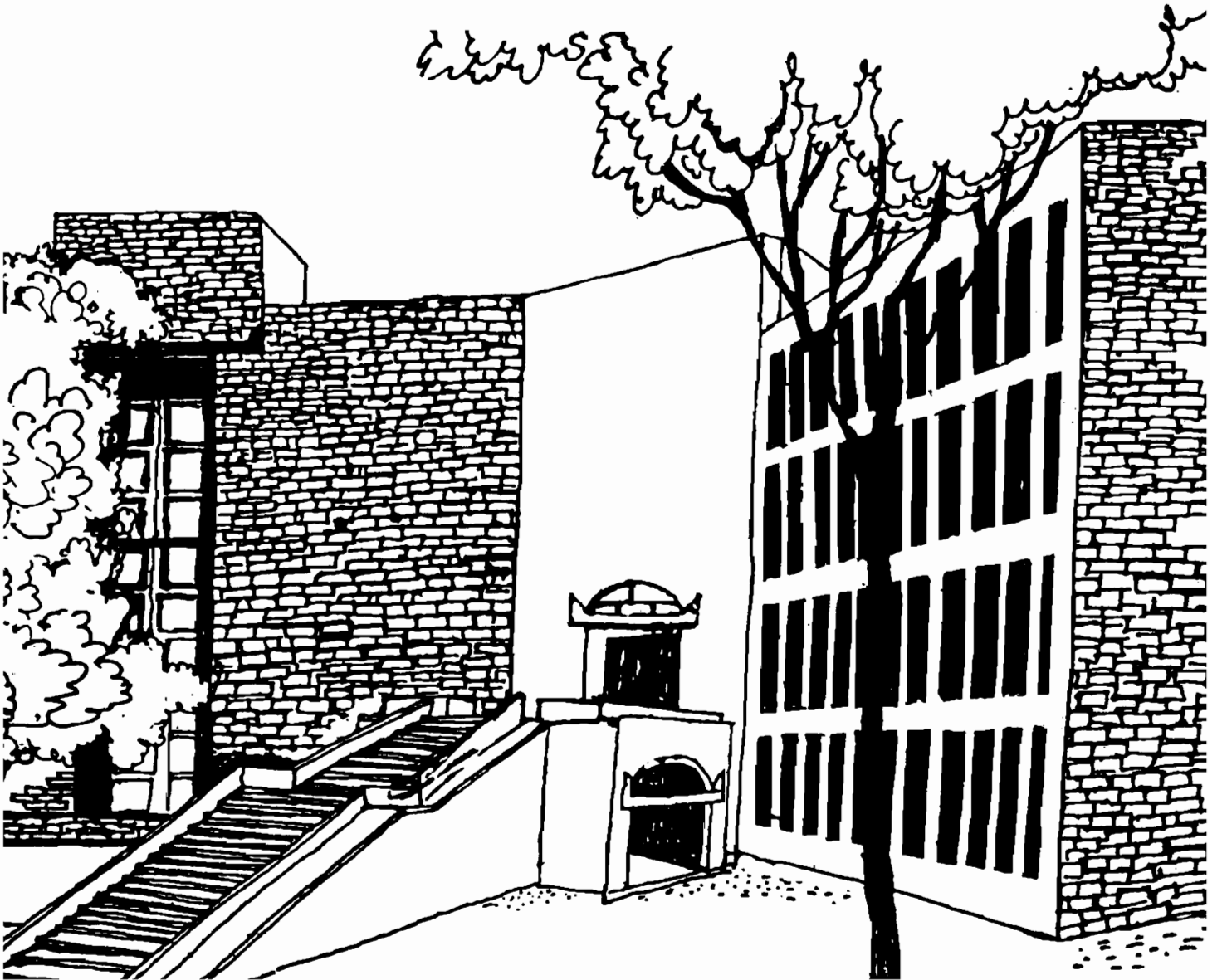




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Working Paper



WHY DOES POVERTY PERSIST IN REGIONS OF HIGH
BIODIVERSITY?: A CASE FOR INDIGENOUS PROPERTY
RIGHT SYSTEM¹

By

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WP938



WP
1991
(938)

W P No. 938

June, 1991

The main objective of the working paper series
of the IIMA is to help faculty members to test
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Why does poverty persist in regions of high biodiversity?
: a case for indigenous property right system¹

Anil K Gupta²

Abstract

The extent of rural poverty has been noted to be unusually high in the Vavilov centres of genetic diversity. Be it rice in Orissa, India or potato in Peru, the cultivator preserving genes for diversity are unable to benefit from newer technologies. The regions of specialized cultivation with mono crop or very low level of diversity and low risk conditions provide markets for mass consumption of external manufactured inputs. Paradoxically, this is possible precisely because genes for resistance to diseases/pests are available from high risk gene diverse environments.

In view of the recent upsurge of global interest in indigenous knowledge system, it is necessary to analyse ethical, scientific, political, economic, ecological and cultural implications of extraction of surplus from biodiverse regions.

Paper addresses following questions:

(a) What are the institutional, organizational and public administration aspects of high deprivation among people managing high biodiversity? (b) If biodiversity is sustained through cultural diversity, is 'modern' concept of state in a capitalistic society inherently unsuitable for cultural pluralism? (c) If cultural diversity implies different images of good life, how does one compensate a non-demanding, non-articulate but disadvantaged community maintaining biodiversity? (d) Should one do pedigree analysis of major commercial hybrids and other seeds, trace the sites of genetic sources and attribute proportionate profits to these communities/societies? Should insistence of intellectual property right by western society be accepted by developing countries so that claim for indigenous property rights (IPR) could be exercised? (e) In what forms and through which fiscal and organizational instruments, the compensations be routed back to the preservers of biodiversity? (f) How should public resource transfer and budgetary mechanisms be designed so that people living in biodiverse regions have incentives to stay on instead of migrating out? (g) If biodiversity in perhaps majority of niches can be maintained only through (and not without) human interference (selection pressure, cultural or ritual compulsions for different types of tasks/cultivars), how should conservation policies be designed in a culturally compatible manner? (h) What are the ethical dilemma that scientists working on IPRs face while earning individual career and professional rewards and doing advocacy for the communities whose lifestyles continually deteriorate in the meanwhile? (i) What are the legal possibilities for codifying claims of different communities over IPRs and value adding recombinations of genes preserved through IPRs.

The paper provides argument for changing the nature of discourse. The existing epistemology relies excessively on the language of such elites whose own record of sharing their rent with

1. Paper invited for the International conference on Property Rights and Genetic Resources sponsored by IUCN, UNEP and ACTS at Kenya, June 10-16, 1991.

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providers of knowledge is not very honourable? I argue that such a code of conduct should be developed which disqualifies such professionals/scientists from participating in the debate on IPRs who have not demonstrated some way of sharing rents with the providers of knowledge.

I believe that valid and authentic institutions for protecting IPRs will emerge only if the nature and arena of discourse is radically altered.

The paper is divided in six parts. In first part-1, I present discussion on diversity and deprivation. Part-2 deals with Cultural diversity and rise of modern bureaucratic state. In part 3, I describe ways of compensating local communities and individual farmers for preserving diversity through breeding, selection and institutional development. In part-4, legal, organizational and fiscal instruments for routing compensation for preservers of bio-diversity are detailed. Part- 5 includes arguments on the need for redefining Indian position on intellectual property rights. In part-6, the ethical dilemma in conducting discourse on bio-diversity are mentioned and paper is summed up in the end.

Diversity and Deprivation

Diversity in ecological endowment is much higher in high risk environments compared to the low risk environments. The variability in edaphic, climatic and resultant bio-mass complexity is high in drought-prone regions, hill areas, flood prone regions, cyclone prone regions and forest areas. The soil fertility, structure, sub-soil characteristics, and groundwater availability and quality vary a great deal at short distance in these regions. With the variability in the soil and climate it is obvious that the human choices with regard to technological possibilities also get modified.

People inhabiting the regions have enriched the variability through their own mobility. Either through pastoralism or through seasonal migration people have had to move to regions providing employment and subsistence. These movements provide opportunities for transmitting and/or embedding ideas, tools, seeds, practices from one region to another. The so-called rational and logical way of exploring nature and resource use does not permit apparently absurd experiments. If society were to survive only through logical organization of technology and institutions perhaps the civilisation would have become extinct long time ago. It is in art, culture, theatre, music and other folk idioms like proverbs, riddles, and adages that we learn about human ability to combine the opposites or the non-comparables.

The absurd experiments became possible when people tried things out of fun, adventure, carelessness or just plain mischief. Through cornucopia of such experiments emerged diversity which became available for selection by people - men, women and children, over time. Pursuit of oddity and search for means of survival, I have recently argued in portfolio theory of household survival provide some understanding of the resultant bio-diversity (Gupta 1981,1984, 1985, 1991).

It is impossible in high risk environments to survive by relying only on crop, livestock, trees, labour or craft activities. Within crop no one specie or variety of that specie can suffice given the variability in soil and climatic conditions. One needs crops and varieties which may be suitable if rains were early or too much or too little or too late. Diversity thus was inherent in the nature of endowment and human need for survival. Cattle mortality was higher in the dry periods while sheep mortality was higher in the rainy periods. Nature had provided for contra-variance among various biological systems to guarantee conditions of survival at certain level of demand.

The variation in demand of various resources is a function of monetised and non-monetised exchange relations mediated through markets, kinship networks or other systems of exchange. The cultural institutions generated an ethic for survival collectively rather than individually. Thus information about various edible and non-edible species, movements of wildlife and anti-dotes for various noxious plants and insects or niches for bee hives or other useful sources of nutrition was shared among social groups or kinship linkages. Emergence of variability in human capabilities to process this information was recognised always. Emergence of experts thus was inevitable. However, the expertise so generated was often premised on knowledge as a common property.

Culture, institutions and diversity: Emergence of common property institutions for resource management and knowledge management through cultural codes were two major steps taken by our forefathers that helped in linking diversity with collective survival. Recognizing the danger of too much reliance on utilitarian logic, moral boundaries were created around human wants and needs through cultural and religious mechanisms. The concepts of sacred groves, different deities in different 'auran lands' (the land left for

gods and goddesses) or mountain peaks were evolved to generate spheres or protocol of retribution in case of offense. Sometimes the characteristics of deities also provided clue to the nature of diversity in a particular mountain or forest range. For instance, certain plants or animals found in abundance in particular niche were also considered the favoured foot or abodes of these deities. The rituals were institutionalised to honour, preserve and in fact reproduce the diversity through various kinds of offerings of different grains, meats, or other provisions to these deities not only when alive but even when people died. In fact remnants of some of these offerings in the graves have been an important source of information about the nature of diversity in past. As if our forefathers knew that some day we would need that information for reconstructing the path through which we had evolved. Studies by national research council of USA on the less known plants have shown the potential that indigenous folk knowledge has for providing means of survival even in future.

Why has deprivation then been a consequence of this ethics of diversity inherent in high risk environments. Part of the answer lies in the nature of ecological endowments. And part in the economic and political institutions. To some extent even the learned behaviour through social approval contributes to this process.

Even if ecological explanation is considered a kind of ecological determinism, I do not think we should feel shy in acknowledging the limits nature imposed on our choices and often in our own interest. The second explanation could be that markets and states always found it difficult to deal with diversity. Standardised cropping patterns through centralised irrigation system made possible the extraction of rent in a bureaucratically administered manner. The possibility of collecting rent in kind so variable in taste, shape, use etc., that converting equivalence would become almost impossible or difficult would have been an enathema to any state- feudal or capitalist. The generation of exchange value as against use value was one means by which resources were transferred from high risk to low risk environments.

The learned helplessness may contribute to lack of protest by the disadvantaged people inhabiting bio-rich environments. The oppression of these people does not always make media headlines.

When persistent protest does not invoke popular sympathy or responsible response from the state, people realize the futility of protest. But not always. There are many bio-rich regions which pose continuous 'law and order' problems to the state. Many of these so called insurgency movements are actually protest against the destruction of their habitat. Some times declaration of certain forests as sanctuaries also leads to tensions with the people who either resided there or grazed their animals there or collected various forest products. We have argued elsewhere that diversity and human interactions are closely linked. Even on the issue of forest fires, there have been debates for last two hundred years but expert opinion seems in favour of allowing this practice to continue (Gupta and Ura, 1990). It is the market oriented interference in the forests and other such regions which causes destruction. And local people become part of it often only when other avenues of survival are exhausted or they find the resources being depleted regardless of their conservation efforts.

The rate of capital accumulation and nature of its investment and distribution depended upon the nature of institutions which were established to collect various kinds of tributes or taxes or reward services or loyalty to the state. People living in harsh environments have always been headstrong, obstinate and difficult to be tamed by any centralised authority. There are any number of examples when these people struggled but were tamed. Over a period of time they lost their ability to protest or became dependent for their survival on the mercies of the state.

The more able individuals particularly the males often migrated out in search of better opportunities and got assimilated in the culture of high growth- low risk environments. Some of these peoples were an important constituent of armies and thus provided institutionalised mechanism for showing their chivalry. However, those who were left behind realised that their knowledge of diverse resources and their skills of reproducing or maintaining this diversity were not in demand in the market place. Local festivals and rituals required certain types of variety and therefore some of these were maintained for cultural reasons. Sometimes the urban demand for some of the low productivity but better taste varieties also stimulated maintenance of some of these varieties. But mass production of uniform quality outputs amenable to centralised procurement, marketing and distribution or decentralised procurement but concentrated consumption. This implied that market would not support diversity as a commercially viable strategy.

Wherever market did support, for instance, the demand for French wine extracted out of grapes grown in specific patches of soil but having unique flavours in great demand by the urban consumers, the diversity was in fact perpetuated. It appears that slowly a demand for organically produced irregularly shaped but tasteful fruits and vegetables is also growing in the West. The tragedy is that in the tropical developing countries which caught on the development path rather late, the vision of the future is often moulded by the local elites in the model of western consumerism. The emergence of organic agriculture or preference for diversity is dismissed as an aberration rather than a pointer to a future trends. Thus the markets and state militate against diversity in farming systems or in forests. The diversity thus becomes a source of deprivation because the skills and resources are discounted by both-the markets and the state-in the process.

The organisations responsible for developing these backward high risk regions often find it difficult to develop procedures and norms for catering to demand for resources or credit for sustaining highly diversified portfolios of enterprises. Studies on banking systems in India have shown that banks in their anxiety to finance short-term low risk activities specialise their investment portfolios. This specialisation implies availability of easier finance for certain activities and lack of availability of finance for other activities. Given the shorter time frame even in the preferred activities the choice of technology is often capital intensive because of low rates of interest. On the other hand, people managing apparently high risk activities unable to borrow from banks either borrow from informal sources at high rate of interest or prefer to shift their portfolios towards labour intensive and responsive enterprises(Gupta 1986, 1988). The high growth rate of sheep, goat or local breed of cattle or cultivation and grazing in the marginal regions - all the activities employing labour intensively- provide illustration of such an strategy of survival through destruction of diversity and impairment of ecological balance.

The organisational strategies and preference for standardise bureaucratic systems in most developing countries may give a sense of control to the ruling elites but these also provide a setting for future catastrophe. In the contemporary history we find evidence of peasant protests generally in the cash crop growing uniformly endowed low bio-diversity regions. However, increasing instances of violence around grazing lands by the migrating pastoralists and emergence of fissiparous or separatist movements in the backward regions clearly indicate that future is going to be different.

The cultures in these regions withstood the loss of bio diversity but seems to be unwilling to suffer loss of cultural diversity. Many of them are realising now that the loss of cultural diversity was inevitable with the loss of bio-diversity.

Cultural diversity and rise of modern bureaucratic state

Few people have realised that bio-diversity was maintained in no small measure through cultural diversity. Not only thousands of gods and local dialects of different languages signify the cultural diversity but also a whole philosophy of life, nature, existence and co-existence of different claimants of natural resources living, dead or to be born. Insistence on common language or common culture often implied dominance of one social or ethnic group over another. Since democratically such a dominance was difficult to be organised, the coercion by state was an unavoidable instrument of ensuring compliance. Sometimes the cultural diversity was controlled by confining the stubborn cultures in clearly identified and enclosed regions. For example, the Indians in America or aborigines in Australia. Sometimes new states were created cutting across cultural boundaries such that same ethnic group got divided into population of different states, for instance, Bengalis in India and Bangladesh, Kurds in Middle East, Arabs in Maghreb or Saharawi regions or large number of states in Africa or Latin America. Celebration of five hundred years of Spanish Conquest in Latin America may be a matter of pride in Europe but is a matter of terrible shame, guilt and agony in the conquered countries. With rise in the power of unified state and the dominance of any particular group, the bio-diverse regions like forests also become the sanctuaries of rebels. The conservation of diversity has often been seen to be high in the regions where local populations is often unresponsive to state control. For instance, in Jhabua - a tribal region of Madhya Pradesh, Central India, one finds forests intact only in those pockets which had most ferocious and 'uncivilised' tribals. Similarly, in northern Burma and southern Nagaland the regions of high gurrilla activities are also the regions of high genetic diversity.

The paradox is that modern state would like to benefit from the knowledge of the deviant and non-submissive cultures but at the same time would use such educational system or developmental strategies which will make the survival of these cultures more and more difficult. Even if they are educated, they are taught to reduce their pride in their local folk practices or ethics of survival. The progress is defined according to the parameters on which they are rated as low. Once an inferiority complex is institutionalised, cultures can work towards their own destruction. Cutting forests or excessive exploitation of medicinal plants becomes completely defensible when social recognition, status and esteem are available mainly on the basis of accumulation of wealth, no matter how.

The professional developers belonging to whichever discipline have contributed to the contempt of the cultural pluralism while analysing it in an etic perspective. For instance, anthropologists and ethnobotanists would help in identifying useful plants which can provide greater vigour to the modern state and its instruments. However, very few ethnobotanists would ever ask for greater control of the local people over their knowledge and its products. There is a need for rethinking about the nature of state being created and recreated through the hegemony of international power politics. It is not in the interest of long-term survival of people in the developed part of the world, if cultural diversity and the consequent bio-diversity is curbed or annihilated through support by international superpowers or multinational corporations or even UN institutions. A good instance of United Nation's contribution to reduction of cultural pluralism is the method and approach used for developing national conservation strategies. Almost in every country these strategies were developed through bureaucratically organised expertise comprising people who often had shown no professional sensitivity to cultural pluralism. They had never communicated their work in local languages to the people from whom they had collected data for their analysis and growth of expertise. Even these strategies

were never discussed in the countries that I am aware of, among different political, cultural or religious groups. Very often expatriate consultants at an extraordinary cost indulged in polemic and rhetoric of the most banal kind. Even when some of these experts emphasised the need for pluralism they failed to build upon the work of native genius often unavailable in English language. This experience is true not only small countries like Bangladesh or Bhutan but also of large countries like India or may be Brazil.

Occasionally a genuine concern has been expressed about the need for cultural pluralism and growth of bio-diversity (McNeely, 1989). However, the development which "tends to destroy the only cultures that have proved able to thrive in these (forests, deserts and other isolated environments) environments" (McNeely, 1989:5); is made possible through an non-sustainable system of governance. For instance, I am not aware of any example where a project financed by UNDP has ever been discussed in local language with the people likely to be affected by the project. In fact the project document is often a classified document not available to indigenous people even in English, of course never in local language. The articulation of cultural pluralism through structures of the accountability which are seen to be responsive to the urges of the local cultures is necessary. United Nations organisations and particularly FAO with its very explicit bias in favour of agri-business has not learnt any lesson from the concerns expressed by IUCN. It is not enough for world conservation strategy to say that traditional communities, "often have profound and detailed knowledge of the ecosystems and species with which they are in contact and effective ways of ensuring they are used sustainably." The strategy should have tried to link the efforts of national governments to balance their books of accounts through borrowing or exports disregarding ecological balance. Neglect of biological resources of limited current value was inherent in such a 'new world order'.

The issue essentially is how the quality of life is defined in a given society and what methods are followed to ensure reasonable availability of good quality of life to most disadvantaged people. The cultural diversity also influences the concept of quality of life and attendant mechanism for achieving the same through various technologies and institutions.

Part-3

Compensating Local Communities and Individual Farmers for Preserving Diversity through Breeding, Selection and Institutional Development

It is not a paradox that the people who conserve biological diversity best are the ones whose expectations from life are minimal. It is not that they lack entrepreneurship or adventurism necessary for technological transformation of local ecological environment. But the range of disturbance which is permitted by the given culture to manipulate ecological parameters is well defined. There are traditions of leaving three rows of crop (known as Akkadi - one run of a drill) in the field for birds/animals etc.(Talwar,1991) Likewise first bearing of fruits in mangoes was forbidden for collection. Perhaps different norms of sharing have evolved as a part of bioethics. The sharing could be guided by at least three set of factors:

- (a) Whether the act of sharing is compensatory in nature (I have scared birds all this while, I have denied food to so many cattle trying to stray into my field etc.), or conciliatory (I have offended different gods using owls, other animals as their abodes, I need to have peace with nature, sacrificial (I must offer some thing I need most to placate god, nature force - prakriti - invite helpful insects/birds etc.);

or just conformity (to what others do, have no particular reason to deviate)...

- (b) Whether the sharing is a conscious effort to restore the ecological chair needs to be enquired into.
- (c) To what extent religion, culture and other collective institutions sanction such behaviour.

The ability to extract more but willingness to extract less than the permissible limit of resource use is guided by very strong cultural norms. How does one compensate the communities practicing shared and restrained use of resources.

It is being realised world over that the task of maintaining bio-diversity is not just a technical or a biological process. It also involves institutional development for enabling individual and community responses to the need for bio-diversity. Some of the alternative ways for compensating farmers and communities could be the following:

Alternative routes for Compensation

- (1) Valuing biological diversity of potential future use: It is always a difficult question as to how much value one should assign to a resource of which current value is either low or nil. Several common property resources suffered not only because institutions managing these resources were weakened over time. But also because the local perception of these resources often did not match with the external or governmental or global perception of these resources. The conventional norms, boundaries and institutions regarding common property resources must be respected. Recent fight in Canada between the state(Quebeck) and local Indians (Mohawks) is a case in point. The indigeneous population respected a particular region because it had graves of the important deities and respected people of the community. The local government authority wanted to make a golf course on this land - undoubtedly very rich in biological diversity. There are similar cases almost in every country. In India, government wanted to build a missile testing range in Balliapal in Orissa which finally had to be given up due to strong protest by local population. Silent valley project in Kerala, south India is another instance when government had to abandon a power project because the local people protested against deforestation of a rich and biodiverse tropical rain forest. It is often argued that development can not be achieved without a price. The issue is why this price should be paid always by the marginal populations in disadvantaged regions.

Two implications follow:

one) the conventional boundaries of common property resources were first violated during the colonial era in most developing countries. Even after independence the violations continued. The state control proved in many cases worse than the feudal control. Can these boundaries be reenacted to the extent possible? Can state allow local communities to evolve norms for governing these resources and renew their biological diversity? It is possible that the hegemony of local powerful people would assert itself. The answer to that would be setting up of environmental courts supported by jury comprising affected populations in greater number.

second) A royalty may be paid to the communities which conserve the most diverse CPRs through taxing the consumers of a specific nature. For instance, Ignacy Sachs (1989) suggested automatic financing at the level of one per hundred thousand of the world gross product (approximately 150 million dollars) to reach at the level of one per ten thousand ten years later. He observed that

"a maritime toll of US 30 cents per 10 thousand tons/mile of oil transported by sea would yield in 1988 156 million dollars, a toll of 1 dollar per 10 thousand tons/mile of oil products 146 million dollars, and another 17 million dollars could be raised with a US 10 cent fee for 10 thousand tons/mile of coal.

An air toll of 1 dollar per 10 thousand passengers/mile would yield 65 million dollars and a tax of 1 per thousand on the turnover of 31 thousand tourist agencies in the world US\$ 250 million" Owen (1987).

Juma (1989) feels that the logistics of tracking the global flow of germ plasm might make the process of compensation extremely complex. He suggests an 'incentive principle' of the kind recommended above under which farmers would be encouraged to conserve genetic resources and be rewarded for it financially. Farmers could be allowed to bargain for their varieties. He also feels that an alternative system could be to have a levy on global seed sales to be used for international fund to compensate farmers in their work. There are many other suggestions made drawing upon African experience by which the farmers rights can be protected.

In Peru examples have been found where local communities charge as much as 2000 US dollars per potato. They have an effective system of checking the outsiders at the exit points (Mario Tapia, 1991, Miguel A. Altieri). It has been observed that greatest genetic erosion has taken place in the low land regions near urban centres and markets in Latin America (Altieri, 1991). A cess on markets and municipal corporations could be an answer. In Maharashtra state in India a professional tax imposed in only one metropolitan city Bombay has enabled financing of a multi-crore Employment Guarantee Scheme in drought prone regions since 1972. Given political determination the compensatory taxes can be used to operationalise the concept of transfer pricing.

(2) Pricing traditional/indigenous knowledge having current commercial value.

Studies have shown that out of 119 pure chemical substances extracted from higher plants and used in medicine throughout the world, about 70 percent medicines were used for the same purpose as identified by the local communities (Farnsworth, 1986). The intellectual property of the people has been usurped by the multinational drug companies which spent about 4.5 billion dollars on research and development in 1985. Farnsworth (1986) estimates that in one drug (oncovin, velban) based on vincristine generated about 100 million dollars revenue of which about 88 percent was profit for the company, Lilly Research Laboratories (Svobada in Farnsworth, 1986). He regrets that more systematic effort were not being made to utilise indigenous knowledge about plant resources. He unfortunately does not make a case for sharing part of these profits with the communities.

McNeil and McNeil (1989) make a forceful case for appropriation of proper share for the social communities which have produced, maintained, and improvised various technological practices. They refer to provisions in the American Law under which such claims can be filed.

In another instance, Iltis (1986) shows that discovery of a wild tomato seed number 832 contributed to about 8 million dollars a year because of slight increase in the soluble solids. It costed US government about 21 dollar at 1961 prices to collect each specimen. While most ethnobotanist do not deliberate on the ways of sharing value earned out of local knowledge with the people, there are some exceptions like Saxena (1976), Bhandari (1977). Ehrenfeld (1986) on the contrary argues, "assigning value to that which we do not own and whose purpose we cannot understand except in the most superficial ways is the ultimate in presumptuous folly". He fears that by the time we finish assigning values to biological diversity, we may not have much diversity left. It is obvious that such a view would appear extremist. However, Ehrenfeld clarifies that what he is questioning is the economic value of bio-diversity. He observes

Value is an intrinsic part of diversity; it does not depend on the properties of the species in question, the uses to which particular species may or may not be put, or their alleged role in the balance of global ecosystems. For biological diversity, value is. Nothing more and nothing less. No cottage industry of expert evaluators is needed to assess this kind of value.

To him diversity must be protected through appeal to basic human values and faith in God or any other force that caused diversity to exist in the first place. On the other hand, Randall (1986) prefers a utilitarian account that extends beyond commercial goods to bio-diversity.

My contention is that locating the principles of accountability towards the unarticulated and disadvantaged communities engaged in conserving diversity, in the ethics of global responsibility is not worthwhile. The entire debate on TRIPS and farmers rights has brought out the hesitation that international capital has in paying any dues to the tropical developing countries that are responsible for conserving some of the most biologically diverse ecological sites. In a way passing on the resources to the elites in the metropolitan capitals may also not be of much help.

Regional Development Boards comprising the representatives of different interest groups might be able to work out viable democratic alternatives for sustainable management of bio diversity. In situ conservation will not be very effective in retaining genes that may not express in the insulated research station environment. Ex situ conservation through botanical gardens can be useful as a refuge of last resort and as Ashton (1986) observes: "a high-risk refuge, perhaps of no escape. The immediate role of botanical gardens in the ex situ culture of rare and endangered species lies in research and education rather than in conservation per se". Perhaps internationally generated resources can be used for funding establishment and management of botanical gardens in dispersed bio-rich locations.

Another way tried by NGOs and professionals from the universities could be organisation of farmers fairs which reward not the best samples or the specimens but the farmers who kept the widest diversity and knew most of the characteristics of what he or she had saved (Tapia *etal*, 1990; Franco, 1990; in Altieri, 1991). This strategy, the author contends, "may or may not promote reproduction or distribution of exhibited materials. Its basic aim is to stimulate farmers to keep diversity in their fields, hoping that incentives (such as public recognition, diplomas or tools for the farm) will make other farmers adopt or recover local varieties. Compared to the other three, this strategy is the one that needs less financial resources and demands less facilities. It is also the one that leaves most initi-

atives and decisions to farmers themselves. Its potential to promote living diversity is highest; however, its effectiveness may vary significantly according to the granted incentives" (Tapia et al 1990).

In 1956, in the 16th All India Cattle Fair, a committee comprising various former rulers of princely states in India and chaired by Union Minister for Agriculture, prizes were given for best bull and cow of different breeds found in various regions. Such fairs unfortunately became less important with the onset of 'Operation Flood' and other such internationally funded dairy programmes. The focus got shifted from preservation and improvement of local breeds to large scale cross breeding. The results are well known. Thus there is a need for EEC and other international agencies funding programmes like Operation Flood that they insist that a significant energy and resources are spent on building upon local knowledge about bio diversity.

- (3) There is a clear trade-off in maintenance of genetic diversity through grass root level efforts and through global or international research centres in collaboration with multinational companies or otherwise. Altieri cites example of Columbian NGOs who were concerned after being informed by a CIAT researcher that it was abandoning work on bean varieties destined for marginal conditions (Diaz in Altieri, 1991). However, the cost and management aspects of decentralised grass root conservation centres either in the form of botanical gardens mentioned above or as informal research centres have to be carefully looked into. There will be a definite harm done to the cause of maintaining bio-diversity if state and corporate sector disown its responsibility because the NGOs are supposed to be engaged in the task. The danger becomes all the more serious if these NGOs are large and funded by international agencies without any explicit accountability to local communities. In South Asian context, it is not uncommon to find large NGOs which are as inefficient in resource use as perhaps some of the state organisations may be. Also the programmatic preferences of NGOs keep changing with the preferences of the donor agencies. Obviously, a long term commitment to conserving bio-diversity is unlikely to emerge in such NGOs.
- (4) There is a view that farmers rights should not be considered as an intellectual property system. Instead farmers should be compensated for the work that they do for the conservation and breeding of various species (Altieri, 1991). The problem with this view is that the task involved becomes a very diffuse category so much so that it involves almost all aspects of survival. Accordingly the demands for farmers rights would incorporate the political economic aspect of the very governance by any state. It is possible that the farmers who do not maintain diversity because they produce high yielding varieties ask for compensation at par with those who do because they may claim that the lack of diversity at their farms is a consequence of conscious decisions by the state. Once the boundary of claimants is expanded, every individual or collective claim becomes weak. We do not wish this to happen. Accordingly, the intellectual property of the peasants, pastoralists, horticulturalists, fishermen and women etc., would need to be properly recognised and honoured. The fact that diversity and economic backwardness co-vary, what one is demanding through this argument for farmers rights is a new criterion for allocating fiscal and other physical resources to high risk low employment and low income regions from national and international agencies. The only difference is that only those communities are sought to be compensated which have maintained diversity despite all odds. Two problems may arise in operationalising such a system of compensation: a) isolation of human contribution to maintenance of diversity from the ecological contribution may not always be easy. There may be some sights inherently more diverse and not amenable to

uniformity in biological endowment. The human contribution in such a case is that of refining and value adding to the existing base of diversity; Also by generating an ethic which advises stay in those disadvantaged regions having the burial grounds or cremation sites of their elders, rather than migrating away, people may have contributed to the diversity. b) the institutions for maintaining diversity may be dominated by the local power lords. Routing compensation through them may make the marginal population even more marginalised.

There are no easy answers. However, we have come across cases where individuals have decided to go against the current and use methods of farming or resource management which aid bio-diversity. For instance, Haribhai in Baglu village of Junagadh district, Gujarat, Western India, decided seven years ago to stop total application of pesticides in his fields. He observed very closely the relationship between birds, toxicity in the pests killed by the pesticide and eaten by the birds with the disastrous consequences. The non-violent ethic generated by his religious beliefs further created dilemma in his mind. To his pleasant surprise he found that his yields were as good or in fact better than the neighbouring farmers who used pesticides. In addition, he had a larger variety of insects and pests, birds, frogs, earthworms, etc. in his field than any other field in the village. He didn't do it to maintain or enhance bio-diversity. He did not claim any special price for his product unlike organic farmers of western countries. When we met him and asked about his motivations, it was obvious that his religious and cultural beliefs seemed to have played a greater role in his decision to pursue organic farming than any so called rational economic considerations. He did acknowledge, however, that his cost of cultivation was much lesser than the rest.

How do we compensate carriers of bio-ethics of this kind. Do we compensate them by according social esteem and providing opportunities for further experimentation? Or do we price this ethics at all?

My suggestion is that we need to use four kinds of incentives i.e. material and non-material and specific and non-specific vis-a-vis a community of farmers or an individual. A material - specific incentive is like royalty payment or patent fee. Material non-specific incentives refer to resource transfer for institution development favouring maintenance of bio-diversity. The debt swap and special concessionary finance for investment in backward regions may also help. Non-material specific incentives include honours, awards, media coverage, special privileges etc., to specific communities or individuals. Non-material non-specific incentives refer to the privileged access of the countries doing most to preserve bio-diversity in-situ conditions to the genetic resources of other countries.

In the above case it will be useful to honour Haribhai and give him due acknowledgement while pursuing research programme on non-chemical based pest control. He should also be given opportunity to visit other farmers in different parts of the world pursuing similar goals. As far as the religious and cultural ethics is concerned, tolerance and appreciation for such values may be the major means of positive reinforcement. It will be improper to suggest that any one religion can only generate such an ethic.

Part-4

Legal, Organizational and Fiscal Instruments for routing compensation for preservers of bio-diversity

The estimates of the value of drugs derived from plants found in tropical rain forests in developing world have ranged from dollar 43 billion to 1468 billion per year (McNeil & McNeil, 1989).

Legal Framework:

The legal arguments about bio-diversity being a common heritage and possibility of value addition only after making huge investments in education, equipment, research, infrastructure, testing of products etc., have been derived from Locke's (1690) theory of ownership. McNeil & McNeil (1989) further add that community's own investment in developing indigenous knowledge is quite large. They suggest that asymmetric transactions "may sometimes be sufficiently one sided as to be immoral or illegal or both". They refer to the international Bill of Human Rights, Article 27 of which says, "everyone has the right to the protection of the moral and material interests resulting from any scientific, literary or artistic production of which one is the author". The American Convention on Human Rights (Williams, 1981) signed but not ratified by the United States says in Article 21, "no one shall be deprived of his property except upon payment of just compensation". The property law, contract law and tort law, McNeil & McNeil observed should be applied to protect the intellectual or tangible property. Transfer of benefits ought to be set aside if unilateral mistake is established and recovery based on fraud or misrepresentation is established.

The authors after citing various property theories observe

Information which was derived by a group after generations of experience; treated by the group as important, essential, or perhaps even sacred; and useful to the group in meeting the demands of their environment would reasonably fit within the trade secret definition (McNeil & McNeil, 1989:33).

While referring to the case of constructive trust, they observe (1989:34)

This also might provide a theory of recovery, since the money acquired by the wrongdoer's actions might be seen as the product of improperly taking advantage of indigenous people "incompetent" to transact business beyond the confines of their culture.

Our conclusion is that many immoral and illegal transactions may have occurred and that the original owners of cultural information may have a just and legal claim for compensation. Perhaps more important, we need to search for new and modified institutions which will reduce the likelihood and severity of future unjust transactions and provide for a more fair distribution of wealth generated.

Kloppenburg (1988) prefers a multilateral approach over market oriented competitive approach for third world countries to claim compensation for their genetic wealth. He prefers this because he fears that a market approach would generate competition among the third world countries and isolate them rather than encouraging a collaborative effort. He suggests a FAO managed International Plant Gene Fund that would "support plant genetic conservation, construction of gene banks, and the training of plant breeders in the

third world'. Money to this fund was to be paid by the advanced industrial nations which have free access to the international germ plasm banks. Size of this payment was to be determined by the "size of the national seed industry, value of the national agricultural production, and frequency and size of drafts upon the FAO's global gene bank".

Organizational structure:

While I agree with the spirit of Kloppenburg's suggestions, I have less faith in some of the multilateral UN institutions. Not only their establishment cost is extremely high but also they are often less cost effective in undertaking various training and other support functions. For instance India has trained manpower in most of the relevant fields and can provide support to most third world countries at costs which would be fraction of what it would be if FAO did the same functions. However, political interests of some of the super powers may not accommodate the idea of India or other such countries providing such a support. This contradiction becomes apparent also when one looks at the conduct of International centres of agricultural research. My preference therefore is for a multilateral institution with a low cost profile, small size and very clear ethical and professional norm of accountability to be set up in collaboration with FAO, IUCN and third world institutions. The professionals from the western countries like Kloppenburg, Warren, Paul Richards, McNeil, Wilson, Farnsworth, McNeely, Ashton, Altieri, Mollinson etc., can be involved in the structure of governance. Third World centres of expertise like ACTS(Kenya), NBPGR(India), IIM-A etc., can also be involved. The FAO, IUCN and CGIAR would need to support it through existing institutional channels. A consortium of legal experts will have to be formed to provide legal advice for TRIPS and GATT negotiations such that the issue of farmers' rights does not get obfuscated again as in past.

I agree with the suggestion of McNeil and McNeil(1989) that international aid agencies have also to do a lot of homework to modify their sensitivities on the subject. Perhaps this modification will not take place unless pressure on these agencies is increased. One way to increase this pressure would be to perform social and ethical audit of these agencies from the point of view of protection of intellectual property, biodiversity and farmers rights.

There is also a need for global network of activists, professionals and NGOs engaged in preservation, development and enhancement of biodiversity. Organizations like International Work Group For Indigenous Affairs (Denmark) should be involved in the discussion. They have rightly pointed out in the context of the wild life issues that many times the restrictions which are put on commercial loggers and users of forest resources are imposed on the native forest residents too. Cutting a tree for their livelihood or killing an animal for their subsistence becomes a crime. At the same time state claims inability to provide them basic necessities at the places where they live and at the price which they can afford. Thus new sources of subsistence are not added while old sources are denied. In any cases much of the diversity, domestication and development of the natural reserves in past was done by these very native people. Organizationally, IWGIA has provided them a voice which other international organizations have failed to do so far. IWGIA does not accord as much attention perhaps for good reason to biodiversity related issues as may be necessary. Once they are involved, they may do it.

It is true, as I said earlier, that many national governments are no more sympathetic to the interests of the disadvantaged people living in the bio-rich but poverty ridden regions than the international development organizations. Swiss constitution perhaps is an exception that it provided for its aid to reach the poorest in the host countries. In actual practice it may not happen in many cases but certainly such provisions do help. Routing resources for bio-conservation through national government in many cases will be necessary despite these limitations. But local committees and structures can be created to ensure

proper accountability of the concerned public institutions. Any organization (public, private or non governmental) must share its balance sheet with the people for whom the resources are being received. It is not enough to compensate people in the developing world for their contribution in past. It is also necessary to protect their experimental ethic and cultural and technological skill of nurturing bio-diversities.

Part- 5

Intellectual Property Rights and need for Redefining Indian Position

Indian Patent Law has reflected Indian variety of patriotism with its usual contradictions. For instance, import of wheat has always been considered a blow to our dignity, but import of edible oil and milk powder did not bruise our ego. Even though the specific laws are yet to be enacted in India to deal with the peculiarities of bio-technology, the December, 1990 issue of Bio-technology and Development Monitor (NR.5) published by Ministry of Foreign Affairs, The Hague and The University of Amsterdam, The Netherlands has summarized the Indian case given below very precisely.

India's patent system has been much criticized by the developed countries because of Indian refusal to accede to Paris Convention and become a member of UPOV (The international convention for the protection of new varieties of plants).

Under Indian patent law, 'the methods of agriculture or horticulture' and 'processes for the treatment of plants to render them free of disease or to increase their economic value or that of their products' are excluded in the Patents Act. Even though there is no explicit exclusion of animal or plant varieties or other biotechnological products, the patenting appears doubtful.

In the food, pharmaceutical and chemical sectors, only processes are patentable. The products are excluded.

The duration of Indian Patent is relatively short, i.e 14 years compared to 17 to 20 years in industrially advanced countries.

The conditions for granting compulsory licence are considered too broad.

The Indian Patent Law permits granting of 'automatic licence of right' in food, pharmaceuticals and chemical sectors.

The Indo-US science and technology initiative in force in 1982 has been postponed twice. In October 1988, 'an agreement was signed to extend the initiative, after India agreed to start bilateral discussions on Intellectual Property Protection(IPP). Since May 1989, India was placed on American 'priority watch list' following 'special 301 provision of the US Omnibus Trade and Competitiveness Act of 1988'. Although most 'priority' countries have been removed to the less critical watch list, India was placed on the Priority Watch List for the second time in 1990.

India has consistently refused to deal with IPP under GATT and instead preferred discussion on this issue in World Intellectual Property Organization (WIPO). It has opposed the attempt of US and European community to harmonize patent laws all over the world. Brazil is the only other country among relatively developed low income countries which shares India's concerns. The ASSOCHAM

suggests that the Indian government should sign the Paris Convention and standardize the life Indian Patents for all substances to 14 years.

On the other hand, organizations like Indian Drug Manufacture Association (IDMA) and the Punjab, Haryana and Delhi Chamber of Commerce and Industry urge the government not to change the patent system lest it gives a blow to Indian pharmaceutical industry. It may be mentioned that more than 60 per cent of the drugs marketed in India have been found to be non-essential and in many cases redundant for the purpose for which they are marketed.

Government of India had set up a National Working Group on Patent Laws in 1988. This working group argues that Indian Patent Law has served the Indian interests very well. This group intends to keep bio-technology outside the purview of Patent Law.

The debate on the germ plasm conservation between IBPGR (dominated by the Europe and USA), and FAO sponsored Plant Breeders Right has at long last accepted the concept of farmers' rights although the precise mechanism of enforcing these rights have not been spelt out. Although some of the alternative ways have already been reviewed in this paper.

The Breeders Right in Europe are being extended in such a manner that in future any company will be prevented even from incorporating a small part of the patented germ-plasm. The EEC directive on patenting of life form "seeks to end both these exemptions. Article 12 of the directive seeks to extend patent protection to the product initially obtained by the patented process, but also the identical or differentiated products of the first or subsequent generations obtained therefrom. Similarly Article 13 stipulates that the patent would be applicable to all products in which genetic information pertaining to patented product has been incorporated" (Economic Times, Feb 13, 1990). The small European companies would find it difficult to compete with large European and American Seed Companies. In a conflict of this kind both the large and the small Indian seed companies might suffer. It is a case where India and other developing countries may find allies in the small European seed companies.

Unless India Patents the germplasm available in India and provides a similar facility to other developing countries there is no way the Indian seed companies and R & D institutions can withstand the onslaught of western multinationals. Indian position, I argue, should be to respect the patents and simultaneously apply IPP to all the wild and domesticated plant and animal resources. India must insist that all seed companies using genes from the parents collected from India directly or through CG Centres (Consultative Group on International Agriculture Research) pay royalty to India and other developing countries as the case may be. The argument that land races i.e. varieties and breeds selected by the farmers are a 'common heritage' of man kind will not then wash. Indian subsidiaries of large seed multinationals might be able to transmit germplasm or part of it to the parent companies without any hindrance under the present laws. Unlike the repatriation of the profits, the repatriation of germplasm or genes was far more easier. However, thanks to the efforts of the scientists like Dr Lalji Singh, India is perhaps the only developing country which has entirely indigenous technology on DNA fingerprinting. It is possible thus to trace the transfer of genes illegitimately from one country to another. India can extend this expertise to most other countries and international agencies can help defray this cost.

India like many other tropical countries has a very high genetic diversity. In collaboration with the countries like Bhutan, Nepal, China and some other African countries, India can insist on a very major income transfer from the European and Western Seed compa-

nies to the developing countries. At the same time, the returns to research on this subject would improve and Indian companies in private and public sector may be able to compete with the best in the world.

I suggest that Indian Government revises its policy on the Law of Patent as it applies to Bio-technology and germplasm if we have to harness the comparative advantage we have in our natural endowment of genetic diversity and institutional capacity of building upon this knowledge.

The argument of drug companies that most of them would not be able to stand the competition with the MNCs is valid. It is also true that the price of many essential drugs would increase if the same had to be imported or made by the subsidiaries of the MNCs. But in a way it will be good. Ayurvedic and other alternative therapy systems will get a chance to survive. It is a pity that a very small fraction of national resources is spent on research on these systems with in developing countries. This is the case when more than eighty percent of the human and about ninety percent of animal health is still guided predominantly by the indigenous health system. It is not without significance that

Part-6

Ethical dilemma in conducting discourse on bio-diversity

Very often public spirited professionals face a paradoxical situation while advocating on behalf of the disadvantaged communities. They have to seek support from the agencies whose policies they do not approve of. In my view there is no way one can avoid this issue. My personal belief is that the rules of the game should not be different for the academic professionals and other interest groups. However, in some cases one cannot insist on complete agreement before deciding to work with a particular organization. Some of the normative principles which may guide one's choices are :

- a) The data and its possible uses after compilation must be shared with the communities or the individuals from whom data on bio-diversity was collected.
- b) One should follow the same norms of acknowledgment of intellectual properties as one follows while dealing with the oral or written works of professional colleagues. In a recent newsletter viz: Honeybee, I have followed this principle. It will call for communication in local language.
- c) The organization from which one seeks support should be persuaded to accept the concept of cultural and institutional context of indigenous knowledge system.
- d) Wherever difference of opinions exist the same should be made explicit.
- e) If a professional gets an award, honour or remuneration by working on the indigenous knowledge systems, a share of the same should be made available in the direct monetary form to the providers of knowledge. Or a proportionate time out of one's personal quota should be spent in advocating on behalf of the indigenous people and their rights.

The nature of intellectual discourse should be such that the espoused and in-use values do not diverge too much.

There is no justification for distinguishing the theory and the praxis completely. It has to be admitted that the professional strength for pursuing a case steadfastly cannot be achieved without sharing spiritual and cultural concerns of the people who have main-

tained bio-diversity forgoing some of the privileges to which we are accustomed.

In each developing country traditions exist about indigenous thinking on the subject. In India ancient texts like Vriksha Ayurveda, Krisi Parasar (Majumdar, 1925), 'Gospel of Dirty Hand ' (Munshi, 1950), Indian Science and technology in eighteenth century (Dharmapal, 1972), indigenous animal husbandary knowledge (Verma and Singh 1969) etc., are some of the early references. If the conservation ethic has to be revived, there is no escape from building upon these traditions in each country. Any other approach will be non institutional and even unethical. Many well meaning scholars commit this mistake not realizing how cultural memory(ignored for long) erupts like a volcano at certain critical moments in history and wipes away all the false edifices.

Summing up

Several modern technologies including DNA fingerprinting, recombinant DNA, tissue culture etc., have generated a false hope that genetic diversity can be preserved entirely by laboratory methods. I do not share this optimism. In my view bio-diversity is not a static concept. People living in bio-rich and economically poor environment keep on making selections of one kind or the other to enrich the given diversity. Therefore the need for institutional mechanisms that safeguard the ability of these people to continue the process of enriching bio-diversity. Given the fact that most of the poor people in these environments have to out migrate seasonally or permanently to cities or other high growth rural regions proves that most countries do not value bio-diversity properly. In view of the unequal terms of exchange and misguided tariff and taxes policies, most developing countries have a very precarious balance of payment position. They are dependent upon developed countries. Elite in developing countries aspire for the same life style that their counter parts in developed countries use. The policy planning system is often manned by the same elite. Thus it is not going to be an easy task to reorganize institutional and policy framework to sustain bio-diversity.

At the same time there is a global concern that something has to be done to prevent very fast loss of genetic diversity. I have argued in this paper that the persistence of poverty in the bio-rich regions is not accidental. It clearly shows the low value that various national and international bodies place on the efforts made by local people in producing and reproducing this biodiversity. This is not a technical problem alone. It affects the whole political economy or political ecology of generating wealth through agri-business approach of standardization in agriculture.

Sustainability of this approach is being questioned even in the developed world(see recent report of National Research Council of Us on Alternative Agriculture). But most of the developing countries have still to realize the value of what they possess. It is not being sufficiently realized that the genes for disease resistance, stability and survival in harsh environment are available only in tropical, Himalayan and Andean environment. If global climatic changes are likely to be even half as serious as these are being made out to be, the skills of reproducing biodiversity under harsh conditions are going to be in great demand. I would not be surprised if the pastoralists , forest people and the mountain communities become the dominant cultures. But the global efforts do not have to wait that inevitable eventuality.

In a recent issue of newsletter viz: Honey Bee aimed at documenting indigenous knowledge of survival through local technical innovations, I have suggested two lessons we ought to learn from the behaviour of Honey Bee. First that Honey bee does not impoverish the flowers while picking pollen from them. Secondly it does connect one flower with another through pollination. I am not sure that the academics participating in the discourse on biodiversity take care of these concerns. Do we extract knowledge of people (as ethnobotanists do) without ensuring that they

do not become poorer because of not inspite of this extraction. Further, do we link one group of people with another ?

Once we have found a satisfactory way of conducting discourse on biodiversity, I think we would have also discovered a way of operationalising our concerns through grass roots oriented action plans.

The disadvantaged communities have become a source of cheap 'unskilled' labour for infrastructural projects. National Commission on development of Backward Areas (Palnning Commission, Government of India, 1981) in fact went to the extent of cautioning against too much effort in stemming migration from the backward regions, lest the supply of cheap labour is affected adversely. Such a perspective is at the root of the problem.

During a very severe drought in 1987, about 20 lakh cattle and their rearers were in the cattle camps of varying quality. Even though an effort was made to catalogue the good breeding bulls at our insistence (Gupta nad Kumar, 1987) nothing much came of it. Africa is under the spell of another drought. How many more land races would vanish because the people are too poor to maintain the seeds or save the pastures, only time will tell.

Unless the discussion on maintainance of property rights about genetic resources includes the stakes of the communities (farmers, labourers, fishermen, pastoralists, hunters and gatherers etc.), I do not know if we would be able to even conceptualise the design of proper institutional mechanisms.

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