

Can protection of intellectual property rights be of any consequence to the poor people?¹

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How could poor people ever benefit if a country protected the intellectual property rights strongly? Wouldn't such a protection mainly help the large multi national corporations, which are known to produce intellectual properties more often? The implication here is that economically poor people are only consumer of products and services, which may be protected by IPR laws. These products and services may become costlier as a consequence of protection.

In this paper, I take a diametrically opposite view. My submission is that economically poor people can in many cases be rich in knowledge. As a result, they may produce innovations, which may deserve respect, recognition and reward in the market place. Protection of IP and applications of ICT can provide incentives for disclosure and dissemination at the same time. We have to reduce transaction costs for common people to learn from each other as has been attempted by Honey Bee Network. At the same time knowledge providers must not be anonymous and also should not shortchanged in the market place. The creativity at grassroots must get its due. More than 99.9 per cent of the knowledge shared by Honey Bee Network so far is in public domain. A very small part therefore is protected by patents. We have not even insisted on copyright protection. Idea is that people must use and share the knowledge as widely as they can. Having said that, do we have a right to do so without prior informed consent of the knowledge provider. Can we publish their knowledge in Honey Bee newsletter or its local language variations in Tamil, Kannada, Malayalam, Oriya, Telugu, Gujarati, Hindi, etc., without ensuring that we don't bring unique knowledge of people in public domain. It is a paradox of enriching public domain without depriving knowledge providers of their rights that we have tried to pursue in obviously an imperfect manner in the network. It is this story that we share in this paper.

In part of this paper, I deal with the issues related to Conserving biodiversity and associated knowledge systems. In part two, the context of protecting IPRs of the knowledge rich economically poor people is described. I mention briefly the alternatives to development: from grassroots to global in part three. ICT applications to empower economically poor and knowledge rich communities and individuals are discussed in part four since these have an important bearing on reducing transaction costs for learning across long distances, language cultures etc. Finally in Part five, I deal with the Reforms

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of IPR systems: Making IP protection accessible to small innovators and local communities.

Part One:

Conserving biodiversity and associated knowledge systems

Economic development in different regions has often been accompanied by a decline in biodiversity. Biotechnology and other value adding technologies offer a possibility of valorising biodiversity. But the distribution of the gains among different stakeholders generated through added value obviously is the function of institutional arrangements. The kind of ethical practices followed by bioprospectors may determine whether or not the benefits of biotechnological or Pharma or agri-business products are shared fairly among different stakeholders.

Most drug companies often are very successful in calculating the price of their contribution towards research and development (R&D) and consequently in generation and commercialisation of the intellectual property in the form of value added products. But they generally fail to price equally meticulously the contributions made by local communities and individuals towards conservation, characterisation and sustainable utilisation of biodiversity and associated knowledge system.

The high transaction cost not only in making prior art search but also in filing patents on behalf of small communities and individual innovators make the goal of filing patents on behalf of grassroots innovators very difficult (though National Innovation Foundation, SRISTI and Honey Bee network have filed national patents on behalf of several grassroots innovators through the help of *pro bono* attorneys in India and abroad). The need for low transaction cost system is obvious and yet most global dialogues on intellectual property rights have not yet included the need for developing such a system.

The fact that most jobs are generated by small enterprises which cannot license the international patents filed at great cost led to the emergence of a proposal for Australian Innovation Patent System with a maximum of five claims, ten years duration and product patent grant at almost negligible fees. This is beyond the utility model, which does not confer the product patent facility and is generally suitable for industrial designs or other such innovations and has almost same inventive threshold as standard patent (and thus did not deliver results).

In the review of the Trade-Related Aspects of Intellectual Property Rights (TRIPS) of the World Trade Organization (WTO), a discussion on Article 23 providing for negotiations on the establishment of multi lateral system of notification and registration of geographical indications in the context of wines is proposed. There is no reason why such a discussion should be restricted only to the wines and not include traditional knowledge as well as contemporary innovations of local communities and individuals. Hence, our proposal for an international registry of innovations made way back in 1990.

There are many other policy and institutional modifications that are called for in the IPR laws. For instance, why shouldn't every patent applicant be obliged to disclose whether he or she had obtained the materials or knowledge used making claims, lawfully and rightfully through prior informed consent? Similarly, in the case of varieties or animal breeds, acknowledgement of debt due to local communities be made obligatory.

It is not my argument that removing the imperfections in IPR regime will by itself generate economic rewards and social esteem for local knowledge rich economically poor people. I realise that the role of non-monetary incentives may be sometime more important. However, the biotechnology, drug, and other value adding industries have yet not shown any explicit interest as a stakeholder in generating models of voluntary benefit-sharing. Does it imply that they believe that future gains in biotechnological products may be made only on the basis of public domain biodiversity.

The terms of discourse on the subject have not included intra national benefit sharing responsibilities of say the farmers in green revolution regions towards the farmers and pastoralists in biodiverse, rainfed and marginal environments. It is easy to find all faults with an external enemy and in the process deny or delay the need for initiatives and reforms internally.

Finally, I would argue that the reform of TRIPS including sue generis system and UPOV should be accompanied by domestic policy reforms in developing as well as developed countries. Failure to achieve significant results in the former case should not prevent experimentation of new models in the latter case. There are various approaches that have been evolved by the Honey Bee Network to scout, spawn, sustain and spread grassroots innovations leading to among other things, conservation of biodiversity.

My submission is that we need to stem the erosion of knowledge which sometimes is a greater threat than the erosion of resource itself, develop contingent mechanisms among children and young people to keep the knowledge stream flowing, persuade biotechnology and other companies and institutions to develop greater reciprocity towards conservator of biodiversity and strengthen reciprocity amongst the beneficiaries of, and contributors towards green (crop), white (milk) and blue (fish) revolution. The empowerment of local knowledge experts will require building bridges between the excellence in formal and informal science.

Reform of TRIPS thus is a process involving reform of knowledge producing and networking institutions in any society. The values underlying knowledge protection cannot be rewarded only through monetary instruments. If technology is like words, the institutions are like grammar. We need to generate a dialogue between technology designers and institution builders.

Part Two:

Protecting IPRs of the knowledge rich economically poor people

The asymmetry in rights and responsibilities of those who produce knowledge particularly in informal sector and those who valorize it (in formal sector) has become one of the most serious contentious issues. I will begin with four case lets to illustrate the interface between the traditional and contemporary knowledge and global trade. I will then demonstrate that there are possibilities of securing the interests of grassroots innovators and traditional communities within the global trade regime provided the ethics of extraction can be factored in the calculation of respective incentives or disincentives for cooperation among different stakeholders. To do so, some of the fast emerging and expanding technologies like Information Communication Technologies (ICTs) will have to be adapted to the needs of local communities and individual grassroots innovators. Lastly, I will summarise the policy changes that need to be negotiated in the next round of review of TRIPS and some other trade agreements having bearing on incentives for local innovations and growth of traditional knowledge and institutions.

Case I : The intellectual property in herbal products: Why has the center of the world moved eastward?

The importance of the fact that almost forty five per cent of the herbal patents in USPTO till 1998 were owned by Chinese, another twenty per cent by Japanese and about sixteen per cent by Russians has not been properly appreciated³. Chinese leadership in herbal products proves that with the right kind of incentives, even a developing country can achieve global pre eminence. Not only that, the first hundred assignees were individuals and not corporations. The notion that R&D by small-scale firms or individual scientists cannot generate globally valuable intellectual property is not true. It is said that one in every five north Americans has used Chinese medicine. The traditional Chinese medicine has succeeded in capturing global markets through available trade routes. How has it happened? Whether this is a replicable model? To what extent has this trade helped the local communities and individual herbalists in China? Is there a reason to hope that the erosion of traditional knowledge will be stemmed because of the emergence of market and valorization of the knowledge? May be answers to many of these questions may not be positive. And yet, simply because not all problems have been solved, the example should not deter us from solving at least some problems to begin with. Caution has to be exercised that if those stakeholders whose problems get solved first (for instance, traders or petty manufacturers), they should not become complacent towards solving the problem of other stake holders such as herbalists, local communities, conservators of biodiversity in wild as well as domesticated domains.

³ I am grateful to Keith Richardson of Derwent Pharmaceutical database for sharing this data with me.

Case II: Genetic Resources Recognition Fund at UC, Davis: Viability of voluntary sharing of benefits⁴

When Pamela Ronald, a pathologist at UC, Davis cloned a gene which conferred resistance to a major disease of rice i.e blast and licensed it to two companies, she was not willing to bear the label of a biopirate. She realized that the wild rice (*O. longistaminata*) from which the gene was isolated and cloned originated from Mali, from where it had gone to Central Rice Research Institute, India, and in turn to International Rice Research Institute. The characterization and identification of the gene in question (XA 21) took place at IRRI. She met with Prof. Barton and conceptualized the Genetic Resource Recognition Fund (GRRF) in which part of the one time royalty from the companies would be credited apart from contribution from UC, Davis so as to provide fellowships to the students from Mali and other developing countries. It is true that no money has yet been put in this fund because the companies concerned have not as yet decided to commercialise the gene through its insertion in various rice varieties. Hence, no fellowship has yet been given. The top management of UC, Davis campus is conscious of the fact that this idea has not been mainstreamed, and thus has not been institutionalized for similar other transactions taking place at this campus or at other campuses of University of California. They are planning to initiate discussions on this subject. Assuming that not many scientists agree to put a part of their income coupled with the share of the university in this fund, the idea will remain an isolated but outstanding example of individual good conscience. Can such voluntary examples show the way for future? Can these models be replicated through reforms at higher level, i.e., in the inter governmental negotiations on TRIPS and trade? Whether the postgraduate fellowships to the students from the gene donor country will be a good means of sharing benefits and providing incentives for in situ conservation? To what extent the amount proposed in this fund is optimal?

There can be many more questions. And yet, the issue remains that the individuals can make a difference, change the perspective and generate hope. To what extent can such models provide a basis for influencing the trade negotiations in genes? Is it possible that while generating global solutions we do not constrict the space for creative solutions, no matter how isolated and non-replicated these are?

Case III: Commercialising traditional knowledge of Kani tribe

Tropical Botanical Garden Research Institute (TBGRI) has been doing research on herbal drugs for a long time like many other botanical institutions. Dr. Pushpangandan being the coordinator of national project on ethno botony and Director of this Institute was well aware of the potential of indigenous knowledge of herbal drugs. He and his colleagues

⁴ Anil K Gupta, Rewarding Conservation of Biological and Genetic Resources and Associated Traditional Knowledge and Contemporary Grassroots Creativity, IIMA W.P.No.2003-01-06, January 2003 – This is a study on the role of intellectual property rights in the sharing of benefits arising from the use of biological resources and associated traditional knowledge, based on the data collected from Mali, Nigeria and India,” brought out in CD format by WIPO-UNEP, 2002. (Ref: Document/UNEP/CBD/COP/5/INF/26 dated 10 May, 2000) and later published by WIPO.

identified a drug from the traditional knowledge collected as a part of their study and filed a patent on the same. An Ayurvedic drug company got interested in the commercialization of this drug and accordingly licensed the right to manufacture and market. Dr. Pushpangandan discussed various ways of sharing the benefits with me and accordingly decided to set up a trust fund of the tribe. He chose this route in preference to the transferring of the benefits to a public sector tribal development corporation. There was criticism of his attempt to share benefits suggesting either inadequacy, lack of widespread involvement of Kani or that TBGRI did not hire enough Kani people or even paid them well. There was no criticism of thousands of researchers in public and private sectors who have been using traditional knowledge without any reciprocity whatsoever. The consciousness of Kani tribe about their own knowledge and need for its conservation and application has increased manifold. Dr. Pushpangandan had been working on many plants and realized the need for sharing benefits only because of the current global and national concern.

Whether the amount of benefit was adequate or not is an important issue but not the most important one. To what extent Kanis will become conscious of their rights and responsibilities is a more important question. Whether a voluntary decision of this kind will bring about change in the behaviour of other public and private sector users of traditional knowledge within India is again an open question. It is interesting that lot of NGOs and others who see MNCs as the biggest enemy of the nation don't realize that for poor tribal, it is no solace whether they are exploited by a domestic company or international company. Globalisation of ethical responsibility is an imperative.

Case IV: Honey Bee Network transforms paradigm of benefit sharing: The case of monetary and non-monetary incentives for communities and innovators⁵

Honey Bee Network evolved ten years ago in response to an extraordinary discomfort with my own conduct and professional accountability towards those whose knowledge I had written about and benefited from. I realized that my conduct was no different from other exploiters of rural disadvantaged people such as moneylenders, landlords, traders, etc. They exploited the poor in the respective resource markets and I exploited the people in idea market. Most of my work had remained in English and thus was accessible to only those who knew this language. While I did share findings of my research always with the providers of knowledge through informal meetings and workshops, the fact remained that I sought legitimacy for my work primarily through publications and that too in English and in international journals or books. The income which had accrued to me had not been shared explicitly with the providers of the knowledge. I had argued with myself that I have spent so much time and energy in policy advocacy on behalf of the knowledge-rich, economically poor people. But all this was of no avail when it came to being at peace with oneself. That is when the idea of Honey Bee came to mind.

Honey Bee is a metaphor indicating ethical as well as professional values which most of us seldom profess or practice. A honey bee does two things which we, intellectuals often

⁵ Gupta, Anil K, From Sink to Source: The Honey Bee Network documents indigenous knowledge and innovations in India, *Innovations*, MIT press, Summer, 2006: 49-66

don't do, (i) it collects pollen from the flowers and flowers don't complain, and (ii) it connects flower to flower through pollination. Apart from making honey of course. When we collect knowledge of farmers or indigenous people, I am not sure whether they don't complain. Similarly, by communicating only in English or French, or a similar global language, there is no way we can enable people to people communication. In the Honey Bee network, we have decided to correct both the biases. We always acknowledge their innovations by their name and address and ensure a fair and reasonable share of benefits arising out of the knowledge or value addition in the same. Similarly, we also have insisted that this knowledge be shared in local languages so that people to people communication and learning can take place. Global trade so far has not created enough space for such knowledge to be exchanged among people in different continents, which reduces their transaction costs of learning from each other around particularly non monetary green technological innovations.

Honey Bee, in that sense, is like a Knowledge Centre/Network, which pools the solutions developed by people across the world in different sectors and links, not just the people, but also the formal and informal science. It is obvious that people cannot find solutions for all problems. At the same time, the solutions they find need not always be optimal. *There remains a scope for value addition and improvement in efficiency and effectiveness. But it is definite that a strategy of development, which does not build upon on what people know, and excel in, cannot be ethically very sound and professionally very accountable or efficient.*

Society for Research and Initiatives for Sustainable Technologies and Institutions (SRISTI) has set up an internal fund to honour ten to fifteen innovators every year from its own resources supplemented by the license fee received from a company to whom three herbal veterinary drugs were transferred based on public domain traditional knowledge. Similarly patents have been filed or are being filed on behalf of several innovators. In the case of Tilting bullock cart developed by Amrut Bhai of Pikhore village, while the patent is pending, the technology has been licensed to private entrepreneurs for three districts of Gujarat for an attractive financial consideration. This amount has been given to the Amrut Bhai through Gujarat Grassroots Innovation Augmentation Network (GIAN). GIAN it self was set up in 1997 as a follow up of International Conference on Creativity and Innovation at Grassroots held at IIMA in collaboration with Gujarat Government to scale up and commercialize grassroots innovations. The golden triangle linking innovation, investment and enterprise, which I first talked about at AIPPI forum, organized three years ago has now been operationalised. SRISTI had pursued this linkage through its venture promotion fund before GIAN came into being. Even after that, it continues to provide financial support for action research to small innovators. Whether global linkages among innovators in one country with investment and enterprise in second and third country take place, is only a matter of time.

Four case studies bring out various issues:

- A) To what extent has been the generation of awareness about rights of traditional communities and grassroots innovators among various stakeholders? It seems that professionals like scientists and academics seems to have been far more proactive than the corporations (Shaman pharmaceutical, Arya Vaidya Shala, and Dr Nair's Technology Foundation are two of the few exceptional companies, most mainstream companies have so far shied away from making any bold attempt to tilt the scales in favour of local communities)
- B) Whether the norms of benefit sharing have acquired the status of a professional value. For instance before accepting a Ph.D thesis, a certificate is generally taken from the student that he/she has acknowledged all the contributions in the research work. However, a similar declaration is not insisted upon from the researchers and commercial users of indigenous knowledge that they have made due acknowledgement and reciprocal arrangement with the innovators. The norm of acknowledgement of local knowledge has not become professional value among germplasm collectors as well as ethnobiologists
- C) What combination of monetary and non-monetary incentives would be optimal for which kind of knowledge system and innovations and under what institutional arrangement? Unless such contingent framework developed, it is unlikely that most users of biodiversity will be able to initiate benefit-sharing experiments.
- D) We do not know as to what level of intellectual property protection will make the local knowledge system vibrant and buoyant. Is it possible that fears about the erosion of local knowledge increasing due to its valorization are unfounded?
- E) What are the reasons, which explains such a lack of information on experiments around benefit sharing? Why are so few people trying to pursue these experiments? Why aren't consumers of value added product in Europe and other western countries as conscious of the rights of local communities and grassroots innovators as they are about the rights of the animals?
- F) What is preventing the NGOs and Government in third world countries from initiating benefit-sharing measures on their own among the various institutions within the country? Why should intra country arrangements of benefit sharing as attempted by TBGRI and Honey Bee Network not take place in many countries and await the resolution of North- South conflicts?
- G) Not in one case, the consumers of herbal and other products have demanded fairer contracts with the local community in contrasts to the boycott of beef

burgers in US some time ago to discourage environment unfriendly rearing of beef in Latin America.

- H) What is the perception of local communities and innovators themselves on the issues of benefit sharing?

The context in which local knowledge evolves and gets modified or transformed overtime is discussed in the next part.

PART III: Alternatives to development: from grassroots to global

SRISTI, a global NGO set up few years ago, provides organizational support to the Honey Bee network around the world. It is a network of odd ball, who try experiment and do things differently. Many of them end up solving the problem in a very creative and innovative manner. But the unusual thing about these innovations is that they remain localized sometimes unknown to other farmers in the same village. Lack of diffusion cannot be considered a reflection on the validity of these innovations. The innovations could be technological, socio-cultural, institutional and educational in nature contributing to the conservation of local resources and generation of additional income or reduction or prevention of possible losses. Farmers have developed unique solutions for controlling pests or diseases in crops and livestock, conserving soil and water, improving farm implements, various kinds of bullock or camel carts for performing farm operations, storing grains, conserving land races and local breeds of livestock, conserving aquatic and terrestrial biodiversity, etc.

Honey Bee has already collected more than eight thousand innovative practices predominantly from dry regions to prove that disadvantaged people may lack financial and economic resources, but are very rich in knowledge resource. That is the reason we consider the term 'resource poor farmer' as one of the most inappropriate and demeaning contributions from the West. If knowledge is a resource and if some people are rich in this knowledge, why should they be called resource poor (a term used in GATT/WTO also)? At the same time, we realize that the market may not be pricing peoples' knowledge properly today. It should be remembered that out of 114 plants derived drugs, more than 70 per cent are used for the same purpose for which the native people discovered their use (Farnsworth, 1981). This proves that basic research linking a material and effect had been done successfully by the people in majority of the cases. Modern science and technology could supplement the efforts of the people, improve the efficiency of the extraction of the active ingredient, find causal mechanism, or synthesize analog of the same, thereby improving effectiveness.

The scope for linking scientific search by the scientists and the farmers is enormous. We are beginning to realize that peoples' knowledge system need not always be considered informal just because the rules of the formal system fail to explain innovations in another system. The soil classification system developed by the people is far more complex and comprehensive than the USDA classification systems. Likewise, the hazards of pesticides residues and associated adverse effects on the human as well as entire

ecological system are well known. Some of these practices could extend the frontiers of science. For instance, some farmers cut thirty to forty days old sorghum plants or Calotropis plants and put these in the irrigation channel so as to control or minimize termite attack in light dry soils. Perhaps hydrocyanide present in sorghum and similar other toxic elements in Calotropis contributed towards this effect. There are a large number of other plants of pesticidal importance found in arid and semi arid regions, hill areas and flood prone regions which can provide sustainable alternatives to highly toxic chemical pesticides.

It is possible that private corporations may not have much interest in the development and diffusion of such alternatives, which pass control of knowledge into the hands of people. However, an informed, educated and experimenting client always spurs better market innovations as is evident from the experience of computer industry. *Therefore, we do not see a basic contradiction between the knowledge systems of people and the evolution of market rules to strengthen and build upon it. However, such a model of market would be highly decentralized, competitive, open and participative.*

Honeybee in that sense is an effort to mould markets of ideas and innovations but in favor of sustainable development of high-risk environments. The key objectives of SRISTI thus are to strengthen the capacity of grassroots level innovators and inventors engaged in conserving biodiversity to (a) protect their intellectual property rights, (b) experiment to add value to their knowledge (c) evolve entrepreneurial ability to generate returns from this knowledge and (d) enrich their cultural and institutional basis of dealing with nature.

Of course no long-term change in the field of sustainable natural resource management can be achieved if the local children do not develop values and a worldview, which is in line with the sustainable life style. Thus education programs and activities are essential to perpetuating reform.

Globalisation in trade and investment through harmonisation of national laws, particularly dealing with intellectual property rights is one of the major impacts of GATT/WTO. The contribution of knowledge as a factor of production is being increasingly given central importance in economic development. The management of knowledge not just in farms and firms but also in non-farm sector will become very crucial in coming years. The intellectual property rights deal with the reciprocity in rights and responsibilities of inventors and society at large. In lieu of the disclosure of the patented innovation or invention, the society agrees to recognise the right of inventor to exclude others not authorised, from commercial exploitation of the invention. It is a kind of social contract between society and the inventor. Society gains by getting access to the inventive process and product, which can be used by other inventors for making improvements as well as developing substantive new innovations. Inventor benefits by having incentive to invest himself/herself or assign it to someone else interested in commercial exploitation of the invention. If others could easily copy the invention as happens in process patents, then investors will not make major investments and inventors will have no incentive to disclose. The plants and animals were kept out of the purview of patents when the concept was developed initially. However, in fifties, discussion started

on finding out ways in which more plant varieties could be developed and breeders could be given incentives to innovate and disclose the improvements.

There are several ways in which indigenous knowledge, innovation and practices can be protected so that the informal knowledge system continues to grow and symbiotically link with modern science and technology:

- a. Overcoming informational asymmetries in the formal and informal knowledge systems through IT applications.
- b. Reforming IPR system to make them accessible for small grassroots innovators
- c. Establishing dedicated green venture promotion funds and incubators for converting innovations into enterprises.
- d. Reforming the mandate and responsibility of CG institutions to make it obligatory for international agricultural and natural resource management institutions to accord priority to adding value to local innovations.
- e. Rethinking and redefining the role and responsibility of international financial institutions with respect to ethical, institutional and financial support for grassroots innovations and local knowledge systems.

Part IV: IT applications to empower economically poor and knowledge rich communities and individuals:

Decline of welfare state in the developed world has been accompanied in recent times with the denial or 'unfeasibility' of similar pursuits in the developing countries. Squeezed by structural reforms, lack of new social imagination is as much a commentary on the state of our civic consciousness as on the fragility and bankruptcy of intellectual apparatus drawn from Legacy of Marshal Plan and 'do gooding' state bureaucracies. I argue that we need a new paradigm of envisioning social change and development built around overcoming information asymmetries. Knowledge can indeed become a means of power if coalition/ networks of relevant actors evolve. The chemistry of evolution of such networks which connect information, institutions, incentives with innovations and enterprises is the subject of this section.

French philosopher, Abbe Pierre argued that modern (read western) society is confronted with three realities. First tragedy is the growing power of media and travelling which deny civilized society an excuse that it did not know; second deals with obligation of developed countries to deal with rising problem of unemployment by reducing working hours and the third refers to the challenge of enormous free time (Jack, 1997)⁶. I argue in this paper that every time information technologies (ITs) reduce information asymmetries, these can also help in increasing responsibility. One can no more take an excuse that one could not intervene since, as Abbe says, one did not know. But not just that, as I illustrate with the example of Knowledge Network/Centre approach to augment

⁶ Andrew Jack, With Both the Eyes on the Human Conditions, an interview with Abbe Pierre, Weekend, Financial Times, Jun. 21/22, 1997, iv.

grassroots creativity, IT also helps align key actors in civil society. The alienation, fragmentation, and dislocation of Knowledge space make it difficult for creative urges of society at grassroots level to coalesce. The market forces, as these have evolved, are generally successful in bringing certain interests at specific scales together. But market failure is evident when the transaction costs are high. Investment in IT infrastructure can help in reducing these Transaction costs for those whose ability to bear it is low. But this will not happen automatically. Just as paving roads in the forests often leads to accelerated deforestation⁷, *IT infrastructure can lead to faster erosion of local knowledge and wisdom unless appropriate institutional interventions are simultaneously made.*

Legacy of development: Developmental paradigm has been dominated for at least half a century, by the idea that role of state or civil society is to provide what poor people lack i.e. material resources, opportunities for skill or resource augmentation or employment. Strategies never built upon a resource in which poor people often are rich in i.e., their knowledge. So much so that developmental lexicon in the last decade adopted a term with great alacrity i.e. 'resource poor people'. As if 'knowledge' is not a resource or that poor people are poor even in this resource also. This is a blemish that one could find in almost every major developmental writing. We plead that we change it, and right away. Once knowledge is recognised as the fundamental building block of the developmental options for the disadvantaged communities around the world, the role of information technologies, and Intellectual property rights becomes conspicuous in this envisioning process.

Incentives and Information: Information Technology can be harnessed to generate incentives for knowledge rich economically poor people to share their knowledge without exhausting their IPRs and creating fear of being robbed of the only resource left with them i.e., their knowledge. It can do so by providing a global registration system such as INSTAR (Gupta, 1997, 1998) discussed herein later. IT can also provide glue to hold institutions for conservation together particularly when the need for horizontal flow of information among communities facing different challenges is very high.

Higher the specificity of environmental challenges, higher may be the isolation and fragmentation of local knowledge systems. And yet analogic learning systems thrive precisely on such dissimilarities and discontinuities of knowledge systems in concrete terms. Fragmentation of knowledge space takes place due to various social divisions and

⁷ The roads increase the reach of loggers and also reduce their transaction costs (all at public expenses) while local tribal communities are exploited even more because an indifferent state fails to protect their property rights as well as livelihood options. Land alienation takes place rapidly despite laws to the contrary in existence and highly skilled tribal communities (skill of dealing with nature) are converted into pool of "unskilled labour". The road and other infrastructure does not empower these local communities in the same proportion as it does their exploiters.

cleavages, discontinuities in inter-generational transfer of traditional functional knowledge, and incommensurability between knowledge and the accompanying ecological and other resource contexts. Fragmentation can also arise if contemporary innovations for resource use are not shared widely due to dominance of external knowledge systems or due to contempt for local and familiar knowledge as happens in many communities and societies. The analogic learning can help over-come many of these discontinuities by helping trigger (a) search for solutions in different contexts, (b) provide clues about the kind of relationships that can be pursued, (c) enrich the repertoire of local communities and innovators so that they can independently locate the ideas for solutions as well as alternative materials. The idea is that even if fish are not found in a dry regions, knowledge about another community using plants to numb fishes before catching them, easily may trigger some other uses of toxic plants in a pastoral community, say for veterinary medicine or vice versa.

IT can provide institutional mechanism for abstracting and exchanging the heuristics underlying innovations dealing with various challenges. It cannot do certain things. Or even if it can, not very well. The ethical values which encourage sharing of knowledge at local level are also accompanied by general contempt for or indifference towards local innovations in many societies. This paper provides some practical ways in which low cost IT applications have provided incentives for sharing local innovations and generate institutional mechanisms for production, reproduction, exchange and critical but appreciative peer evaluation of knowledge systems for sustainable resource use.

The knowledge systems that enable people to survive particularly in high risk environments have involved blending secular with sacred, reductionism with holism, short term options with long term ones, specialized with diversified strategies whether involving individual or collective material or non material pursuits. The classical dichotomous approaches have seldom worked. The environmental ethic of these communities have also reflected these blends contrary to the populist rhetoric of so called unitary approaches with one kind of strategies say, holistic ones dominating and displacing the other, say reductionist ones.

Higher the stress whether of physical, technological, market, or socio-economic kind, greater is the probability that disadvantaged communities and individuals generate innovative and creative alternatives for resource use. It must be particularly noted that innovations whether originating in traditional or contemporary consciousness could be evolved by communities as well as individuals. Excessive emphasis on communities to the exclusion of individuals may have contributed to the widespread indifference towards entrepreneurial potential of the knowledge rich economically poor people.

The information technology needs in regions with majority of household managed by women will be quite different from regions dominated by male decision makers. The health needs, agricultural systems, technological challenges and interface between cultural taboos and economic pressures will be most acute in these regions. Knowledge network can generate new choices by connecting one group of women who may have overcome some of the socio-cultural constraints to their economic improvement with another group that is struggling to do so.

Innovations in technological, cultural or institutional subsets often remain isolated and unconnected despite an otherwise reasonably robust informal Knowledge network in existence.

Part V: Reform of IPR systems: Making IP protection accessible to small innovators and local communities

Publication of Indigenous knowledge, innovations and practices and exhaustion of Intellectual property rights: The case for international and national registration system

In a recent paper ⁸, I recognized the problem that arises due to the publication of local knowledge provided by healers, innovators, farmers and tribal individuals and communities. Such a publication brings the knowledge in public domain. It can no more be protected. At the same time, local language publications makes it possible for people to learn from each other. Ideally, it should be possible to register such a knowledge without much cost and effort and then publish it. If the National Register on Grassroots Innovations and Traditional Knowledge maintained by NIF (National Innovation Foundation) could be given legal status, such a need can be met immediately. The IP protection prevents biopiracy and at the same time enables value addition by private sector who can then share the benefits. Publication can also prevent biopiracy but it does not in any way generate the opportunity of benefit sharing though value addition can still take place. If traditional knowledge is considered a prior art as is attempted in the Indian Patent Act, then nobody needs to compensate traditional knowledge holders after using their knowledge for commercial purposes. It is obvious that we do not agree with such an interpretation of the provisions of Indian Patent Act. We believe that only reasonably accessible traditional knowledge should be considered prior art. 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 therefrom through commercialization by themselves or third parties.

Local language publications make it possible for people struggling with similar problem to learn from it. This happens through publication in local languages as attempted by Honey Bee. However, the challenge is to marry two goals of easy and quick opportunity for lateral learning (through local language publication) and sharing of benefits through value addition in the same knowledge. A quick legitimacy

⁸ Anil, K Gupta, 1996, *Rewarding Creativity for Conserving Diversity in third world: Can IPR Regime Serve the Needs of Contemporary and Traditional Knowledge Experts and Communities in Third World?*, Presented at AIPI forum, Interlaken, Sept, 1996

to Data Bases like Honey Bee and registration system⁹ of innovations may provide the answer. Honey Bee will then make its databases accessible to all patent offices in lieu of the protection provided to the communities and individuals whose knowledge is catalogued in it. The alternative of greater secrecy and withholding of knowledge will make every one loser through a) greater erosion of oral knowledge, b) continued unwillingness of younger generation to learn the knowledge, innovations and practices developed over a long period of time, c) depriving any opportunity to knowledge holders as well as those dependent upon them to improve their livelihood prospects through sharing of possible benefits, d) lack of material incentives for conservation of endangered species, e) knowledge rich poor communities may migrate out due to low opportunities for subsistence and employment and not take care of local resource or over exploit the resource itself netting very little value in a short period of time, and f) stifling the very creative and buoyant laboratory of innovations at grassroots by denying any social esteem for such knowledge through material as well as nonmaterial incentives and general neglect.

Since it will be very difficult for any and every community to seek protection of its knowledge and inventive recipes for various purposes such as herbal pesticides, human or veterinary medicines, vegetative dyes, etc., a registration system should be developed. Such a registry will prevent any firm or individual to seek patent on community knowledge as well as on knowledge and innovations produced by individuals without some kind of cross licensing. A proposal for International Network for Sustainable Technologies, Application and Registration (INSTAR) has been mooted by SRISTI at several fora during last thirteen years. The basic structure of INSTAR is as follows:

It will be possible to achieve the following results from such a registry:

Primary entitlements:

- i) Acknowledgement of individual and collective creativity
- ii) Grant entitlements to grassroots innovators for receiving a share of any returns that may arise from commercial applications of their knowledge, innovations or practices with or without value addition.

Secondary entitlements:

- iii) Linking the golden triangle of entrepreneurship by linking Investments, enterprise and innovations. Small scale investors in North and South can not afford to go to various countries, scan diversity of knowledge and resources, negotiate contracts and invest up front huge investments for value addition. If they do not participate, then the field will remain dominated by only large corporations. This register will help small scale

⁹ Such a registry will prevent any firm or individual to seek patent on community knowledge as well as on knowledge and innovations produced by individuals without some kind of cross licensing.

investors seek opportunities of communication with communities and individual innovators and explore opportunities of investment. Large number of potential negotiations will take place increasing the opportunities for innovative communities and individuals. The competition among the investors tempered by competition among potential suppliers of a various kinds of knowledge as well as diversity will moderate expectations on both the sides¹⁰.

- (iv) An autonomous authority of which local community representatives will be the majority members could be entrusted with the responsibilities of having access to all the contracts. A copy of the contracts may have to be deposited with this Authority so as to avoid shortchanging of the communities. These contracts will also be scrutinized to see whether management plans for sustainable extraction of diversity have been drawn upon scientifically appropriate manner or not. Penalties may have to be imposed for non-sustainable extraction of herbs by domestic as well as external extractors. Under the Indian Biodiversity Act, local biodiversity management committees were supposed to have this function at least in an implicit form. The local Panchayati Raj bodies can also be empowered to incorporate this as a constitutional function. Unfortunately, no concrete steps have been taken in this direction. Administrative Reforms Commission is seized of this matter and the author has submitted a proposal in this regard¹¹.

- (v) Each entry in the Register will be coded according to a universal system like ISBN. The postal pin code of the habitat of the community or individuals registering innovations will be incorporated in the indexation system so that geo-referencing of innovations can be done. In due course the contextual information of innovations can also be incorporated in the system so that this systems of innovations can help cross connect the communities having similar ecological situations or facing similar constraints or challenges.

¹⁰ NIF has received enquiries from such small investors and entrepreneurs from Liberia to Fiji, 42 countries around the globe in the last few years. Such an overwhelming interest could arise because NIF has shared the awarded and other innovations in synoptic form at its website (www.nifindia.org). The CD of NIF is shared widely. There is a small risk that some people may copy ideas and then seek protection. If the proposed registry status can be given to National Register, such risks will be minimized. A similar registry at global level will make it far more attractive for local creative people to share their knowledge without any risk of being shortchanged. This will make people to learn from each other and at the same time protect their interests. The Prior Informed Consent (PIC) framework provided at NIF's site developed earlier by SRISTI and modified by NIF and its collaborators provides a possibility available under Linux general purpose license. That is, if a farmer or a self-employed small-scale producer wishes to use any knowledge in the registry for one's own survival, no compensation was due. However, if the innovation or TK was used for generating commercial returns, then a proper licensing agreement was imperative. Such a framework combines the advantage of open source technologies and protected innovations.

¹¹ Gupta, Anil K., Knowledge based empowerment of local bodies: Generating entrepreneurial approach to development, paper presented at the National Colloquium on Decentralisation in Rural Governance, organised by the Administrative Reforms Commission, 2 March, 2007

- (vi) The entry in the register will in the first stage be mere acknowledgement of creativity and innovation at grassroots level. But later some of the innovations will be considered appropriate for award of inventors certificate or a kind of petty patent which is a limited purpose and limited duration product patent protection for low inventive threshold innovations/traditional knowledge. Essential purpose of this institutional or policy innovation also is to reduce transaction costs of the potential investors and entrepreneurs (a cooperative of consumers, producers, an entrepreneur, or a large firm in private or public sector) in seeking information about investible innovations. This could operationalize G²G™ i.e., Grassroots to Global vision of Honey Bee Network¹².
- (vii) The award of certificate will also increase entitlement of innovator/s for access to concessional credit and risk cover so that transition from collector, or producer of herbs to developer and marketer of value added products can take place in cases where innovators/traditional knowledge holders deem that fit.
- (viii) The registration system will also be part of Knowledge Network linking problem-solving people across the world at grassroots level. This will promote people to people learning and serve as a multi-language, multi level, multimedia (oral, textual, electronic) clearing house for local and indigenous communities. Wherever necessary and possible, formal scientific institutions will be linked up in the network.

Apart from the registration system a large number of specific incentives would need to be developed for different categories of knowledge, innovations and practices. Similarly the incentives for preservation of sustainable lifestyles of indigenous communities would also be different.

Knowledge Network for sustainable technological options operationalised through Honey Bee network approach implies that innovations in one part of the world, may seek or attract investments from another part, if necessary, to generate enterprises (whether

¹² The forces of globalisation have often squeezed the space for grassroots innovations or technologies or enterprises. The opposition to globalisation by civil society organizations around the world is motivated by this one sided pressure from large corporations on small enterprises. However, we believe that with proper support of the public policy, relevant institutions such as NIF, and adequate resources, we can reverse the globalisation pressure. Grassroots innovations with proper support of risk capital and network of small entrepreneurs carve out a niche at the global level. NIF has succeeded in selling technological innovations by grassroots innovators to entrepreneurs in five continents. While the scale is quite limited, but with the budget of hardly 350,000 USD per annum and a small team, this is not a small achievement. More than 100 patent applications have been filed and three patents are already granted to grassroots innovators through SRISTI, GIAN and NIF in USA and about a dozen patents in India. More than 24 entrepreneurs have been licensed grassroots innovations and almost all the benefits have gone to knowledge providers with some share for local communities, nature and innovation fund.

commercial or non commercial, individual or co-operative) in third place. Several innovative experiments have been started to explore this Golden Triangle for rewarding Creativity. It requires acknowledging that not all innovators may have the potential for becoming entrepreneurs or have access to investible capital. One could have an innovation say from India, investor from Europe and enterprise in South Africa. Forces of globalisation could after all be also mobilised in defense of poor creative people.

Information Technologies like any other technology can help bridge as well as widen the gaps between haves and have-nots. What is very encouraging about the new possibilities that ICT applications offer is the scope for democratizing knowledge, which was never so high as now.

Other reforms in IPR system:

1. Search for prior art and essential disclosure by the applicants: It has been felt for a long time that patent offices issue improper patents because they do not have either access, time, perspective or sometimes even willingness to explore information in databases not available on internet or in electronic format. Recently, CIEFL has submitted a presentation to USPTO suggesting modifications in the procedures for searching prior art. SRISTI has also been pleading for last several years that databases of community as well as grassroots knowledge should be accessed by the patent offices to avoid issuance of trivial or improper patents. Specific steps required in the matter are:
 - a. Various NGOs and other documentation services should be contracted by WIPO or leading patent offices to convert published data on ethnobiology, indigenous knowledge and other innovations into electronic databases so that each patent office can screen these before issuing any patent. The cost of building up of these databases will have to be raised from multi lateral sources. In some cases, it would also include translation from local languages.
 - b. There should be incentives for groups documenting local knowledge to share it with patent offices regularly.
 - c. Every applicant should be required to disclose that material, information or any other knowledge used in the patent application has been obtained lawfully and rightfully.
 - d. Those patent offices which do not disclose the patent applications before granting the patent should be obliged to make the applications public after eighteen months of application so that objections can be filed by the interested groups.
 - e. There is a tremendous amount of knowledge, which is available only in oral form and has not yet been documented. There have been cases when such knowledge communicated in good faith by local people has been used without acknowledgement or reciprocity to claim intellectual property on the same. There should be severe penalty for such attempts so that these act as a deterrent. At the same time, mechanisms should be put

in place for worldwide campaign for documentation and registration of these knowledge systems.

- f. Just as a discussion is going on in US on linking the application cost of patents with number of claims, there should similarly be incentives for disclosing extensive prior art. This will encourage applicants to make extra efforts to disclose as much as prior art as possible and accordingly get concessions in the cost of application. This is particularly applicable for patent applications on biodiversity based knowledge and resources.
 - g. Not every localized knowledge, which is not yet documented, should be considered public domain unless it is easily accessible. Therefore, oral traditional knowledge in which some improvements may have been made should be eligible for being considered patentable. This will help the communities to decide whether they would like their knowledge to be public domain and thus become part of prior art or would like it to come in public domain after getting protection for a given period of time.
2. Global dialogue on new systems of IPR for protecting localized traditional knowledge vis-à-vis the protection for traditional life styles embodied in geographically indicated products like wine.
- a. The conventional IPR system will limit the rights of local communities and traditional healers upto 14-20 years depending upon the system in vogue in different countries. There is a need for experimenting with different kinds of protection for different kinds of traditional knowledge. Some can be protected through trademark route, some by geographical indications, and still others through a combination of patent and inventors certificate entitling the communities for sharing benefit for at least two generations i.e. 50 years. It is obvious that a small share provided regularly over a long-term period gives greater certainty than a larger share given only once or for few years. The communities must be enabled to evolve institutions for utilizing external resources in a sustainable manner without becoming victim of non-sustainable life styles and consumption patterns as happened in the case of many of the north American native Indian communities.
 - b. The new systems of protection will have to balance the long-term need for the community to have interest in conserving the knowledge system and the incentives for those who add value to share the benefits for a limited period of time. Longer the period of the protection, the more delayed access will be there for those smaller firms which want to add value, reduce cost and make products available for larger consumption. Therefore the new system we propose should discriminate between rights of communities in the knowledge system vis-à-vis the rights in a specific knowledge output. The rights in the systems should be perpetual. For instance, the classical health systems such as ayurvedic, unani or sidhdha have recipes, which are being granted patents in a rather indiscriminate

manner. This is improper. TKDL (Traditional Knowledge Digital Library) developed by Government of India may help in preventing this. It is a different matter that this library may be accessible to international patent offices but is inaccessible to national organizations, networks and institutions so far.

However, modifications in the codified and classical knowledge should be permissible for patenting with the understanding that a share of the benefit will go into a global/national pool of funds meant for augmenting indigenous systems of medicines all over the world. This is similar to a system for plant varieties in which improved varieties based on land races should contribute a share to the global fund for in-situ conservation. Since every such benefit is shared ultimately at the consumer costs, it is only natural that consumers should pay for the conservation of diversity.

- c. Before granting any patent, patent office should demand declaration that the data or material used in the patent application has been obtained lawfully i.e. in fulfillment of the laws of the country from where these have been obtained, and rightfully i.e. through prior informed concerned of the local community and the appropriate authorities.

3. Developing low transaction cost system for small innovators.

In addition to the model of INSTAR, we need experiment with another model based on Australian Innovation Patent System. In Australia it was realized that most of the jobs are created by small firms—a fact which is evident in most of the countries of the world and yet it was very difficult for smaller firms to license the standard patterns which are much more costlier. The petty patent system did not serve the purpose because the inventive threshold was similar to the one required in the standard patent system. Therefore it was proposed to setup an innovation patent system in which the innovations having lower inventive threshold will qualify for a protection for eight years with maximum number of five claims. The prior art requirement would be same as in the standard patent and formality examination would also be undertaken on all applications though substantive examination only on the request by the applicant or third party. The publication of the innovation patent application to occur three months after filing. Dual protection by standard and innovation patent to be possible (Review of the Petty Patent System, Advisory council of industrial property, AIPO Canberra, 1995). Conventionally the fees for the Petty Patent and the Standard Patent were more or less same and the time taken in the Petty Patent worth lesser. The Australian report cited above mentions that on an average 300 Petty Patent applications were filed with 50 to 60% granted patent. The foreign applicants had rarely used this facility. The majority of the Petty Patent applications were made by individuals rather than companies. In comparison, Australia received 20000 applications for standard patents out of which only 10% were made by Australians. As against this, only 1.5% was the share of Petty Patent. The share of agriculture or veterinary was just about 5% in petty patent. In view of this, a modified system

was introduced. If a developed country has evolved mechanism to help small entrepreneurs, pharma companies which can only make incremental innovations with low inventive threshold, should we assume that small companies in India will have better R&D performance, say in Australia. It makes sense therefore to support IP protection for incremental innovations without in any way letting this window be used for evergreening by large corporations. In the context of the current debate on Section 3D of the Patent Act, we should ask ourselves whether we should restrict the patent protection only to the new chemical entities when we know that the majority of the Indian pharma sector may not be able to develop many such entities in at least coming one decade. At the same time, incremental innovations are already being made by many companies such as Troikkaa which have filed patents by improving technologies out of the patent. Further, should the efficacy be judged by Drug Controller of India or the Patent Office. We should also ask ourselves that should a patent application be kept pending till the data on efficacy has been collected and submitted. Normally, a full application has to be submitted within one year of filing. The efficacy data is unlikely to be generated within one year. Should a small Indian company be denied an opportunity to protect its innovation till then. What if a large corporation with much higher resources is able to generate the efficacy data before the small company.

Should we not allow lack of efficacy data as a ground for opposing patents at pre or post grant stage. There can be no two opinion about preventing MNCs from evergreening of patents through marginal changes. At the same time, a lesson has to be kept in mind. Years ago, while doing a research on matching farmers' concerns with breeders objectives, I realized that it was very difficult to develop a technology which was useful for poor but could not be taken advantage of by rich. When Prof. Ruttan¹³ made this observation, I was not convinced given my pink heritage. However, after doing research in detail, I found it very difficult to think of technologies, which will only help one class. Therefore, to assume that we can create a policy provision, which will benefit small sector but may not be taken advantage of large companies is difficult, though not impossible. However, to prevent smaller companies from benefiting from IP protection lest large companies take advantage of the provision seems short sighted. I am convinced that farmers, healers, local communities need to have the option of protecting their knowledge or putting it in public domain. While I prefer that all knowledge be treated as open source, I cannot impose my values on those who wish to benefit from IP protection. Therefore, the product patent regime can be extremely helpful to small herbalists who may have developed unique formulations but may not have an efficient process to make it viable in the market place.

The distinction that one needs to make from the conventional utility models relates to the subject of protection. The utility models were intended to cover

¹³ Vernon W. Ruttan, Agricultural research policy : University of Minnesota Press, Minneapolis, MN, 1982, 369 pp

designs and other implemental improvements but not necessarily a kind of product patent for drugs, or agriculture. What is recommended here would be further improvement on the Australian innovation system so as to include the term of at least 10 years, claims 5-7, low ever inventive threshold but availability of a product and use patent. Thus an indigenous herbal drug developed by a local healer can receive product patent for 10 years. During this period, potential manufactures may get in touch with the inventor and may negotiate the right so as to file a standard patent if large-scale manufacture was considered desirable and profitable. The fees should be negligible but publication of application within a year should be obligatory and the granting of patent should not take more than a year or 18 months.

The global registry can incorporate the information on these patents as well. In addition the plant variety registered should also be catalogued.

4. Given the fact that the children of the herbalists do not want to remain poor as their parents have been, we thought that IP protection might generate opportunities for the healers to get the benefit from the commercialization of their drugs. There is a need to develop action research programmes, which have generated hope among the children of healers without commercializing the technologies and also without seeking any kind of protection. It is true that development of low cost medicines disseminated among the people can help in reducing health costs considerably. The interest of the poor consumers and poor producers have to be matched. Since providers of knowledge have remained poor and therefore, the risk of their knowledge not getting passed on to the next generation is real, the need for incentives for them to conserve the knowledge, associated biodiversity is very high. These incentives need not be only monetary as mentioned earlier, and need not restrict to IP, but should include non-monetary individual and collective options as well.
5. Improvements in the Plant Varieties Registration and Protection System

The Article 27-3 b has been negotiated hard at the recent review. There are several issues, which need consideration:

- a. The definition of the variety should include discovered wild or other plants having distinctive and stable properties. France and China have the concept of discovered plant having DUS property as eligible for the protection. However, the problem with the uniformity requirement is that heterogeneous or buffering populations characteristics of marginal environment with high fluctuations may not get protection under DUS provisions. In the times to come the genetic uniformity is likely to become a major threat to food security. Therefore provisions for buffering population which are distinct and stable over a long period of time (5 – 10 years) may be created. The present system is designed primarily for commercial crops in irrigated regions.

- b. A national and international register of land races acknowledging community right should be established. Simultaneously recognition of the community rights in the extant varieties as mentioned in the PPVFR Act should be elaborated. The cost of collecting passport information for the varieties should be borne by the PPVFRA so that farmer breeders do not suffer on account of their inability to provide such data.
- c. The passport information sheet of the Gene bank should include the knowledge of community with particular focus on women knowledge. At present a very small proportion of the passport sheet identify the community, region or specific farmer for 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.
- d. 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 after signing a material transfer agreement (MTA) with the local communities/farmer breeders.
- e. The negotiations for an international registry of wines through international registers may be accepted only if similar registration facility for local varieties of crops and indigenous animal breeds is provided.
- f. Unlike International Union for Plant Variety Protection, there is no international agreement for protection of traditional animal breeds and associated knowledge system. India must plead for a similar arrangement within the country and also at the international level.

6. Reforms at CGIAR level

International negotiations must include a need for modifying the mandate of CG institutions so that these are obliged to acknowledge the local contributions in the development of land races, knowledge about uses of local varieties be included in the passport sheet as mentioned earlier and value addition in grassroots innovations be a necessary responsibility of these institutions. The global support for these institutions should be contingent on their accepting these conditions.

It should also be obligatory on the part of each CG institutions to share the germplasm with private sector or others only through material transfer agreement (MTA). While a moratorium had been placed by the technical advisory committee (TAC) on patent on the land races by third parties, it is not sufficient. In fact we should encourage characterization and value addition in the land races and the protection of so improved or characterized land race but with the

appropriate benefit sharing arrangements. The countries which have provisions of patent as well as plant variety protection must provide research exemptions and farmers privileges.

Pedigree analysis of improved varieties should be undertaken regularly so that rights of communities contributing land races are acknowledged and reciprocated.

7. Reforms in Financial Institutions

No amount of registration or grant of patent will help make local knowledge system vibrant unless venture promotion grant are available to local entrepreneurs at very low transaction cost. While we have Grameen Banks or Saving and Credit Self help groups in different parts of the world, we do not have venture promotion fund for small innovations anywhere in the world. The result is the growth of entrepreneurial process is highly stilted. GIAN and MVIF (Micro Venture Innovation Fund) at NIF are exception. Similarly most developing countries do not have incubators to convert grassroots innovations into product. SRISTI has started a project involving India, China and Brazil to provide online incubation support for grassroots innovations in each country.

There are many more ideas, which can be taken up to improve the IP protection for grassroots innovators and traditional knowledge holders. The issue is whether we should prevent them from getting some of the benefits associated with protection because the same benefits may accrue to large corporations as well. I don't think so. I believe that our first commitment should be to knowledge producers and innovators in our country. If local communities, which are benefited from the services of the economically poor healers and herbalists and have not generated enough incentives for them, then they should not be expected to subsidise the cost of knowledge production, improvement and dissemination. The state and the market have to play a role in this regard. However, the state, which can only provide manual employment in the Employment Guarantee Programme, may take a long time to understand and appreciate the role of poor people as knowledge generators and providers. The social activists and NGOs which oppose the need for protecting the rights of grassroots innovators, small firms and local communities should provide practical examples of conserving knowledge, resources and institutions without any additional incentives based on market or non-market channels.

There is no doubt that IP protection alone cannot answer the questions raised in this paper about the state of knowledge economy at grassroots level. If out of around 1000 US patents granted till last year October on psyllium (*isab gul*) based products grown only in India, only four belonged to Indians, we obviously have practical evidence of what can happen in a commodity market without IP protection. The prices of psyllium in Indian markets are not decided by Indian producers and traders. These are determined by Procter and Gamble, a major buyer along with a few other buyers. Can Indian farmers get better prices by supplying only raw material for the international markets. Will research on value addition take place in small scale private pharma companies if their technologies are allowed to be copied freely as the case has been for so long. Why do

two young entrepreneurs from Vadodara file patent on developing a technology for blending psyllium in bread if their interests are served by keeping this as an open source technology. Why wouldn't Indian government acquire the right to such patents and then make the technology open source for all the small bread bakeries. This way the innovators will also get rewarded and the consumers will also benefit. I have been pleading for a National Technology Acquisition Fund for this precise purpose with the Finance Minister and other policy makers. Do they care.