious to us that for a development process to become dignified, we should build upon a resource in which poor people are rich. The tradition of protecting knowledge rights or drawing boundary around them exists in almost every society. This is not a post-industrial revolution development, as many studies on intellectual property rights protection suggest. Every ancient society had a tradition of some knowledge experts or the other using the principle of trade secret to withhold disclosure. As a consequence, a great deal of traditional knowledge has been lost because it was not transferred to the succeeding generations.

The opportunities in the domestic and international markets are not being harnessed by the communities because they lack the capacity, tools, institutional strength and / or other legal and financial resources. The communities are not able to track the contemporary utilisation of their knowledge without any attribution or reciprocity by the third party who have not even taken their consent. Much of the publications by the academics bring knowledge of individuals or communities into public domain without explaining the implications of the same to the knowledge providers. The generosity of the knowledge providers has become therefore a reason for their continued poverty and deprivation. This is neither fair nor just. It is obviously not sustainable.

The capacity building at community level requires appreciation of two basic conceptual issues (a) the barriers to the entry and exit of the knowledge holders in various markets and non-market exchange platforms, (b) lowering and eventually underwriting as far as possible the ex-ante and ex-post transaction costs of the knowledge holders as well as other stakeholders can add value to the knowledge, generate benefits and share them in an equitable manner.

Part one:
Transaction costs involved in linking innovations, investment and enterprise

The *ex-ante* transaction costs have four components: (i) searching information (ii) finding supplier, (iii) negotiating contract and (iv) drawing up the contract. The ex-post transaction costs include (i) monitoring and compliance, (ii) side payments, i.e., concessions which can make the contract enforeceable through modified inducements/discounts, (iii) resolution of conflicts if any and (iv) redrawing the contract if none of the above help in going ahead with the contract. Majority of the traditional knowledge holders and conservators of genetic resources have to be empowered to do following functions. Against each function, we also

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provide mechanisms through which the needs can be met. It is obvious that to make IP based mechanisms accessible and affordable, lot of non-IP based mechanisms will have to be put in the portfolio of incentives for various actors including the knowledge holders[3].

i. Searching information: How do traditional knowledge holders know as to what applications their knowledge has for which somebody (whom they don't know and who they cannot easily find out) is willing to enter into a contract, generate benefits and share them. The access to multimedia, multi language databases may make it possible for people to learn from each other and also with other stakeholders. The transaction costs of the potential investors, entrepreneurs, and R&D players in seeking knowledge about the local communities with scientific names of the plants is enormously high. In the absence of scientific names (which can only be ascribed after taxonomic authentication), the modern scientific institutions, drug, dye, nutriceutical companies may not be able to make offers of possible cooperation.

   Local communities and individual innovators also need to track the usurpation of their knowledge by unauthorized IP seekers. They will have to have access and the ability to scan the patent applications around the world, interpret and then inform themselves and the patent offices about any suspected violation[4]. Otherwise they will remain dependent on the benevolence of the state or other civil society organization. The bringing of their knowledge into public domain without their authorization by national and international scholars and institutions has been the single most important instrument of exploitation and unfair treatment of their knowledge rights (no research council in developing world or developed countries has yet characterized such a behaviour on the part of the scholars as inadmissible and unethical conduct). In the absence of such a reform as mentioned later in the paper, 'lawful' and 'rightful' disclosure is the only option.

ii. Finding suppliers: Having found the sources of information, one has to find providers of information, services and other support systems. For a local healer or conservator of genetic resources to take a sample of their material to a public or private sector R&D lab to get it analysed for potential negotiations is almost well neigh impossible. It is

[3] The portfolio of incentives may include material and non material incentives and for individuals as well as communities as explained earlier (Gupta, 1995), intellectual property is only one of the matetial –individual kind. Everybody knows particularly in academic profession but that applies to all knowledge production industry, that material incentives only as far as they can. Even corporations realize that today.

[4] USPTO has started recently a discussion forum around the patent applications and under certain condition, any prior art revealed by any one on the web can be taken into account while examining that application. But there is no doubt, it will improve the quality of the applications. This innovation is particularly important for those developing countries which do not have enough examiners like India. But the substantive issue is, how to enable communities and local innovators to read these patents put up for discussion in USA and published in other countries, How much public is public domain after all, and for whom? Will information in English be accessible to the local communities not knowing English language. How should translation wiki, as was suggested by a student in Margaret Chong's class at Seattle Law School, be created for worldwide access to different language communities. May be on students worldwide can translate patents apparently based on traditional knowledge or biodiversity in different languages one page a week and soon, we will have enough resources for tracking the unauthorised IP. There is another way to tackle this problem., I have suggested that every patent applicant should declare that all the knowledge disclosed or used while making claims made in their application have been obtained 'lawfully and rightfully'.

important to create capacity so that they can deal with the knowledge providing, processing and managing institutions at their own terms.

iii. Having found a supplier or potential user of their knowledge, they have to negotiate a contract and use a combination of IP instruments as a basis for negotiation. Having filed patent applications for grassroots innovators, we know how much of empowerment one has to do to be able to provide simple access to existing instruments. The tension between individual and collective knowledge, organizing proper representation and nomination for negotiation and having internal as well as external negotiations are other dimensions that come into play.

iv. Drawing up the contract: To be able to exercise prior informed consent, and then arrive at reasonable terms of agreement which are acceptable within the community and as well as to the negotiating partner involves tremendous complexity, cost and resources. Without meeting these costs and enabling the communities, the contracts may remain asymmetrical and sometimes difficult to enforce.

v. Having entered into a contract, keeping track of the licensing and sub-licensing of technologies by the primary contractor becomes an obligation of the communities. It is possible that the contracting party, in this case, a company or a state agency, may not work the licensed IP from the communities directly. They may sub-license it to a third party who may generate revenues which may or may not be shared. It is important to keep track of such a process. The enforcement of the conditions therefore requires tremendously important skills and capacities have to be built for acquiring and using those skills.

vi. Side payments: It is not always possible for communities to wait for benefits to accrue and share. Upfront benefit sharing may be necessary. Such concessions may have to be negotiated. Some times offering concessions beyond the terms of contract generates confidence. Recently, a firm, Matrix Bioscience, to which SRISTI licensed twelve herbal products developed in its lab gave the name and photographs/sketches of the innovators on the package of these products. This was a side inducement so to say. Likewise, innovators can offer some additional leads if the deal on the earlier one goes well to induce the contracting parties go beyond the terms of the contract.

vii. Conflict management: During the benefit sharing process, conflicts may arise. Such situations require capacity building of the community to settle the disputes in an efficient manner, without damaging their interests and welfare. Hence, the capacity of the community to negotiate, identify the right platforms, engage public interest lawyers and supporters becomes crucial to achieving the ends of justice.

Part two:
Globalization: quest for justice in knowledge economy

James (2007) critiques the debate on globalisation between two extremes: free movement of commodities, regulated movement of people, vs. regulated movement of commodities and free movement of people. He suggests that an ethic of agonism, rights, care and foundations that has to guide the discourse on globalisation. He observes quite poignantly:

> Principles such as the importance of reciprocity in co-operation or an emphasis upon equality are thus treated not as discrete liberal rights but as interwoven into a tapestry of contingent rights founded in relation to deeper "ways of being". Personally agonizing over relativised private fragments of what you, as a single individual, think is right and good (the level of an 'ethics of agonism') even if it is institutionalised in an ethic of rights is not sufficient. Worse than that, in the individualising of questions of what should be done we are all left personally agonising over how much money to give to this or that charity, which party to vote for, and who to leave our wealth to when we die. The agony of deciding 'what feels right today' is hardly a satisfactory way of reimagining the future.

While pleading for a slow cultural revolution, requiring living differently, James acknowledges the limits of concurrent responses through conflict and domination rather than long term engagement and solidarity. Having an 'authentic' life and search for discovering relevance by taking concrete initiatives is suggested by Goldfarb (2006) through Politics of Small Things. Both seem to suggest that problems of globalization are not going to disappear by helplessly watching them. Cummings exhorts the public interest lawyers not to be taken in by simple market based approaches to dispense justice but engage in grassroots activism and networking to complement community based economic development. In other words, author seems to suggest what I will call *moulding the markets* in the way ends of social justice are met.

Bagawati (2004) recalled the 'tyranny of the missing alternative' as the situation where the supporters and opponents of globalisation seem to use a very limited domain of discourse. He feels that many young people oppose globalisation because of inadequate accommodation of social justice. The capitalism is not seen as the system to destroy privileges and open up new economic opportunities for the many. The connection between anti-globalisation, and anti-immigration takes the debate back into commodity vs. people debate.

He misses the debate on flow of knowledge across the world and the asymmetry of rights and opportunities in dealing with the knowledge that common people produce. The debate on subsidiarity (i.e., taking decisions as close to the point of action as possible) is posited between autonomy and centralisation (Young and Tavares, 2004). To what extent should the autonomy be linked to the ability to negotiate local rights in global context has not been pursued within the large corporations or for that matter, nation states or international fora. Almost in every international agreement, it is assumed that sovereign nations have complete and fully authorised right to represent the interests and preferences of individuals in those nations, particularly if they are in minority or social deviants.

The discourse on globalisation provides little scope for international institutions to recognise the rights of deviant thought leaders, specially if they are articulating unpopular notions. The trampling of rights of knowledge producers seldom agitate the human right activists the same way as other violations. Is it because pervasiveness of violation by the activists themselves may weaken their resolve?[5].

[5] Even at the cost of being unpopular and perhaps being misunderstood, I must say that a large number of activists against dominant tendencies of globalization do not try to bring about the same degree of personal transparency and authenticity through accountability to knowledge providers as they wish big institutions to achieve. The people whose causes they espouse, thus remain in the background and also as passive subjects, excluded from a share in their personal wealth and remuneration for their 'activism'. Personal and professional remain apart, just as rights and responsibilities remain distant in market place.

Increasing iniquity at global level among countries and within them has led to challenging the dominant consensus on globalisation (Milanovic, 2003). Whether the growth impulses in emerging economies in the last decade would make a difference to the expected outcomes of globalised economies remains to be seen. There is no doubt that in countries like India and to an extent China, the unprecedented economic growth has not been inclusive enough. Whether the social distress would have been lesser without growth is an argument that is left often unaddressed by the critics as well as the moderates. For supporters of globalisation, there is no argument. The answer is yes.

Rugman (2003) suggests that discourse on globalisation is often ill-informed by the empirical evidence. The result is excessive generalisations. For instance, among the 500 largest companies, 72 per cent of all the sales are reported to be within the home region. The economies are more regional, i.e., American, European Union and Asian are the regional triads. World's largest companies, he demonstrates, are not global but home region based. In fact, the most pervasive multi national companies are not even American but European and Japanese. Implication is that we ought to characterise the problem more sharply, if solutions have to be searched more pragmatically.

Teitel (2005) argues that globalisation has not encouraged universalisation of technological learning across or with the developing world (exceptions apart). He focuses much of his arguments for reform in the area of international finance and trade including labour. But, underplays the flow of knowledge, innovation and learning across the world. The possibility of truly global blending between local knowledge and international capital is not explored to any appreciable extent. Johnson (2002) acknowledges the increased flow of ideas from one part of the world to another and feels that the flow of knowledge has improved life expectancy, reduced child mortality and doubled the grain production. In a very robust defence of global flows of knowledge, primarily from developed to the developing countries, he submits that the flow of ideas has played more important role than just trade and investment. He also ignores the flow of reverse knowledge, i.e., from the south to the north. Or from the aborigines to the immigrant populations.

In a famous book, 'The Indian Givers' by Jack Weatherford (1988), the knowledge flows from indigenous people in US to the immigrant European population are well documented. The knowledge about quinine to control malaria for which Europeans had no protection was one such gift from the indigenous people. Books on history of ideas or innovations would generally not mention this, nor will our children be taught about such gifts from the native people, who are seen as irrelevant to the knowledge economy. The voice of globalisation seems to go silent on such flows of knowledge. Johnson (2002) is correct in expecting many changes taking place in future through flow of information from north to south. But, south will not remain just a sink of ideas, innovations and investments.

Bhagwati (2007) while responding to the critics of globalisation on the issue of no effect, or adverse effect on the unskilled workers, suggests that problem may lie not so much in globalisation as in the inability of such workers to acquire new technical skills (this is surmised from his writing, though he does not say it in so many words) or be insulated from the job displacing effect of the new technology. The challenge could be to identify the

markets for the skills such workers have in abundance. Why certain skills tend to get always devalued and not upgraded (for instance, why herbal healing skills of traditional communities are not upgraded among the healers; though based on their knowledge leads, the large corporations and research bodies would not mind developing modern solutions), is not explained.

Thus, the logic of our view is that we should not treat such people as sink of aid and assistance instead look at them as a source of ideas, innovations and functional and valorisable traditional knowledge. This is what Honey Bee Network has tried to pursue.

Towards self organizing knowledge networks:

Krishnan (2006) focuses primarily on intellectual globalisation though within the context of multi national and global corporations. He defines intellectual globalisation as a 'process of generating and sharing organisational knowledge (whether the development of knowledge concerns blueprints for a new plant, a new patent, or an innovative strategy for outsourcing of some services to provide superior customer service on a worldwide basis) by developing system-wide institutional systems to create and diffuse knowledge from various regional centers of knowledge creation and transformation in different parts of the globe.' However, Rycroft and Cash (2003) demonstrate another facet of similar globalisation achieved through self-organising innovation networks. The cooperative innovation, author suggests may trigger overlapping networks. The self-organisation takes place because of informal relationships and development of mutual trust besides existence of the reciprocity and feeling of community. Here, the focus is not on learning within the large firm through its regional R&D and other individual strategies. Instead, the networks include many organisations as well as informal associations and individuals. The competition is accompanied with cooperation generating distributed competences. Authors observe, "just as the products are becoming increasingly multi technology, technologies are becoming increasingly multi-capability and multi-firm". While there can be weaknesses in the self-organising innovation networks, the strengths seem to be more. The co-existence of globalisation and localisation is found to be mutually reinforcing.

But such a platform does not exist as yet for small or tiny firms, workshops or individual innovators around the world. Their need to design self-organising innovation networks is no less apparent or imminent.

Rycroft (2007) recently revisited the issue and finds a correlation between increasing globalisation and proliferation of self-organising innovation networks. He suggests, 'cooperative innovation creates complex and overlapping relationships that shape global markets, provide intelligence about innovation opportunities around the world and serve as the organisational base for acquiring relevant knowledge and expertise wherever it is located." While spatial expansion is taking place, the temporal contraction in terms of life cycle for developing new products is also taking place. Innovations are speeding up. But at the same time, "triadization" i.e., regional networks, north American, European, Japanese and Asian are also growing. For grassroots innovators, need for similar exchange mechanisms, networking opportunities, learning environments and cooperation does not have to be stressed.

The Johannssen, Olaisen and Olson (2001) fear that with the expansion of information technology applications in managing knowledge at different scales to cope with the global economy, the tacit knowledge may be lost.

The knowledge retained in personal domain but also shared partly in community and public domain (Gupta, 2004) is culturally hinged in the tacit form. Globalisation through online platforms will help in emergence of knowledge networks. Perhaps, local networks of tacit knowledge will help in interpreting the explicit knowledge produced and exchanged through global networks in culturally adapted manner. Innovations will require appreciation for both explicit and tacit knowledge exchanged through different platforms and with different incentives. In the case of grassroots innovators, the dialogue with formal sector scientists leads to codification of their tacit knowledge in new scientific language. However, innovations can emerge both by using codified knowledge as well as by relying on local taxonomies.

Bhargav (2007) suggests in the context of National Knowledge Commission, a significant support for the strategies articulated by the Honey Bee Network and defends the need for recognising knowledge rights of local communities, whose participation in national and global economy should be through their Prior Informed Consent (PIC) with fair share of benefits. Failing, Gregory and Harstone (2007) argue in the same vein that, "the treatment of knowledge claims should be systematic, transparent, and equitable, with emphasis on methods for putting different sources (formal or informal) on equal footing." The facts based in the value-based claims may have equally important contribution to make in the choice of criteria and indicators for sustainable resource management.

Kookman (2005) acknowledges that relevant relationship between a traditional knowledge and invention claim may go unnoticed because of lack of 'see-through descriptions'. The tendency to treat traditional knowledge as public domain takes away from the communities the rights to be compensated. He finds a weak legal basis for biopiracy therefore. While acknowledging the article 7 & 8 of TRIPS which established relationship between IP and non-economic interests, he finds it difficult to enforce. He accepts that patents granted on traditional knowledge are wrong. At the same time, he suggests a difference between 'inspiration' and 'theft'. He feels that patent law could be modified for protecting the interests of TK holders who wish to participate in the global market by following the proprietary road. He does not think that reforms in the patent law would help in solving most of the problems related to the decline in cultural and biological diversity. Given his eclectic approach, he acknowledges the problem but prefers to keep patent laws more or less intact with a minor concession here and there.

The aspiration of local knowledge holders to seek space in global markets is acknowledged but mechanisms for dealing with existing players who do not acknowledge this space are not spelt out adequately.

The need for international legal instrument for protecting the right of indigenous people and their knowledge systems has been repeatedly debated in the Inter Governmental Committee on Intellectual Property and Genetic Resources and Folklore (2007) at WIPO.

Sunder (2006) provides a legal basis for considering the poor people as agents, i.e., the subjects who produce the intellectual property and not just the object i.e., providing raw

materials for others to transform. She notes a worldwide shift in the position of indigenous people and the poor who are not satisfied just with the concept of equitable benefit sharing but want to protect their cultural and scientific innovations. She refers to the draft treaty on access to knowledge, which might be a possible route for temporary distribution of IP protected medicines at cost 'for compassionate use'. It is obvious that the compassion does not necessarily generate respect for something that is due. Perhaps, if she had taken the cases of technologies developed through value addition in the people's knowledge but which became inaccessible to the same people, she would have found that sharing the products of knowledge with the agents of knowledge does not require compassion but actually justice. Elsewhere, Chandar and Sunder (2007) shift their ground considerably. They quote Chon (2007) approvingly to suggest that distributive justice was the central issue in determining the allocation of rights to technical knowledge between users and producers. The problem in a distributed justice framework is the trade off between what Gupta (2008) has called 'fairness' and 'justice'. They argue that harnessing intellectual property rights for meeting the ends of social justice is imperative. They rightly argue that the theory of intellectual property is behind its practice (Chander and Sunder, 2007) because the movements like Honey Bee which try to harness IPRs for empowering the poor people without excluding the other small producers from accessing the local innovations are experimenting with new models.

We need a blend between IPR as an instrument to recognise knowledge rights of the people and Open source movement which democratizes the knowledge, innovations and practices that can help survival of forms and farmers more sustainably. Intra generational fairness is a prerequisite for inter generational justice. At the same time, the ends of justice may be met in many situations without the goal of fairness being met. The public domain can and should be expanded without compromising the rights of knowledge producers to the derivative rights in knowledge applications.

The framework for evaluating knowledge rights of creative people in global economy:

The private, community and public domain knowledge (figure one) imply different boundaries within which the rights of different actors have to be exercised. Once we bring the distinction between awareness of knowledge and ability to practice it generally or with special skills, the problem becomes even more complex. The entitlements of general practitioners and specialists are never considered at par in any system of knowledge. Combine this distinction with varying ability of practicing a branch of knowledge with the specialised skills with new innovations that provide unique advantage for the practice, we now have a layer of new rights triggered by the innovation over an existing knowledge base which in some cases may be shared within a community or a sub group or even an extended family.

I have argued earlier that the differential rights over physical resource governed by different property rights regimes interact with the variable rights in different knowledge domains. I now take the argument to the next stage of assignments or responsibilities and rights in knowledge exchange across the world.

There are four assumptions that one has to make to understand the complexities of knowledge rights in a globalised economy:

a. The future economic growth will rely far more on knowledge exchange than commodities, investment or human capital.

b. The exchange of knowledge produced in formal and informal laboratories of learning cannot be governed by separate legal and moral regimes (as many experts have persistently argued. They would rather wish that patent system be left alone and a new legal regime for traditional knowledge be evolved.

c. If self-organising knowledge and innovation networks help speed up the scope and scale of innovations in high tech sector, a similar opportunity to grassroots innovators and traditional knowledge holders should also work.

d. The reciprocity, trust and collegiality are building blocks of any healthy learning environment. Informed consent is a prerequisite though by itself not sufficient to guarantee respect for knowledge rights. People's knowledge systems are not exception to such an imperative.

The knowledge rights are invariably accompanied by learning and sharing responsibilities. In formal system, publications of research papers or patents help in achieving these goals apart from educational system for building capacity among younger knowledge workers.

In the informal system, the apprenticeship and reputation to serve different classes of clients, often without much expectation or reciprocity help in achieving similar ends. A mechanic may train an apprentice who may set up his own workshop after a while. And this is not looked down upon. The sharing of knowledge even by the contemporary innovators can take place in creative ways. Upplechwar developed a herbal pesticide and wrote the formula on the wall of a school in the village. He also sent a letter addressed to 'an anonymous farmer' in every village of a district disclosing his formula. But he added that if the reader did not want to make the pesticide himself, they could buy from Upplechwar. In some respect, this model had anticipated way back in early 90s what later on became the general purpose license (GPL) in the Linux community. But, what an innovator may do for other fellow farmers, artisans or pastoralists and feel satisfied, he may or may not do for other, larger global commercial corporations.

The asymmetry in historical opportunities before small scale knowledge producers and innovators did not provide enough opportunity to them to develop appropriate strategies for dealing with global corporations or the other actors.

Every grassroots innovator, at least conceptually, recognises that the 'other' need not be a large corporation or an inter – governmental organisation. The others could also include small producers like them or even the labourers who might need the given technologies for improving their livelihood opportunities. The rules of the game have to be so evolved that community does not suffer in preference to individual, entrepreneurship is not scarified while creating common or public goods and global community (of small producers and labourers) is not deprived of the opportunity to benefit from the innovations and knowledge at local level in different parts of the world. That's how the concept of *Technology Commons* evolved (Sinha, 2008). The concept of Technology Commons (TCs) builds upon General Purpose License (GPL) and *creative commons* but is a shade different, emerging out of Ph. D work of my senior colleague, Riya Sinha. Idea is that IPRs should not be used to hinder people to people learning, imitation and improvisation, etc. The core or

anchor technology and all the improvisations could be pooled in a TC and then made available for free use by common self employed people/artisans/small fabricators etc., but should be available only on licensing basis to the corporations/ medium size companies or evens small scale companies for a valid consideration.

Part three:
How do we achieve scale without sacrificing speed, scope, and social justice?

The proposals that I make here are born out of two decades of experimentation by Honey Bee Network (www.sristi.org) . Given our material resource constrained efforts, there are many ideas which have not been experimented upon as much as others.

1. *Tending the garden of knowledge:* The knowledge production and reproduction requires conservation of resources, access to tools and opportunity to experiment. All the three factors have not been augmented in most of the disadvantaged regions. There are no mobile workshops, no decentralised trust funds and hardly any support for taking risks and experimenting new ideas. In spite of these constraints, innovations have emerged and are still emerging. Perhaps, the doggedness of creative individuals and in some cases communities has helped in overcoming various constraints. It is desirable that the documented experiences of persistent experimenters are shared through multimedia and multi language tools to promote lateral learning and rather fast (see www.sristi.org and www.nif.org.in).

2. *Providing collegial environment for co-creation, lateral learning and collaborative deconstruction:* Any conference generally provides opportunities for people (i.e. academic scholars or practitioners) to learn from each other. But, similar opportunities often elude the local communities, creative people, particularly aborigines and other roadside innovators. Why would not resources be available to forge similar opportunities for informal knowledge producers whose taxonomies often are richer and whose ecological footprint is almost always smaller. The online and offline incubation platform being launched for use by different language and cultural communities is one such attempt (see Tianjin Declaration, 2007, globalgian.sristi.org).

3. *Learning and layering of knowledge through bricks, buildings and colonies:* The communities around the world can take concepts or technologies out of the available artefacts and put them to new use. An innovation is thus born. One can use conceptual building blocks viz., bricks and use them for creating buildings across different domains. Or one can apply available devices to new applications or scales by creating local repositories or registers of knowledge akin to the building or one can imitate or innovate eco systems around specific innovations like colonies of buildings. .

4. *Cross regional applications of innovations to overcome local resource and knowledge constraints:* Formal R&D systems seldom address the needs of

disadvantaged sectors, spaces and social segments. The people themselves have to invent or innovate. But many times, the isolation and lack of basic tools and materials has prevented certain kinds of innovations to emerge in a specific context. For instance, a 125 dollar windmill developed by Mehtar Hussain in Assam, northeast India was successfully tried in western India, in an arid saline region for pumping brine water to make salt. A groundnut digger was used for making sea beach cleaner. A variety of paddy developed by a farmer in Maharasthra viz., Shri Khobragade diffused in more than five states and over 0.1 million acres and led to derivative selection of mutants in them and thus development of further varieties by other farmers.

5. *Every time a technology diffuses, a tradition dies*. There is a constant assimilation of exotic knowledge, new materials and ideas in different traditions. The traditional knowledge systems therefore are not static. They provide scope for innovations. The possibility of using these innovations in different regions and for different applications need to expand. After all diffusion of local innovations like exotic innovations replace some practices in vogue already and thus create the learning pressure. Traditional knowledge is dynamic and incorporates new knowledge all the time.

6. *The concept of Prior Informed Consent (PIC), relatively better established in medical practice are yet to take deep roots in social science and other knowledge systems:* The dilemma while seeking consent of people providing knowledge may be of several kinds. For example, interpretation (whether the expectations are being interpreted appropriately), social expectation (will an innovator's partnership with an outside organisation or individual be perceived favourably by the peers or not), lack of peer concern (people may not bother whether the consent has been taken appropriately or not), graduated opportunities (consent given at one stage of awareness may not remain valid with accumulation of more information or opportunities. Should a knowledge provider have the right to revise the terms of consent), embedded responsibilities (should consent to share knowledge also explicate the responsibilities of knowledge provider as well as seeker. For instance, if a herbal drug works well but not too well, will the herbal healer and knowledge provider agree to work together with the outside scientist to improve the drug or it dispensation. Likewise, will the institutional scientists seeking knowledge share the findings of research with the knowledge provider from time to time and in an easily understandable manner. Distributed knowledge with distributed consent or centralised consent (different kinds of knowledge distribution systems may require different mechanisms of seeking consent), etc., may call for different institutional arrangements for fair exchange. A taxonomy of different PIC frameworks needs to be developed so that one can generate pragmatically feasible and ethically justified PIC options. It is not always possible to explain all the implications every time in every case. What are the categories whether exceptions can be made, how much, how often and why.

7. *The legal pluralism and knowledge exchange:* Different countries have different traditions of legal pluralism. Same problem may be tackled through different conventions depending upon specific situations. It is very difficult for local communities to encourage people to people exchange and exclude commercial

players effectively. In fact, no great purpose is served by excluding them. Without adding value how will benefits be generated and distributed. Therefore, opportunities for legally enforceable regime of rights which encourages contractual agreements but provided remedies in case of violation. In digital economy, several such models have emerged.

8. *The incentives for disclosure:* SRISTI had proposed a national and international registry for grassroots innovations traditional knowledge to connect innovation, investment and enterprise way back in 1993. Subsequently, this argument has been made in several papers including WIPO study (2004) that during the entire debate in the last two decades, no additional incentive has been given to people to disclose their knowledge and innovations except through the national register maintained by NIF. Unless such an incentive is institutionalised, not only knowledge will not be disclosed, but lot of it will be lost without being documented.

9. *Reforms in the patent law:* here we have a very large number of proposals. These are discussed in next part.

Part four:
The need for certain specific reforms in the present IP regime

For making the existing IP system more favourable to the preservation and protection of traditional knowledge, and recognition, respect and reward for distinctive TK and grassroots innovations, we need many reforms:

a) Need for better Prior Art Searches
Better prior art searches and essential disclosure by applicants can avoid issuance of trivial or improper patents. The prior art searches must include searching in community and grassroots databases. Recently Honey Bee network has shared its database of published traditional knowledge practices and grass roots innovations with WIPO, in furtherance of this objective. But this still would not address the need for scanning local language databases.

b) Penalties for violations
Severe penalties must be imposed in cases wherein traditional knowledge is used without proper acknowledgment, informed consent and/ or reciprocity to claim intellectual property on the same.

c) Providing incentives for disclosing more prior art.
One of the many incentives we have suggested in many fora for promoting disclosure of more prior art is on the lines of the ongoing discussion in US in linking application cost of patents with number of claims. We have recommend a similar strategy to be included in the present patent system to ensure that applicants have some incentives for disclosing more prior art.[6]

d) The need for finding a low cost IP system
There exists a strong need for a low cost IP system. Even though the poor people in third world may be creative and innovative, they cannot afford a costly IP system. High transaction

[6] Gupta (2007)

costs had posed difficulties even for organizations like SRISTI working on behalf of such knowledge holders. One of the ways the Honey bee network has tried to over come this issue was seeking the help of *pro bono* lawyers in India and abroad for filing patent applications on behalf of several knowledge holders.[7] But we realize that we require a system that can provide this help through public interest institutions or initiatives. **A model based on Australian Innovation Patent System** – which retains the scope for applying for a regular patent may be considered.[8] It may have 10 years protection and may protect around 5-7 claims. Formally an examination will be conducted on every application, but substantive examination will be done only on the request of the applicant or a third party. There should be publication of application within one year of application. The fees for this new system should be negligible. The problem remains as to whether short duration rights for knowledge claims which have evolved over a very long time make sense to the knowledge producers. We have to develop multiple systems of protection for varying kind of knowledge systems. We already have arguments that electronic and software patents might not need longer term protection because of high obsolescence factor.

e) Special Grace period to be given for filing an application.

We strongly believe that the traditional knowledge holders should not be punished for their innocence in sharing their knowledge with other people without knowing the implications of such disclosure.[9] If the modern patent system can give grace period of one year in most jurisdictions, there is no reason why the same should not be given to the economically poor, knowledge rich people. A special grace period should be provided with respect to the cases of anticipation by way of publication of traditional knowledge. European Union has been discussing the issue of one year grace period given to inventions published in the preceding year and US already has such a grace period. What is being proposed here is that traditional knowledge published, say in last five years may be allowed to be protected so that the local communities do not feel betrayed by the researchers who documented their knowledge and denied their rights through publication without their informed consent.

f) Traditional Knowledge as Prior Art

Unless the community or individual knowledge is reasonably accessible, i.e., it has been coded and/or catalogued in publicly accessible databases, it should not be considered as constituting prior art for the purpose of determining the patentability.[10] If traditional knowledge is considered as constituting part of prior art, then it may pre-empt all the arguments for benefit sharing. The present Indian Patents Act is a real disappointment in this regard.[11] The consistent stand that has been taken by the Honey Bee network is that to prevent others from exploiting India's traditional knowledge, we cannot take away the rights of local communities and traditional knowledge holders from protecting their own knowledge and benefiting from the possible commercialization of such knowledge.[12]

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[7] Gupta (2007)
[8] Gupta (2007)
[9] Gupta (2002)
[10] Gupta (2007, 2002, 2001, 2000, 1996)
[11] See Sec. 3 (p) of the Indian Patents Act. Sec 3 talks about "what are not inventions" and section 3 (p) excludes from the ambit of "invention", anything which in effect, is traditional knowledge or which is an aggregation or duplication of known properties of traditionally known component or components.
[12] Gupta, (2007)

g) The need for finding a balance between the long term needs for the community to have interest in conserving the knowledge systems and the incentives for those who add value to share the benefits for a limited period of time

The new systems of protection must be able to achieve a balance between the long term needs for the community to have interest in conserving the knowledge systems and the incentives to those who add value to share the benefits for a limited period of time.[13] The new system must discriminate between the rights of communities in the knowledge system and the rights in the system must be perpetual. For example, obtaining patents based on classical health systems like Ayurveda, Unani and Siddha must be prevented at all costs. But at the same time, the system should allow intellectual property protection over modifications in such codified systems on the condition that a share of the benefit shall go to a global/ national pool of funds meant for augmenting indigenous systems of medicines all over the world. Evolution of such a fund is not impossible, as is found from the provision for gene fund under the Protection of Plant Varieties and Farmers Rights Act in India.[14]

h) Need for collective management systems

Just as collective management systems exist for protecting copyright in music, songs, performances, etc., there must be institutional mechanisms 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.[15]

Part five:
Some specific recommendations with respect to Plant Varieties Protection.[16]

i. **The definition of a variety should include discovered wild or other plants having distinctive and stable properties.** Some of the countries are already giving protection to discovered plants having DUS property. However one of the problems identified with the uniformity requirement is that heterogeneous or buffering populations with high fluctuations may not get protection under DUS provisions. Moreover, genetic uniformity has the possibility of becoming a major threat to food security. Therefore provisions for buffering population which are distinct and stable over a long period of

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[13] Gupta, (2007)

[14] See Sec. 45 of the Protection of Plant Varieties and Farmers Rights Act 2001 of India.
Sec. 45. (1) - *The Central Government shall constitute a Fund to be called the National Gene Fund and there shall be credited thereto –*
(a) the benefit sharing received in the prescribed manner from the breeder of a variety or an essentially derived variety registered under this Act, or propagating material of such variety or essentially derived variety, as the case may be;
(b) the annual fee payable to the Authority by way of royalty under sub-section (1) of section 35;
(c) the compensation deposited in the Gene Fund under sub-section (4) of section 41;
(d) the contribution from any national and international organization and other sources.
(2) The Gene Fund shall, in the prescribed manner, be applied for meeting -
(a) any amount to be paid by way of benefit sharing under sub-section (5) of section 26;
(b) the compensation payable under sub-section (3) of section 41;
(c) the expenditure for supporting the conservation and sustainable use of genetic resources including in-situ and ex-situ collections and for strengthening the capability
of the Panchayat in carrying out such conservation and sustainable use;
(d) the expenditure of the scheme relating to benefit sharing framed under section 46.

[15] Gupta (2002)

[16] Most of these recommendations have been put forwarded in Gupta (2007, 2000, 1999)

time (5 – 10 years) may be created as the present system is designed primarily for commercial crops in irrigated regions.

ii. A **national and international register of land races, acknowledging community rights,** should be established. Recognition of the community rights in the extant varieties mentioned in the Indian PPVFR Act should also be elaborated. The cost of collecting passport information for the varieties has to be borne by the PPVFRA so that farmer breeders do not suffer on account of their inability to provide such data.

iii. T**he passport information sheet of the Gene bank should include the knowledge of community with particular focus on women knowledge**. In the present context, only a very small proportion of the passport sheets identify the community, region or specific farmer from whom the material has been collected. Updating of passport sheet will be very necessary for operationalizing a benefit sharing system and therefore global efforts to create a fund for the purpose are urgently called for.

iv. The concept of **lawful and rightful acquisition** is equally applicable here also. Every applicant seeking plant variety protection must disclose that the germplasm, parent lines or other material used for developing new variety, were collected through prior informed consent and only after signing a material transfer agreement (MTA) with the local communities/farmer breeders.

v. The **duration of protection for land races**, so far as the right to share benefits from commercial use is concerned, **should be more than twenty years;**

vi. **The farmer breeders may not be able to provide data required by the Plant Variety Authority.** It should be necessary for the authority to fund generation of this data whether in farmers' fields or on research stations. **Pending that stage, the claims of the farmer breeders may be accepted provisionally.** One of the cases which may highlight the seriousness of this issue is the HMT Paddy Variety developed by Mr. Dadaji Ramaji Khobragade from Maharashtra in India.[17] This farmer selected and bred this variety from a conventional variety named 'Patel 3', a popular variety of that time developed by Dr. J. P. Patel, JNKV Agriculture University, Jabalpur. Through continuous study and research for about five years in a small farm owned by him he succeded in this developing this variety, without any support from the scientific community. This HMT variety has an average yield of 40 – 45 quintals per hectare with short grains, high rice recovery (80 %), better smell and better cooking quality in comparison with the parent ones. This variety has diffused over a million hectares in several southern, central and western Indian states and in many districts of central India, it has become the first choice of the farmers. A recent doctoral research study has even shown that for a character like thinness of grain, Protection of Plant Varieties and Farmers Rights Authority (PPVFRA) uses this farmer bred variety as a reference.[18] Several seed companies have earned millions of dollars by selling the seed of his variety. But even today the farmer continues to be economically poor, though his variety has brought prosperity to thousands of farmers and dozens of seed companies. To save this farmer from this exploitative and unfair situation, National Innovation

[17] Dadaji Ramaji Khobragade has been granted a National Award by National Innovation Foundation (nifindia.org).

[18] Personal communication, R Sinha, (2007)

Foundation attempted to submit this variety for protection under the present PPVFR Act of India, in his name. But they rejected and returned the application by citing that it doesn't have the required data. We have not been able so far to submit data to their satisfaction and we realized from this case whom this legislation presently favours. Only big seed companies who can generate data easily can make use of the existing system.

vii. **The requirement of uniformity and stability may not be necessary for composite varieties designed to deal with fluctuating environments.** This requirement may need modification in specific cases.

viii. Any applicant seeking plant variety protection must **declare that s/he has not used any variety developed by a farmer / community without their authorization.** This argument assumes real importance in the light of the example of HMT Paddy variety which we mentioned earlier. This variety was earlier taken up by one of the state funded agricultural universities scientists for purifying and later they released it as another variety under the name PKV HMT. But the DNA finger printing studies at Centre for Cellular and Molecular Biology (CCMB) under the guidance of Dr. Ramesh Agarwal has now revealed that PKV HMT is essentially the same variety as HMT.[19]

ix. **ix.** Applicants seeking protection for varieties that have incorporated characteristics from public domain agro biodiversity must be willing to contribute a specific part of the sales or licensing fees towards national gene fund and in case of international companies, International Gene Fund proposed under FAO.

x. The **farmers' right to exchange, store, sell or distribute protected seed** material without brand name should be allowed, as more than sixty to seventy per cent of seed materials is obtained through such exchanges or storage.

xi. The **administrative procedures for the plant varieties protection must be simple** so that farmers can benefit from such a protection mechanism. For example, when we tried to submit the application for protection of HMT Variety through post, the PPVFRA authority returned it by saying that they cannot accept it by post and we have to submit in person.[20] It must be noted that the PPVFRA is situated at Delhi and just think about the difficulties faced by farmers at other parts of the country.

xii. Unlike International Union for Plant Variety Protection, there is no international agreement for protection of traditional animal breeds and associated knowledge system. There exists a need for a similar arrangement within the country and also at the international level.

The need for trying diverse existing IPR systems

Experiment different kinds of existing IP systems to find out the best suitable one for each situation. For example existing systems like trade marks (including Certification marks and

[19] Personal communication, R Sinha , (2007)

[20] See, Letter No. PPV&FRA/Registrar/15-1/2007/122 dated June 21, 2007 from Mr. S. P. Yadav, Plant Variety Examiner included in Annexure 3.

Collective Marks) and geographical indications may also be attempted for securing proper and longer protection.[21]

The relevance of maintaining an Open source Approach

Even though Honey Bee Network advocates strongly for the protection of traditional knowledge through intellectual property regimes, the same doesn't mean we are undermining the need for open source technologies. In this light, it needs to be specifically pointed out that more than 99 per cent of knowledge shared by Honey bee Network is in public domain and only a very small number is protected by patents.[22] Even though the Honey bee Network has documented more than 75000 innovations, the total number of patent applications filed is only around 150. This makes our stand clear. We are of the view that people must use and share knowledge as widely as they can.[23] Even with respect to patented technologies, we permit all reasonable exceptions including personal use. But if one is to use the technology for commercial purposes, s/he needs to take a license so that benefit sharing can be assured.[24] One of the well known open source technologies in Honey Bee Network's portfolio which has benefited the society, especially the women in rural areas, through wider dissemination, is a pulley with stopper, invented by Sri Amrutbhai Agarwat, which could easily prevent the falling of bucket to the well while drawing water from it. The need for wider dissemination makes us strongly promote the open source approach on the lines of GPL of GNU.[25]

Conflict management over IP issues

Disputes regarding the inventorship are bound to happen during many traditional knowledge protection measures. One of the consistent approaches we have taken in this regard is to try to settle the disputes by making the subsequent *legitimate* claimants, Co-inventors.

Need for overcoming informational asymmetries

There exists a strong need for Patent databases in local languages. It can really help as a tool for empowerment of Traditional Knowledge holders. Moreover, IT applications must be used to the fullest possible extent for overcoming the informational asymmetries in the formal and informal knowledge. IT infrastructure can reduce the transaction costs. But appropriate institutional interventions need to be made to ensure that the same technology does not pave way for faster erosion of local knowledge and wisdom.[26] This can be assured with a global registration system mentioned earlier. This also proves the need for legal status to the National Register on Grassroots Innovations and Traditional Knowledge. It can prevent biopiracy and at the same time it can work as a platform for enabling value addition by private sector who may be willing to share benefits.

The need for monetary as well as non-monetary benefits, apart from IP based incentives

We need to explore a framework where monetary and non-monetary incentives are combined in the optimal level and appropriate institutional arrangements are formed for the same, so

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[21] Gupta (2002)
[22] Gupta (2007)
[23] Gupta (2007)
[24] Gupta (2001)
[25] Many people still have a misconception that free software under the GNU-GPL cannot be sold for a price. But this is not true. It permits sale of the software, at the same time ensuring much freedom. It is actually giving the users the freedom to run, copy, distribute, study, change and improve the software. See http://www.gnu.org/licenses/gpl-faq.html#DoesTheGPLAllowMoney (visited December 3, 2007). Also see the preamble of the GNU-GPL version 3 license. See http://www.gnu.org/licenses/gpl.html (visited December 3, 2007)
[26] Gupta (2007)

that users of the biodiversity will be able to initiate benefit sharing experiments.[27] SRISTI has set up an internal fund to honour ten to fifteen innovators every year from its own resources earned through the licensing of three herbal veterinary drugs. In a similar way, SRISTI has been organizing a traditional food festival under the name 'Satvik' every year and during this festival the best traditional recipes are given awards. In the past seven years, NIF has also conducted four national award functions to honour knowledge holders.

Need for financial support

The Honey bee network attempts to link the golden triangle of innovation, investment and enterprise.[28] To achieve this goal, financial support to knowledge holders for further value addition and commercialization is a must. SRISTI pursued this linkage through venture promotion funds. Later GIAN and NIF were able to provide such funding through mechanisms like Micro Venture Innovation Fund (MVIF). Similar, and may be even better mechanisms needs to be evolved across the world. Every national government must also think about setting up a Technology Acquisition Fund, wherein the governments can pay a certain sum of money to acquire good technologies from the knowledge holders for disseminating it as open source technology.

The capacity building would require recognition that in knowledge based economy, it is certainly possible to harness economic benefits from the application of traditional knowledge. It can be done in several ways. We can use outstanding traditional knowledge and find a contemporary application (a modern variety or a drug). We can also pool or mix or blend several traditional knowledge practices to generate new products and seek market opportunities for the same. In addition, one can also fuse or blend individual or pooled traditional knowledge based product with the modern scientific methods/materials and develop value added products. The more we move traditional knowledge towards contemporary application, closer we get to the modern IP system. However, some would argue that objections against contemporary IP system may stem not from contemporary relevance of the traditional knowledge but from the historical origin and evolution of the same. In either case, the investment from the formal private sector may follow only if the investors can recover their investment in a reasonable period of time. The benefit sharing systems are important not only at international level but also at the national level. Honey Bee Network's experience demonstrates considerable potential for benefit sharing within the country. It is here that the national IP system has to be reformed to provide a special window and the fast track system for protecting the rights of TK holders. Such windows do not exist in India or most developing countries. The conceptual problem of treating TK as prior art also needs to be resolved. If all the TK is indeed prior art, then why should anybody feel obliged to share benefits from the obligation of TK. It is only when we recognize the rights of the people that the obligation for sharing benefits.

We have argued in this paper that a combination of various IPs and IP management systems (such as collecting societies) can trigger reforms in IP system.

Unless incentives are generated (both monetary and non-monetary) for individuals and/or communities, there is very little chance of young people getting interested in learning traditional knowledge and augmenting it for the future generation. It is here that the greatest challenge has to be faced.

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[27] Gupta (2001)
[28] Gupta (2007)

Summing up:

The knowledge rights of creative communities require to be respected, recognised and rewarded globally. Today, there is hardly any mechanism for these rights to be respected globally. It is true that much of the traditional knowledge has evolved over long period of time. Therefore, to use conventional patent system with limited duration may be counter productive. At the same time, in the absence of any protection, incentives for young people to learn may be lost. One strategy may be to create space for young people to learn and then expect that they will continue to produce patentable knowledge and innovations recurrently. Thus, more than the stock of traditional knowledge, the flow of traditional ways of knowing may become important. The innovations can diffuse through open source framework. Lot of innovations must remain open source to expand the public domain, reduce the transaction costs and encourage growth of knowledge. One has to find ways of blending open source movement with variation in IP system.

What is most crucial is to have an international fund as well as the regime to acquire potentially viable innovations and traditional knowledge practices from the knowledge producers after compensating them by a particular multiplier of their income. This stock of knowledge can then be licensed at low terms to small-scale producers and entrepreneurs or be made open source. The argument here is that those who produce knowledge or innovations need not subsidize the cost of learning of the rest of the society.

The Grassroots to Global (G^2G) need not remain a rhetorical claim. By now, we should have perfected the mechanisms for creating inverted supply chains, from people as producers to consumers around the world as well as in their neighbourhood. Both horizontal and vertical markets ought to emerge to encourage exchange of knowledge, innovations and practices among creative communities around the world. The challenge is not to contain the ambition of people at the grassroots to learn from other creative people around the world. The globalisation has to find grassroots idiom for its expression.

Contested Domains of Local Knowledge

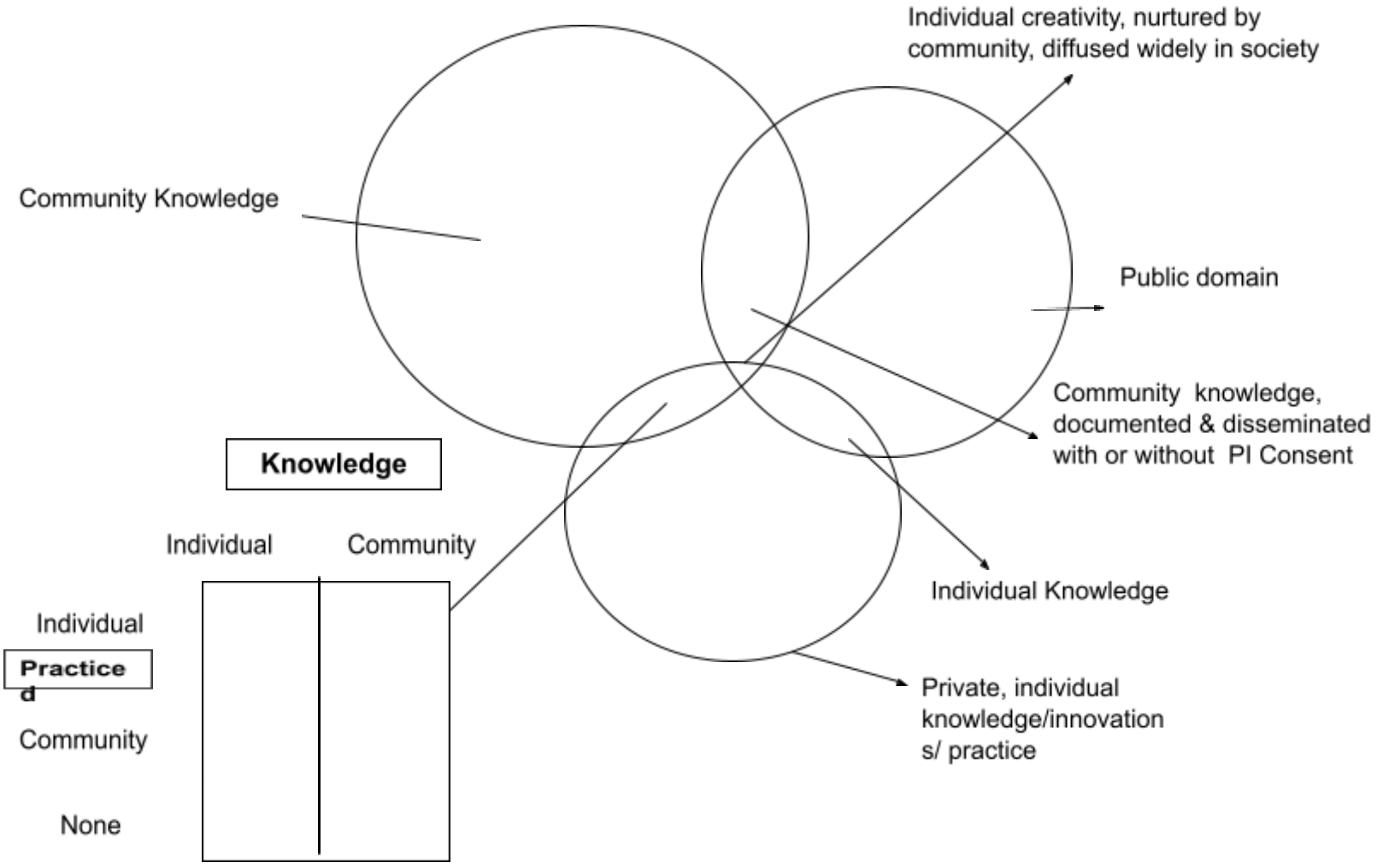

Figure 1. Source: Gupta 2001

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