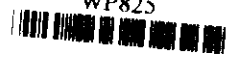


MANAGING ECOLOGICAL DIVERSITY, SIMULTANEITY,
COMPLEXITY AND CHANGE: AN ECO-POLITICAL
PERSPECTIVE

By

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Abstract

Mainly Indian studies on Governance from Ecological Perspective during last decade were reviewed as a part of Third Survey on Public Administration organized by Indian Council of Social Science Research ,New Delhi .

The importance of ecological or environmental issues has been realized in several studies but the bearing ecological variables have on the design and dynamics of public administration has not been adequately conceptualized. The discipline of Political Science has particularly neglected the rigorous empirical studies on this aspect . Of late there has been resurgence of interest in the study of ecological perspectives as it evolved in ancient Indian literature. The fusion of ancient understanding and the modern insights available through both natural and social science analysis remains to be done .

This review is about conception of ecology (relationships between living beings and their environment—living or non living) in viewing interaction between people and state. Several questions have been kept in view: how have the demands of ecological variability and administrative uniformity been matched; if scientific enquiries and institutional arrangements for incorporating the emerging insights in design of public systems are adequate, how have peoples organizations and NGO's (Non Governmental Organizations) reacted to the chasm between public policies and local realities; what are the strategies and styles of protest, campaign and legal activism in conflicts around natural resources; how has the framework for analysing public policies for risk and uncertainty evolved; and, finally what are the questions that the discipline must address in future.

The paper is divided into Four parts . Part one deals with the evolution of ecological thought in public administration .Part Two includes discussion on ecological diversity and uniformity of administrative systems. Part three looks into ecological movements and the strategies and styles used by these struggles in different parts of the country . The approaches to negotiation ,campaigns and legal activism used by the eco-movements / struggles are also discussed. How public policy deals with the issue of risk and uncertainty is discussed in Part Four. The implications for further research have been drawn in each section but an overview has been presented in the end.

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**MANAGING ECOLOGICAL DIVERSITY , SIMULTANEITY, COMPLEXITY AND CHANGE
AN ECO-POLITICAL PERSPECTIVE**

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Managing Ecological Diversity, Simultaneity, Complexity and Change: An Eco-political Perspective

The need for uniformity in design of public administration system has always been upper most in the mind of any central authority. It is easier to monitor and even easier to legislate. To fulfill this need, the state could either ignore the variability in the characteristics of people and their context or perceive only the common features.

The coercion in generating uniformity of perceptions in the mind of people having different historical subjectivity is bound to generate popular discontent sooner or later. The location, intensity and timing of this discontent could influence the social formations significantly.

These formations acquire the characteristics of nationalities or sub nationalities. The ecological variability or diversity could then become an issue of reconciling conflicting definition of the nation state or with in it the sub nationalities. It is this relationship, we contend, between socio-ecological diversity and diffusion of central authority which underlies most social tensions in developing societies.

We have looked at various studies, newspaper reports, debates on the ecological aspect of public administration. Since this subject has not received adequate attention in this discipline, borrowing ideas from other disciplines became necessary. Ecological processes are characterized by Diversity, Complexity, Simultaneity and change in the biotic systems. 'Holism' often dis-

cussed in relation to ecology reflects the inter-relationships between different units to be so complex that one could not be changed without affecting others. Ecological systems can not be explained or understood without looking at the multi-level simultaneous interactions. Study of such systems through linear relationships is not possible.

This review is about conception of ecology (relationships between living beings and their environment-living or non living) in viewing interaction between people and state. Several questions have been kept in view: how have the demands of ecological variability and administrative uniformity been matched; if scientific enquiries and institutional arrangements for incorporating the emerging insights in design of public systems are adequate, how have peoples' organizations and NGO's (Non Governmental Organizations) reacted to the chasm between public policies and local realities; what are the strategies and styles of protest, campaign and legal activism in conflicts around natural resources; how has the framework for analysing public policies for risk and uncertainty evolved; and, finally what are the questions that the discipline must address in future.

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gles are also discussed. How public policy deals with the issue of risk and uncertainty is discussed in Part Four. The implications for further research have been drawn in each section but an overview has been presented in the end.

Part One : Evolution of Ecological Thought in Administration

Moonis Raza (1987:4-5) in a very perceptive account from geographical discipline recognizes the crisis in the field of knowledge.

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He observes:

The gap between the essentially holistic character of the objectively existing system and its fragmented cognition through disaggregated analysis has already become a serious constraint on and had led to a crisis in knowledge. It is the experience of history that at such critical moments, unifying principles emerge which provide the basis for Weltanschauung, and integrated view of totality. The four-element four-humour universe of Hippocrates-Aristotle Ptolemy, the principle of gravitation of Newton, the theory of evolution of Darwin, the dialectical and historical materialism of Karl Marx and $E=MC^2$ equation of Einstein may be considered to be such unifying principles of knowledge, emerging on scene as synthetic constructs integrating disaggregated findings into a system of ideas and bringing the entire spectrum of scientists into their orbit of influence".

He rightly terms the ecology-development as a false contradiction. The vertical shift in the work force and its horizontal mobility over space is considered to provide the dynamics of productive forces. The relationship is considered particularly relevant for developing countries where the spatial structures created during the colonial rule still exist (in fact are being strengthened in many cases).

The ecological concerns have been incorporated in different social science disciplines beginning from the ancient vision of natural philosophy.

Historically speaking, it has been suggested that

Terrestrial resources have always been the prime mover of mankind's main action. The great migration, for an eloquent example, was triggered by soil exhaustion of the Central Asian Steppes after centuries of sheep grazing. (Also) People did not have to wait for science to formulate the Entropy law in order to realize that useful terrestrial resources are irrevocably "destroyed" through use" (Georges- cu - Rogen, 1980).

The tradition of incorporating ecological concerns in social institutions has been very old in our society. The terms 'Vriksha ayurveda' and 'Gulma-vrukshayurveda' are discussed in Agnipurana ,Brihatsamhita and Atharvashastra. Soil classification and its relationship with different types of plants was established several thousand years ago .A very well developed taxonomy of plants , pests and water existed in our ancient texts of knowledge such as Krishi Parashara (Majumdar 1927). The perception of environment by peasants and pastoralists was a necessary adjunct of evolutionary process in any society. Gautam in Nyayashastra in Fourth century B.C. referred to perception (pratyaksha), inference (anumana) and comparison (upama) as valid means of cognition and drawing inference(Sharma 1987) . PPST ,Madras has developed an excellent repository on ancient Indian texts on ecology and its interface with society. (Also see, Garg, 1987; Gupta, 1981(a), 1987(g), 1987(h), 1988(b), 1989(b); Mando Khot, 1987, 1987(a); Tyagi, 1987; PPST Bulletins, 1981-89; Jhunjhunwal- la, 1986; and Rao, 1982.

The administrative system was organically related with environment significantly perhaps in Ashoka's period in Fourth century B.C. The responsibility of administration vis-a-vis upkeep, health and management of animals was well specified (Prasad 1987). The responsibilities of people and state in maintaining the ecological balance and aesthetic habitat were also well defined.

The emergence of rules and institutions for maintaining resource relationships in society during different periods of history remain to be documented and analysed. Bernard (a colonial officer) conducted a survey of 2000 villages in 1760 in Chingelpet District of Tamil Nadu. He provided evidence about the rules regarding sharing production in a village among 130 and odd claimants ranging from temples, sluice gate operators of irrigation tanks and dancing girls (Dharampal, PPST, 1989). The analysis of such data may provide some clues about the way the natural resources were managed in village societies at the on-set of colonial rule.

Another way to look at the patterns in the evolution of man-nature interactions is to study the spatial and historical context in which different culture/communities grew up. The cultures that evolved at the junction of major migratory movements have often shown far greater sensitivity towards scarce natural resources than the ones which evolved in river basins. In any country people living in most adverse ecological conditions have always been found to be most dogged in nature. The cultures on the margins like deserts and hills people have generated institu-

tions for regulating scarce resources without external intervention. The resilience and pragmatism which characterised the 'hydraulic' society based in river basins contributed towards consolidation of power in the hands of local elite. They assimilated cultural attributes of dominant power and thus prevented their own marginalization. There could have been many factors explaining the greater respect for natural resources that existed among the people living in the forest, hills and desert regions. This respect, studies have shown (Singh, 1985, CSE, 1982, 1985) could not be sustained due to numerous pressures inherent in the capitalistic development. Market penetration and commoditisation of the produce from the common properties might have shortened the time frame for appraising investment options of different social classes in these regions.

Climate and Development

The relationship between climate and development (Biswas 1979:238-258) has not been given the attention it deserves in various disciplines. There have been instances where people have used models implying ecological determinism. Huntington in his book on 'Civilization and Climate' published in 1915:

maintained that different types of climates determined the varying levels of development and civilization of the different nations of the world, since climate affected human energy, and thus, achievements of the society. Huntington, unfortunately, popularized the vague feeling of pessimistic geographical determinism, i.e, the colonized people were somehow racially inferior to the European stock" (Biswas 1979:239-240).

Several other authors during this period echoed the above prejudice (Tytler, 1953, Harvey 1947). It is observed that while above conceptualisation was basically faulty still 'the fact remains that no tropical country in modern times has achieved a high state of economic development' (Kindleberger, 1965). The studies on history and capitalism have shown that lack of development of tropical countries had to do less with ecology than the colonial rule, hegemony of internal power groups and unequal exchange relations even in the post colonial phase. It is brought out that influential book of John Mellor (1966) on 'The Economics of Agricultural Development' did not have a single index citation on climate.

Myrdal (1968) criticised the tendency to use western concepts for analysing institutions, attitudes, modes and levels of living in developing countries. However, when the western theories did not apply, the social scientists in developing countries often with training in West also did not break fresh ground (Biswas 1979: 244). Many social scientists felt climate to be a 'parameter'. There was a tendency to treat climatic conditions as boundary conditions keeping them out of the overall framework of analysis. Myrdal (1968: 2121) emphasises

Climate exerts everywhere a powerful influence on all forms of life--vegetative, microbial, animal and human -- and on inanimate matters as well.. Every serious study of the problems of underdevelopment and development in the countries of South Asia should take into account the climate and its impacts on soil, vegetation, animals, humans and physical assets -- in short, on living conditions and economic development".

Streeten (1971)), also observed that the conditions of developing countries between the Tropic of Cancer and the Tropic of Capricorn were comparable to the conditions with the pre-industrial Europe. It was noted :

Even though the interrelation between tropical climates and health or work efficiency have not been conclusively established, several comments can be made. Because of socio-economic and climatic conditions, diseases seem to be quite prevalent in the tropical and semitropical regions. Indeed, the whole situation gives rise to a vicious cycle. Lack of appropriate development means that people do not have adequate education, nutrition, sanitation, or health care, all of which contribute to make them more prone to diseases. This in turn affects efficiency of work, which further reduces rate of development. The warm and humid climates of the tropics further worsen the situation" (Biswas 1979:254).

It is argued that various problems of development requiring modification of natural eco-systems could be resolved only if the existing ecological basis of the systems being replaced was adequately studied and understood. The tendency to pursue adhoc research without linking it up systematically with a long range programme could not achieve a major breakthrough. The need for more information, Biswas however, stresses need not be made an excuse for not using the information that is already available. He recalls, if Plato described some 23 centuries ago the way deforestation increased the soil erosion and floods and if ancient Indian texts provided the ways of coping with it than obviously arguments of more research even in those cases where alternatives exists may be counter productive. This is not to belittle the need for continued research for improving the efficiency of existing alternatives.

In other cases the variability in the ecological and economic endowments has been considered a part of a continuum. Thus while recognizing a great variability that existed in the agricultural conditions in developed and backward parts of the country a recommendation was made that development would follow by teaching those in the backward parts of the country the better practices of the most advanced Indian Agriculture (Voelcker, 1893):

The institutionalisation of the separation between practical knowledge and academic knowledge of agricultural environment perhaps took place after this report by Voelcker. It was observed that the personnel of Indian Civil Service 'must learn primarily to be an educated and administrative officer'. Voelcker did not think that practical agriculture could usefully be included in the professionals examinations. He recommended against common position of the Director of Land Revenue and Agriculture. It is here that the myth of separate role of regulatory and developmental administration must have been created. The bearing such a conceptualisation had on the design of administrative systems in post colonial period are not difficult to workout. While the 'anavari' (estimation of productivity in each village) has remained a function of revenue administration, the development which should have been tailored to the variability in anavari caused by climate and soil conditions became a function of the so called development departments which never used this information. The transformation of spatial characteristics into sectoral responsibilities was thus embedded in the very nature of public administration. We have argued elsewhere how the sectors have to

be transformed into 'access' space while critiquing the conventional regional planning theories (Gupta 1981a). The logic of spatial diffusion of technologies and development processes also deserve study in this respect (Morrill, Gaile and Thrall, 1988).

Concepts of Ecology in Different Disciplines

The conceptualisation of ecology in social and other sciences has revealed that, "contemporary sociological theory has developed with an implicit taboo against incorporating ecological variables in the analysis (Buttel, 1986: 338). Social science has borrowed biological analogues right through the work of Comte, Spencer, Malthus and Marx. In fact Marx considered dedicating Das Kapital to Darwin (1986:339). Durkheim had suggested that division of labour in society:

increased the adaptability of more populous and dense societies to their environment by decreasing direct competition over resources and causing cultural changes (including but not limited to those in science) that would redefine and effectively expand resources" (Buttel 1986: 341).

Marx is believed to be the most controversial 'classical environmental sociologist'. "Marxist thought has frequently been utilized by proponents to delegitimize 'neo-Malthusianisms' such as the environmental movements or notions of ecological limits to growth (1986: 342)". Parsons study on 'Marx and Engels on Ecology' (1977) demonstrates the crucial role of natural resource issues in the way Marxist political economy evolved. Weber on the other hand believed that the environmental factors were not all that pervasive determinant of social structure. They could become

"causally relevant at certain key junctures in the histories of particular societies" (West 1978:27). The efforts to develop environmental sociology (Dunlop and Catton 1978 and 1980) have been acknowledged to have influenced much of the contemporary social ecology in the west. However the environmental sociologists have been advised to study many other mainstream sociological issues from an ecological perspective.

In a recent study we have demonstrated how the linkage between ecological and sociological aspects through the POET variables (Population, Organisation, Environment and Technology) captured in the Human Ecological school of Thought developed by Park and Hawley (1950, 1981, 1982 and 1984) do not provide a testable framework. Since everything is assumed to be related to everything else at the same time no causal analysis was possible (Gupta 1985 a, b, c, and 1989a).

While the political scientists have made plea for developing a theory of Ecology (Dwivedi, 1988) or Political Ecology (drawing upon work of Beakhurst, Dwivedi 1986), the arguments have unfortunately been often rhetorical. The need for holism has been argued without explaining the analytical scheme which would capture various relationships in the 'ecological whole'. Dwivedi (1986) bemoans that the political scientists have not paid adequate attention to environmental issues at sub-national or local levels. They have preferred what he terms, the greener pastures of environmental research at national, international and other levels. It could also reflect, as I see it, an often articulated desire of the Western Social Scientists that global and macro

level issues be better left to the more 'enlightened' elite whereas the professionals in third world should concentrate themselves with collection of primary information about local phenomena. The inadequacy of his framework can be judged by his belief that "keeping humans out of the domain of ecology was challenged in the 1970s with the rise of the environmental movement" (1986: 10). Given the fact that work on ecology and its interface with human beings has been always in the centre of social enquiry such a statement betrays a proper understanding of the history of studies on the subject.

Dwivedi, Tiwari and Tripathi (1984) and Shendge (1986) discuss the Hindu Concept of Ecology. We believe that such a search for concepts drawn from historical and/or religious beliefs should be mounted in all the religious frameworks and not restricted to any one view.

The search for paradigm selection has led people to argue for ecology as a paradigm (Woodwell 1978, Robertson 1979). It is obvious that ecology provides a way of viewing interrelationships between organic and inorganic, animate and inanimate and conscious and not so conscious elements of nature. The social conflicts arising out of differential access to scarce resources have to be studied through the help of disciplines other than ecology (Also see, Mlinar and Teune 1978).

Amartya Sen (1987), stresses the need for politics to make use of rest of the sciences including economics. An interesting possibility of what I may call 'Reverse Sanskritization' is manifest-

ed in this work (1987:26). It is mentioned that people of higher classes accepted the role of lower classes due to distress (perhaps caused by famine and other such calamities). To what extent 'Reverse Sanskritisation' affected social relations and the process of making demands on public systems in the post distress period remains to be studied (also see, Richard, 1979).

Recently while reviewing the need for bringing Ecological Demography in the sociological enquiries Namboodiri (1988) identified several problems. While suggesting the way out he refers to the population ecology perspective which I assert almost corresponds to social Darwinism (Gupta 1989). In this framework in a community of organizations the most fit forms of organization are supposed to survive (Hannan and Freeman 1977, 1984). The fit is defined in terms of what survives - an obvious case of tautology. (Mitra, 1984) provides Indian perspective on relationship between population and environmental degradation.

Since the ecological approach which 'eschews the subjective values and purposes of individual actors' (Robson 1969) is considered incomplete, the need for looking at normative pressures is identified. Finally a case is made for closer correspondence between demography and human ecological approaches as a part of mainstream sociology.

In a move towards linking ecological perspective with political economic perspective on rural development, Buttel (1980) quotes Syzmanski (1978:25) to state:

the potential chaos that might result from the expression of so many particularities of class interests in the state structure will tend to be mitigated by actions by state officials to 'aggregate' the interests of the dominant class. In other words, state functioning will be facilitated if it is able to forge a dominant class 'will' so that this class can be more unified in its struggles with subordinate groups (1980:50).

The capital is supposed to have no 'monolithic' interest in various policies such as agriculture energy, environment etc. Once the division over policy issues becomes considerably intense the need for consensual politics increases.. The subordinate class groups, it is suggested while advancing their own interests and demands, further complicate the policy determination process. It is in this context that Syzanski talks of the potential chaos that might result from competing claims for resources. It is a very important insight which may help anticipate the role of a state in framing policies while dealing with numerous ecological and other social protest movements in the country.

Singh (1987) while reviewing various agricultural-economics studies on ecology and environment restricted himself to the methodological and technological issues involved in looking at environmental implications. The groups of economists which discussed various issues did not consider it necessary for economists to become ecological protagonists (also see Murty (1985) for discussion on Economic Evaluation of Environmental Management Programme).

It was argued that ecological considerations could always be accommodated in the analytical framework of an economist for

optimum use of the society's resources including the economic and ecological interests of the future generations. The conventional social benefit cost analysis in spite of its inherent conceptual deficiency was considered sufficient for the purposes of measuring and evaluating ecological and environmental problems.

While discussing the institutional problems it was stressed that research on the role of property rights and land tenure systems in soil erosion; institutional economic constraints in reversing land degradation and social economic aspects of alternative land use including farm technologies besides farming systems research was necessary (Singh, 1987:533). In another study on relationship between agricultural development and ecology Nadkarni argues for taking into account the three dimensions viz. externality, sustainability and equity which form the basis of classical social ecology. Raghunandan (1987) argues against technical solutions to ecological problems and feels need for reorientation of policy for science and technology. The scientific knowledge he feels would influence the ideological struggles. For policy analysis in context of environment, the studies are scattered and often deconceptualised (e.g., Mrema, 1982).

Ethnicity, Culture and Ecological Identity

Anthropologists and others have looked at the problem of ethnicity in different cultural groups set in ecological and social context (Khubchandani 1983, Roy Burman 1988: 380, Duncan, Otis and Schmore, 1959). It is believed that the language and its interaction with politico economic establishments can be seen on

a continuum of developed and underdeveloped stages of language. I feel that to consider language of tribals (ignoring the history of functions for which it was evolved) as undeveloped involves passing value judgments.

Gadgil and Malhotra (1983) provide evidence on adaptive significance of Indian caste system particularly among pastoral communities in Western Maharashtra. The argument is that, "castes more directly dependent on natural resources had so organized their mode of subsistence as to avoid excessive overlap with other castes in their demands for various resources". They further believe that the monopoly of lineages over particular resources in a given locality perhaps created the conditions for a culture to evolve rules of social restraint for resource utilisation in a sustainable manner (Gadgil, 1983).

Perspective from physical sciences

It has been suggested that ecology and the new physics in their own way represent nature to be an internally related, systemic, integrated organic whole (Callicott 1988). It was believed,

The mechanical world view was laid to rest less by ecology than by the so called 'New Physics'. The theory of relativity warped and dilated Euclidian space and time, and quantum physics dissolved the hard material particles of classical physics into patterned fields. Casual determinism and even objectivity (according to the widely held Copenhagen Interpretation of the new quantum theory) were abandoned as the process of observation at the subatomic level was understood partially to constitute reality. Not only were the fundamental conceptual elements of nature rendered relative, structurally integrated, and mutually defining, object and subject were inextricably bound up with each other (1988: 6)".

It is further added that, in the ontological sense ecology did not deal with relationships as real as things. The relationships were more than the real things. In fact relationships were logically and ontologically 'prior' to the relata or the things related (1963: 7). This leads to an important direction in conceptualising ecological and political interactions. The critical social science has to question the dominant strategies of poverty alleviation relying on a conflict free model of natural resource management.

Yapa. (1979) in eco-political economic analysis of agricultural innovations suggests the need for taking into account relationship not merely within the society but also between society and nature. The crisis thus had to be seen in light of the social relations influenced by economic relations in the given context of production forces shaped by natural endowments.

There are dangers in using general systems perspective symbolising the holism of ecology without at the same time combining it with critical science. One can in anxiety to study all or most of the relationships decide to accord equal importance to every relationship. The fact that weights given to different relationships are to be determined by the ethical presuppositions of the researcher should not be ignored (Pacey, 1974: 319). In a very influential study on the 'Soft Energy Paths' (SEP) which were more sustainable compared to the other hard energy paths, Lovins (1977) observes that in SEP, "the stakes are smaller, the choices wider, the mistakes more forgiving. Few decisions are irreversible, none compulsory. Preference rules over pattern" (1977:152).

In this very impressive polemic, Lovins argues for redefining the developmental priorities and instruments. The hazards of nuclear and other hard energy choices are amplified. He adds that "energy decisions can and do affect the spatial distribution of jobs, hence of settlements, hence of political power that can reinforce the pattern".

In such a context one has to recognize that the centralization in public administration is a logical correlate of centralized energy systems. Lovins stresses that such systems were inequitable because these separated the energy outputs from its side effects and allocated them to different people at opposite ends of the transmission lines, pipe lines or rail lines. The increased preference for expansionist energy policies by the Central Governments world over are leading to a strong local reaction. One of the subtle but important disadvantage of such technologies is that they are so big that one could not play with them. An essential breath of both fun and creativity, Lovins suggests is lost.

One might differ from such a polarised view. Nonetheless it is only in the context of extreme position that one can appreciate the need for discriminating among the choices that lie in between. It has been observed that all organizational structure generate false images in the decision making system. "Larger and more authoritarian the organization (to attempt to cope with the complexities) the better the chance that it's top decision makers will be operating in purely imaginary worlds" (Boulding, 1970).

This appears to have almost a prophetic ring.

In the context of environmental economics four types of values are referred for appraising any choice of investment - the option value, the use value, the bequest value and existence value (Turner, 1988). The first refers to the price which an individual is willing to pay in order to keep his utility (satisfaction) constant for different levels of natural constraints. The optional price minus use values equals the optional value. The use value is the expected consumer surplus for actual recreation or welfare drawn from a natural resource. The bequest value refers to the judgment one makes about the price to be paid for foregoing current consumption in order to safeguard the interests of future generations. The existence values are assigned with the knowledge that such assets would continue to be conserved even though no individual current or future use are anticipated. The implications for designing administrative systems which can generate debate and dialogue on these values remain to be drawn.

Sustainable development in the political perspective requires consideration of four basic principles (a) knowability (b) homeostasis (c) internal bio ethics and external bio-ethics (O'Riordan 1988). The first refers to the scientific limits that exists about the phenomena and its interrelationships. The homeostasis refers to the resilience i.e. ability of a natural system to come back to its original form. The internal bio ethics refers to the moral constraints imposed on using a resource below the threshold limits. While the external bio ethics implies using a resource upto a sustainable yield. A reference is made to a practice

during Greek period when the provincial governors were rewarded or punished according to the 'look' of the land. Perhaps with all the efforts made in raising the consciousness of people and elite on the environmental issues, one aspect on which most activist groups seem to feel confused is the degree of accountability of the state. How much of this accountability should be stressed in the short run in favour of achieving assurance for larger accountability in future. It involves choices of methods and means which still have to be described and refined (also see, Gupta, B.S., 1984; Gupta, K.D., 1981).

In the discipline of psychology, the ecological parameters have been used but more in the larger social environmental sense (Sinha, 1962) rather than in natural resource context. The only reference to ecological roots of deprivations was in Misra (1983) where the place of residence was found to be one of the fourteen factors explaining the cultural deprivation. Out of the four most important variables other three were family income, father's education and caste.

A Mexican novelist, Carlos French suggests that without culture of tradition, we could not have the tradition of culture either; we could be like orphans of imagination (Feuntes in Singh, 1981:91). Krishna Chaitanya refers to similar ideas drawing upon illustration from Indian epics (Chaitanya, 1982). The relationship between cultural variables, ecology and political economy has been traced in Chinweizu(1982), where the economic rationality of plunder is related to the culture of individual self inter-

A World Bank study on tribal people and economic development observed three dimensions of development; (i) the value of tribal culture to be recognized, (ii) potential harmful effects of contact between dominant plain vis-a-vis tribal culture, (iii) control of tribal members over pace and manner of their adjustment--natural, society and culture. A plea is made that cultural autonomy did not preclude training of selected tribal representative in the dominant culture and their role as mediators with the latter.

It is this understanding of cultural and eco-adaptation of tribals which generates pressure in public administration for co-optation rather than cooperation.

To contrast it, Bishnois have been known as a religious community in Rajasthan and Haryana which took upon itself the role of protection of animals and plants. If one while passing through deserts in Indian west came across dense forests and wild life, one could assume that Bishnois might be living in the neighbourhood. To what extent such cultural diversity closely patterned by the ecological diversity be maintained depends upon the way contradiction between national elite and regional identity are resolved.

The administrative thought, as a body of core concepts derived from different disciplines having bearing on people-state-nature interactions is yet to evolve. However, the rich variety of questions being raised in different disciplines from ecological

perspective promise considerable breakthrough in next decade.

GLOBAL DIMENSION OF NATIONAL ENVIRONMENT:

Lester Brown (1989) an influential voice on the global environmental science writing on 'Global Ecology at the Brink' felt that food security might substitute the military security as the principal preoccupation of the government. The pressure on water supplies was increasing in U.S., China, Soviet Union and India. Eleven percent of cultivable land in U.S. is being 'retired' for it's conversion into grassland or woodland. Soviet union is presumed to have lost about thirteen percent of their grain land over last decade due to erosion. In China, the loss is about seven percent. U.S. Department of Agriculture recently reported that one fourth of all the irrigated land in USA was being irrigated drawing down the underground water table by atleast half a foot a year. In some case the drop was as much as four feet.

In Soviet Union, much of the irrigation was concentrated around Aral Sea in the Asian Republics. This sea was fed by two rivers which had been diverted for irrigation. The sea began thus to shrink and one fishing Port Muynak was now thirty miles away from the coast, Brown (1987, 1989) observes.

Brown adds that in in Japan, rice yields have not increased since 1970 despite the fact that support price offered to Japanese farmers is four times the World prices. The highest productivity (and not production) levels achieved in 1966 in Asia through the release of new varieties have not since been super-

cedal. Thus the hope that reduced water and land would be made up by the increase in productivity was not very rational.

Each year, out of the total world area about 24 billion tons of topsoil in excess of the soil formed through natural processes was being lost. To get an idea, it is equal to the entire top soil of Australia.

The drought of 1988 in USA reduced the world grain stocks from 101 days of world consumption at the beginning of 1987 to 54 days in early 1989. The world prices increased by 50 percent over last year.

The climatologist fear that drought could become past of U.S. destiny. The annual food production in 1988 in U.S. fell below the domestic consumption first time in modern history.

Most alarming pointer to the global politics and its bearing an environmental policies the world over is that by the beginning of 1989 harvest, the US grain reserves built over a long time would largely disappear through export commitments and reduced production.

If the year 1989 was a drought America would have no exportable surplus. Argentina, Australia and France would occupy the centre stage. The price increase, Brown fears, might shadow the gravity of 1972-73 oil price shock.

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Global Warming:

Brown further adds ,the three droughts of 1980, 1983 and 1988 in U.S. coincided with five warmest years of the century which could or could not be a coincidence. It is often ignored, he feels that increase in temperature by 3 to 8 degree Fahrenheit by the year 2030 or 2050 would not be uniformly distributed over globe. The equatorial countries were not likely to be affected much.

The countries in the higher latitudes of Northern and Southern hemisphere - the grain growing regions - would be affected most. The increase in carbon dioxide levels in the atmosphere due to industrialization and other processes was the price future generation have been committed to pay. Norway and Canada were the only two national government that had urged the world to think about reducing the consumption of fossil fuel. Brown warns that governments world over might become so preoccupied with measures to meet food shortages and increased prices that energy conservation (and ecological security) may not even remain on the agenda. This, we feel, is the real challenge to the students of administrative expediency in the light of catastrophic crisis. The growth rate of population in India is about 2.2 percent, China, 1.2 percent, Bangladesh and Pakistan 3 percent, and Kenya 4 percent. It is not sustainable at all.

Even if the fertilizer consumption was doubled in USA, the production might not much change. The diminishing returns had set in all the high growth regions. In USA fertilizer use was lesser now than what it was six year ago (not surprising, the increased

emphasis is being given on organic farming). If one looked at the soil erosion and the decline in water table, one could see the unsustainable nature of majority of the world food output.

Whatever changes take place in the major food exporting countries were bound to affect the world economy and politics. We may add that what changes in the style of governance could take place in the event of such consequences for world food economy, long term climatic changes and localised concentration of effects have to be studied in each country.

Whether the migration of populations world over to metropolitan cities has implications for the type of institutions such articulated and aggregated population will demand has not been looked into. Though authors do recall numerous studies arguing against the urban biased policies. The role of foreign assistance in growth of metropolitan development is also critiqued.

GLOBAL CLIMATE AND LOCAL SURVIVAL;

The Chlorofluorocarbons(CFC) and their effect on depletion of ozone layer have started bothering the people world over.

The aerosol propellants, refrigerants, cleaning solvents for electronic components and foaming agents for plastics and some of the chemicals that release atomic chlorine affect the ozone layer. In 1965, a hole was discovered in the Antarctic ozone layer which made the decision makers in the western countries conscious of the damage at hand. Ozone layer helps in checking

the ultra-violet rays of sun reaching the earth. The effect of ozone loss on global climatic change (by way of increased melting of glacial ice, rise in the sea level in some places) and green house effect (the increase in the earth's temperature due to increase in Carbon Dioxide accumulation) and entire biomass on earth are still being estimated (Rowland, 1989).

U.S.A. had banned the use of CFC in 1976 and the ban became effective from 1978 for its use in aerosols. Other uses of CFC however, continued. A UNEP convention to protect the ozone layer was signed in 1985 in Vienna. On Jan 1, 1989, Montreal Protocol to reduce the emission of the CFC family of gasses was signed and ratified by 28 countries. Among these 28 only five were the developing countries viz., Egypt, Kenya, Mexico, Nigeria and Uganda. Usher (1989) reviews various factors which influence the hesitance of developing countries including India to sign the protocol. After all 74 percent of all the CFCs are emitted by developed countries (also see, Kramer, 1989).

The argument from the developing country's perspective is quite expected. The economic development of the western societies has inflicted tremendous damage on the environment (be it nuclear waste, CFC, CO₂ build up, other Industrial effluents, even debris in space etc). By the time developing countries managed to assimilate these technologies, the exporting countries wanted them to abandon these in favour of substitutes, which again will have to be imported from the same developed countries (Gaikwad, 1989). The cost of contributing restraint on using CFCs and other such environmentally harmful technologies will have to be borne

by the developed countries.

Heckert(1979) Senior Director of DuPont Company(which is a major producer of CFCs) acknowledged, "Political and social scientists have been involved with the ways entire societies structure themselves and choose among conflicting values in a world of limited resources". He then argued for a dialogue between the representatives of industry who he stressed, shared the same concerns as the academicians. It was noted that technology, alone would not solve the problem. 'Value judgments must be made and consensus politics developed if success is to be achieved'. He felt that current system of policy making suffered from three limitations : (a) lack of solid consensus on environmental goals, (b) tradeoffs required to implement the existing environmental policies were not adequately recognised and understood, (c) the existing political process did not provide for 'thoughtful consideration of all the relevant data'. It did not permit flexibility in terms of rate at which specific objective had to be achieved. In light of this, the academicians and business community had to evolve a consensus.

The experience of dumping in developing countries those pesticides, drugs and other technologies which were banned in the countries of origin did not justify much optimism. However, it is true that institutional space for dialogue and debate on such issues has to be continuously created and in fact expanded. The concept of 'ecological audit' has yet to sink in the mainstream understanding of public administrations. For discussions on

environmental indices that can be used for monitoring the changes, see Lohani, 1984).

Wieberdink and Ketel(1988) show that Nicaragua offers perhaps one of the best recent examples of innovative integration of environmental politics into national programme. Sandino (the founder of Sandinism) had raised in 1930s the issues of proper natural resource management since these were being exploited by an affluent minority. Ernesto Cardenal (presently Minister of Culture) had written in a poem, "Not only the peoples, but also nature is longing for liberation".

'Global Commons' such as the ozone layer, atmospheric temperature, debris in space, marine resources (fish, minerals, other biomass) international river system, nuclear wastes, industrial effluent etc are not any more concern of one nation or society. Studies of social structure and mediation by public servants in conflicts around natural resources can not be restricted to only national boundaries. Implications of global climatic changes on local conditions in developing countries are only now being realized (Jodha, 1987).

The fact that genetic diversity is maximum around the equator (Ehrlich, 1986) where poverty and deprivation is also highest should raise questions about the way we view the resources. The genes for disease resistance are often derived from land races of crops grown or found wild in tropical countries. These contributions unfortunately do not impose any obligation on those who extract rent through agribusiness and seed-chemical tie ups.

The ecological diversity would have vanished if the 'development' implying mono-culture had diffused in these backward societies. It is a different matter that climatic, edaphic (soil related) and other environmental variabilities in semi-arid and arid regions world over prevent any possibility of 'modern' technologies diffusing widely. The politics of not paying due price for preservation of this genetic wealth to poor dry region people has to be properly understood.

It is not often recognised that variability in genetic resource was maintained through institutionalisation of certain rituals requiring different varieties of rice/ragi or other such crops for different occasions. In which ever commodities taste is important, the behaviour of social system is comparable be it grape vine growers for making wine in France and other parts of Europe or paddy growers in Eastern and Southern India.

How is this variability being preserved? The international community is divided on the matter. International Bureau of Plant Genetic Resources (IBPGR) which is responsible for indexation and preservation of genetic variability is located in US and is covered by US laws though every country practically has contributed to this pool. Many developing countries fear that they may be denied access to this pool should some political conflicts arise. Further the right of agri-business firms to draw on this pool without disclosing the genetic constitution of the varieties developed by them for commercial exploitation is also being debated. Administration of this exchange needs to be studied.

Another dimension was added by the decision of Government of India under new seed policy to permit import of certain fruit vegetable seeds under open general licence through almost a non-feasible quarantine. As is well known, there is no concept of sampling in quarantine. Either there is quarantine of every unit of plant material imported or there is not any at all.

Research on Margin: Technology Assessment

In context of the agricultural research towards improving the ecological balance it is important to note that the boundary issues which don't lie in the mainstream of any particular discipline are often ignored even in the developed countries (Rennie, 1988). Several examples are given in the proceedings of the Select Committee on Science and Technology, Agricultural and Environment Research, House of Lords, Fourth Report (1984), UK. One of the most important instance is where Director of Research of Game Conservancy Institute complains that in the hope that Rothamsted would carry out research on environmental aspects of certain technologies no funding to other Institutions for those problems was being provided. The scientist notes.

part of the reason why above work (Research on Long Changes in Biomass particularly insects in the farm land because of various changes in environment) is now so difficult to finance is that the responsibility for solving the questions does not rest clearly with any one source of funding. There is no one customer for such a broad watching brief on farm land which is not clearly associated with either agricultural or environmental interest (1984 : 159).

The problem in India is even worse because institutional arrangements for review of fringe areas do not exist. Related to this is the problem that certain types of studies such as on the Environmental Impact of Pesticides are not published even in U.K. (1984:19). The ostensible reason is that commercial confidence would be violated if such information was shared. The research resources for soil science were cut in UK leading to abandoning longer term basic science work. In India the situation is alarming. The total contingency budget for dry farming available for experiments was hardly 2 1/2 percent of the total allocations for the purpose in one of the leading Agricultural Universities of South India (for example, see, Loeffler and Schillhorn, 1988: Livestock research related to environmental aspects in Africa).

Biotechnology is another area which is likely to affect the environment in various Third World Countries significantly. A number of companies in United States are manufacturing substitutes of Vanilla, Cocoa, Sugar, Arabic Gum etc. which will substitute the natural products exported by Latin American and African Countries. Once this is disturbed the whole ecological system evolved around these export crops would come under strain (Jamal, 1988). There is a need for constant monitoring of such technological changes in the global system so that anticipatory measures can be taken.

Part Two : Ecological Variability and Administrative Uniformity: Is Marriage Possible Between the two?

Literature on Organizational Behaviour and Public Administration includes many references to the need for reappraising current methods of analysing interactions between people and institutions. However, these concerns have excluded any reference to the way social formations emerge in different ecological contexts, for instance Nef and Dwivedi (1981), Khandwalla (1984,1988-89). Comprehensive review of Indian studies on Organizational effectiveness after 1976 (Khandwalla,1984) does not include a single reference on the need for taking variability introduced by ecological endowments in social experience, articulation and interaction with organizations.

How has the question of 'space' or 'region' figured in the study of governance? Jain felt uneasy that due to the conflicts between centre and states, 'an uneven situation exists in various states regarding environmental management and the implementation and/reinforcement/of national policies'(1984:303). The remedies for inappropriate implementation of environmental policies included (a) greater technical competence in Department of Environment and the Boards set up at state level; (b) funds for setting up expert committees, preparation of environmental appraisal projects, and (c) greater attention by the state governments. It was believed that "financial stringency, coupled with inadequate attention being paid by state government to their whatever environmental departments/committee 'that' exist is affecting the dedication and motivation" (Jain 1984:304-305). This is an

example of the problem identified quite rightly by the Third Review of Social Science Research in India by ICSSR (New Delhi, 1986). This report observed, "social scientists have responded more to the problems as perceived by governmental agencies than to the issues facing society" (1986:8). Whether the dedication and motivation of the leaders and officials at central level should be affected adversely when variability in the endowments, needs and historical context of different states are ignored in the guidelines issued by the centre is not disputed by Jain.

The issue is whether the analysis of this demotivation should include the perceptions and needs of the people in states also? Need for more training, greater funds, better networking etc., in this context has been noted by others including Mathew (1984) and Bala (1980). Why such perception come about can be better understood if we look at the way environmental policies evolved at the central level.

It was in fourth Five Year Plan that the government realized the limits of standardized solution to regionally differentiated problems. Fifth Five Year Plan saw the evolution of a large number of eco-specific programmes such as for Hill areas, coastal regions, drought prone areas, deserts, tribal-forest regions etc. This was perhaps the period when ecological sensitivity was being taken into account while designing public systems, at least to some extent. Even among these programmes, DPAP had, to begin with, greater flexibility in evolving programme content, administrative strategy and organizational structure. Not only this.

flexibility was removed in sixth Five Year Plan but standardisation was taken to its extreme extent in Seventh Five Year Plan in the form of Integrated Rural Development Programme (IRDP) and District Rural Development Agency (DRDA). With increasing tendencies for administrative centralization, the central government has shown lesser willingness to accommodate variabilities in the programme design and content. It is ironical that role of NGOs was given maximum attention in the Seventh Five Year Plan but not for generating feedback on the poor fit which existed between central policies and regional realities. Instead it was to either bypass the 'diffident' administrative system so that 'governance' is done by 'non-governmental organizations' or to incorporate NGOs in speedily implementing the centrally sponsored development programmes.

Role of Environmental NGOs

A detailed examination of the role of NGOs in public administration is presented elsewhere in this review. We may only highlight certain features relevant in above context.

Several typologies of NGOs have been proposed with regard to the environmental issues. Jain(1984) divided the environmental NGOs into three groups (a) those involved in enhancing environmental awareness (CSE), (b) those involved in practical development as well as environmental awareness (Shahdol Group, Kerala Shastra Sahitya Parishad-KSSP, Dasholi Gram Swarajya Mandal-DGSM) and (c) environmental activists (Bombay environmental action group-BEAG).

It is obvious that such a typology is inadequate largely because each of these roles that is, awareness, action and activism could be simultaneously pursued by various groups. For instance the CSE has been involved in activism as well as in promoting environmental awareness. What is more important to notice is the positive role that the author visualises for NGOs - (a) .pressing State Governments to implement the guidelines issued by the Department of Environment and (b) forcing the states to allow DOE to 'study and analyse potential environmental impact of critical projects'. The weaknesses identified are (a) weak linkages between the State and NGOs (b) weak role in enactment of environmental legislation (c) inadequate links between city based NGOs and their rural counterpart and (d) lack of 'perfect' understanding of environmental problems of NGOs.

There are several problems with such a conceptualisation of the role of NGOs. With increasing centralization in the public polity the suggestion for stronger NGOs - State (central authority) linkage might further weaken the tendencies for greater federalization of the State. Instead of strengthening the institutional capacity at the state level the NGOs can be used to bypass the local level structures. Whether this would help in evolution of eco-specific policies and procedures in public administration is an issue for further research. On the other hand there are examples of NGOs articulating the concerns of people struggling against government's short sighted policies (Agarwal, D'Monte and Samarth, 1987).

Other weaknesses identified in NGOs are (a) lack of trained per-

sonnel with NGOs, (b) limited access to authentic data (c) lack of statutory support and judicial sympathy for the efforts of non officials (d) apathy of public towards sustained campaign and (e) weak inter NGOs coordination (Mathew 1987). The successful cases recalled by Mathew in this context are: Silent Valley Project, Appiko Movement, DGSM, Save the Western Ghat Movement. This is not withstanding the impression that very few NGOs are really genuine in their concern. The possibility that any institutionalised space for negotiation may lead inevitably to emergence of hierarchies and bureaucratic structures has not been adequately appreciated. The voluntary nature of many of these NGOs becomes weaker as they become institutionalised in state structures (Lokayan Bulletins, 1981-1986). However, several initiatives for policy reform would not have been taken but for sustained pressure by concerned NGOs such as IDS in Dharwar, Karnataka and Vikalp, Saharanpur; Centre for Science and Environment, New Delhi; Bombay National History Society, Bombay; etc.

Bureaucracy and Ecological Variability:

How bureaucracy at different levels should relate to the issues emerging from the interface between ecological variability and the administrative uniformity requires enquiry at several levels (Gupta, 1981a, 1984e, 1985a, 1986c; Handelman and Leyton, 1978). While there have been some studies which looked at the role of District Collector (DC), Sub Divisional Officer (SDO) and other local administration (Ranjising, 1984; Hooja, 1982) the lack of studies on this interface at higher level is conspicuous by

absence. The ones pursued in terms of the concern and objectives defined by the Department of Environment or other bodies at central level (Jain 1984). We need studies that look into the influence foreign aid agencies had in setting up of Society for Promotion of Wasteland Development (SPWD), involvement of several retired environment/resource administrators in SPWD besides the involvement of academicians; the genesis of National Wasteland Development Board (NWDB); issues on which the conflict took place between the Chairman and the Secretary (former a non official and latter a career bureaucrat who later became cabinet Secretary), influence on policies towards involvement of private corporate sector, voluntary organizations, academics and administrators in resource augmentation programmes, the evolution of NWDB into a technological Mission and resultant diminution or enlargement in its role?

Similarly, we need explanation for extra-ordinary number of activities with regard to NWDB: where as the sister body viz: National land use and Conservation Board has not even met for two years (Vohra, 1988). Does it have to do something with the fact that former relates more to public/forests/revenue/panchayat lands (i.e. common or public properties) where as the latter may involve choices regarding private individual land? Both these bodies are expected to report to a national council chaired by Prime Minister. How do these relationship evolve, grow or get diluted, influence or are influenced by central interventions in matters pertaining to State's realm, are questions that remain to be analysed.

There are studies which indicate that there could be structural dysfunctional features of hierarchy in dealing with people living closest to nature (i.e. tribal population). In a very thought provoking analysis of bureaucratic system dealing the nature-tribal interactions, Dr. Sharma a seasoned administrator, (1985) notes: (a) Higher level officers in the hierarchy are more amenable to manipulation (by the vested interests p 370); (b) time frame of top administrators is very short (p 374); (c) conceptualization of adapting delivery system to local needs through delegation rather than inherent power at local level is invalid (p 374-375) (d) the touch stone of the modern public system is often a set of rules and regulation rather than experience and judgment of people involved, (e) the notion of representative leadership in designing modern administrative system for tribal is invalid, and (f) increasing abstraction of the nature of discourse at higher level of administration may create barriers to articulation and participation by tribal leaders. He argues that models of governance being thrown up by some of these nature loving tribal communities can be a rich source for designing public administration even for what we may call eco-alienated elite.

Sharma cites example of Mizoram government which decided to evolve the concept of rotational leadership when no party got clear majority. The first Chief Minister resigned after his term and the leader of the opposition took over. By implication, it is suggested that the principles of eco-adaptation may offer new

styles and structures for mainstream public administration. It is of course necessary for such styles and structures to be identified and tried. The researchers in Public Administration have to shed their obsession with analysing a phenomenon only in local, isolated, disconnected and autonomous terms.

Sectoralization of Environment

While reviewing governmental response to environmental needs in India, Mathew (1982) complained that no durable mechanism had been created to appraise the extent to which environmental factors had been taken into account while formulating various public policies. The problems arising out of (a) poverty and consequent resource conflicts or (b) the very process of 'development' could not be adequately tackled in public policy for two reasons, (i) the environmental safe guards required to be maintained were ignored due to usual bureaucratic inertia. Also, resistance to learn the complexities of different disciplines involved in understanding these problems came in the way; (ii) 'even the well intentioned planners' and technocrats tried to think environmental protection as something new - an additional sector of government. Fresh allocations of men, money and material were to be made for this sector amidst competing demands from agricultural and industrial sectors. There are some who allege that clearance of projects by DOE has generated the same 'rent' extraction mechanisms as any other licensing system may do (Arun Agarwal 1989).

There are several studies which confirm above perspective. it

has been pointed out after reviewing various models of environmental management followed in different states: "there is no such thing as a 'model' structure for environmental management" (ESG, 1982, Vohra 1982). I would rather wish that we search a range of models rather than any one suitable model.

Evolution of State Structures

Given the emphasis on sectoralization of ecological consciousness, various efforts have been made in the government to provide administrative platforms for negotiation, dialogue and dispensation of 'justice' (Khoshoo 1984; Ram Krishna, 1984; Sapru, 1987; special issue, IJPA, 1981; Law Review, 1983; Administrator, 1984; State Structures, ESG, 1982) etc.

The Government of Gujarat was the first state government to set up the 'State Council of Ecology' in 1970. A private sector body, Wankaner Ecological Foundation was established in 1971. (Baskar, 1985). National Committee on Environmental Planning & Coordination (NCEPC) was set up in 1972 headed by Pitamber Pant. Being housed in the Department of Science and Technology, it relied more on technical inputs rather than policy and institutional inputs.

It has been recognized that neither NCEPC nor its successor (NCEP) have made any significant practical impact on the environmental scene (ESG, 1982:3). We have several studies which describe the working of these bodies (Subba Rao, 1985, Sinha 1984, Biswas 1982) but none provide rigorous analysis of the way deci-

sions were made, or interactions held with various constituencies. Setting up of Department of Environment headed by Prime Minister in 1980, aimed at ensuring proper management of the country's natural resources of land, forests and water. Other concerns were also identified (Vohra, 1982), (a) the need to preserve threatened species of flora fauna, and fragile ecosystem from extinction; (b) the need to prevent the pollution of air, water, and land by industrial effluents and waste and (c) need to improve the condition of human settlements. Major achievements of NCEP (National Committee on Environmental Planning) were claimed as: (i) all new development projects were submitted to DOE for environmental appraisal, (ii) An Act was enacted for prevention/control of Air Pollution in March 1981; (iii) Social forestry programme were launched on large scale and (d) public awareness pertaining to environment was being increased. Five Year later, Vohra(1988) was quite dejected.

Part of the policy failure has been attributed to the personalization of the campaign by professionals like Vohra. Adirajaiya (1987) bemoans that Vohra ignored his peers who worked hard to produce the report on the National Commission on Agriculture and contributed to perspective on environmental conservation. He initially argued for 'man-made' forest route for restoration of vegetation cover and ignored alternative routes for resource conservation. Without going into more such examples, one has to confess that personalization of public policy position has led to adoption of elitist styles of policy discourse. In the context of the top political leadership relying increasingly on the bureau-

crat advisers this distortion of administrative style is not surprising. It may be added that we are not questioning the partisan nature of administration.

Further, such polemics also distracts attention from structural changes in policy analysis instruments of state. It is not surprising that efforts by such high profile public servants to develop popular constituencies instead of using time tested means of negotiation and bargaining within the state structures reduce the institutional 'Room for Manoeuvre' (Schaffer, 1984).

If more than half a dozen secretaries change in the Department of Environment within a few years, there might be a method in this madness. May be, the government deliberately would like to avoid (a) too much learning by any senior civil servant and (b) development of personal constituency by any administrator in the fertile ground of 'environmental' governance.

Part Three: Ecological Movements: Emergence, Evolution and Interaction with the State

Conceptually the process of feeling deprived or aggrieved had been considered responsible for political action on social issues. On the other hand the resource-mobilization theorists have considered grievance as ubiquitous. They believe that grievances could partly explain participation in political protest. The collective-theorist (Olson 1965; Hardin 1982 in Opp 1988:353) argue,

that in large groups, grievances (i.e. preferences for collective goods that have not been provided to a sufficient extent) are not incentives for collective action because a single member has only a negligible influence on providing collective goods. Contrary to the classical model, this theory assumes a conditional effect of grievances: a multiplicative relationship between the preferences for public goods and influence on providing the goods and collective action. Since in large groups influence is assumed to be negligible, the preferences for public goods do not affect SMP (Social Movement Participation).

The grievance could lead to Social Movement Participation (SMP) if opportunities for participation are available. After studying 121 opponents of nuclear energy in West Germany before and after Chernobyl accident on April 26, 1986, it was found that the pre Chernobyl grievances did not lead to post accident SMP. However, a positive effect of grievances was noted across the panel,

those low in grievances before Chernobyl became more aggrieved. Nor was a reciprocal relationship found between legal and illegal forms of protest. Grievances affecting legal (illegal) protest had no indirect effects on illegal (legal) protest. The data refute frustration-aggression arguments. Social-movement participants chose actions they regarded as most effective for success. This supports the assumption made by resource-mobilization theorists that actions are chosen rationally for political reasons (1988:362).

The results explained the 'legal' rather than the 'illegal' protest regarding both the simultaneous and the lagged effects. It was hypothesised that selective incentives were much more important in explaining illegal than legal protest. Also perhaps illegal protests were much more spontaneous. It was also felt that ideology also generated discontent not captured in the study. For instance some people justified their actions by referring to the health problems as well as the discontent with the capitalist system (1988:862). The author looked into the public choice theory framework in which the availability of common good and associated costs and the benefits may help the participants in framing their moves. I present next a brief review of the events in India about conflicts noted in the last few years from the point of view of strategy and style chosen for protest.

While there are several studies of social movements and agrarian struggles (see for a recent discussion Gore, 1989; Desai, 1986; Das, 1983; Alexander, 1980) the studies that deal with ecology and social movement have been far fewer (Omvedt 1984, Bandyopadhyay and Shiva 1988, Kothari 1985, Agarwal 1983, Rao 1989; Guha, 1983). The relationship between tribal movements, ecological conditions and protest have not been clearly established in many studies.

The perception of society about distribution of power and its bearing on control over resources has been considered to be a major factor explaining emergence of protest movements around

ecological issues (Fernandes 1984). It has been further observed that the rural and urban poverty get linked up in urban slums which elite characterize as pollution of urban environment. Given the powerlessness of the poor they either become totally helpless or assume that public administrators would do something about their problem. Sometimes when the grievances do not result in any action they internalise the perception of elite about the system and poor people. The result is that they may develop a lower self image which comes in the way of mobilization or articulation (Fernandes 1984). This illustrates the weakness of grievance induced SMP. Another view is that the conflicts around natural resources are inherent in the very concept of development which we have adopted (Agarwal, 1983; Gupta, 1981, 1985; Ninan, 1980; Khosla, 1983).

While analysing the probability of emergence of extremist struggles it has been hypothesised that the areas where movements would emerge could have a) high percentage of tribal population, b) difficult terrain and forest area c) failure of land reform d) exploitation by outsiders and e) tendency towards increasing disparity in income (Das, 1983:73). While reviewing various tribal movements (Sen Gupta 1988, Dubey 1987, Singh 1987) we notice that an integration of the perspectives from the ecological, political-economic, anthropological, historical, psychological and sociologic perspectives remains to be achieved.

It has been argued that in North East the alienation of tribal population from the main stream society and solidarity with the similar people in the neighbouring countries generated strong

sense of deprivation and alienation. Sub-nationalism was generated in the economically backward regions in North East. Isolation, low population density, ecological endowments making very low rate of capital accumulation possible coupled with high literacy rate generated new identity (Bose 1967, Dubey 1987). The ethno-political movements of tribals got intensified after independence when non-tribals continued with their exploitation (Dubey 1987). The Christian identity is suggested to have also fueled the alienation (Ninan 1980). I see these explanations as a part of continuing search for frameworks that explain why so few people protest despite so widespread deprivation.

Guha (1986) regrets that otherwise a very comprehensive and pioneering report on the State of India's Environment (CSE 1985) it ignored the militant movements of ethnic minorities in Chota Nagpur and North East. He emphasises that this neglect could be an outcome of the assumption made by the editors about the 'Vanguard' roles for voluntary agencies.

It is added "the ecological innocence of our political parties is not an adequate reason for the abandonment of traditional forms of political expression" (Guha 1986:626). It is not that the environmentalists have not been sensitive to the contradictions in the development process, it is just that the role of state, voluntary agencies and historical consciousness in the society has not been made very explicit.

This problem as mentioned earlier has been characteristic of some of the most eminent environmental professionals/scientists. For

instance Dr. Swaminathan exhorts the people to live harmoniously in rural and urban regions for ensuring sustainable ecological and social development (1986). He had earlier coined the phrase, "Ecological Refugees" (also mentioned in CSE 1985) to characterise the migration of people to urban areas. He like many others failed to notice that if only people from drought prone regions, tribal or hill areas migrated to cities it was not just an ecological phenomena though it had ecological origin.

Undoubtedly the spectrum of ideological position of various ecological movements may range from Gandhian to Marxian (Guha 1986). However, to suggest that these two tendencies were creating the space for appropriate technology as a third strand is to perhaps misread the situation. The 'appropriateness' of technology in different time frames has been widely considered a matter of political choices. Various technological combinations reflect a whole range of these choices.

In fact there are several dimensions of these movements which remain to be properly assimilated in a comprehensive framework. For instance the involvement and perception of women is seen to be influenced some times by factors totally different from the one influencing involvement of men. It has been suggested that Chipko Movement began by the men of regions protesting not so much against deforestation as for a share of the forest produce. While man opted for fruit and timber trees women are reported to have preferred fuel and fodder trees (Majumdar 1986:102-103, Jain 1988, Rao 1989). Otherwise the women studies have generally

ignored the ecological dimensions altogether. (Exceptions are the studies by Indian Social Institute, New Delhi; Centre for Science and Environment, New Delhi; Lokayan, and Dietrich, 1988 etc.). In the model curriculum designed for women studies (Raj, M.K. 1986) no consideration was shown for the study of very systematic relationships between women, ecology, deprivation and public policies. It has not been understood that the proportion of the women headed household is maximum in drought prone regions and hill areas. It is also important to note that public policies for various systems such as banks discriminate against women borrowers (Gupta 1983, 1985). Recommendations for removing the requirements of male co-obligants for such women borrowers have been dismissed at the highest policy making levels (Gupta 1983). If such concerns do not occupy central attention of the ecological movements it is obvious that the politics emerging from such assumptions would only serve limited purpose. Of late the bias against gender issues has been giving way. In fact some very exhaustive but polemic studies (Shiva 1988) and other more rigorous but impressionistic ones (Agarwal and Narayan 1985, Rao 1989) have contributed in focussing attention towards women issues in ecological movements.

To illustrate the way ecological movements are incorporating deviance or plurality of perspectives the example of Save the Western Ghats Movement (SWGGM) is useful. Dr. Madhav Gadgil had presented a view point of technocratic participative reforms which was contested by the participants in SWGM from Kerala. The critic objected to the idea of limiting the desirable goals by the criterion of feasibility. They said,

Definitely planners, sociologists and ecologists should have in mind only what is desirable for the majority of the population and not for the microscopic minority of the urban elite. Dr. Gadgil sets great store on feasibility and one cannot but point out that even at the conceptual level it would mean further degeneration (SIC) of the environment and further impoverishment of the masses.....

Another point of disagreement was Dr. Gadgil's proposal "to seek the involvement of the Central and State government efforts."

The Kerala delegation asked in the note,

Does he seriously believe that Wimco Match Industries, West-Coast Paper Mills, Harihar Polyfibres, Western India Plywoods, Gwalior Rayon and other similar paper, pulp or plywood industries can be trusted with the responsibility of taking care of our environment, especially the eco-development of the ghats(1988:36) ?

The critique further objected to the proposition to include armed forces in a forest station. The SWGM was considered to be the legitimizing mechanism for what they called the repressive apparatus of the State. They also did not like appeal to the religious sense of the masses which to them was a wrong way to do the right thing (also see, Gadgil, Prasad and Ali, 1983; Gadgil, 1984).

It must be mentioned that not all these points are valid or even helpful in developing a viable strategy for the movement. To see contradictions in terms of agriculture or industry or to label any instrument of state such as the Army as monolithic and uniform in its character may not be very logical.

What is important to note here is that the movement has shown the maturity to contain plurality without any insistence on agreement

on major approaches to achieve a goal which fortunately is shared by most members of the movement. It is also fortuitous that the Kerala group rejected the need for an organization. This is one of the most useful lesson for the students of political science and public administration. When should movement become an organization and or an institution is an issue which still remains to be properly analysed and understood.

One of the most innovative feature of the movement was collection of empirical data about resource availability and its use in various villages on the route of march of SWGM and feeding back this analysis to the people as well as the members of SWGM. Hundred and sixty villages were surveyed (Malhotra, 1989). This has been a major lapse in most branches of social sciences. The findings of research are very rarely shared with the people from whom the data is collected (Gupta 1987).

The need for networking with international movements to resist similar nexus between the state and MNCs has been noted but rarely practiced. The National Fishermen Forum (Lokayan Bulletin 1986, 86-92) is one of the oldest movement having established links with fishermen's union in different coastal states and organization in other countries. The demands of the NFF have included ecological, economic and institutional support necessary for their continued survival. The relation between degradation and diminution of commons on one hand and the so called needs of society/nation for foreign exchange through exports led technological change on the other is brought out most precisely in this case. The competition with the large trawlers without looking at

the sustainability of fish collection has raised the issues of choice of technology, ecology, economics and sustainability in the long run.

Some other issues which have not been adequately looked into include the relationship between cultural identity and ecological conditions in different regions and at different times of history; the uniformity of administrative structures and variability in the nature of demands; the leadership structures in these movements which often fail to throw up second line of leadership; the bearing organizational strategies and historical contingencies have on the potential for mobilization of movements thus providing incentives for loose affiliations; the strategies used to protest, negotiate and resolve conflicts vis-a-vis short and long term ecological objectives and inherent social and technological conflicts; whether different styles of negotiations would be appropriate for contesting claims of different institutions of State over natural resources vis-a-vis different levels of claims of people; to what extent legal activism reinforces the legitimacy of advocacy model of reform; whether networking among movements is possible/desirable and if so what are the organizing principles which facilitate networking; assuming that the public institutions are also conflict ridden how can the minority of concerned and committed public administrators be prevented from being marginalised in the process of resisting the hegemony of the dominant but minority elite etc.

The patterns in the strategy and style of conflict resolution are discussed next.

Strategies and Styles of Conflict Resolution Around Environmental Issues and Negotiation Process

While looking through the literature it was frustrating not to find many analytically rigorous research studies on governance of ecology in social and political context. The journalists had played a pivotal role in raising the consciousness of society on environmental issues. It also implied that the data on various dimensions of eco-development had to be culled from either accounts written by journalists or written by academic and other activists in journalistic style. There are problems with analysis of such data. We still do not have studies such as attempted by Gamson (1975) on social movements over a century or so. However, with all the limitations of content, categorization and interpretations the data presented in this section does indicate some trends discussed below.

Data on Conflicts

We looked at a wide range of sources primarily for last five years but in some cases for last ten years to scan writings on ecology. Given the fact that public administration as a discipline has not given much attention to this subject, we decided to cast our net wide. We looked at 55 journals, 83 books and reports, 24 news papers and magazines to collect information for this review.

Table 1 : Strategies of Protest

Resources/ Sectoral Project	Physical Pressure							Moral Pressure.							
	Boycott	Threat to Actual Obstruction (Physical)	Rasta Roko	Gherao	Resource Destruction (Uprooting)	Morcha	Other	Total	Fast	Group fast graha	Satya- graha	Reli- gious	Appeal	Others	Total
1. Forest	1	7	2	3	4	1	1	19	-	1	4	1	12	2	28
2. Hydel Projects /Dams	-	2	-	-	-	2	1	5	-	-	3	-	12	1	16
3. Mining/Quarrying	-	4	1	-	-	2	2	9	1	-	-	-	1	-	2
4. Effluent/Water Pollution.	-	-	1	1	-	2	-	4	1	1	2	1	1	1	7
5. Thermal Power Ind. Air Polln.	-	-	-	-	-	2	-	2	-	-	-	-	2	-	2
6. Nuclear Power Plant	-	-	-	-	-	-	-	-	-	-	1	-	4	1	6
7. Depletion of Marine resources	-	-	2	3	-	4	1	10	-	-	3	-	4	-	7
8. Urban Area/Slum Improvement	-	-	-	-	-	1	-	1	-	-	-	-	3	-	3
Grand Total	1	13	6	7	4	14	5	58	2	2	13	2	39	5	63

In Table 1 the physical and moral pressure tactics have been presented for 63 cases. It may be added that each case may have many events/reports. Various physical pressure tactics implied either threat, rasta roko (obstructing the movement of traffic or the officials of the concerned agencies), gherao (physical encirclement of the concerned officials/decision makers, resource destruction such as uprooting the plants (for instance Eucalyptus seedlings were uprooted in Karnataka and Tamil Nadu by the people's movements). Morcha (procession of people) has been distinguished from Satyagrah. The latter is included in physical pressure tactics in the sense that it is coercive whereas the Satyagrah is persuasive.

Moral pressure tactics include fasting (individual or groups), invoking religious sentiments, issuing appeals etc. What is most remarkable is to note that the fasting as a means of Gandhian technique to persuade the opponent did not seem to be very popular with the protesters. In the absence of longitudinal data we can not suggest whether there is a declining trend. The fasting implying Hatha Yoga has been a long standing method of putting moral pressure on others through self torture. In contrast issuing appeals seems most popular option among the moral means of protest compared to Morcha and physical obstruction among the physical means.

Another feature which strikes us is that only a minuscule number of protesters have chosen to use resource destruction as a means of protest. Apparently the non-violent persuasive strategies

seem still to have primacy over more militant alternatives. If we take out Morcha out of physical tactics and shift it to the moral methods of protest the difference between the two groups become much more significant.

The message is that if public administrators and policy makers continue to resist pressure for negotiations and dialogue there is no escape from protesters using more militant means of articulation.

The styles and legal means of protest are described in Table 2. The primacy of forest and dam based protests is maintained. Among various strategies of campaigns, public meetings followed by informal associations, procession and press seemed more popular. The fact that post card campaign or inter-state networking were of very minor importance perhaps indicates the localised nature of most campaigns. The implications of such a style are that it would be easier for the state to put one group against another or ignore till the mass mobilization takes place.

There were only thirteen cases of legal activism which we could locate. It is quite possible that the actual number is much higher. Interestingly the academics and consumer associations have not yet been attracted by these means of articulating their concerns. We may however, record that Professor Baxi and others have indeed supported various groups interested in legal redressal of their grievance. There are a few other leading advocates in different cities as a part of People's Union of Civil Liberties (PUCL) and People's Union of Democratic Rights (PUDR) who

Table 2 : Styles & Means Of Protest.

	Campaign											Legal-Means								Total
	Press	Hand Bill/Poster	Procession	Folk Media	Inter-Net Working	Informal Assoc iation	Village Commu nity based	Post card Comp aign	Memo to VIPS	Public Meeting	Oth-ers	Total	Direct	Activ-ist	Jour-nalist	Profe-ssional body	Acade-mician	Con-sumer Asso-cia-tion	Others	
1. Forest	4	-	8	5	-	9	3	1	7	17	-	54	3	-	-	-	-	-	-	3
2. Hydel/Projects/Dams	11	1	12	2	1	12	3	1	5	10	2	60	1	-	-	2	-	-	-	3
3. Mining/Quarrying	4	-	4	1	-	2	3	-	1	5	-	20	1	1	-	1	-	-	-	3
4. Effluent/Water Pollution	1	2	4	2	1	6	1	-	1	4	3	25	-	-	-	-	-	-	1	-
5. Thermal Power/Air Pollution	2	-	2	-	-	2	1	-	-	3	-	10	-	-	-	1	-	-	-	1
6. Nuclear Power Plant	4	4	2	2	-	4	-	-	1	3	-	20	-	-	-	-	-	-	-	-
7. Depletion of Marine Resources	4	3	4	3	1	3	1	-	1	4	-	24	-	-	-	-	-	-	-	-
8. Urban Area/Slums Improvement	3	1	1	-	-	1	-	-	-	3	-	9	-	-	1	2	-	-	-	3
Grand Total	33	11	37	15	3	39	12	2	16	49	5	222	5	1	1	6	-	-	1	13

have supported these movements. Such efforts would not be classified under academics led legal activism.

The type of negotiation strategies used are presented in Table 3 along with the levels at which these negotiations have taken place. Open bargaining seems to be slowly becoming as important a process as traditional means such as appointment of committees or dispatch by government of study teams. The right to information is still being resisted by the state in contravention of the democratic ideals which society seems to cherish. The recent example of debate between government, scientists and the concerned people on the Kaiga project in Karnataka is a good case in point. There are cases where government felt pressured to abandon or freeze a particular policy measure. The case of forest bill illustrates such a process.

Among various levels of negotiation the state government level turns out as most important. It is pity that hardly any efforts have been made to strengthen institutions at state level. The state level land use boards have remained more or less defunct and the national level Land Use and Conservation Board has not met for two years. Despite all the rhetoric on Panchayati Raj the role of village panchayat in negotiation around ecological conflicts has remained quite insignificant. This is another area where researchers have to study to draw long term implications. The management of common properties cannot but be done at village or taluk level depending upon the nature of resource. (Of course in the case of Ozone layer around the earth the commons can even

Table 3 : Process & Level Of Negotiation.

	Type of Negotiation									Negotiation Level							
	Tribunal/ Committee	Boards eg. Polln.	Visit of Govt. Officials	Coer- sive	Closure of Mills	Open Bangai- ning (Govt & People)	Elec- tural issue	Free- zing earlier decision	Others	Total	Enter Prise	Central Govt.	State Govt.	Muni- cipal	Village Pancha- yat	Others	Total
1. Forest	5	-	3	8	-	1	-	6	-	23	-	2	16	1	1	1	21
2. Hydel Proj/Dams	4	-	5	-	-	7	1	-	2	19	-	4	12	2	-	-	18
3. Mining/Quarrying	2	-	-	2	-	2	-	-	-	6	-	1	5	-	-	-	6
4. Effluent/water Polln.	1	2	2	-	-	-	-	-	-	5	3	1	6	-	-	-	10
5. Thermal Power/ Ind. Pollution	-	1	-	-	-	-	-	-	-	2	1	2	3	-	-	-	6
6. Nuclear Power Plant	-	-	1	-	-	1	-	-	-	2	-	4	4	-	-	-	8
7. Depletion of Marine Resources	2	-	2	1	-	2	1	1	-	9	-	-	4	-	-	-	4
8. Urban Area/ Slum Improvement	-	-	1	-	-	1	-	-	-	2	-	1	2	3	-	-	6
Grand Total	14	3	14	11	-	14	2	7	2	68	4	15	52	6	1	1	79

be global. We will revert to this later).

The region and resource-wise cases and events of conflict are given in Table 4. The Forests and Irrigation projects are the major resource or sectors around which the conflicts took place. What is most noteworthy is the significantly less number of cases in Eastern and Central India where tribal population is maximum. Excepting the Jharkhand Mukti Morcha and related struggles in Bihar, West Bengal, the Bodo movement in Assam and protests around dams, mining, riverine lands in Bihar the East and Central India presents a disquieting picture. One implication is that people in these regions have 'learnt to be helpless'. Other implications could be that the bureaucracy is much more oppressive and thus does not let people organise and the day to day needs of survival take precedence over medium and long term goals requiring sacrifice of short term subsistence.

There may be several other explanations such as lack of horizontal communication and limited awareness about which demands to make, where and how (Arun Agarwal, 1989).

That this could be a possibility is borne out by the experience of farmers' movements. When have we heard about farmers agitation for prices of bajra, sorghum, minor millets, pulses or oilseeds. The dry regions are characterised by severe deprivation. The ability of poor people to articulate, aggregate, register their demands with the supply or delivery system to pressure these to respond, is very limited.

Nature of Protests

Table 4 : Region and Resourcewise - Cases of Conflicts/Events.

Resource/Region	Forest		Hydel Project Dams		Quarrying Mining		Effluents Water Polln.		TPP/Industry Air Polln.		Nuclear Power	Marine resources		Urban slum		Total		
	No. of Cases	No. of Events	No. of Cases	No. of Events	No. of Cases	No. of Events	No. of Cases	No. of Events	No. of Cases	No. of Events	No. of Cases	No. of Events	No. of Cases	No. of Events	No. of Cases	No. of Events	No. of Cases	No. of Events
North India	05	53	02	18	05	36	02	17	--	--	--	--	--	--	01	07	15	126
West India	05	39	05	43	--	--	01	08	02	18	01	08	--	--	01	07	15	120
South India	04	28	01	08	--	--	03	17	01	07	03	28	4	55	--	--	16	144
East India	01	04	03	14	01	10	01	09	--	--	--	--	--	--	01	10	07	47
Central India	03	16	04	38	--	--	--	--	--	--	--	--	--	--	--	--	07	53
Total	10	140	15	121	06	46	07	51	03	23	04	36	04	55	03	24	60	496

While evaluating the strategy of social protests Gamson (1975;143) observed, "If it costs so much to succeed, how can we be confident that there are not countless would-be challengers who are deterred by the mere prospect". The problem indeed is, why do so few people protest despite widespread deprivation (also see, William, 1975).

The illustrations thus have to be seen as reflective of persistence shown by various social groups who are not prepared to accept a relationship with the resources that is mandated by the state. One must not infer that there has not been any attempt on the part of the state to modify the resource relationships compared to what they were years ago. For instance in the case of the Narmada Irrigation cum Power Project controversy there has been a fairly wide ranging debate although it has not always been treated in a professional manner by the state. For instance some of the signatories on an appeal sent to the Prime Minister for reconsideration of the project were forced to withdraw their signatures using the facility of the state patronage as a carrot or a stick. At the same time there are voluntary organizations (like ARCH) which are taking government at its face value and are ensuring that every oustee gets all the privileges provided in the project documents (also see, Satyanarayan, 1988).

The pity is that the entire debate is taking place either at the level of economics or ecology apart from social cost that oustees are expected to bear. The working of the Institutions, participation of different stake holders, sharing of information and

capacity in the institutions to implement commitments being made in the development plans are not being systematically studied by the researchers. Also what prior rights the oustees should have in the ownership and control over the Dam being built has not been looked into. Whether the bureaucratic growth could be checked by ensuring management of canals and other systems by the associations of oustees has not been even considered.

Among various gains of Chipko movement one was that the overall survival rate of plants increased with the people's participation. In the Government programmes without involvement of local people, the survival rate was about 20 to 50 per cent. On the other hand in programmes with people's participation the rate went up from 70 - 90 per cent (Chandi Prasad Bhatt, 1984). While the movement succeeded in getting a ban put on the logging of trees the studies have indicated reduced employment opportunities and consequent hardship to rural youth. In the first phase when complete ban was put the amount of hardship was so high that Bahuguna had to reportedly dilute the demand. This is a case where without providing for short term survival of people the long term sustainability of forest could not be achieved (Dogra, 1988).

Studies have shown that many panchayats in Northern India as well as Western India had given their common lands to forestry department for so called social forestry just in order to prevent this land being used by the landless harijans owning livestock in the villages. Without exception the most fertile land was given

first (Gupta, 1984, 1983).

The NGO interactions with state many times have ignored the social contradiction between different classes, between cultivator and pastoralists, between sheep owners and cattle owners, between small producer or a larger producer.

Some researchers have used video films as means of action research on the bearing above contradictions have on resource management (Shah, 1989, CENDIT, 1988).

The conflicts around the game sanctuaries in Srisaillam, Andhra Pradesh, Bhartpur, Rajasthan (Gupta 1982, CSE, 1985), Simillipal (Statesman, 1985) etc, are becoming more and more frequent.

Joint Committee of paper industry submitted a memorandum to the Government for expediting the import of wood, pulp and industrial plantations for improving the capacity utilisation (E.T. 1988). It may be useful to recall here that during 1974-75 when there was a crisis in the paper industry and the prices had shot up there was an all-round effort to economise the use of paper. Every public office was supposed to recycle all the paper to the extent possible. However, soon the pressure was withdrawn. Not that the supply of wood had increased or the demand had gone down. There was a spurt in the installation of capacity for paper production. After a while when the supply of raw material became problematic the pressure on government to relax land reform laws for creation of captive industrial plantations increased. At the same time pressure also increased to persuade Government not to issue any fresh licences. The technological upgradation did not

take place and barriers to new entry were being sought. It is not difficult to imagine what implications such an industrial policy would have on environment. Among various competing claimants of natural resources the organised sector has always managed to get the best terms.

Encouraged by certain policy recommendations of National Waste-land Development Board private industries proposed to the Government to allot the deforested land for commercial plantation. Orissa and Karnataka have already taken such decisions. The proposal required concessions under the land reform act. The industrialists were also pleading for physical and financial concessions (TOI, 1987). The fact that NWDB got almost 60 percent of the budget of the Ministry of forest and environment seemed to have generated considerable dynamics in the system.

The Associated Chambers of Commerce and Industry of India (ASSO-CHAM) made a plea to the Government to evolve a policy for pollution control measures without affecting industrial production (FE, 1988). Studies have shown that in terms of environment the small sector is even more guilty (Vyasulu, 1987). In Jodhpur about 1500 small scale textile units released a huge amount of effluents into open drains, river beds, reservoirs etc. affecting the drinking water supply through contamination of underground water table (CSE, 1985: 28-46). CSE report provides detailed evidence about the water pollution through industrial and urban wastes and other environmental hazards.

Eucalyptus controversy has been one of the most talked about

issue in the field of forestry in recent times. While FAO study showed that eucalyptus consumed more water in humid tropics and regulated the water flow less well than the natural forest. It also reduced the water content of the catchment. However the report concluded that there was a need for proper balance between ecological and social needs(NH 1988). On the other hand expert committee in Karnataka concluded that much of the criticism against the eucalyptus was baseless. It was considered useful for regions receiving 20-45 inches rainfall (DH 1983). People somehow remained unconvinced and therefore resorted to uprooting ~~the eucalyptus seedlings as a part of Appiko movement.~~ The cases against the decision of state government to allocate land to private sector unit for commercial mono culture plantation is still pending in Supreme Court. Recently a study has been taken up by State Forest Department Karnataka in collaboration with Oxford Forest Research Institute to look at the water uptake by eucalyptus and its effects on adjoining ragi crop (Nayaknur, 1988). To the extent that this study reflects willingness of a state bureaucracy to learn empirically it is a tribute to sustained social movement by people supported by NGOs and professionals in Karnataka and outside. Contrast this effort with unequivocal judgment given in 1983 (also see for research on Eucalyptus Effects, Nayaknur, 1988).

Disputes over rights to eucalyptus grown on gomal lands in Dharwad District has led to a protracted struggle on the part of people. They are demanding that the wood be sold to the villagers at a concessional price rather than auctioning it in the open

market. When Mandal Panchayat and Zilla Parishad could not negotiate the matter with village Panchayat the issue went to the high court (Reddy, 1980). One of the lessons from various studies about the eucalyptus mentioned here is that when issues of empirical nature are transformed into polemic or rhetoric an informed debate is unlikely to take place. The environmentalists, professional researchers, administrators and NGOs have to recognize the cost of populist struggle without backing it up with rigorous data. The SWGM in Karnataka and Kerala did open a new path by way of organizing research based social movement.

In one of the insightful studies on the issue of tree and tenure an administrator cum researcher raised the debate on 'who owns the trees' (Saxena, 1988). The argument was that the forest laws did not provide any incentive to people to grow more trees because the right to harvest these trees had to be obtained from the forest department.

In West Bengal a new approach of participatory management of forest resources has been developed under which 25 percent of the usufructs from the rehabilitated forest was to be shared with people. (Raha, 1988).

Fisheries both Inland and Marine have been source of conflict between the poor fishermen families and the mechanised fish owners. The problem is quite complicated because any disruption of the on going system had costs in terms of loss of employment and decline in export of prawns. On the other hand the fishermen were suffering and becoming worse off. Kerala Swatantra Matsya

Thozhilali Federation (KSMTF) had been pleading for ban on trawlers during monsoon months (CSE, 1985: 331). While government has enacted appropriate zoning legislation it did not strictly enforce the laws due to various reported constraints (Kurien and Achari, 1986). The NFF as mentioned earlier has been networking with various regional unions within the country and outside to protest against the non sustainable fishing by trawlers and purse-seiners (Lokayan Bulletin, 1986).

Another dimension of conflict around fishing relates to the problem of 'Panidari' just like Zamindari in Bihar. The Patna High Court has decided that Zamindari abolition did not imply abolition of Panidari in 1964. After more than 20 years the case is still pending in Supreme Court (CSE, 1985; 47). In Goa the coastal ecology and tourism have been in conflict even though so far the large hotel owners have been able to manage concessions (APPEN, 1988).

The marine eco-system in Gulf of Kutch had suffered due to cutting of mangrove for fuel and timber, camel grazing, industrial construction, mining, salt ponds or brine evaporation ponds, oil and other chemical hazards, waste disposal by the steamer as well as oil tankers (Chavan, 1986).

The movement against limestone quarrying, mining activities for other purposes have also been gaining strength in different parts of the country. When would an ecological conflict assume a dimension of law and order problem is difficult to state. The debate on Doon Valley eco-system has finally reached Supreme Court

(Bandyopadhyay and Shiva, 1987; Ramamurthy, 1984). Often the people living around the mining zones are unaware of the long term consequences of the pollution through dust and dislocation of underground hydrological systems. The issue is whether the state would consider its duty to share information before undertaking, 'development through mining' (CSE, 1985: 26).

Legal activism as we mentioned earlier has played an important role in defining the boundaries of debates around ecological issues. After 42nd amendment in the constitution in 1977 two articles i.e 45A and 51A have defined the duty and responsibility of state as well as people. In a perceptive analysis Prof. Baxi (1984) has stressed that the most fundamental flaw with the institutional design of law particularly in environmental arena was its neo-colonial orientation. Overloading of statutory authorities was another mechanism for perhaps deliberate non performance or mal-performance of statutory task. It was paradoxical that environmental expert or the law commission were never consulted by the environmental law making or modifying committee. He adds:

If legislation is an important component of planning, and if planning is intended to achieve results, then we must abandon the odd belief that the law is merely a technique, not relevant at the stage of policy formulation, which can be pressed into service at the level of converting the settled policy into a binding enactment (1984: 12).

Recently the new environmental law passed in the Parliament curbed the right of environmentalists to go to court on ecological issues. They were expected to give notice to the government

of their intention to make complaint atleast 60 days before actually doing so. Civil courts were barred from entertaining any such suit against central government. The Government officers were also protected if they had acted in good faith and without negligence (The Tribune, 1986). Obviously this is the case of reverse activism of the law makers to thwart attempt for policy reform.

In the Shriram Oleum Leak Case Supreme Court has suggested setting up of environmental courts to deal with the cases of environmental pollution, and resource degradation. It was suggested that such courts could have one judge and two experts. One could appeal against the decision of the court in supreme court. Further it was suggested that a high powered authority to be set up to oversee the functioning of hazardous industries in the country. An Ecological Science Research Group should also be set up comprising of experts of different branches of Science and Technology to act as the information bank for the court and government departments (Tel, 1986). Undoubtedly any action on this moves would take the society towards a culture of more informed debates. At the same time it would be difficult for the national leaders to test the gullibility of the masses by presenting simplistic scenarios of resource management. There is no doubt that more frequent intervention by Supreme Court such as in case of closure order for all but three mines at Dehradun would push the public administrators towards equally strong defense mechanisms (SO, 1988).

A comprehensive review of all the environmental protection laws

passed between 1976-1986 led Devi (1986) to suggest that the limitations of the environment act 1986 were very serious and needed to be overcome. For instance the act did not talk about radio active pollution of air and water, the point 4 of the act prevented the members of the public to seek legal assistance to control environmental pollution under given conditions. Certain other acts dealing with industrial services would need to be modified to become compatible with this act. The most serious flaw in the act was its leniency regarding the effect of other laws. Section 24 (2) reads:

Where any act or omission constitutes an offense punishable under this act and also any other act, then the offender found guilty of such offenses shall be liable to be punished under the other act and not under this act.

After reviewing the various laws affecting forests and the forest dwellers Singh (1986) observes that the substantive equality was more than important than the formal equality when one had to evaluate the politics and legality of State interventions. Often people viewed only one side of the story that is how state interventions help the poor but ignored the other side how, the state interventions created the poverty (1986:47) He strongly makes a case for forest dwellers to get what they deserve as a matter of right and not out of compassion. Also the right of forest dwellers had to over-ride those of other people in certain aspects. (Also see, Chaudhari, 1986; Krishna Rao, 1982).

It is useful to refer here to a very robust even if less sophisticated academic statement by an administrator Ashok Vardhan

(1987) on the rights of tribals in forest lands. It is recalled that certain sections in the land revenue provisions would advise the need for abiding by the settlements done by European survey officers during British period rather than honouring the legitimate claims of tribals. He cites the entries appended to a land record by a European survey officer stating bluntly "This has been opened by fraud by grabbing tribal land"(1987: 39). With decreasing tendency among the administrators for field camps and personal survey of records the possibility of tribals ever being able to argue their case was very remote.

Another graphic account has been presented about the land acquisition from tribals for poorly designed projects. The grievance of the tribals who could never make do with the cash compensation were considered genuine by the author. He refers to the efforts made by the then commissioner North Chotanagpur division (Mr. Saxena) who enthused the revenue staff to serve the real claimants of land as against the musclemans. This is just to illustrate that both the reform in the law and more importantly reform in the institutions for the interpretation of the law were necessary if poor people dependent upon natural resources or common properties had to survive. Sharma (1985) makes a forceful case for reconceptualising the administrative system and the provisions of law for serving the tribals.

The overview of various conflicts around natural resources indicate a need for developing proper framework to conceptualise fresh 'the eco-sociological' or 'eco-political' resource relationships. The role of state and its instruments in fulfilling

the constitutional obligations cannot be understood unless the nature of this relationship is properly defined. We present in the next section a framework which will make it possible to integrate the insights from various disciplines and field experiences in exploring the basis of governing social ecological systems.

Part Four :Public Policy for Managing Risk & Uncertainty

Under crisis, such as a drought or flood, bureaucracies are known to rise to the occasion and provide succour to the affected people within the parameters drawn by the policy makers. The bureaucracies regain quickly their original inertia once the crisis is over (Mathur and Bhattacharya, 1975, Mathur and Gupta, 1984). Whether a problem is defined as a crisis or not depends upon what is considered 'normal'. In a seminal contribution which has not attracted attention it deserved, Prof Mathur argued that ~~change in the role of bureaucracy after independence~~ was aimed not in the structure of public administration but the attitudes, behaviour and achievement orientation of civil servants (Mathur, 1972:2).

If the definition of what is normal or not-so-normal in terms of eco-development becomes a function of behavioural styles of the administrators, I am doubtful if we will ever be able to unravel the politics inherent in what Sen called 'Description as a Choice' (Sen, 1980; Gupta, 1985c). Thus, widespread malnutrition or vulnerability to occupational hazards in mining or quarrying activities or large scale disposal of assets to cope with drought or flood damage may be considered 'normal'. The report by Government of India on Drought of 1987 does not even once discuss the policy framework for arresting the income transfer from poor to rich in drought years.

How do we conceptualise the way public administrators treat a phenomena as 'normal' or 'abnormal'. If defined as 'abnormal'

,the issue arises whether the event is just worthy of some extra attention or calls for reformulating the whole strategy ?. Whether it is a crisis or catastrophe ? Can it be anticipated in terms of location, timing, intensity and consequences for different social classes?

Answers to these question will depend upon how administrators deal with risky and uncertain events. The risk is defined as a situation when probability of an event can be anticipated. The uncertainty is when chances of an event can not be anticipated.

How does one learn to cope with such events . Whether the coping strategies suitable for risky events work for uncertain one too ? Whether individual learning leads linearly to organizational learning (Gupta, 1984).

Public administrators would want to perceive the problem of 'uncertainty' as a 'risky' problem when they want to exercise strong control. On the other hand, they will do the opposite when they wish to reduce the zone of their responsibility.

The public policy cannot be considered analogous to the growth of scientific knowledge (Wittrock, 1977). By implication the learning could be planned to be low just in order to justify the poor or weak assumptions behind public policies. This is the oft repeated defense of public administrator in the event of being confronted with evidence which he/she could have used but did not.

The 'learning by doing' could be preferred over an informed and analysis based solution of social problem (Lindblom and Cohen, 1979 in Wittrock, 1977). However, the counter view is that learning by doing could be preferred if the cost of the error was not very high and also if the 'risk makers' of the public policy were not the same as 'risk takers' of the potential error or disaster. Further,

it makes supreme sense to argue for trial and error, and sometimes it may be legitimate to deride risk-aversion in policy planning which talks about trial but does not allow for error. However muddling through by way of 'interaction' may sometimes be just a euphemism for error without trial; if you do not have any idea of what you are doing, there is all error and no trial and therefore no learning (Wittrock, 1987:23).

The cost of not paying heed to the warning issued about the possibility of disaster in Union Carbide Plant at Bhopal was not paid by the administrators and the politicians who believed in 'learning by doing'. One wonders whether appropriate lessons were even learnt after the disaster (Gupta, 1984 a).

The report of CSE (1982, 1985), Lokayan Bulletin (1985), Gupta (1981, 1985c, 1988d) records several experiences of persistent refusal to learn by the public administration in government as well as science and technology institutions in case of soil conservation, irrigation management, dams and most importantly the Bhopal disaster.

Vishwanathan and Kothari (1985) demonstrate evidence of systematic attempts to prevent proper data collection even after the disaster in Bhopal so that people who were dying could be given

remedial treatment. Despite the fact that the leakages were reported from the plant in 1981 and 1982 with persistent warnings by a Keswani, a local journalist no cognizance was taken.

The Multi National Corporation (MNC) in this case did not share the information about the poisonous gas. Officially the information was prevented from flowing to the voluntary organization and even public health doctors engaged in the treatment. The controversy over sodium thiosulphate treatment revealed how various public administrators systematically prevented large scale availability of the antidote lest it confirmed the presence of cyanide. Protecting the interest of MNC became a matter of 'public interest'. There are many other aspects of this tragedy which highlight that a problem of **risk** was deliberately converted into that of **uncertainty** so that public administrators could justify their inaction.

The environmental effects of the tragedy would have required a long term research programme but support for such research was not available to those who were most articulate in mobilising support for the victims such as Medico Friends Circle, Patriotic People's Science and Technological Group, Kerala Sastra Sahitya Parishad, Ekalavya, Zaherili Gas Khand Morcha etc. (Lokayan Bulletin, 1985:59).

The next case for analyzing response of public policy to environmental uncertainties relates to drought. Numerous studies have been done on short and long term impact of drought on social systems (Jodha, 1975, 1978, 1983, Rustamji, 1979, Bhatia, 1988,

Gupta, 1980a, b, 1981, 1982 a,b,c,d, 1983 b,c, 1984 a,c,d, e,f,g,h, 1985 a,b,c; Mathur & Gupta, 1984, 1988). There are few studies which have tried to look at the way households adjust with the risks vis-a-vis the organizational adjustment with risks (Gupta, 1984d, 1986 a,b,c, 1987 a,b,c 1989).

I will discuss first the report of National Commission on Development of Backward Areas (NCDBA, Planning Commission, 1981) and contrast the perceptions in the report with a recent report on 'Drought of 1987: Response and Management' brought out by the Department of Agriculture and Cooperation, Government of India.

The NCDBA report reviews the organization of Administrative and Financial Structure for backward areas development (1980) and notes several important limitations of the existing set up. The gap between intention and implementation is found to be particularly high in backward areas. The recommendations to overcome the limitations are : use of Project Approach; merger of all programmes under District Monitoring and Coordination Cell, and appointment of Director General for Development of Backward Areas at Central level. Among the issues affecting personnel policy the report notes: elements of punishments to be replaced by compensation; large scale vacancies to be avoided; the selection should be institutionalized at all level; first posting on promotion should be in backward areas; enhanced travelling allowance should be provided; special leave for research and study in academic settings; facilities for educational and medical needs; the posting orders in these regions should not be cancelled

unless there is an exception.

Regarding approach to planning the report puts considerable reliance on the internal administrative expertise instead of relying on academic experts. The involvement of NGOs is considered necessary but any attempt to form federations at district or higher level are sought to be avoided. These federations, it is feared, may 'politicise' the development process.

The report also observes that routing of grant-in-aid through the political system at local level can lead to lack of any strict accountability in using funds. Often the criteria for disbursement of funds were provided but seldom were these implemented. Following the line of least resistance the administrators provided limited funds uniformly to everybody.

Now contrast these recommendations and the perception of problems with the experience of Jawahar Rojgar Yojana - a nation wide public employment programme with uniform criteria, and allocations in many cases being higher for more developed regions. It has been ignored that need for employment can not be similar in regions with varying level of growth and wage rates.

NCDBA report (1980:25) had noted that the **exact conditions in backward areas were neither uniform nor fully known.** A similar feeling of inadequacy of uniform policies has been expressed in the annual report of National Bank for Agricultural and Rural Development (1987-1988). And yet public policies have tended to become more and more standardized over the years. Worse, the report on Drought '87 does not draw upon the earlier reports like

that of NCDBA(1981); debates in the parliament on the subject and recommendations of various finance commissions.

It also is true that many of the recommendations of NCDBA were based on an inadequate understanding of the situation. For instance it was recognized that these regions were used as punishment postings and that many positions remained vacant however, the suggestions were half-hearted. Undoubtedly the compensation might help but it would not correct the distortions that arise because of the monitoring and performance appraisal system. As long as the parameters on which bureaucracy was monitored were as crude as the 'exhaustion of budget', no amount of professional incentives would be able to correct the demotivation stemming from unachieved 'targets'.

The cost of delivery of goods and services in low population density regions was inherently high. The financial and budgetary allocations on per capita basis intensify regional imbalances (Gupta, 1983a, 1985c, 1987d,e). The delivery system in these regions is expected to perform more efficiently because the markets are weak and the uncertain rainfall necessitated greater degree of preparedness and resourcefulness on the part of farmer and administrators. The practice was just the opposite.

The uniformity of allocative criteria is one of the most fundamental ironies of equity (Schaffer, 1982, Gupta, 1985c). Comparing non-comparable can lead to one of the most unfair administrative practices. Stationary organizations for mobile populations are another example of mismatch between what people want and what

they get (Gupta 1981a, 1984e, 1985a). It is well known that market forces coordinate the choices of consumers having surplus in their own interest. If administrative coordination did not exist in developed regions, the market forces would organize it through demand system (Gupta 1985c, 1987d, 1989). After all the various associations of Industrial Houses are heard before finalising the budget proposals every year. In the same way many other forms of networking between capital and administration exists. It is in high risk ecological regions that the need for administrative coordination is particularly more (Gupta, Parashar and Sanwal, 1988; Rao, 1984). The field officers often feel that these regions are not on the travel itinerary of the top administrative leaders. In the process the reverse 'Hawthorne' effect is witnessed. The lack of attention gives a signal that development in these regions is not important.

The NCDBA report as also the recent report on Drought (1987) have ignored that the proportion of women headed households was highest in drought prone regions or hill areas because of male emigration (Gupta 1985 a, b, c, 1987). What type of administrative systems would match such social ecological realities has not been looked into?

The norms of locating bank branches are uniform for all the regions. For instance 17,000 people were supposed to be served per branch of commercial branch in the regions with population density varying say, from 1500 persons per square kilometers to 35 persons per square kilometer. One does not have to imagine

the problem of physical access and institutional access faced by the people as a result of this policy (Gupta 1981, 1984c, 1989a).

Highly diversified households in such regions would require highly diversified administrative repertoire (Gupta 1981, 1985, 1989b). To what extent has the Government of India document on Drought 1987 (1989) reflected the lessons learnt so far is discussed next. Whether the variability in administrative approaches has matched the expectations of people will also be looked into.

It is claimed that every major drought contributed towards bringing about "Qualitative changes with regard to drought management policy" (GOI, 1989: 9). The Public Distribution System was strengthened after the droughts of 1965-66. Massive employment problems were organised after the droughts of 1972. The drought of 1979-80, "underlined the need for taking (sic) durable and productive assets to enable the people of the affected area to withstand future droughts better" (1989:9). The relief manuals were supposed to include the latest approach to Drought Management. It is worthwhile to note that the focus of the strategy to deal with the drought of 1987 was on

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the need for providing access to food to the affected people, but also to maintaining their quality of life. It is no more a question of saving life from the threat of widespread starvation during such a natural calamity. The central theme of relief today is to meet the food and nutritional needs of all sections of the people keeping in view their normal energy requirements, supply of drinking water, providing adequate health care and fodder for the cattle" (1989:9).

It is against this claim that the research on survival systems should be examined to look at the efficacy of public measures.

A study on "Small Farmer Household Economy In Semi-Arid Regions: A Social Ecological Perspective on Risk Adjustment" (Gupta, 1984) had looked into the drought and the post drought recovery of the losses by the concerned households during 1979-1982. Earlier, Jodha (1975) had looked at similar changes during and after the drought of 1967. These are the only two studies to our knowledge which have looked at the drought loss-replenishment process.

One of the major findings of the study by Gupta was that the importance and sequence of asset disposal in the risk adjustment repertoire of households had undergone basic change in the last few droughts. Livestock disposals remained an important means of risk adjustment as also the income transfer. Accordingly, a warning of the continued loss of livestock assets was issued in January 1988 so that the Government could find ways of preventing (a) liquidation of the savings of the pastoralists still available and (b) increase in the surplus generating potential of richer pastoralists and cultivators (Gupta and Kumar 1988). Much of the damage had been done by January 1988. However, all was not lost. The policies of Government of India did not include then or later any measure to arrest such immiserization. Discussions were held with most of the concerned officials at senior level.

The fact that drought did not affect all the classes equally has been known to the planners for quite a long time. But, the

persistent bias towards preventing absolute and visible misery but ignoring the short and long term ecological and economic losses for the poor continued. Several suggestions were made based on earlier research referred above. For instance it was recommended that the policy for drought management should discriminate among those who had deficit in their budget, who could just subsist and those who had surplus in their budget. It was suggested that people who had lost their assets may become muted and not raise their voice in any political institutions. Suggestions were made regarding (a) scheme for calf rearing and support price for calf buy back scheme, (b) since the proportion of infant bovine was far higher in dry regions compared to the rest one had to device suitable fodder concentrate combinations and prevent distress disposal of good quality calves, (c) a large number of measures were suggested which were necessary in case the rains were good in the coming season, (d) in view of the special skills of women particularly in non-farm activities the drought relief should include organisations of production and marketing of these goods, (e) the interest subsidy would need to be given to those who could not pay their debts to the Banks in addition to rescheduling and rehabilitating finance, (g) cattle camps to be used for mass vaccination and popularisation of improved livestock and range management technologies, (i) the implications of stress fodder, fuel and food needed to be shared with the people along with the remedial measures to be taken in the post drought period to overcome the adverse effect, also see, Mahar Homji, 1988, (j) the beneficiaries of the relief programme should be made conscious of their responsibility towards less

fortunate pastoralists, (k) mobilisation of science and technology institutions for improving drought proofing mechanisms, (l) documentation of indigenous knowledge for survival, (also see, Gupta 1988b,c, 1989b), (m) restriction of PDS only for the affected regions so that rest of the society could pay higher prices and save public resources which would have been necessary if everybody was to be subsidised.

Despite the fact that relief Commissioner and relevant secretaries to the Government were contacted nothing much happened. So much for the claims for improving or maintaining the 'quality of the life' of the affected peoples. Despite widening budget deficit and increasing balance of payment problem Government maintained that, "the central theme of relief today is to meet the food and nutritional needs of all sections of the people" (GOI 1989:9). Government has to recognise that just the way everybody was not equally affected by the drought, everybody did not need to be subsidised equally. This simple lesson has not been learned.

There are studies on Famine Foods (Bhandari 1974), stress fodders (Rangnekar, 1989) and Veterinary Medicines evolved by the people (Varma and Singh 1969) which deserved to be drawn upon while drawing the public policies for drought affected regions.

Contrasting the Gujarat Government's perspective (Koshy, 1987) with that of voluntary organisations, Bhatia (1988) very perceptively records the misery that poor women and man had to bear during the drought of 1987. The labourers to be hired for public

works had to report at 6 O' clock in the morning and they were marked absent if they were slightly late. Those who did not have ration-cards suffered just as in case of Bhopal tragedy. If the ration-cards would not be available with the poor did it require a great imagination or administrative acumen to anticipate who would suffer under such guidelines. There was no way by which a person who was sick could be substituted by another family member. There were many other anomalies which were documented by Bhatia and others.

Sanjeev Shah(1987) made a very imaginative film on drought of 1987 entitled 'The Famine, 1987' which recorded among other things the instances of abandoned cattle in the camps being sold for Rs.50 each. The amount of income transfer could be imagined by the fact that cost of a dead animal is around Rs.400 including the cost of carcass and hides.

Rao (1989) refers to example from Maharashtra where drought, deprivation, caste, class and gender got related. She raises a very provocative issue about the possibility that, "activism on part of the women, especially without the involvement of men, threatens to divest them of their identity as women". Ecological crisis such as droughts she felt not only provided the pretext and the context for struggles of women for defining their identities but were intimately related with them. She hoped, "scarcity of ecological resources have the potential of both encouraging as well as hampering movements of women for access to production conditions and for self-definition". I believe that emphasising

gender conflicts too much among the poor could be a sign of false contradiction. In a study on "Impoverishment in Drought Prone Regions" we observed that the poor women were often more articulated than the men in the dry villages. There were certain economic exchanges where she had greater control understandably because of their greater involvement, for example in the case of collection and marketing of grass/weeds.

All these examples bring out the need for analysing the reasons for non-utilisation of research by the policy makers. The cost borne by the society has to be worked out. I also suggest that researchers should venture into being 'marginalised' if that is the price for speaking out (Gupta 1985, also see, Murishwar and Fernandes, 1988).

The management of risky situations makes policy makers vulnerable on account of the possibility that their judgment either way may be questioned. One way to avoid such dilemma is to provide equal attention to everybody. Other way is to convert risk into uncertainty and thus express helplessness. Still another way is to anticipate and define the problem in such a manner that success can be ensured. Thus, lack of human deaths is an achievement of drought of 1987. The disposal of assets, malnutrition induced sickness in animals and human beings, non-sustainable harvesting of trees and other biomass and indebtedness induced dependency and deprivation are not the issues which are relevant and thus no accountability need be exercised. It is this framework of public administration which explains such a slow rate of policy reform. I may add that there were certain positive moves

made by the Government during the drought. To illustrate the procurement price for green fodder was declared and enforced, close monitoring of distress was done to avoid problem of food, fodder, drinking water etc., in most of the villages. However, given the wastage and inefficiency of resource use and lack of adequate advance planning these positive features lose part of their significance.

I present a framework in which future research on Governance from ecological perspective can be pursued.

Eco-Politics of Sustainable Development

Managing Eco-diversity

The response of the state to ecological diversity has been studied primarily in a spatial sense. There too, the space has been conceptualised as a constraint rather than as an opportunity. In a socio-ecological perspective the relation between space, season, sector and social systems is studied in such a manner that the ecological characteristics of the environment can be related to the design criteria used by resource delivery organisations (Gupta, 1985, 1989).

Organising the delivery of resources to the poor in a fair manner in basically "unfair" social and political-economic structure poses a very difficult challenge to the planners and administrators. The complexity increases when the variability in the endowments of the poor is so large that designing uniform stan-

standardised policies becomes counter productive. If managers have to be appraised in such regions in the same manner as in the rest, the tendency to prefer, 'safer and surer' organisational practices becomes a necessary part of administrative expediency. It is inevitable that the articulated demand for resources rather than administrative design should take precedence over other needs of the people. A separate study on The Political Articulation in Backward Regions (Mathur and Jayal 1989) has brought out that members of Parliament from drought prone districts of Western India simply demanded more resources rather than different designs of public policies and administrative structures.

First I summarise the socio-ecological framework and then present the modifications which are required to evolve it into an eco-political perspective.

Diversity:

The main assumptions of the socio-ecological framework are that ecological conditions define the mix or portfolio of enterprises that can be sustained in a given spatial context or a watershed. The scale on which different social classes maintain these enterprises, however, is a function of their respective access to factor and product markets; kinship networks and an extended family system; and public, private, and communal risk adjustment strategies that have evolved historically; The mean variance characteristics of the portfolio of assets influence the risk perception and response patterns of different classes.

The mix of enterprises, varies within a narrow range in the ecological context of a local watershed area. Which crops can, for instance, be grown in a region is defined largely by the edaphic (soil-related) and climatic variables. However, who will grow more of a certain crop or maintain more of a certain type of livestock is not a function of ecology, but of access to factor and product markets and of kinship networks.

It may be added here that Malhotra and Gadgil(1981-1983) have through an independent route established relationship between ecological habitat and composition of enterprises such as live-stock species among pastoral castes. They have shown that with the degradation of the ecological habitat the composition of herd shifted from buffalo to cattle and then to goat.

The portfolios of enterprises could be classified on the basis of a return-variance matrix(Gupta 1981,1989). One could have households with high-return - high-variance, low-return-high-variance, and low-return-low-variance types of portfolios. These portfolios will influence the investment options of different classes.

Access:

Access to risk adjustments would influence the perception and response to risks. These options can exist at the level of household, but also of common property or communal or public institutions such as drought-relief or public works programs. The household options can further be divided into intra and inter-household ones. The intra-household options imply reduced or modified consumption, migration, asset disposal, etc. The inter-household options include entry into credit, labour, and tenancy contracts(Gupta 1989:70,1985).

The consequences of differences in perception and response could be deficit, subsistence or surplus household budget. This in turn would influence the ecological conditions through aggregation and interaction of household choices.

If organisations were to take a short time perspective as is apparent from the reports of NCDBA and GOI on Drought '87, only those portfolios of activities may be supported which could

payoff in short time frame. We should not be surprised if we noticed that the portfolios of the better endowed people with high variance-high return or low variance high return were selected.

The contrast between household options and the organisational strategies can be studied through the 4-S Model (Gupta 1985, 1989). Imagine a three dimensional matrix with the space, sector and season as three dimensions. Each dimension can be dichotomized. "Space" for instance could be understood in terms of high or low population density, undulated or plain topography etc. "Sector" can be dichotomized as specialised or diversify, public or private, agriculture or industry etc. "Season" can be dichotomized into uni-modal or bimodal rain fall or low or high rain fall conditions.

Given any two conditions third can be anticipated. In regions with low rainfall or high seasonal influence with low population density, one can anticipate the absence of private organizations, a specialization-based economy, and single or specialized crop conditions. The diversification of the household portfolio in risky conditions over time (i.e. over seasons), space (through migration, pastoralism, etc), and sectors (crop mixtures as against single crop, crop-livestock-craft inter-linkages as against any one as a dominant enterprise) can thus be understood....

Thus, in regions where private market forces are strong today thanks to historical factors, favourable ecological conditions, and public investments in irrigation, transport, and other services, public management of resource delivery may not be warranted. The state may merely perform the role of regulation and reinforcement of social accountability of private and voluntary organisations. In regions where private market forces are weak and demand and supply of different resources do not clear at reasonable prices because of various imperfections in the mobility of factors and dispersal of information, public organizations have an important role to play. (Gupta 1989:73-74).

The fact that poor households survived through informal pooling mechanism (of resources, information and trust) reinforced by caste and kinship implies that social stratification in such regions will be very different compared to the other regions. The conceptual issue before the students of public administration is how one should characterise the environment of the organisation. I have argued that classical efforts by the organisation theorists to define the environment as placid or turbulent (Emery and Trist 1965) or homogeneous versus heterogeneous (Thompson 1967) are subject to multiple interpretation. There is a need to anchor the organisational environment to objective characteristics.

Since risk averse organisations can never reach the risk averse households, the role of organisation in not merely adapting to the environment but in modifying it has to be recognised. The perception of an environment by the policy makers and the administrators (Smith, Latham and Thoolen, 1980) has to be distinguished from its objective characteristics (Gupta 1981). The socio-ecological perspective makes it possible to characterise environments of organisations objectively.

The transition from the socio-ecological perspective to eco-political perspective requires incorporation of several other dimensions which we discuss next.

If the diversity in ecological endowments influences the type of occupations in which poor peoples are engaged in, then the nature of support the state provides to different markets dealing with

each of the occupations would make a substantive difference to the survival of people. For instance, if poor people survived primarily through reliance on common property resources (Gupta 1984, Jodha, 1985, Kalla and Ananth Ram, 1988) and through non-farm activities, a weak response of policy makers and public administrators would reflect on the nature of the state. The changes in political perception of the needs of forest dwellers and artisans may have to be inferred by looking at not just the policy statements but also the organisational arrangements. The policies have to be interpreted by analysing the institutions (Clay and Schaffer 1984) that act as filters or conveyor belts. There is no point in drawing a false contradiction between policy and implementation or between regulatory and development administrations.

The articulation of ethnic and regional identities, I have shown in the earlier section, may emerge from the administrative neglect of the underlying diversity. The permeability of institutions to the interest of such ethnic and regional groups depending upon natural resources has to be built into the political framework of society. Various ecological movements in developing and developed countries are slowly growing into political formations after finding the doors of existing political institutions closed or not sufficiently open.

The other aspect of ecological diversity and weak market forces is to design organisational space where development does not become contingent upon availability of voluntary initiatives or organisations. This is a very serious fallacy being reinforced

by supporters of voluntary activism. It is ignored that historical deprivation experienced by the people in high risk environments does generate a feeling of 'learned helplessness' which may prevent emergence of voluntary initiatives.

At the same time Non Governmental Activism triggered by the outsiders has in many cases opened new avenues for enforcing accountability of the administration towards deprived populations (Sethi and Kothari , 1981-1989).

Simultaneity:

Most ecological processes involve simultaneous changes in several resource systems. The commodity oriented single - activity or enterprise organizations work well with surplus producers. These organizations may be suitable also for those commodities which are in high demand domestically or abroad . However, such organizations or sectoral departments are seldom successful in reaching people involved in survival through simultaneous involvement in several markets. Budgetary and administrative systems are particularly suited for sequential implementation of public programmes.

Simultaneity of ecological processes also implies that a small change in one sub-system has to be followed up with several simultaneous ones in other sub-systems (Mathur and Gupta 1984). That such a process of change is seldom conceptualised in hierarchical bureaucracies is now well known. We have shown in this review that when conflicts arise around natural resources the administration may also use several and simultaneous strategies

to prevent mobilization and organization. In the period of crisis such as drought or flood the simultaneity substitutes the sequential response (Mathur and Bhattacharya 1975). The dysfunctional part of the administrative assimilation has been the resilience of administration to revert back to its original sectoral and sequential nature once the crisis is over.

The mechanisms for open negotiation are rare. Unwillingness of state to receive and act on orderly feedback has led to the ecological movements acquiring militant character. Most social groups in hill and forest regions recognize the message of states's response to the agitation for autonomy say by Gorkha National Liberation Front. There is increasing trend towards setting up of regional development boards in such regions but without any fundamental difference in the pattern of people-administration interactions. Whether such a response to diversity and complexity will help is doubtful.

One of the reasons for the likely failure of such approaches is the absence of attention being paid towards the information processing capacities of these administrative bodies. They collect and process information in the same manner as a sectoral agencies.

Complexity

The short time frame taken by the administrators and politicians makes it impossible for sustainable technological choices to compete with the ecologically undesirable but commercially prof-

commodities has not been related to ecological changes. Declining ground water tables, diminishing returns from the soils, depletion of micronutrients, increasing resistance of pests to chemical pesticides with high residual effect, greater vulnerability to disease epidemics due to narrowing of the genetic basis and other related problems are outcomes of short term solutions to long term problems. The pressure of these changes is increasing the demand for subsidies. The ecological security of a society is closely related to the politics of ignoring such signals.

It is the bias towards such regions which results in the recommendation that one should not try to check migrations from the backward regions too much lest the supply of cheap labour for large 'developmental' projects is disrupted (NCDBA 1981).

The gaps in the research on public administration from ecological perspective can be located in:

The need for recognising that the risk averse organizations can not serve risk averse households. The administrative response to risk and uncertainty has to be conceptualised properly. The Four-S model and the eco-political perspective may help. However, empirically more robust frameworks have to be established.

The neglect of ecological variables in the theories of public administration in primarily agrarian societies is indefensible (Reddy 1980, Gupta 1989). The local and global adaptations with changes in ecology (Climate, soil, water, trees, air, ozone layer, global atmospheric temperature etc.), require new forms of organization and governance. How these forms will evolve may depend upon the way protest against uniform administrative structures is responded to by the state. More coercive response may lead to demand for greater autonomy through reinforcement of sub nationalities.

The role of **Access** (to natural resources and the institutions governing their use) **Assurance** (Horizontal--that is about others behaviour vis-a-vis ones own ; Vertical --

future returns from present investments)and **Ability** (the skill to transform resources into outputs) in design of public systems needs to be properly conceptualised. The interaction between spatial, sectoral , seasonal and social variables have to be studied properly so that ecological diversity, complexity , simultaneity and change can be treated as indigenous variables in the process of development.

If development is defined as widening the choices of the poor and extending the time frame for appraising their choices then there is no escape from looking at the divergence in these parameters in case of social classes besides in the case of civil servants at various level.

The role of common properties or their erosion in the evolution of national and sub national consciousness has to be studied. The relation of these layers of consciousness embedded in culture with perception of state and its instruments has to be more rigorously studied for understanding strengthening of ethnic and regional formations.

Search for sustainable technologies building upon indigenous/local knowledge of peasants, pastoralists and artisans will require closer participation of these groups in the formal research system.

Finally the tendency in public administration to convert **Risky** problems into **uncertain** ones to reduce the zone of responsibility and **uncertainty** in some cases into that of **risk** to increase control needs careful scrutiny.

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