

CHAPTER: 1

CONCEPTUAL AND THEORITICAL FRAMEWORK

In this chapter a conceptual framework is developed to understand the response pattern under different temporal, environmental and socio-economic conditions vis-à-vis the timber trade. Generally, timber trade has suffered a marked loss of social credibility. While timber traders, perhaps justifiably, take credit for being the backbone of the infrastructural and

developmental activities, they are accused of causing a host of environment related socio-political problems and of being insensitive to socio-environmental needs. Considerable pressure is put upon the timber traders to improve their socio-environmental accountability. The judiciary and the legislature have exerted pressure upon the timber traders for compliance of laws and policies. The type of issues that the timber traders should tackle and the adequacy of their responses have spawned new issues relating to timber trading not only in India but across the world. However a relative lack of development of a conceptual and theoretical frame work has hampered a systematic study of timber trade and the environmental issues that lead to its success and failure and to respond the societal problems.

THE FRAME

Evaluation of any trade and its performance must be on societal and temporal frame. Action or performance of trade becomes relevant only in context of time, societal demands, and state of the environment and conduct of the trading involved. Some activity may be considered socially relevant at one time under a particular set of circumstances and socially and environmentally detrimental at another time. The 1894 Forest Policy considered timber trading to the prime source of revenue earning but under the 1988 Forest Policy indiscriminate timber trading is considered to be one of the prime causes of climate change and environmental degradation. Thus the time frame and the socio-political environment cannot ignore while discussing any trade or business.

THE FOCUS

In order to achieve a meaningful result there must be terminological and conceptual clarity. The present research looks to the legal framework for timber trade in India. Timber¹² here means, wood, wood-product, or log etc. The framework of this research work temporally fits in the time frame of 1980s to 2014 and the contemporary socio-environmental conditions. It does not emphasize any specific or particular social situations or problem and the timber

¹² Timber means wood, tree, log, wood suitable for building or carpentry, wood products, furniture fashioned out of wood

trade is not assessed in the context of any particular activity. It merely looks at the control and regulation of the trade in the backdrop of resulting deforestation. This approach will enable development of a logical and acceptable canvas for discussion.

TIMBER TRADE AND CONFLICT OF SOCIETAL INTEREST

Trading, ordinarily, is subject to two kinds of social forces: market and non-market. In order to meet the market demands the trade adapts itself to various factors like product demands, service promotion, pricing, consumer expectations, profit and growth etc. All these actions have some non-market social costs such as environmental degradation, unbridled pollution etc. These are the costs that are borne by the society as a whole. Now a social pressure is built up on the trade to minimize these costs and assume greater social responsibility for correcting the negative fallout of the trade¹³.

The response to the non market forces to mitigate the cost, commonly known as social responsibility and social responsiveness, are matters of concern. Trading is an integral part of social life and society is dependent on trade for its existence, continuity and growth. Thus both must strive to achieve to bring their respective goals in congruence. Trade, however, depends on its social acceptance even though the gaps between their respective goals are perpetual. If the gap widens the trade loses its sustainability and social credibility. Its survival becomes threatened as is now happening with timber trade. It is time for the timber traders to narrow the gap with the society and maintain maximum discretionary control over its internal decision making process and external dealings. The core of the controversy lies in the tension between market demands, factors of trading and the cost that is borne by the society.

The behavior in response to the market forces or legal constrains may be termed social obligation. The criteria of legitimacy in the area of social responsibility and social obligation are both economic and legal. This is met by the timber industry by taking some affirmative actions through the process of afforestation on private land holdings and also by contributing towards regeneration of forest and thus becoming socially more acceptable.

Economics and law impacts upon the, competition for resources and procurement of raw materials. The conflict lies in the timber industry trying to free themselves from economic and legal discipline Imposed upon them. Norms in a social system are developed from a

¹³ S. Prakash Sethi, Conceptual Framework For Environmental Analysis of Social Issues and Evaluation of Business response Patterns, Academy of Management Review, 1979, Vol-4, No. 1, Pages 63-74

voluntary consensus among various stake holders like the policy makers, law makers, judiciary, consumer, conservator and the civil society. Under these circumstances law tends to codify socially acceptable norms of trading that seldom lead to social change. These laws rarely operate as instrument of social change or social engineering¹⁴.

Despite the law and the policy framework, the timber industry fails to meet social expectations. Challenge lies in bringing the timber trade up to a level where it is in parity with currently prevailing social expectations, norms and values. Not aggressive, radical departure from the normal corporate activities. All that is needed is rational responsiveness to the justified demands of the society. Examples of such response are afforestation, prevention of illegal logging, stopping of illegal transit of timber etc. This also determines the long term goal of timber industry. This defining the long term role and goal of the industry is its social responsiveness. The timber industry is also expected to anticipate the changes that are in the offing and how they will impact upon its current activities¹⁵.

THE ROLE OF THE EUROPEAN STATES

The genesis of exploitation and vandalization of the forest has a deep root in history and can be traced to the period where the western world especially the European Nations started venturing into the unknown land masses occupied by the indigenous and aboriginal people. With the drive for colonization, European states indulged in relentless pursuit of occupying and capturing indigenous land which they justified through developing various doctrines, principles and other rationale such as the white man's burden. The motive behind colonization was discovered new markets and raw materials for satisfying the needs and comforts of the western world. As a result the forests fell victim to European machination.

DOCTRINE OF CONQUEST:

This denoted acquisition of sovereignty over a territory through the use of arms and vanquishing the native power that be in existence. Thus the territory so acquired became a part of the conquerors empire.

¹⁴ Ibid
¹⁵ Ibid

It emerges as an example of the White Man's Burden to civilize the non-Christian non-white. In 1452 Pope Nicolas V issued a Bull "Romanus Pontifex" declaring war against all non-Christians throughout the world and specifically sanctioning and promoting the conquest, colonization and exploitation of non-Christian nations and their territories. This Papal Bull permitted Portugal to claim and conquer land in West Africa. The various theological and legal doctrines formulated during and after the crusade considered the non-Christians and non white's enemies of catholic faith and less than human. In the Bull Romanus Pontifex in 1452 Pope Nicolas V directed King Alfonso to "capture, vanquish, subdue the pagans and the enemies of Christ and to put them into perpetual slavery and take all their possessions and property". This forms the basis of human trafficking as slaves and expansion of European dominion by 'discovering' other nations.

Later Pope Alexander VI issued another Papal Bull "Inter Cetera" dated 3rd may 1493 in which he granted the request of Ferdinand and Isabella of Spain the right to conquer land. On protest of Portugal another Papal Bull was issued on 4th may 1493 that Spain shall not establish dominion over any land which had already been captured by any Christian Lord. This clearly demonstrates the vendalization of forest and aboriginal land by the European Nations under the guise of White Man's Burden. It is a general rule that the conquered must be subjugated to the law of the conqueror and thus began the exploitation of forest. The interpretation of doctrine of conquest was outlined by the permanent court of international justice in the status of Eastern Greenland case¹⁶. According to decision the doctrine of conquest operates as a cause of lack of sovereignty when there is a war between two states and the conqueror state establishes sovereignty. Exploitation of forest therefore becomes an incidental .consequence of the conquest where the conqueror does not develop any attachment to the conquered land or its people.

DOCTRINE OF DISCOVERY:

At the centre of doctrine of discovery lies the adventures of Christopher Columbus who was authorized to take possession of the land he discovered that were not under the dominion of Christian rulers. This process of capturing indigenous and aboriginal land had a religious

¹⁶ (1933), 3 W.C.R 148

connotation to it because it asserted that the Christian nation had a divine right based on the Bible to take absolute title and authority over the Christian inhabitants and their land. In 1823 the doctrine of discovery was adopted into the U.S. Law in *Johnson v. McIntosh*¹⁷. Chief Justice John Marshall observed that Christian European Nations had assumed ultimate domain over the lands of America during the age of discovery and due to this reason the native indigenous people lost their right to complete sovereignty as independent nations and had only the right to occupy their land. The court held that –

- i. The principle of discovery was acknowledged by all Europeans because it was in their interest to do so.
- ii. The nation making the discovery had the sole right of acquiring the soil and establishing settlements on it.
- iii. The rule regulated the nations among the competing interests of European powers, and
- iv. The original inhabitants had the right to retain possession of their lands but were without the powers of alienation except to the discoverers who had obtained exclusive title by virtue of making the discovery.

This resulted in reduction of tribal sovereignty and reduction of tribal control over natural resources of which the forest happened to be the most important one. The forest dwellers and the native who had the mechanism for protecting the natural forest lost control over it and the forest was vandalized by the outsiders.

The doctrine of conquest differs from the doctrine of discovery. In conquest the conquered is vanquished and in discovery sovereignty is acquired over uninhabited territories.

DOCTRINE OF OCCUPATION:

It was believed that discovery conferred imperfect title and occupation completed the same. It was a requirement that land so discovered and occupied had to be terra nullius. It means uninhabited land. But it was interpreted to mean a claim based on discovery was incomplete until accompanied by the “effective occupation” of the region by the discoverer. The term effective occupation included the notion of uninterrupted and permanent possession. It would then mean only the native aboriginal people could show continuous uninterrupted occupation

¹⁷ 21 US (8 wheat 543) 1823

of land forest. But it was further interpreted that certain tribal land or land belonging to the native would fall within the scope of “uninhabited” if the people of the area exhibited and unwillingness to exploit the land in a civilized fashion¹⁸.

DOCTRINE OF ADVERSE POSSESSION:

This doctrine is again linked with doctrine of discovery and occupation. Ordinarily adverse generally means that one can acquire title to another’s land if one openly occupies it for an extended period of time and the original owner acquiesces to ones presence. In order for such claim to be valid there must be de facto exercise of sovereignty which is peaceful and unchallenged.

Therefore over the year those who vandalized the forest occupied unquestionable absolute title that allowed them to exploit the forest at their sweet will¹⁹.

DOCTRINE OF CESSION:

A treaty is an international agreement concluded between States in writing and governed by international law, whether embodied in single instrument or one or more related instruments. Bilateral contracts are formed by exchange of promise in which promise of one party is consideration supporting the promise of the other party. Such treaties and bilateral agreements may incorporate provisions that take away the independence of the native people and the land/forest is ceded from the control of the native folks²⁰.

DOCTRINE OF SOVEREIGNTY:

Sovereignty means supreme, absolute and uncontrollable power by which an independent State is governed, supreme political authority, the supreme will, paramount control of the constitution and the frame of government and administration. Tribal sovereignty refers to the right of tribes or of federally recognized native notions to exercise limited jurisdiction within and sometimes beyond reservation boundaries²¹.

DOCTRINE OF EMINENT DOMAIN:

¹⁸ Dr. S.R.Myneni, Environmental Law, Edn- 2008, Asia Law House, p.160-194

¹⁹ Ibid.

²⁰ Ibid.

²¹ Ibid.

In “Dominium Eminens” (Supreme Lordship) was used by Hugo Grotius in 17th century to describe the doctrine of ‘Eminent Domain’ in the power of government to appropriate private property for its own use without owners consent. The terms ‘condemnation’ or ‘expropriation’ and taking refer to the act of a government exercising its power of eminent domain.

The term condemnation is used to describe the act of governance exercising its powers of eminent domain to transfer title of property from rightful owner to itself. In common law legal systems the eminent domain is the inherent power of the State to seize a citizens private property, expropriate property or right in property or right in property without owners consent²².

THEORIES OF ENVIRONMENTAL JUSTICE

The doctrine of Distributive Justice in relation to the utilization and natural resources can be understood with the help of Distributive Justice that becomes an issue when people realize that the distribution of resource benefits and burdens are affected by government activities as there are continuous making and changing of laws that affect the economic benefits and burden. Every society than is always faced with a choice about whether to stay with the current laws and policies or to modify them.

Distributive Justice Theory contributes practically by providing guidance for these unavoidable and constant choices. These operate both at the national and the international level. It can be used more as a virtue than a vice but in reality it often is otherwise depending upon the degree of equality existing in a given society. It means that a person should have the same level of material goods and services. It is justified on the ground that people are owed equal respect and equality in use of natural resources and in material goods and services is the best way to give effect to this ideal.

Rawls proposes two principles of justice:

- (a) Each person has equal claim of to a fully adequate scheme of equal basic rights and liberties which the scheme is compatible with same scheme for all and in this scheme the equal political liberties and only those liberties are to be guaranteed their fair value.

²² Ibid.

- (b) Social and economic inequalities must satisfy two conditions- (i) they are to be attached to position and offices open to all under conditions of fair equality of opportunity; and (ii) they are to be greatest benefit to the least advantaged members of the society²³.

Rawls difference principle allows allocation that does not conform to strict equality so long as the equality has the effect that the least advantaged in the society are materially better off than they would be under strict equality. In other words there is a need for reasonable classification. Resource based principle prescribe equality of resources and does to prescribe a patterned outcome and that outcome are determined by the extent people are able to access and use resources freely.

Most prominent resource based theory is developed by Ronald Dworkin²⁴. He proposes that people begin with equal resources but end up with unequal economic benefits as a result of their own choices what constitutes a just material distribution is to be determined by the result of a thought experiment designed to model fair distribution . If everyone has equal purchasing power and each uses that power that bid in a fair auction, for resources best suited for their life plans and use them as they see fit. Although people may end up with a different economic benefit they consciously exercise their choice.

Many resource theorists including Dworkin add to this system of equal resources and ambition sensitivity to inequalities in natural endowments. They note that natural inequalities are not distributed according to people choices nor are they justified by reference to some other morally relevant fact about people. Dworkin proposes a hypothetical compensation scheme in which he supposes that before the hypothetical auction people did not own natural endowments.

Welfare based principles are motivated by the idea that what is of primary moral importance is the level of welfare of people. They do not believe the primary distributive concern should be material goods and services which have no intrinsic value and are valuable only in so far as they increase welfare. Hence the distributive principle should be designed and accessed according to how they affect welfare.

²³ John Rawls, *Theory of Justice* (1972) as cited in M.D.A. Freeman (Ed) *Lloyd's Introduction to Jurisprudence* (6th Edn 1996) Sweet & Maxwell, p-466.

²⁴ Ronald Dworkin, "Is there a right to pornography" (1981) 1 *O.J.L.S.*, Vol- I, Also in *A matter of principle* (1985) Ch 17 as cited in M.D.A. Freeman (Ed) *Lloyd's Introduction to Jurisprudence* (6th Edn 1996) Sweet & Maxwell, p-434.

For the libertarians, just outcomes are those arrived at by the separate just actions of individual. A particular distributive pattern is not required for justice. Robert Nozick²⁵ proposes a three part Entitlement Theory. According to him if the world were truly just the following inductive definition would exhaustively cover the subject of justice in holdings:

- (a) A person who acquires a holding in accordance with the principle of justice in acquisition is entitled to that holding.
- (b) A person who acquires a holding in accordance with the principle of justice in transfer, from someone else entitled to the holding is entitled to the holding.
- (c) No one is entitled to a holding except by repeated application of (a) and (b) above.

The complete principle of distributive justice would simply say that distribution is just if everyone is entitled to the holdings they possess under distribution. This refers to injustice in acquisition and transfer. The latter is least controversial and designed to specify fair contract while ruling out stealing, fraud, etc. Acquisition is more complicated and controversial and involves gaining in exclusive property rights.

Nozick is inspired by John Locke's idea that everyone "owns" themselves by mixing one's labour with world self ownership can generate ownership of some part of the material world which increases the value of self ownership. He advocates a system where there are exclusive property rights.

The absence of distributive justice due to greed and mal distribution of power and natural resources within and among nations led to the current sad state of affairs.

Principle of compensation and rehabilitation is another important aspect environmental justice. Compensation is an amount of money paid to make up for the loss or injury caused as far as practicable in equivalent proportion to the loss or injury. In case of land it should be the fair market value. But to assess the value of the lost forest or illegally felled timber and the resultant environmental cost is most difficult if not impossible.

Rehabilitation means restoring the status quo ante. When dams are constructed to control flood, or agricultural power production, the cost suffered by the internally displaced people is

²⁵ R. Nozick , *Anarchy, State and Utopia*, (1974) as cited in M.D.A. Freeman (Ed) *Lloyd's Introduction to Jurisprudence* (6th Edn 1996) Sweet & Maxwell, p-491

again almost impossible to calculate or it is impossible to restore their status quo ante. The human rights denied are beyond restoration. Both compensation and rehabilitation are rights that are implicitly recognized, but difficult to implement.

Environmental justice may be a political coinage but the relationship and interdependence of factors and components of environment is not new and cannot be denied.

Vandalization of forest is not a new phenomenon. It has been politically, economically and socially planned by the European conquerors and passed on to the native inhabitants as a legacy of White Man's Burden to civilize the non Christian and the non white.

ENVIRONMENTAL POLICY AND MANAGEMENT

This involves the process; tools and institutional arrangements devised and implemented that shape how society human beings interact with the natural world. Such policies often strives to secure and protect natural resources needed for survival, growth and enjoyment such as forest, clean water and fresh air etc. The policies also address the problems created by humans by their over consumption of natural resources. The laws strive to prevent over marketing, over consumption etc. In short environmental policies and laws strive to control and regulate human behavior vis-à-vis resource exploitation.

Framing of environmental law or laws for control and regulation of timber trading involves complex processes, tools and institutional arrangements. There are formal collective choices that precede the framing of policy at various levels such as national regional and local. It also involves the legislature, the bureaucrat and the judiciary. There are adjudicatory fora such as courts and tribunals that interpret the law and / or the policy and the arena of civil society in the form of Non Government Organization (NGO), Voluntary Organization, Informal Gatherings, Private Clubs and Associations that influence and shape the law and policy making. There are also the inevitable interventions of chambers of commerce and trading associations that influence and shape the law and policy making process²⁶.

Science, technology and information impacts upon both the framing of the policy or law as well as their implementations. Implementation or enforcement mechanism has two aspects: "Formal and Informal". The Formal part is taken care of by the formal adjudicatory process

²⁶ Tanya Heikkila etc, Digging for Framework, Theories and Models in Environmental policy and Management and Why We Need Them, Presented at the workshop on Policy Process Research and Environmental Affairs Working Group Seminar on 1st February 2012.

of the courts and tribunals and the informal shaping takes place by the civil society and the media. The physical environment is both the subject and the object of the process. There are incentives for compliance and sanctions for non compliance of the laws and policies. However, if the sanction is weak and avoidable, the implementation becomes very difficult. In this complex process the societal and economic interest of the nation has also to be balanced.

The tool for obtaining compliance of law and policy is no less complex. They involve imposing of harvesting limits, granting of license, scientific methods of cultivation and harvesting of timber, declaration of protected areas of forest, identification of banned and exploited species and imposition of economic and criminal sanctions. Side by side it is also important to have an educated, aware and sensitive consumer. These factors are generally taken care of by the forest department which acts as the monitoring body. But if the monitoring body is weak then the policy and laws becomes dead letters in print.

THEORIES

Theories are required to study a phenomenon and in the present case the environmental policy and management in the context of timber trading. Theories help to reduce the complexity of the subject and focuses on the understanding of the issues at hand rather than taking an adhoc approach. Different theories help to focus on different aspects of the problem and thereby enable to obtain a fuller picture through multiple comparisons and explanations.

THEORY OF COMMON POOL RESOURCE:

This theory recognizes that users are dependent upon a common pool of resource and there exists a common understanding of the resource system among the users. In such situation there is a common trust and reciprocity leading to a greater autonomy to organize and manage the resource base. In order to do so common organizational experience and acceptable leadership is necessary. The resource base for the timber traders is the forest. The common pool resource would require the planting of a tree for a tree. If one tree is felled by the timber traders they are constrained to plant a tree before felling it. This requires a certain degree of cooperation and commitment among the group and absence of ego based

competition and drive for excess profit. This system involves the use of common infrastructure that is procurement, transition, transformation and distribution of raw materials as well as common use of electricity, transport, machineries and the local green generated infrastructure. There is a built in check and balance in this system. This keeps the pollution and deforestation under control. The timber traders will not wither away, they will survive but they will not be making indiscriminate and exorbitant profits at the cost of the society.

THEORY OF REFORMATION:

Though born in the 1970s, the theory of reformation became very popular in the 1980s. This theory adopted two lines: Analyzing Environmental policies and Movements by Environmental NGOs and protests. Environmental problems and crises are mainly conceptualize as market failure in provision of collective goods and emerging environmental institutions were widely conceived as most important tools to deal with the failures. The establishment of national and local environmental ministries and authorities and the legal frame works and regulations, assessment procedure for major economic projects, and other innovations drove sociological and political sciences interests, analysis, and investigations towards understanding environmental reform processes. Building strongly on Neo-Marxist analytical schemes, the State was perceived to be structurally unable to regulate, control and compensate the inherent environmental side effect of the ongoing timber trade. The environmental crisis was seen as being closely and fundamentally related to the economic demands of the market and the consumers. Notwithstanding this dominant position during the birth of environmental sociology and the politics of environment the State was seen as of critical importance for the control and regulation of timber trading through environmental reforms. The procedure for it was largely normative and design oriented, focusing on the contribution of timber trade to and development of new State oriented institutional layouts vis-à-vis environmental policy and reform. Environmental impact assessment schemes, environmental integration models and policy instruments control an enforcement arrangements were the important aspect of the agenda setting for environmental reform.

Environmental Non Governmental Organizations' and Civil Society Protest formed a second object of the environmental reform process which took into considerations the local issues at its core. Two dominant perspectives that tried to understand the importance of civil society in bringing about social transformations in the core institutions of modern society were the protest against what was being seen as the fundamental roots of environmental crises and also

by taking into account the contribution made by the environmental movements to the actual and necessary reforms of the institutional orders, dominant economic structures, campaign against polluter through lobbying and influencing political process. Many of the more radical and structuralist analysis saw the root of the environmental crises as the last resort for bringing about change and reform.

Reviewing the above, one cannot ignore the contribution of social sciences to environmental reform and draw several conclusions. First, in the 1970s and 1980s the majority of the environmental social science studies were not focused on explaining environmental reform, but rather on understanding the continuity of environmental degradation. During this period much lamentations can be seen as to how the activities of timber trade was causing deforestation and desertification but there was hardly any constructive focus on how to secure sustainability in the area. Second, conventional political and civil society institutions received most attention where as economic institutions and organizations were prominently absent from making any constructive contribution towards the process of achieving sustainability in timber trading. Third, although India was decidedly a socialistic country and Neo-Marxist perspective dominated its process of policy framing, India also became aware of the global demand of privatization and open foreign trade during this period, yet no clear dominant theoretical perspective emerged for achieving the desired reform. Fourth, although these traditions in studying the environmental protest, politics of environment and reformative attitudes originated in the 1970s, they still have strong positions in the contemporary social, political and economic scenario.

THEORY OF ECOLOGICAL MODERNIZATION:

From the mid 1980s and during the early 1990s there was an explosion of concern for the environment and huge number of empirical studies were undertaken for environmental improvements, ecological restructuring and environmental reforms. These studies have focused on distinct levels of analysis and tried to assess whether a reduction in the use of natural resources and / or the discharge of emissions and effluents can be identified, either in absolute or in relative terms compare to economic indicators such as GNP. This development is manifest in the studies on sustainable trade, clean production, industrial metabolism,

industrial ecology and perspectives on the greening of consumption, life styles, and households. Although most of these studies occurred in developed countries they soon found their way into the developing or less developed parts of the world.

All these studies do not yield the same conclusion or point towards the same direction but a general picture can easily be seen. From the mid 1980s onwards there was a break in the tendency of parallel economic growth and increasing ecological disruption caused by legal and illegal felling of trees and excessive pollutions. This slow down is often referred to as the decoupling or delinking of material flows from economic flows. In a number of cases environmental reform also resulted in an absolute decline in the use of natural resources and / or in discharge of emissions, regardless of economic growth in financial or material terms. These conclusions are sometimes also valid for rapidly industrializing and modernizing countries for instance: Asia in general and India in particular.

Social dynamics behind these changes, that is, the emergence of actual environment induced transformations of institutions of social practices became one of the key objects of ecological modernization in 1990s.

The basic idea of ecological modernization is that, at the end of second millennium, modern societies witness a centripetal movement of ecological interest, ideas and considerations in their institutional design. This development crystallizes in a constant ecological structuring of modernity. Ecological structuring refers to the ecology inspired and environment induced process of transformation and reform in the central institutions of modern society. In this theory ecological restructuring is conceptualized at an analytical level as the growing autonomy, independence or differentiation of an ecological rationality vis-a-vis other rationalities such as timber trade. In the domain of states policies and politics the emergence of economic rationality has emerged in 1970s and the early 1980s. The constructions of governmental organizations and departments dealing with environmental issues date from that era. Equally, environmental laws, environmental impact assessments systems and green political parties date back to that period a distinct “green” ideology manifested by environmental NGOs, environmental value systems, and environmental periodicals started to emerge in the 1970s. Only in the 1980s however, this ‘green’ ideology assumed an independent status and could no longer be interpreted in terms of the old political ideologies of socialism, liberalism and conservatism.

However, the crucial transformation that makes the notion of the growing autonomy of an ecological rationality especially relevant is of more recent origin. After an ecological rationality has become relatively independent from the political and socio ideological rationalities of the 70s and the 80s, this process of growing independence began to extend to the economic domain in the 1990s. Because this growing independence of ecological rationality from its economic counterpart is crucial to the ecological question, economic processes of production and consumption are increasingly analyzed and judged from both economic and an ecological point of view. In the 1990s some institutional changes in the economic domain of production and consumption became discernable. Among these changes are the wide spread emergence of environmental management systems in the corporate sector, economic evaluation of environmental goods through introduction of eco taxes, the emergence of environment inspired liability and insurance arrangements, the increasing importance attached to the environmental goals such as natural resource saving and recycling among public and private utility enterprises and the articulation of environmental considerations in the economic supply and demand through eco-labels and product information systems. Within ecological modernization ideas, these transformations are considered as institutional changes indicating their semi permanent character. Although these changes would be difficult to reverse

THEORY OF NETWORKS²⁷ AND FLOW²⁸:

The second half of the 1990s witnessed the emergence of what is labeled as the sociology of networks and flows. The relevant innovations of the sociology of network and flows for environmental reform are four fold. First, with the introduction of the pace of flow and contrasting it with the space of place a new kind of time-space organization of practice is introduced that takes globalization fully into account. Globalization is no longer understood as elevating a process to a higher level. Second, the sociology of networks and flows lifts the sharp distinction between the social and material world, between flows of information and money and flows of material substance between the institutional infrastructure and the technological – material infrastructures. Within the sociology of networks and flows there is an effort to overcome the dichotomy of social and the material. Thus it goes beyond the conventional schemes of environmental social sciences which assert that social systems should be seen as systems having a material base and with the recognition that material

²⁷ A group of people or organisations that are closely connected and that work with each other

²⁸ Smooth uninterrupted movement or progress

conditions matter for social practices and institutional developments. Hybrids and socio-technical systems are the key concepts that point to the fading dichotomy between the social and the material. Third, the strong separation between conventional categories of state, market, and civil society is lifted in favor of all kinds of new emerging arrangements. Socio-material infrastructures are no longer understood in terms of state and market. Fourth, ideas of governance, management, and control drastically change following the sociology of flows especially in general ideas of nation's states losing their sovereignty and power; possibilities of governance and control are seriously questioned.

In applying the sociology of networks and flows for understanding 21st century environmental reform to build an environmental sociology of networks and flows alone is not sufficient. This new social theory runs counter to the same frictions that the environmental sociologists had with earlier theories. Whereas most of the flow literature in social sciences emphasizes flows of capital, money, information, travel, migration and analyse them from perspectives as diverse as economic development governance and control, cultural diversity, or democracy, and environmental sociology of flows focuses on an explicitly environmental interpretations of the flow concept. This environmental interpretation differs in two ways from the sociology of flows: (a) By analyzing flow of information, capital, goods and persons from an ecological rationality point of view and (b) by analyzing environmental flows such as energy, water, waste, biodiversity, natural resources, contaminants and the like and also by taking an in-depth account of environmental change. Environmental flows are mentioned in between all other kinds of flows that could become or are object of sociological analysis. These flows are not assessed for their role in and contribution to environmental governance, deterioration, or reform. Nowhere, however, it is argued that the set of material flows as commonly addressed within the environmental sciences and social sciences deserve a special scientific approach. The question is whether it is helpful for a full understanding of environmental reform. What is needed is a more focused approach on environment which not only builds on such general conceptualization but also specifies them for environment networks and flows that might contribute more significantly towards environmental reforms.

POLITICS OF ENVIRONMENT

For more than two decades, there has been a lively environmental debate along with a high degree of legislative activity in India. This intensified as a consequence of the Bhopal gas leak in 1984 which led to the Environment Protection Act of 1986. However, there is vast

agreement that the results of various reforms and regulations have been disappointing. Implementation has been poor. India's course of development is most likely unsustainable. Its current development strategy is therefore increasingly disputed along lines of ecological considerations. There are massive schemes for afforestation, there are laws to control air and water pollution and for conservation of forests. India has received world wide praise for its attempts to preserve tigers. But there is a major problem with this entire range of activities; it does not appear to reflect a holistic understanding of the relationship between environment and development. Programmes are ad hoc without clear priorities and there are too much of a police like attitude. In fact the members of Indian forest departments are now referred to as Indian forest force. There seems to be a belief that environment is to be protected from the developmental pursuits and from invasion of the people. There are little efforts at harmonizing the developmental process with the needs of the people and maintenance of ecological balance and at the same time increasing the productivity of land, water, and forest resources.

The political debate in India centers on two issues: equity and growth. The third dimension of sustainability evolving from environmental concern poses a major challenge to the issues of equity and growth. Today the challenge is to identify developmental process that will lead to equity, growth and sustainability.

The environment is not just pretty trees and tigers, threatened plants and ecosystems. It is literally the entity on which everybody subsist, and on which entire agricultural and industrial development depends. Development can take place at the cost of the environment only up to a point. Beyond that point, it will be like the foolish person who was trying to cut the very branch on which he was sitting. Development without concern for the environment can only be short-term development. In the long term, it can only be anti-development and can go on only at the cost of enormous human suffering, increased poverty and oppression. India may be rapidly approaching that point.

Hundreds of field-level groups today take a keen interest in environmental issues and their experiences and interests are extremely diverse. Some are interested in preventing deforestation others are interested only in afforestation. Many want to prevent the construction of one dam or another. There are others who want to prevent water pollution. There is the famous Chipko movement²⁹ in the UP Himalaya, probably the oldest and most famous of all the groups, which has played a major role in bringing the issue of deforestation

²⁹ *The State of the Environment — 1972-1982*, United Nations Environment Programme, Nairobi, 1982, p 5-7

to the forefront of public opinion. There is its counterpart in the south, the Appiko movement³⁰ in the Western Ghats of Karnataka. Dams like the Silent Valley³¹ and Bedthi³² have already been stopped because of strong people's protests, and the well-known social worker Baba Amte led a major campaign against the proposed Bhopalpatnam and Inchampalli dams³³ on the borders of MP, Andhra Pradesh and Maharashtra. The Kerala Sastra Sahitya Parishad³⁴ has had a long acrimonious battle over the pollution of the Chilyar River in Kerala by a rayon mill. The India Development Service finds itself embroiled in another case of river pollution by a rayon mill in Karnataka.³⁵ Meanwhile; the Shahdol Group has worked against the pollution of a river in Shahdol district by a paper mill.³⁶ There is, also, the Mitti Bachao Abhiyan³⁷ to organize farmers against water-logging caused by faulty irrigation systems. While all these are relatively well known groups and have attracted varying degrees of media attention, there are many others who are doing excellent work in mobilizing people, both to prevent further ecological destruction, often in the face of determined government policies, and to bring about ecological regeneration. One thing, however, that binds most of these groups is their concern to put the environment at the service and the control of the people, the people usually being defined as the local communities who live within that environment.

Environmental protection *per se* is of least concern to most of these groups, including the well known Chipko movement, for example. Their main concern is about the use of the environment: how should the environment be used and who should use it and benefit from it. It is this growing understanding of the relationship between the people and their environment,

³⁰ For an example of how the argument is turned on its head, see what Barbara Ward has to say: "We must be clear where the immediate responsibility for inaction lies. The peoples of North America, Japan, UK and the east of Western Europe make up, together with a few oil states, the great majority of the world's rich citizens. Ours is the responsibility for the present appallingly skewed distribution of resources. The richest 20 per cent, largely living in the West, have three-quarters of the wealth, the remaining three and a half billion of our fellow citizens must make do with the quarter that remains. And it is for the world's poor, the nations of the Third World and the poor majority within those countries, that a decent environment is even more important than it is for the rich West. The poor are always near the margin and the margins of our global environment are today smaller than they were 10 years ago in Stockholm." Quoted in Vohra, B B, *Environment within the United Nations — Developing Country Viewpoint*, ed. Shiela Bajaj, Environmental Services Group — World Wildlife Fund, New Delhi, 1982

³¹ H. S. Mann, and Ishwar Prakash, *Halting the March, Ecodevelopment in the Thar*, Department of Environment, Environmental Services Group — World Wildlife Fund, New Delhi, 1983,

³² Madhav Gadgil, and K C Malhotra, Report of the field study conducted on behalf of the Committee on legislative Measures and Administrative Machinery for Environmental Protection, Department of Science and Technology, New Delhi, 1980,

³³ *The State of the Environment — 1972-1982*, United Nations Environment Programme, Nairobi, 1982

³⁴ *World Conservation Strategy*, UNCN UNEP WWF, 1980, section 19

³⁵ Madhav Gadgil, *Towards an Indian Conservation Strategy*, Policy Paper, Indian Social Institute, New Delhi, 1982

³⁶ Kapil Bhattacharya, *Bangladesher Nod, Nodi O Porikolpona*, Bidyesoy Library Pvt Ltd, Calcutta

³⁷ Vijay Paranjpaye, *The Woes of Gangawali: An Economic Analysis of the Bedthi, Stage I, Hydroelectric Project in Uttar Kannara*, Gokhale Institute of Politics and Economics, Pune, 1981

born out of a concern for a more equitable and sustainable use of the environment, that is probably the most fascinating development in India today.

To understand the nature of the environmental problems in India, it may be useful to compare and contrast certain environmental trends and concerns in India with those in the West, especially since the environment crusade began in the west and since many groups in India, including political parties, have for long dismissed it as a petty western concept. The argument has always been that too much concern for the environment can only retard economic and industrial development. The UN Conference on the Human Environment held in Stockholm in 1972 was the landmark conference that created worldwide consciousness about environment. No UN conference has ever been able to collect so many luminaries at one place. Many delegations from developing countries had argued that the solution to environmental problems lay in economic development. "Smoke is a sign of progress," the Brazilian delegation had thundered, then representing a country witnessing an economic boom. India's Prime Minister Indira Gandhi, who made a major impression on the conference, is still remembered for her oft-quoted statement: "Poverty is the biggest polluter." In all those who came from the Third World, both leftists and rightists, there was a sneaking suspicion that the Western countries were up to some trick. The West may simply be pushing the environmental concern onto an unsuspecting Third World to retard its technological modernization and industrial development. It was even argued that having got their riches and their affluent lifestyles, westerners were now simply asking for more affluence: clean air, clean water and large tracts of nature for enjoyment and recreation, many of which were going to be preserved in the tropical forests and savannas of Asia, Africa and South America. But exactly 10 years later when the UN organized a meeting to commemorate the Stockholm conference, few non-governmental groups from the Third World was prepared to argue in favor of the development process as it is. The Third World today faces both an environment crisis and a development crisis, and both these crises seem to be intensifying and interacting to reinforce each other. On one hand, there does not seem to be any end to the problems of inequality, poverty and unemployment, the crucial problems that the development process is meant to solve. On the other hand, environmental destruction has grown further apace. But what is interesting is that while many environmental problems, especially those related to air and water pollution have tended to become less severe in many parts of the industrialized world, because of the introduction of highly capital-intensive pollution control technologies, these problems have continued to grow and become critical in many parts of the developing world. In other words, while the economic development process

in the world is only worsening our environmental problems, it is tending to solve them in the West³⁸. Very simply speaking, the only major environmental problems in the West are those arising out of waste disposal — problems of air and water pollution and of disposal of highly toxic industrial and nuclear wastes. Though problems of acid rain have definitely increased and there does not yet seem to be any solution to the problem of toxic wastes, it is true that some cities and rivers do look cleaner. In the Third World, however, as its own industrialization proceeds, these waste disposal problems are getting worse day by day but they are still not the major or the only environmental problem. In the Third World, the major environmental problems are those which arise out of the misuse of the natural resource base: the soils, forests and water resources. These problems are created to a great extent because of the pressure to produce raw materials for modern industry. The Third World's environment not only provides raw materials for its own industries but also for the industries of the West. The UN Environment Programme (UNEP) in a recent report points to the impact of the heavy debt burden of the Third World and high interest rates in the West on the environment of the Third World³⁹ The debt burden and regressive terms of trade have forced many developing countries to put enormous pressure on their natural resources, sometimes even to the point of overexploitation. In 1981, for instance, it took one Latin American country 9.8 times as much beef to buy a barrel of oil as it did in 1981. At the end of the 1970s, profits from the export of one ton of bananas were enough to purchase only half the steel they would have bought at the end of the 1960s. When interest rates are high, there is a tendency to discount long-term issues like environment for short-term gains. A one per cent increase in interest rates adds approximately US \$5 billion to the current debt burden of developing countries. To have increased its export earnings (not profits) by \$1 billion in 1981, South America as a whole would have had to increase its banana exports three-fold, Ecuador three-fold and Colombia nine fold, while leading cotton exporters like Egypt and Turkey would have had to double and triple their cotton exports respectively. This would have meant bringing millions of additional hectares into production to grow these export crops. And, it can be added, this would have pushed millions of marginal peasants into marginal lands like desert fringes and steep hill slopes for their survival, leading to accelerated desertification and soil erosion.⁴⁰

In our own country, the first major attack on the forests of the northeast came with the establishment of tea plantations. Destruction of forests goes on for coffee and other export

³⁸ Ibid

³⁹ *Evolution of Legislation of Forestry in India: A Note in the Light of the Forest Bill*, Seminar Paper by Anil Agarwal, Indian Social Institute, New Delhi, 1982

⁴⁰ Ibid

crop plantations even today. The current overfishing on India's coasts, as on the coasts of almost all Southeast Asian countries, is taking place because of the heavy demand for prawns in Western and Japanese markets. This overfishing is leading to considerable tensions between traditional fisher folk and trawler owners, and violent encounters between the two are regularly reported⁴¹ Recently, Indonesia completely banned the operation of trawlers in its coastal waters and several countries, including India, have decreed regulations to prevent trawler operators from fishing in the first few kilometers from the coast. This zone is reserved for traditional fisher folk. But policing trawlers over such an extensive coastline is an expensive proposition and regulations are, therefore, seldom observed or enforced. The export of frog's legs to cater to the palates of Western consumers and its impact on the agricultural pest populations in affected areas is now an old story⁴²

But the pattern of environmental exploitation by industry that we see on the global scale simply reproduces itself on the national scale in India. That Western industry does to the Third World environment, Indian industry does to the Indian environment. Just to get an idea of how heavily dependent modern industry is on the natural environment, it may be useful to point out that nearly half the industrial output in India is accounted for by industries which can be called biomass-based: that is, industries like cotton textiles, rayon, paper, plywood, rubber, soap, sugar, tobacco, jute, chocolate, food processing and packaging, and so on.

Each of these industries exerts an enormous pressure on the country's cultivated and forest lands. They need crop lands, they need forests, and they need energy and irrigation. The Indian paper industry has ruthlessly destroyed the forests of India. Paper companies in Karnataka, having destroyed all the bamboo forests, are now getting their raw materials from the last major forested frontier of India: the northeast.⁴³ The government's own public sector paper companies are coming up in the northeast itself. The Andhra Pradesh government has meanwhile set its sights on the forests of Andaman and Nicobar Islands for the paper mill that it wants to build in Kakinada. A leading soap manufacturer has proposed that the Great Nicobar Islands be denuded to plant palm oil. The shortage of raw materials for wood pulp has already forced the government to liberalize import of pulp for the country's paper industry, thus adding to the pressure on the forests of other Third World countries⁴⁴.

⁴¹ *Water Pollution: A Threat to the Desert*, Environment Cell, Gandhi Peace Foundation, Jodhpur

⁴² Dinesh Mohan, , *'Accidental' Death and Disability in India: A Case of Criminal Neglect*, First Annual State Bank Lecture, Centre of Biomedical Engineering, Indian Institute of Technology, New Delhi, 1982

⁴³ Tapan K Bose, *Ecopolitics and the Adivasis*, Cinemart Foundation, New Delhi, 1983

⁴⁴ *Report of the Workshop on a New Forestry Policy*, Indian Social Institute, New Delhi, 1982

One lesson is, therefore, clear: the main cause of environmental destruction in the world is the demand for natural resources generated by the consumption of the rich (whether they are rich nations or rich individuals and groups within nations) and because of their gargantuan appetite, it is their wastes mainly that contribute to the global pollution load.

If we want to see this process of 'resource colonization' in a historical light, we can trace it back to the beginnings of the industrial revolution. The cultural diversity that existed in the world at that time was no historical accident. It was born out of the world's biological diversity and people's ability to shape a society with the use of that biological diversity.

People came to adopt a lifestyle that was in harmony with the dictates of the immediate environment. Those who lived in the deserts practiced nomadism and those who lived in the hills practiced shifting cultivation. Houses and cities built with local materials and skills were built differently to satisfy the conditions set by the local climate. But as modern science and technology grew, it gave people enormous power. Unfortunately the new knowledge created by scientific and technological development fell on an highly unequal world, where access to this knowledge was and still is, unequal, and the infrastructure to use it very uneven. The major result of scientific and technological development, embedded as it is within an unequal global society, is that it has given few people more and more power to exploit resources from further and further away. First, distant lands (distant ecosystems) were turned into colonies for resource exploitation; when decolonization took place, multinational corporations took over the role of global resource exploitation and management within a framework of liberal international trade; and now it is the turn of such hitherto unfathomable global commons as the deep sea bed, Antarctica and space to be exploited. The UN even has a committee to discuss resource exploitation on the moon.

But at least on the terrestrial level, with hardly any uninhabited frontiers left, this relentless search for resources from others' ecosystems can only mean extraordinary conflict. In a more and more densely populated world, that which is a resource in a distant ecosystem for one human being is simply a resource within someone else's immediate ecosystem. If that someone's very survival is dependent on the resources of the immediate ecosystem, then there will be conflict, and resource colonization by the powerful will end in the dispossession and impoverishment of the less powerful, in their own homeland, so to say.

These trends raise serious doubts about the sustainability of the Western industrialization model based on global management of resources for the consumption of a few. The growth of science and technology has indeed been humankind's most magnificent achievement but definitely not the ends to which this knowledge has been used. The most unfortunate part of

this process is that we have now got a large number of consumers in the world whose consumption is highly destructive of the environment but who cannot perceive this destruction psychologically. These are consumers of distant resources: those who have access to all the fruits of modern science and technology. Just imagine a resident of Delhi who uses shirts made of cotton which has been produced in a field in Maharashtra heavily sprayed with pesticides leading to multiple resistance in mosquitoes; electricity from a dam in the Himalaya that has destroyed forests and blocked migration of fish; paper produced in Madhya Pradesh by a factory that has polluted the local river and logged forests in an ever-widening circle, disrupting the life of tribal's; cereals from Punjab where food is produced using a technology that drains soil fertility, and so on. It is humanly impossible for such distant consumers to appreciate what their purchasing power is doing to distant areas.

Just imagine, then, the situation of the Western consumer whose beef and fruits come from Latin America and Africa, peanuts from west Africa, coffee from east Africa, tea from India, prawns from Asia and timber from all over the world. But what is probably worse is that such consumers no longer dependent in any crucial sense on the immediate environment for their consumption needs, slowly become oblivious of the destruction even of the immediate environment. Thus, we get a world economic system in which individuals with power have almost no interest in the fate of their environment, distant or immediate — and only a global environmental crisis, situated amidst a sea of economic poverty, has been able to evoke some concern, and we still talk of the need for environmental education in a big way. Modern science and technology is not always used as a brutish tool by the rich and powerful to dispossess the poor. It has also been used subtly to undermine the confidence of the poor in their own resources and resource-use patterns. Particularly, if a natural resource used traditionally by people is so widely available that it just cannot be monopolized, every effort is made in the name of scientific progress to discredit that natural resource as archaic and useless. This drive to discredit a resource is undertaken to the extent that even the poor, who often have no alternative except to use that resource, look forward to the day when they can do without it.

The classic example is mud. Over half the world's population lives in mud structures. Prices of cement and bricks required for modern buildings continue to rise, being extremely energy intensive, faster than the purchasing power of the world's poor. The chances of all mud dwellers ever moving from their buildings are pretty low, at least not in the next 50 years.⁴⁵

⁴⁵ *Evolution of Legislation of Forestry in India: A Note in the Light of the Forest Bill*, Seminar Paper by Anil Agarwal, Indian Social Institute, New Delhi, 1982

The majority of the urban population in the Third World cannot afford even the cheapest modern housing. In most cities of the developing world, including India, the portion of the population living in slums and squatter settlements has been rising rapidly. Unable to meet the housing needs of the relatively small urban populations, the governments of the Third World have not even dared to launch housing programmes for rural areas, where the majority of the population lives⁴⁶

The field experience of voluntary groups confirms that eradication of poverty in a country like India is simply not possible without the rational management of our environment and that conversely, environmental destruction will only intensify poverty. Environmental destruction goes hand-in-hand with social injustice. A major reason for this is seldom recognized. The vast majority of the rural households meet their daily household needs through biomass or biomass-related products, which are mostly collected free from the immediate environment. In short, they live within nothing other than a biomass-based, subsistence economy. Food, fuel (firewood, cow dung, and crop wastes), fodder, fertilizers (organic manure, forest litter, and leaf mulch), building materials (poles, thatch), herbs and clothing are all biomass products. Water is another crucial product for survival. Water is not biomass itself, but its availability is closely related to the level of biomass available in the surrounding environment. Once the forest disappears, the local pond silts up, the village well dries up, and the perennial stream gets reduced to a seasonal one. The water balance gets totally upset with the destruction of vegetation; in a monsoon climate like ours with highly uneven rainfall over the year, this means greatly increased runoff and floods during the peak water season and greatly increased drought and water scarcity in the lean dry season. There is reason to believe that the number of 'problem villages' from the point of view of availability of drinking water may be increasing.⁴⁷

Nature is not just being destroyed. Nature is also being steadily transformed. There are two major pressures operating on the country's natural resources today. The first, generated by population growth and thus increased household demand for biomass resources, has been widely talked about. The poor often get blamed for the destruction of the environment. But the second set of pressures, generated by modernization, industrialization and the general penetration of the cash economy, are seldom talked about, at least in policy-making circles. Modernization affects nature in two ways. Firstly, it is extremely destructive of the

⁴⁶ Ibid

⁴⁷ For several examples of people's initiatives, see *State of India's Environment: A Citizens' Report*, Centre for Science and Environment, New Delhi, 1982.

environment in its search for cheap biomass-based raw materials and in its search for cheap opportunities for waste disposal. Unless there are strong laws which are equally strongly implemented, there is no attempt made to internalize environmental costs and both public and private industrialists prefer to pass them on to society. State governments are also happy to give away large tracts of forests for a pittance and throw water pollution control laws to the winds to get a few more factories⁴⁸

Secondly, modernization is steadily transforming the very character of nature. In physical terms, the tendency is to reduce the diversity in nature and transform it into a nature that is full of high-yielding monocultures. The driving force for this transformation arises out of the co-modification of nature. Whether it is a herd of cattle, a pond, a forest or an agricultural field, the attempt is to reduce diversity and promote the most high-yielding gene for maximum profit and production, the first more so in capitalist systems and the latter probably more in socialist systems. The long-term sustainability of the new system is seldom considered. The ecological role of the original nature is usually disregarded while transforming it⁴⁹.

Let us look at a few cases of how the destruction of nature has affected the lives of people in India. One very dramatic area where government policies have consistently increased conflict is forests. The entire tribal populations, and millions of other forest dwelling people, depend on the forests for their very existence. Destruction of forests has meant the social, cultural and economic destruction of the tribal populations in particular. Beginning with the British and continuing with free India, the government has decided to control the forest resource itself, leaving little or no control in the hands of the forest dwellers.⁵⁰ Government control over forests has definitely meant a reallocation of forest resources away from the needs of local communities and into the hands of urban and industrial India. The end result is both increased social conflict and increased destruction or transformation of the ecological resource itself.

Yet another major component of the country's physical environment is grazing lands. The destruction of the grazing lands has meant enormous hardships for poor people, especially for the nomadic groups in the country. Few people know that India has nearly 200 castes engaged in pastoral nomadism, which adds up to nearly six per cent of India's population.

⁴⁸ *Evolution of Legislation of Forestry in India: A Note in the Light of the Forest Bill*, Seminar Paper by Anil Agarwal, Indian Social Institute, New Delhi, 1982

⁴⁹ *Ibid*

⁵⁰ *Ibid*

India is unique in the world in terms of the diversity of animals associated with pastoral nomadism. There are shepherds of camels in Rajasthan and in Gujarat, of donkeys in Maharashtra, of yaks in Ladakh, of pigs in Andhra Pradesh, and even of ducks in south India. Sheep, goats and cattle are of course the main nomadic animals.

A number of factors, including land reforms and development programmes which have promoted expansion of agriculture to marginal lands, have steadily led to an erosion of grazing lands. The Rajasthan canal is a fine example of a government programme that has transformed extensive grazing lands into agricultural lands.⁴⁰ No effort was made by the government to ensure that the nomads who used these grazing lands earlier would benefit from the canal on a priority basis. In almost every village, the *panchayat* lands, traditionally used as *gauchar* lands, have been encroached upon by powerful interest groups and privatized. Nomadic groups have been increasingly impoverished over the last 30 years and an ever-increasing number is being forced to give up their traditional occupation to become landless laborers or urban migrants.

Riverine fisher-folk constitute another group that has suffered immensely with environmental destruction. Riverine fisheries are being seriously affected by the construction of dams which affect migratory fish and by increasing water pollution. ⁴¹ Large scale fish kills are regularly reported. Rivers have now become a resource for urban and industrial India to be used as cheap dump yards for their wastes and all this is sanctioned in the name of economic development.

In the 158-km stretch of the Hooghly, the average yield of fish is just about a sixth in the polluted zones as compared to the unpolluted zones. Growing water pollution is thus affecting thousands of riverine fisher-folk in the country, but little data is available on their plight. The increase is coming mainly from aquaculture, a technology that only those with sufficient capital and land can benefit from. Meanwhile, those poor fisher folk who depended on access to a common property resource like a river for their livelihood suffer from its degradation. The new commercial nature that is being created is of little help to village communities and their daily needs. There are people's protests in many parts of the country against the conversion of oak forests into pine forests and of sal forests into teak forests. Neither pine nor teak is of any interest to local communities. In the Singhbhum area of Bihar, there is even a movement to destroy the new teak forests. Equally, there is a strong protest in Karnataka against the planting of eucalyptus on farmers' fields. The planting of eucalyptus on farmers' fields and even on so-called barren fields is an excellent example of the adverse biomass conversion, harmful for the people, promoted by modernization. What happens to

the poor people when eucalyptus is planted on a farmer's field? We have a concrete example from a village in Punjab, where a rich farmer, a former governor, with over 100 ha of land has stopped growing cotton and has switched to eucalyptus. As long as he grew cotton, enormous quantities of cotton sticks would be available for the landless laborers in the village to use as fuel. Because of the shortage of firewood, crop wastes from the landlords' fields are the major and often the only source of fuel for these poor landless villagers. Now with eucalyptus growing, their main source of fuel has dried up, putting them in a precarious position. This is a case where afforestation has actually created a fuel famine for the neediest community⁵¹.

A weed is defined as a plant which has no economic value but in the socio-economic reality of India, *Lantana*, *Parthenium* and *Eupatorium* are weeds only for the revenue-earning forest departments of the government. For poor households who have no lands of their own, weeds growing on public lands are extremely useful because of the very fact that they are not wanted by the modern sector of the economy. Once they acquire an economic value, they will go out of their hands — like bamboo, which was for long described as a weed by foresters⁵².

Thus, when a patch of barren land is planted with eucalyptus, even the weeds are no longer available to poor, landless households and their fuel crisis intensifies. Not surprisingly, foresters report from all over the country, in the form of a complaint, that women even take away dry eucalyptus leaves from eucalyptus plantations for use as fuel, thus destroying, the foresters say, and any chance of the leaves breaking down into humus and enriching the soil.

What we see in India today is growing conflict over the use of natural resources and, in particular, over biomass between the two sectors of the country's economy; the cash economy (or the modern sector) on one hand and the non-monetized, biomass-based subsistence economy (the traditional sector) on the other.

As the growing stock of biomass goes down and the demand for biomass from the cash economy goes up and finally demand begins to exceed supply, pressure to exploit the remaining biomass increases enormously; biomass prices rise, and destructive processes accelerate because of market forces. Illegal timber felling is today a major activity in the country, undertaken with the full support of political interests. Stealing a few dozen trucks of timber is the surest and easiest way to become rich. No less a person than a chief minister — the well-known Ram Lal of Himachal Pradesh — recently had to resign because of his family's involvement in timber smuggling.

⁵¹ Ibid

⁵² Ibid

Nothing could be more important for planners and politicians today than to rebuild nature. But this can only be done if we re-establish a healthy relationship between the people and their environment. Then only a nature that is useful to the millions, but not for making millions, can be re-established. Regardless of what happens in the West in the next two decades, for all its electronics revolution, its efforts to mine the oceans and its efforts to build solar cells and windmills, and how dramatically this changes the face of the world techno structure, and regardless of how much one may want to catch up with the West in the name of modernization or out of the sheer compulsions of geopolitics, rebuilding nature and rebuilding its relationship with the people will remain the only way to solve the problem of poverty and possibly even unemployment. With some 100 million to 150 million hectares of waste and near-wastelands and with a crying need to produce biomass, this country can never get a better opportunity to harness the power of its people to the productivity of its land, to strike at the roots of landlessness, poverty and unemployment, all at the same time.

If enough biomass was available, poverty, that is, lack of cash, as defined by economists and by the modern civilization, will not disappear. But the rigours of poverty, the increasing susceptibility to natural emergencies like floods and droughts will be arrested by creating more biomass. In fact, conventional measurements of poverty based on income data or on food calories are clearly inadequate in a situation where the rest of the biomass needs are becoming increasingly difficult to meet and collecting them on a daily basis constitutes the worst — and growing — drudgery of humankind, especially womankind, has ever known.

These calculations are not only just inadequate but they also reflect a strong gender bias because they deal mainly with those aspects of poverty — lack of cash — that the male is generally concerned with, but not with those aspects of poverty that the woman deals with — lack of fuel, fodder, water etc. If one were to construct a concept like gross nature product, one would find that for the poor it is this indicator, which is many times more important than the conventional gross national product (GNP). In fact, it can be said that those who do not get much from the conventional GNP — the poor — are the ones who are most critically dependent on the gross nature product. The GNP cannot be allowed to destroy or transform the gross nature product.

The economists get very worried about the structure of the GNP; it would be worthwhile if they had the poor in mind get worried about the structure of the gross nature product. It is not just the quantity of biomass that is important for meeting basic household needs but also its diversity; sources of biomass within any village ecosystem must be diverse enough to meet

the various household needs of fuel, fodder, building materials and herbs, and of raw materials for artisans.

The diversity in nature has also acted as insurance during periods of emergency by reducing societal vulnerability. During the period of drought and flood which are recurring phenomena in many parts of India, fruits, roots, leaves and wild animals in the forests often become an important alternative source of nutrition. In 1983, the tribals of Chotanagpur survived a drought not because of government assistance but despite government callousness. It is the forests which gave them their nutrition. Surviving on the forest during a drought is common in Bastar⁵³. Wild animals caught in the jungles become a significant source of food during periods of crop failure. A study from Africa found that in times of drought, traditional societies had nearly 150 responses. They even fed the thatch of their huts to the goats. But in a modern village there were only two responses: pray to God (which evens the Tamil Nadu government recommended during the Madras water crisis) or migrate to the towns. The combination of trees, grasses, crops, animals and ponds, which can be found in almost every village, was an extraordinarily interactive and resilient system for emergencies. Instead of destroying this complex and interrelated system, science must be used to build on it.

In other words, it is not enough to preserve biological diversity in just those areas of where the flora and fauna are genetically rich and diverse by setting up biosphere reserves and national parks, but that biological diversity must be preserved and/or recreated in every village ecosystem. Concentrating on the production of a few commodities (cereals, for instance) is totally inadequate in a society which is only partly monetised and where the vast majority still has to depend on access to free biomass resources from the immediate environment. Every village has to become a biosphere reserve. If sufficient biomass could be generated, there would also be none of those tensions we see around nature protection areas today.⁶⁵ At a time when biomass is in acute shortage, it is obviously foolhardy to attempt such protection without massive schemes for large scale biomass generation.

Understanding of the gross nature product and how it is changing within the national ecological space (or shall we say, national economy) is extremely limited, despite its crucial importance for the poor. We know nothing, for instance, about the importance of so-called weeds for the poor. The reason we know so little about the gross nature product is because the 'growing stock' of biomass does not get reflected in GNP calculations anywhere. Therefore, whether the 'growing stock' lives or dies, exists or disappears, does not make any

⁵³ Ibid

difference to economists. Most economists, not surprisingly, have no clue of what happens to a subsistence economy when its biomass resources are affected. The increasing hardships and tensions only get reflected in studies of 'political economy which record growing conflicts over land, forests, fodder, grazing lands, water sources, etc, or in totally unexpected indicators like the sex ratio of the country. Just why 22 million women failed to show up in India's 1981 census is anybody's guess. Surely their extraordinary work burden, in a situation of malnutrition, must be an important factor.

It is for this reason that an indicator like gross nature product, and changes in that indicator, would probably reflect far better the changing reality in the subsistence sector of a country like India. Unfortunately, we do not know as yet how to construct such an indicator. But if we did, we will definitely find that while the conventional GNP has gone up, the gross nature product has steadily gone down, the former acting as a parasite on the latter.

The answer to India's immediate problem of poverty lies in increasing the biomass available in nature in a manner that access to it is ensured on an equitable basis. But giving a relevant 'green cover' to the country — the real Green Revolution — would probably require the most holistic thinking that planners' economists and scientists have ever known. The conflicts and complementarities in the existing land use patterns have to be extremely well understood. Otherwise, land use patterns will remain as chaotic as today. Landless and poorer peasants will continue to oppose planting trees on community lands under so-called social forestry programmes because they are afraid this will take away their grazing lands, while forest departments and richer peasants will only plant those trees which animals cannot touch (like eucalyptus) even though there is a stark fodder crisis all around. Nothing could take us closer to Gandhiji's concept of *Gram Swarajya* than striving to create village ecosystems which are biologically diverse and self-reliant in their local biomass needs to the maximum extent possible. This will clearly demand an extremely intensive use of our natural resources like land and water to create huge and diverse growing stock of biomass. Any science which teaches how to do this will truly have the right to be called a people's science — and indeed it will have to begin with the traditional knowledge of the people. Even more so, planning for the enhancement of village ecosystems will call for village-level planning with the involvement of the people — a level of decentralization that has never been attempted either in resource planning or in resource management.

The biggest challenge, therefore, is before social workers and politicians who have to play a crucial role in ensuring that people can participate in this biomass-based development process. No biomass-based strategy can succeed without the involvement of the people,

especially women. If useful nature is to grow, it will have to be protected and nurtured. The walls built to protect nature will be respected by the people only if they are people's walls and if the people know that what grows beyond belongs to them.

Easy availability of biomass leading to a reduction in women's work burden could create the appropriate conditions for many desirable social changes. Kerala, for instance, is often cited as an interesting case of an economically poor state moving ahead with its demographic transition. But is Kerala poor in environmental terms also? The availability of biomass, in fact, appears to be the maximum in India and women's work burden low. This may sound an exaggerated proposition but would it be right to surmise that, among many other things, it was also the easy availability of biomass and relatively lower work burden that created the appropriate conditions for literacy programmes for women to succeed? If women in Kerala had to spend as much time working as women do in large parts of Rajasthan, Uttar Pradesh and Bihar, wouldn't there have been immense male pressure to keep women working in crucial household activities and away from schools? Immediately, at least, the country must realize that a clear biomass policy is desperately needed, which recognizes the competing uses for biomass in society, especially between biomass-based industry and poor households and sets clear priorities on the use of biomass in a situation of scarcity. The needs of the poor must be specified as a priority use of biomass in the existing situation of environmental degradation. A beginning definitely needs to be made with the proposed Forest Policy and with rural energy planning in general.

If India fails to recreate nature on a massive scale in a manner that generates employment and equity, not only its villages but also its cities will become un-livable. Many people prefer to call the urban migrants economic refugees from the countryside. But to my mind many of them are really ecological refugees, displaced by dams, by mines, by deforestation, by destruction of grazing lands, by floods, by droughts, by urban expansion, and what not. India has today the world's fourth largest urban population but before the end of the century it will be the largest. Managing this huge urban population will call for extraordinary political and managerial sagacity and altogether new approaches, something we cannot learn from the rest of the world. But one thing is definite — if the process of urbanization continues to create the same demands on our rural environment, it will only accelerate the destruction of that environment and in turn make the urban environment impossible to manage. India cannot survive without a low-energy, low-resource input urbanization. In its absence, no law or laws, like the so-called Delhi Bills, which try to turn the incoming ecological and economic

refugees into our cities into criminals, will work. Only a holistic approach to our problems and dedicated political will to solve them will.