Ethical issues in accessing people's knowledge and innovations for developing low cost health technologies[1]

Anil K Gupta[2]

Abstract

There is a widespread concern all over the world about the emerging tensions in the local, regional and global dialogues on relationship between formal and informal knowledge systems. It is realized that the basic social contract between knowledge producing communities and the knowledge valorizing corporations and professionals needs redefinition. Several professional societies have incorporated discussions on ethical issues in accessing knowledge, innovations and practices of local communities involving use of local biodiversity resources. The situation becomes even more complex when we realize that the healthcare needs of large majority of poor people still are met by their own survival strategies dependent upon use of local knowledge and resources. It is obvious that this knowledge is precious and can generate viable and productive alternatives valued by modern markets. At the same time, it is also true that if this knowledge was sufficiently robust as it stands, the local health conditions would not have been as precarious as these often are in many regions because of nutritional and other economic hardships. The linkage with formal science and technology is therefore vital.

The paper deals with four issues: (a) what can we learn from the analysis of a country wide campaign in India on documenting more than 30000 local health traditions maintained by communities and individuals, (b) whether the health priorities and the options for addressing them require new technological and institutional paradigms, (c) how can new partnership between people, professionals, public policy makers and profit-oriented corporations be conceptualized so that not only benefits are shared fairly but also the knowledge systems grow and thrive and (d) what should be the ethical code of conduct guiding the knowledge exchange, value addition and benefit sharing for generating viable health options for knowledge rich, economically poor people.

The paper would thus provide an overview of the global debate on this subject and also suggest how an ethnobotanist can become the watchdog of, as well as the advocates for, the interests of healers, herbalists and other traditional knowledge rich communities.

[1] Paper prepared for presentation at the IV International Congress of Ethnobotany, Istanbul, August 21 – 26, 2005, published in the Proceedings of the ICEB 2005 (Ed. Z.Fusun Ertug), November 2006

[2] K.L.Chair Professor of Entrepreneurship, Indian Institute of Management, Ahmedabad, India; Executive Vice Chair, National Innovation Foundation, Ahmedabad, anilg@iimahd.ernet.in and anilg@sristi.org

Introduction:

Knowledge happens when our expectations are belied, modified and sometimes confirmed. Because the asymmetry in our expectations is influenced by our access to resources, institutions, technology and cultural platforms, we get different kinds of knowledge, even when we confront similar situations. In any community living close to nature, asymmetry in knowledge generation and its utilization is inevitable. The experts exist not just in our profession, but in every profession. This raises the issue about conceptualizing the functional asymmetry without which knowledge systems cannot grow or provide incentives for experimentation, innovation and dissemination of either the knowledge itself or its applications for community well being. Why would a community encourage asymmetry becomes apparent when we look at the problems of survival with particular reference to health.

Whether a child is to be born, a bone has to be repaired or a chronic ailment has to be relieved, one needs advice. In one of the Shodh Yatras (walk through the villages) in a village in Karnataka, a young person felt very disturbed when we paid respect and appreciated the expertise of a particular healer who seemed to be very effective in curing the cases of snake bite. This village was located in the western ghat region with very rich biodiversity. This young person felt that everybody in the village knew about the herbs to be used in such cases, what was so special about the old person whom we seemed to revere so much. We asked a question to all the people sitting there, as to how many people had had a case snake bite in their family in the last three months. Three people raised hands. We asked them who did they go to, for consulting. All three pointed towards the old healer whom we were honouring. Everybody laughed and the answer became obvious. While many people in the village know, not everybody knows, how to use the specific knowledge in a specific case such that it works. The specific part of a generalized knowledge is available with only a few experts. Society respects such experts but does not adequately incentivise them. The result is, they often remain poor. Therefore, despite having walked for more than 2600 kms., during every summer and winter Shodh Yatra in last eight years, we have not come across many young healers.

This is the crisis. If younger generation no more feels inspired and emboldened to learn, acquire, specialize and improvise the knowledge that has been generated by the older generation, the knowledge systems come under threat of erosion. I have argued that when knowledge erodes, a plant becomes a weed. How does one ensure that this knowledge system grows, becomes vibrant, encourages innovations and welcomes fusion of external, institutional and formal knowledge at its own terms? The ethical dilemma arise when we have to decide the terms, mediate the exchange and generate the portfolio of incentives for the community, local experts and those who add value to local knowledge. Ethical dilemma also arises when we the intellectuals, document people's knowledge in good faith, publish it and become the author without even acknowledging the knowledge providers or protecting their intellectual property rights. The question of sharing benefits seldom arises. When resources are allocated for adding value to local diversity and associated knowledge, decision about which problems/whose problems get how much priority also involves ethical dilemma. The irony is that healers who help us

cannot provide even the primary health care to the children, when need arises because public infrastructure and market forces are invariably very weak in the regions which are rich in biodiversity. Sixteen years ago, in a paper entitled, "Why regions of high biodiversity have high poverty", I asked this question as to why such regions have (a) poorest public infrastructure, (b) highest rate of drop out in the primary education and lowest level of literacy, particularly of women, (c) highest level of male emigration and consequently high proportion of households managed or headed by women, (d) low level of employment and (e) high degree of poverty. Ironically, the public representatives from these regions are also not very articulate and are unable to put pressure on the policy making process. It is not surprising, particularly in Indian context, almost all the insurgent groups are active in precisely these regions where social, economic and institutional disparities have widened over time. The last straw on the camel's back would be, if we the ethnobotanists or socio ecologists or natural resource experts/scholars add to the disparity and asymmetry. This conference has to resolve some basic principles which should guide the exchange between local communities and outsiders.

Part I

Where does the problem lie: A brief literature review

Yamin (1995) suggests that new theories of distributed justice are required so that the distribution of resources not only among humans but also humans and the non-humans, present and the future generation may be pursued fairly in future. The moral and ethical issues underlying these theories will require decision about how we relate to ourselves and the nature around us[3].

The perception of nature and its social context raises tremendous ethical difficulties. Not all of us use similar language to describe the same human nature interaction. The very term, 'ethnobotany' itself is a problematic in its orientation. Why should knowledge of local communities be ethnic in orientation whereas the music of the similar kind in western context becomes classical. The contradiction between what is 'classical' and what is 'ethno' is not going to be easily resolved. But it is useful, as Mary Douglas[4] (1995:264) suggests (cited in Cooper, 2000:1012[5]) the word, 'construal' vis-à-vis 'construction' as less problematic, perhaps more consensual. Whether one should use the term, Cooper asks, 'forests' or 'wood' depends upon the ethical and moral position one takes in relating to specific part of nature. Both are socially construed/constructed terms. Amartya Sen (1980) in his famous paper entitled, "Description as Choice" asked a similar question. When does description inherently suggest prescription or prediction, he said, was a function of the underlying values. Thus, the poor people after sixth five year plan in India were named, in the planning documents, as 'weaker section'. He draws

[3] Farhana Yamin, Biodiversity, Ethics and International Law, *International Affairs* (Royal Institute of International Affairs 1944), Vol.71, No.3, Ethics, the Environment and the Changing International Order (Jul., 1995), 529-546.
[4] Douglas M (1995) Acceptance of the 1994 Bernal prize. Science, Technology and Human Values 20 (2): 262 – 266.
[5] Nigel S Cooper, Speaking and listening to nature: ethics within ecology, Biodiversity and Conservation 9: 1009-1027, 2000.

attention to the fact that language in this case turned the responsibility from the external forces and actors to the poor people themselves who were supposed to be weak. He asks as to how could weaker section carry the heaviest burden. When we use the term, 'disadvantaged' vis-à-vis just the 'poor', we highlight the dialectics in one case and mask it in another. Culture specific to a region provides different ways of construing nature.

Just as I mentioned in the beginning, the moment the knowledge about a plant is lost, it becomes weed, i.e., a plant out of its place. Come to think of it, can a plant ever be out of its place? How do we determine what its place is and who determines it? Imagine a library without a catalogue. Will we be able to locate the books? Perhaps those of us who have walked through the carrels may through recollection reach the point where probability of finding a particular book is high. But then, librarians are creative people. The cataloguing assistants can interpret the titles and the subjects ingeniously. Book may not be where we suspect it to be. Catalogues, therefore, have a place. They need to be developed, preserved, updated and shared. Local communities have been trying to do it, but with more and more difficulty. The outsiders use Latin names (difficult to argue why only Latin), but a common classification scheme is necessary to pool the knowledge and make it accessible to the entire profession.

The cultural project is just the opposite. As Margret Mead had stressed that the emphasis on etic meanings vis-à-vis the emic meanings was a reflection of dominating global over local. The communities create meanings which are accessed more easily by the members and are often inaccessible to outsiders. Conservation, perhaps requires respect for particular. The scholars, used to dealing with generalized meanings construct newer and newer projects which deny the locality of the meanings. This tension is understandable and to some extent desirable. The problem arises when assertion of locality and within locality, expertise is construed as contrary to the communitarian spirit. Attempt to reinforce the respect for individual experts is interpreted as an assault on assumed communitarian process of production of knowledge. The spirit is confused with the structure. The communitarian spirit does not in any case violate the need for individual expertise and location specific knowledge, language, terms and above all ethical norms. Should our profession consider its duty to understand, and then expand the space, both in policies and institutions for knowledge, institutions and technologies that originate in a specific socially construed spaces and cultural contexts. If we have to do that, we will have to use modern science and technology to validate and value add in this knowledge according to the local parameters so that social benefits in the form of drugs for masses raise the status of the little science.

I will come back to the issue of building bridges between the 'little' and the 'big' science without comprising much with the rules of each system of knowledge.

First let us understand, 'who gets to tell the story', (Lease, 1995 in Cooper, 2000[6]) implies the power of those who describe, as Sen says often to prescribe. Toulmin (1982

[6] Lease G (1995) Introduction: Nature under fire. In Soul ME and Lease G (eds) Reinventing Nature : Responses to Postmodern Deconstrution, pp 3 – 16, Island Press, Washington DC

in Cooper, 2000[7]) teased out the ethical dimension of ecological (or if I may, botanical) concepts and terms. Those who narrate, also select what to narrate and how. Therefore, the evaluation of the local knowledge only on the basis of narration by third parties may not always do justice to the dynamics and complexity of the knowledge system. Since most researchers seldom share their findings with the knowledge providers before publishing or presenting at the conferences, the ethical dimension of the discourse also deserves attention.

Bodeker (2003[8]) reviews various examples where the knowledge rights of the local communities have not been respected adequately. The South African example where the San people objected to the patent by CSIR on their knowledge from which a drug was developed for anti obesity, illustrates the conflict between CBD and TRIPS. Bodeker strongly endorses SRISTI's proposal for a global registry of traditional knowledge and grassroots innovations. He also supports the SRISTI's arguments in support of a disclosure requirement from every patent applicant. Our proposal has been that every applicant should declare that source material and/or knowledge associated with it has been 'rightfully' and 'lawfully' acquired. The 'rightful' refers to moral as well as ethical issues in accessing biodiversity (also see Pew Ethical Guidelines and background papers prepared for the purpose, Gupta 1994a & b). However, the task of making databases is fraught with risks. He refers to the Ethiopian example in 80s when government required traditional healers to register themselves as practitioner. Many healers, 'submitted inaccurate information' with the result that this database was not taken seriously (Bishaw, 1991 in Bodeker 2003[9]). He describes an initiative on Global Information Hub on Integrated Medicine as a part of Commonwealth Working Group on Traditional and Complimentary Health Systems which will build a database of various stakeholders as well as information resource regarding the intellectual property rights in traditional medicine and associated biodiversity.

The concept of Prior Informed Consent (PIC) articulated in CBD but never incorporated in TRIPS has created considerable tensions with regard to the ethical aspect of information exchange. Ragavan (2001[10]) feels that the concept of 'free' and 'informed' consents have not been defined. CBD does not provide framework of consequences when the consent is not informed or adequate. She asks several other questions about the right of knowledge holders to withhold or not to disclose or keep information trade secrets. The legal respect for traditional knowledge has been debated in different courts. She provides an interesting example of a case, *Hodosh v. Block Drug Company (786F 2d 1136 Fed.Cir., 1986)* in which a Chinese traditional medicine example was considered unacceptable as a prior art because the court observed that a "skilled person exercising reasonable diligence, would not be able to locate the prior art, given the esoteric nature of

[7] Toulmin S (1982) The Return to Cosmology: Postmodern Science and the Theology of Nature, University of California Press, Berkeley

[8] Bodeker,G., 2003, Traditional Medical Knowledge, Intellectual Property Rights & Benefit Sharing, Cardozo J. of Intl. & Comp. Law [Vol.11:785-814]

[9] Makonnen Bisha, *Promoting Traditional Medicine in Ethiopia: A Brief Historical Review of Government Policy,* 33 Social Science & Medicine 193, 193-200 (1991)

[10] Ragavan, Srividhya, 2001, Minn.Intell.Prop.Rev.2(1), available at http://mipr.umn.edu/archive/v2n2/raghavan.pdf

references. The constant dilemma of applying statutory law or common law is referred as one of the persistent problems. She questions whether codification of knowledge is a necessary condition for a traditional knowledge system to be recognized as legally valid system. Toffel (2002[11]) reviews the possibility of using code of conduct in the absence of legal provisions for guiding the knowledge exchange between providers and receivers. He refers to the code of conduct developed by various indigenous communities as well as Association of Social Anthropologists, Society for Economic Botany, International Society for Ethnobiology, NIH, NCI, etc. In 1994, we had reviewed many of these guidelines and found that most did not posit any consequences for violation[12]. Gupta and Sinha (2001) felt that the Honey Bee philosophy has not yet permeated the discourse on ethical ways of knowledge exchange, although it was enunciated way back in 1988-89. Toffel's advice that ad hoc contract between indigenous groups and pharmaceutical companies seemed to be the best answer for getting compensation may be a pragmatic response but is not a long term institutional solution. Many others such as Posey, Dutfield and Brush have made familiar arguments questioning the concept of graduated and gradient rights in the community. I define '*graduated*' rights as those which are modified subject to the value which is added in different stages of the value chain (sometime referred as milestone based payments or rights) and the '*gradient'* rights as the asymmetrical knowledge distribution within a community and thus knowledge experts not being treated at par with those who are either only aware or sometimes not even aware of the details. The knowledge and ability to practice it in specific contexts is a skill developed over a period of time with enormous effort and perseverance. Knowledge systems would not grow or survive without such gradients being recognized as an inalienable feature of knowledge systems. In professional and institutional contexts, we recognize this concept very well but hesitate in according it the same respect in informal context and community context.

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[11] Toffel, Michael W., 2002, Intellectual property rights and traditional resources: Indigenous challenge, downloaded on August 18, 2005 from
http://faculty.haas.berkeley.edu/toffel/papers/indigenous_manuscript.pdf

[12] Gupta, Anil K., Dilemma in Conservation of Biodiversity: Ethical, Equity and Moral Issues — a review, Prepared for a workshop of Pew Conservation Scholars on Developing Ethical Guidelines for Accessing Biodiversity, Arizona, October, 1994, published under the title, "Ethical Dilemmas in Conservation of Biodiversity: Towards Developing Globally Acceptable Ethical Guidelines" in Eubios Journal of Asian and International Bioethics 5 (Japan), March 1995, pp.40-4

Suggested Ethical Guidelines for Accessing and Exploring Biodiversity - A Pew Conservation Scholars Initiative, October 21, 1994 (A collective effort of Pew Conservation Scholars based on three background notes including G 16 and G 17), published in Eubios Journal of Asian and International Bioethics 5 (Japan), March 1995, pp.38-40.

Gupta, Anil K., and Riya Sinha, 2001, Should we save, what serves only human ends? A review on Environmental Ethics, published under the title, 'Environmental Conservation: Ethical Concerns' in International Encyclopedia of the Social & Behavioral Sciences, Elsevier Science Ltd., p. 4602 – 4607.

Ogumanam[13] believes that the alternative world view of traditional healers is not fully captured in the western bio medical approaches. He considers two systems as basically incompatible. However, he hopes that a global framework for protection of indigenous knowledge would emerge consistent with cultural and philosophical diversity of local health traditions. Norchi (2000[14]) refers to the traditional Onge people of Indian Nicobar and Andaman Islands and suggests that customary laws evolved by Onges need to be recognized by forming Onge Corporation. The corporate firm could respect the trust of the community who could be share holders. The corporation would then enter into contract for their knowledge to be accessed by outsiders. He refers to the work of Ashish Kothari and many others who have raised the issue of Onges. The health leads from one of the oldest tribes of the world would obviously be of interest to the Indian society. Whether utilitarian logic will suffice in this context, is the issue that we need to address. Posey (1990[15]) had suggested a new eco-ethno ethics, essentially enforced by not the law but the professional societies. He warned that anthropologists and ethnobiologists would lose the respect of native people if they did not follow proper ethics. Brush (1993[16]) also feels that ethnobiological information collected so far did not touch upon several issues that were arising due to commercialization prospects. He believes that Intellectual property may be less attractive way than guaranteeing human, cultural or land rights in 'meeting the goals of conserving indigenous knowledge and providing more equitable treatment for indigenous people who have been generous with their knowledge and resources' (1993: 667). Obviously, he confuses the issue of intellectual property rights with the available legal arrangements for enforcing these rights. Former are non-negotiable and latter are subject to debate and can be improved. Knowledge rights are at the root of cultural and other rights. Gadgil, et al (2000[17]) explains the concept of People's Biodiversity Register (PBR) and suggests that these registers could be a tool for conserving and respecting folk knowledge. They also suggest that compensation could follow according to the quality of documentation (which will often be done by outsiders). They propose that in due course this knowledge could be fed back to the people from whom it is collected. Recently, National Innovation Foundation (NIF) and a community in Karnataka having developed PBR signed an MOU to honour the knowledge rights of the communities, already articulated in the PIC framework used by NIF (see www.nifindia.org/pic.htm). Simpson, Sedjo and Reid (1996[18]) had earlier cautioned that despite much hype about the biodiversity use in pharmaceutical research, not much benefit may flow to the people either for conservation or for consumption because the

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[13] Oguamanam, Chidi, 2004, Localizing intellectual property in the globalization epoch: the integration of indigenous knowledge, Indiana Journal of Global Legal Studies, June 2004 - http://www.findarticles.com/p/articles/mi_hb3300/is_200406/ai_n13064680

[14] Norchi, Charles H, 2000, Indigenous knowledge as intellectual property, Policy Sciences, 33: 387-398.

[15] Darrell Posey, Intellectual Property Rights: And Just Compensation for Indigenous Knowledge, Anthropology Today, Vol6, No.4 (Aug., 1990), 13-16

[16] Stephen B. Brush, Indigenous Knowledge of Biological Resources and Intellectual Property Rights: The Role of Anthropology, *American Anthropologist,* New Series, Vol.95, No.3 (Sep., 1993), 653-671.

[17] Madhav Gadgil; P.R.Seshagiri Rao; G.Utkarsh; P.Pramod; Ashwini Chhatre; Members of the People's Biodiversity Initiative, New Meanings for Old Knowledge: The People's Biodiversity Registers Program, *Ecological Applications,* Vol.10, No.4 (Oct., 2000), 1307-1317.

[18] R.David Simpson; Roger A Sedjo and John W Reid, Valuing Biodiversity for Use in Pharmaceutical Research, *The Journal of Politicla Economy,* Vol.104, No.1 (Feb., 1996), 163-185.

companies had several options and the biodiversity based options were necessarily the most attractive ones. Lewis and Ramani (2003) feel that ICBG proposal in Peru was fair on account of communication, confidentiality and compensation. However, the issue of who all were the, 'authors' of the knowledge was controversial. They endorse the proposal of community rights in the national and international law.

Cochran (2005[19]) describes the ethical guidelines of the Yukon First Nation people from Alaska region. The Alaska Federation of Natives (AFN) requires that native people be advised about the purpose, goal, timeframe, data gathering technique, impact – positive and negative of the research; the informed consent of appropriate governing body. Fund the monitoring committee of the native people to track the research project and ensure the compliance, protect the sacred knowledge and cultural and intellectual property, hire and train native people in the study, use native language whenever English is the second language, ensure confidentiality, incorporate native people's view points, acknowledge local contribution, inform the community about the major findings and provide the copies for the local library. This, to me, is a neat summary of what the local communities aspire. We could benchmark our practices against this expectation and judge for ourselves as to how far have we reached.

However, as we know, no ethnobiology or ethnobotany conference has refused to accept a paper unless it follows the concepts of (a) PIC, (b) sharing of knowledge with the knowledge providers in the manner and language they understand before sharing it with third party, (c) not treating knowledge providers anonymously, (d) ensuring that any benefits generated by the knowledge are shared with the knowledge providers in fair and just manner and (e) the rights of individual experts vis-à-vis community are differentiated as per the local norms.

Part II

Healing strategies and ethical engagement with people's knowledge systems: way ahead

Herbal formulations developed by local communities involve not just the plants, or their derivatives but also a process, a perception, and sometimes a deep philosophy. It is true that in most of the cases when we do documentation, we often get information about plants, their uses and in some cases the methodology. There are also cases when the formulations are accompanied with some hymns or chants, essentially combining the material world with spiritual consciousness. The scientific evidence on the effect of prayers is not robust. Recent study led by Krucoff in July 16, 2005 issue of Lancet does not provide much support for the therapeutic effect of the prayers. Surely, it will not change our tendency to pray when either we or our dear ones are in pain. We cannot say the same thing about a herbal medicine. Prayer relaxes us and to that extent its effect is instantaneous. Herbal medicine needs to interact with our metabolic or physiological

[19] Patricia Longley Cochran, Ethical Guidelines for the Use of Traditional Knowledge in Research and Science *(Adapted from Traditional Knowledge Research* Guidelines— *Council of Yukon First Nations—http://www.cyfn.ca/index.html) Downloaded on 18th August 2005 from* http://www.ed.psu.edu/icik/2004Proceedings/section8-cochran.pdf.

pathways and demonstrate results compatible with expectations. More than 60 per cent people in India rely on herbal and alternative medicine for meeting their regular or occasional health needs. Even among the 40 per cent, the popularity of herbal medicine from different traditions (ayurveda, siddha, unani, homeopathic, etc.) is increasing. The story of Chinese medicine is well known. One in five persons in US is supposed to have used Chinese herbal medicine or food additives. The knowledge about the herbal medicine abounds in most developing countries. In last five years, NIF scouted about 51000 grassroots green innovations and traditional knowledge practices. More than 70 per cent deal with herbal knowledge for curing human, animal or plant diseases/pests or disorders. Formulations developed by people are often multi ingredient based. Scientists find it very difficult to deal with formulations having more than 3 or 4 ingredients. The limits of modern science therefore define the range of opportunities one can create for local knowledge holders. Most ethnobotanists have documented the knowledge governed by private, community or public domain. Often the scientists will document proprietary knowledge from individuals and/or communities and bring it in public domain without any possibility of reciprocity. Conferences like this have to raise fundamental question about ethics of such appropriation.

If we follow ethical practice and people voluntarily share their knowledge with mutual faith and respect, how can this knowledge become the basis of improving societal health.

There are five ways in which we can achieve the health objectives using herbal knowledge:

a. Large number of diseases in rural areas are water borne and therefore herbal substances that can purify water of various impurities and eliminate the chances of even viral diseases should be the top priority. We must recognize the social gain of such substances for safe, affordable, accessible and widely available solution to this persistent global problem.

b. In a study of about 8000 entries from our database, we found about 1000 remedies for pain and aches. Pick up any public health document and look for any reference to pains and aches. I doubt if we will find any. I myself did not realize it till my colleagues in NIF analysed the frequency distribution of disease wise herbal leads. When we look at the fact that large majority of poor people and their livelihood by essentially using labour and are not able to obtain sufficient nutrition for meeting their needs, it is understandable that they would suffer from certain deficiencies. In addition to these deficiencies, the inability to compensate the loss of energy may also add to the burden. Further, the physical drudgery involved in various activities takes toll of one's stamina. Pains and aches are also caused by the hazardous occupations. For working class, solutions to this problem which may be caused by a variety of reasons (ranging from excess fluorides to other deficiencies or sprains and other injuries). Various analgesics may have to be discovered to supplement the effect of aspirin which itself originated from plants.

c. Nutraceuticals seem to be the next major category of solutions that can lead to healthy communities at low costs and perhaps by strengthening preventive health care. One of the problems of the working class is that it ages faster. Nutraceuticals could help in extending the working life and therefore the wellbeing of the families of poor people.

d. The diarrohea, diabetes, jaundice, wound, malaria and many other tropical diseases are well known candidates for discovering herbal solution. The important concern should be to distinguish four kinds of ingredients in any herbal formulation: curative, carrier, bio enhancer, suppresser of side effects or stimulator of supporting/suppressing hormonal secretions. Unless we do careful analysis, we may bark the wrong tree. While National Cancer Institute of US screened 35000 plants and could isolate only seven leads, taxol being one of them, it does not mean that hit rate should be so low. One reason why scientists often fail in confirming the claims of local communities or individual healers is because of the basic difference in the protocol of extraction, delivery and dosage. There are many examples where healers find something effective and scientists fail to find appropriate results. The heuristics of validation also will have to be taken into account while developing solutions for various diseases.

e. The problems of women whose access to basic sanitation and hygiene facilities is severely restricted. Many problems occur because they don't take enough water lest they have to keep their bladder under control in situations where public toilets are often absent or available infrequently. There are large number of other institutional conditions which create stress and other problems for women. Millions of women have to carry water and other loads on their head and back, perform farm operations by using inappropriately designed tools, have to transplant paddy by keeping their feet under water attracting fungal infections. Why should not such problems be the priority for scholars and scientists?

Having identified five major areas which affect working class and their children and women, how would changing the ethical discourse provide a solution?

Part III

Towards solutions: Learning from Gandhi

Gandhiji was once asked by a group of young students as to what should they do for rural development. Gandhiji replied that he had never worked rural areas and therefore how could he answer this question. The students insisted, assuming that Gandhiji was being unnecessarily modest. After a while, Gandhiji relented. He said that while he lacks experience, he has a proposal to make. Assume that we have to work in a particular problem area, say livestock development, in a given group of villages. He described what he would do in such a situation. He will go to the

villages and look for the most efficient livestock producer whose animals produce maximum milk or other products. He will study from morning till evening all the practices of feeding, managing, watering, sanitation, hygiene and even psychological care of the animals. He will write them down. Then he will study the similar practices of the average livestock producer. The gap between the two will be his plan of work.

Can we follow Gandhiji's advice in using ethnobotanical knowledge for solving widespread global health problems of common people? Can we focus on identifying those members of the working class whose health is far superior to the rest, and study the entire set of strategies including herbal medicine that they use? Likewise, we could identify local experts who specialize in solving specific problems. After assuring them that the solutions will be used exactly as per their advice and with all the conditions they would impose in the PIC form, we pool the best practices and develop new products. There is no reason why our hit rate will not be higher and gains to all the partners in building herbal value chain not be commensurate with their expectation.

We should resolve in this conference a minimum protocol to be followed by all the ethnobotanists and health researchers. We should aim that by the next conference, the ethical barometer will show a much higher reading than is the case today. We should benchmark and aim that at least 50 per cent papers in the next conference will be based on this protocol. The key elements of this protocol discussed many times in past are:

a. Complete disclosure of the purpose of research, documentation or any other research interaction with the local communities/researchers.
b. Disclosure of the advantages and disadvantages of saying 'yes' or 'no' to different choices in local language (see annexure one on PIC note used by NIF and SRISTI).
c. Clarification about two stage PIC process so that benefit sharing in general may be discussed in stage one but specific elements of agreement may be discussed in stage two when something useful has been found out.
d. Clarification about the risks and chances in developing products through various stages and therefore moderating expectations, linking them with the milestone based performance indicators and assuring sharing of findings in the manner that can understand at each stage.
e. Respecting the identity of knowledge providers and publishing only those results which are authorized by the knowledge providers with their name and identity. Unless requested otherwise, knowledge providers will always be named either as knowledge provider or as knowledge holder or innovator.
f. The responsibility of taking permission of the community or informing it as the case may be, should be fulfilled without compromising. It should be understood that this process can take lot of time and trouble.

g. The benefits can be in monetary or non-monetary terms and can be targeted at individual or communities. A portfolio of incentives will have to be evolved for different situations. It cannot be same everywhere.
h. The ethical basis of knowledge exchange will need to be recalibrated from time to time so that the learning at the level of community or scholars is factored in the evolving ethical framework.
i. If the drug has to be patented, the patentee must take prior permission from the knowledge providers and disclose that moral and legal provisions of ethical knowledge exchange have been followed scrupulously.

There can be many more suggestions. Protocol can be modified, tested and improved. The plants which are endangered have to be conserved. It has to be recognized that medicines based on such plants can pose threat to the environment, particularly when such plants may also be endemic. The use of biotechnology or other such means to propagate such plants must be encouraged.

Health solutions are often developed by understanding the problem of disease, disability or disorder. I am proposing that we study health, wisdom and wellbeing. Very seldom, do we ask the question why are some people are more healthy than others. Let us learn from those knowledge rich, economically poor people who have solved problems through their own genius and have managed to survive sometimes sustainably and sometime precariously. It is the balance between holistic and reductionist vision which will help blend informal and formal science. We need both. Without reductionism, we cannot specialize. If a bone setter does not focus only on bone setting, he or she will never become an expert. We need general physicians but we also need experts. Holism is the context, the reductionism is the content. Without one, the other cannot sustain.

Let me conclude by suggesting that good ethics also makes good science. Only when people have trust in our intentions, they will share the cases where they fail in treating a problem or cases where they had remarkable results. Unless we get to learn the extreme values in the repertoire, we will not be able to dissect the problem in parts that make it comprehensible and also assimilable with modern science. Let us remember that health is not absence of sickness. It is a moral state in which we feel responsible and because we feel responsible, we have joy, and because we have joy, we are able to build relationships full of trust and respect with people who have as much right to enjoy the same state of happiness despite all the deprivations they suffer form.

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