

**ACCESS, CONSTRAINTS AND USE OF NATURAL RESOURCES:
STUDY ON POVERTY-ENVIRONMENT LINKAGES OF
FOREST FRINGES IN CENTRAL KERALA.**

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*Dissertation submitted in partial fulfillment of the requirements for the degree of **Master of
Philosophy in Applied Economics** of the Jawaharlal Nehru University*

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1999-2001

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June 2001**

*I hereby affirm that the work for the dissertation, **Access, Constraints and the Use of Natural Resources: Study on Poverty-Environmental Linkages on Forest Fringes in Kerala**, being submitted as part of the requirements of the M.Phil Programme in Applied Economics of the Jawaharlal Nehru University, was carried out entirely by myself and has not formed part of any other of Programme and not submitted to any other institution /University for the award of any Degree or Programme of Study.*

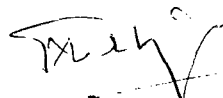
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The present study tries to address some issues of development, environment and its impact. Present environmental problems represent a challenge to our thinking habits and conceptual frameworks about societal development. In order to understand the problems and prospects of development, we need to grapple with issues of poverty and environment. This study considers environment as a social factor constitutive of the development process, rather than as a technical unit/factor amenable to measurement. Studying environmental problems, poverty, and development projects in an eco-sensitive region enables us to conceive the empirical regularities of the poverty and environmental linkages. The study focuses on these issues within the framework of Ecological Economics. Ecological Economics has evolved from the interaction of diverse streams of thinking with multi disciplinary roots. For an empirical understanding of the issues, we seek to analyse the economic activities of people living in the border area (the fringe area) of Forest Reserves. The settlers under study include tribals and migrants. It has been argued that the poor people live in deprived conditions and they exploit natural resources for their livelihood. The relationship between poverty, environment and development is quite complex and not amenable to easy generalisation. The poverty-environment linkage debated more intensely in recent literature centers around the question whether poverty leads to environmental degradation or not. Some studies show that poverty is the main cause of environmental deterioration as the poor are not in a position to use natural resources in a sustainable way. Other schools of thought disagree with the above arguments and state that the resource use pattern and behaviour of the poor may not induce environmental degradation. To capture this complexity in terms of a single approach such as the vicious circle (poverty-environmental degradation- more poverty) would be naïve. There is limited scope for generalisation, so an in-depth analysis and a holistic understanding are warranted to situate the complexity of the processes of human-nature interactions. The study tries to problematise the process of poverty -environmental linkages in a historical perspective. It will inquire into the history of migration, the source of income of local communities, and nature of dependence on natural resources etc. It also situates the influential factors leading to the conservation or extraction of natural resources, changes in accessibility, environmental entitlement and the impacts on environmental regulation on user groups. The methodology to be pursued is constructivist methodology, in an Ecological Economics perspective. In short it's based on dialectic, relativist and subjectivist understanding. The analysis is mainly based on primary survey, with structured and unstructured interviews. The empirical evidence shows that there is continuous interaction between the people and forest resources. There is a change in the dependencies on forest resources by different user groups. The poor user groups rely on forest resources for their livelihood. The current resource use pattern of the poor user groups may not lead to biodiversity loss in a long-term period. Loss in the environmental entitlement and enforcement of environmental regulation has led to the disruption of local labour markets, and has adversely affected poor people's livelihood. It has also unleashed a process of economic impoverishment and socio political disempowerment where communities have lost control over their material environment and cultural identity.

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Chapter I

CONCEPTUALISATION OF ISSUES AND RESEARCH METHODOLOGY

'In reality, there are no 'economic', sociological or psychological problems, but just problems, and they are all complex'....(Myrdal G., 1975).

1.1 Introduction

This study tries to understand the dynamics of environment and poverty linkages. The dynamics involved here is highly complex. Different schools of thought consider the issue in different contexts viz., in terms of time, geographical specificity, cultural specificity, etc. The study attempts a dynamic analysis within the framework of Ecological Economics.

The present study tries to address some issues of development and environment and the impact of one on the other. Present environmental problems represent a challenge to our thinking habits and conceptual frameworks about societal development (Soderbaum, 1999). Environment and development issues are major concerns in the Indian ecological politics and movements. Much of the current literature on environmental movement in India, whether considered along with studies on other social movements, or not, reflects a disenchantment with state-led development strategies (Omvedt, 1993; Kothary, 1984; Gadgil and Guha, 1995; Bandopadhyaya, 1989; Wignaraja, 1993; and Escobar, 1992). In order to understand the problems and prospects of development, we need to grapple with the issues of poverty and environment. Environment is an asset that can be utilised either directly or indirectly to provide the means for survival and sustenance of human populations. This study considers environment as a social factor constitutive of the development process, rather than as a technical unit/factor-amenable to measurement. The analysis thus seeks to study the Natural System in a dynamic link with human and non-human impacts on it.

In Kerala, today, there is a continuum of the rural with the urban. The transformations occurring in the villages are far reaching. Studying problems of environment and development in an eco-sensitive region would enable us to understand specific issues related to environment and development. As a particular and illustrative case we are analysing the Human-Nature relationships of the people living in the border area (the fringe area) of Periyar Tiger Reserve

and nearby forest reserves in Central Kerala. Despite the limited scope for generalisation, an in-depth analysis of a particular case would illuminate the nature of possible linkages between poverty and environment.

The relationship between poverty, environment and development is quite complex and not amenable to easy generalisation. Some studies show that poverty is the main cause of environmental deterioration as the poor are not in a position to use natural resources in a sustainable way (Das Gupta, 1998; World Bank, 1992; Lele, 1991 etc). To capture this complexity in terms of a single approach such as the vicious circle (poverty→environmental degradation→ more poverty) would be naive (Nadkarni, 2000). The study thus focuses on the dynamic nature of the issues rather than any aspect of static analysis.

1.2 Situating the Research Problem

The study tries to focus on two issues. Firstly, understanding the dynamic process of the inter linkages between poverty and environment. Secondly, analysing how and why environmental degradation and environmental regulation affect the poor social groups. The environmental interactions of different social groups (rich and poor) are dynamic and complex. Different factors involved in social, cultural and institutional changes also affect Human-Nature relationships. Further, it is not axiomatic that the poor will have a worse rural or urban environment, although there are strong reasons to believe that the poor are less able to protect themselves against environmental pollution. Economic and cultural deprivation prevents them from freeing themselves from the environmental hazard even in future. Thus the present study seeks to understand the changes in the effects of ambient environment and the related factors on poor. There is some evidence that the poor are most affected when deforestation, soil erosion and other negative impacts on the environment occur, but detailed studies of these effects would throw up a lot of information on the mechanisms, including coping strategies, that is otherwise simply lacking (Markandya, 2000). Detailed quantitative empirical evidence will give a better understanding on how the poor are affected relative to the non-poor, which is more useful to policy-making. This dimension is particularly relevant when earlier studies point out that environmental regulations can achieve their environment goals without causing significant decreases in the welfare of the poor. The present study also tries to explore promising alternatives to our current command-and-control based environmental management systems. The enormous uncertainty about local and trans-national environmental impacts needs

to be incorporated into decision-making. We need to know more accurately how and when the changes take place. "We also need to better understand the sociological, cultural and political criteria for acceptance or rejection of policy instruments" (Costanza and Liza Wainger, 1991).

1.3 Contextualisation of the Study

The issues of environment and development are very complex and therefore require an empirical context to situate. We seek to analyse the economic activities of the people living in the border area (the fringe area) of Periyar Tiger Reserve and other nearest reserves. The people living in fringe areas are always under the limiting influence of the regeneration cycles of eco-system on which they depend as well as the entry restrictions posed by the environmental regulations. The region is also affected because of urbanization backed by large-scale migrations and the spread of commercial agriculture. This again has not been adequately researched though there is a general hunch regarding the adverse impact of urban development on the forest eco-system. The impacts of developmental activities like the proposed dam¹, Sabarimala railway, highway further pose a major threat to the already fragile environmental situations at the fringe. The people of the region are suspicious of the proposed development projects, because of the threat of further displacement.

The history of the settlements in the region can be traced to 1940s when there was an influx of the people from the plains of Travancore to the high ranges responding to the slogan of 'grow more food'. The region was also inhabited by tribal groups already rehabilitated/displaced from other project areas in the 1930's. The settlers in this area thus include tribals and migrants. There are five tribal settlements in the area- the *Mannan*, *Paliya*, *Malayaraya*, *Malampandaram*, *Urali*, and the *Ullada*. The migrants include Dalits and migrant peasants belonging to other communities. Most of the people are landless or with land holdings of below 10 cents.

The general notion about resettlement and displacement due to the development activities is that it will provide a better standard of living. A similar idea is prevalent in the discussion of environmental regulations and its impacts on poor user groups. Government intervention to

¹ This is the Parakkadvu project; it may lead to the eventual displacement of nearly 3000 families from Pamba valley (central part of the study area). This project will submerge large part of cultivable land and settlement area, if commissioned.

solve the problem of market failure creates conservation efforts and this has an adverse impact on the livelihood of poor user groups. Both these issues though occurring in different contexts are being addressed in terms of compensation. Displacement causes disruptions of production systems and kinship groups and losses of occupation opportunity. In the case of the tribes who were engaged in making handicrafts, displacement/environmental regulation led to the disruption of local labour markets and labour exchange networks. It unleashes a process of economic impoverishment and socio political disempowerment where communities loose control over their material environment and cultural identity. These issues direct that there is a need for conceptualizing the dynamics of development and environment in the context of the deprived condition.

1.4 Towards Conceptualizing the Research Problem

A prevalent view in the decade from the mid 1980s to the mid-1990s was that poverty and environmental degradation were intimately connected, so that poverty was seen as both a cause and an effect of natural resource depletion, in a downward spiral (Leonard, 1989). The poverty-environment linkage, debated more intensely in recent literature, centers around the question of 'can poverty lead to environmental degradation?'. Some of the studies show that poverty is the main cause of environment deterioration and among them the notable studies are Brundtland Report² (1987), World development Report (1992), Dasgupta (1993), Dasgupta and Maler (1994), Reordon and Vosti (1995), Maler (1997), Prakash (1997), and Lopez (1997). There are other studies showing that there is no direct linkage between poverty and environment degradation, and they argue that developmental processes have been instrumental in the degradation of environment. Most important among them are the studies of Jodha (1989 and 1998), Broad (1994), Guha and Gadgil (1997), Cavendish (1999a, 1999b, and 2000) Natkarni (2000) etc. The contemporary writings that problematise infrastructure developments from its impacts on environment include those by Gadgil (1997), Agarwal (1992 and 1999), Guha (1999) and Bromley (1999). The writings of Dixon and Sherman (1990), Barbier (1990 and 1994), Kemf (1993) and Tacconi (1997) are insightful for understanding the economics of protected areas, forests and natural resources.

² The Brundtland Report delineated what we will term the first hypothesised equation about the relationship with its focus on poverty as " a major cause and effect of global environmental problems". The insertion of poverty as a variable was seen as an attempt to merge the 'development'. field with the "environment' field and therefore as an important break from past analysis (Broad, 1994)

Dasgupta (1993) found a positive relationship between rural poverty, fertility and environmental resource base degradation and concludes his study by stating that it was not only poverty but also institutional failure that were the root causes of environmental degradation. Further, Maler (1997) noted that if poverty is associated with high rates of time preference, poor rural households might discount the future heavily and thus degrade resources today. Jeganathan (1989), and Jodha (1989) both disagree with these conclusions and assert that the poor do not: 1) have resources to degrade the environment; and 2) have short time preference which propels them to destroy a resource which they regard as safety buffers during times of destitution (as quoted in Duraiappah, 1996). However, they do agree with Das Gupta on the role institutional- and market- failures play in providing incentives to the poor to have short time preferences; and the rich to exploit the resource base at unsustainable rates.

It has been stressed that affluence may induce consumption patterns that can cause environmental degradation (Durning, 1991 and Duraiappah, 1996). The relationship between wealth, poverty and environmental degradation varies with each factor analysed; wealth is a greater threat to the environment than poverty (Guha and Martinez, 1997). More balanced growth that promotes rapid expansion of the rural economy both reduces rural poverty and provides greater incentive for the poor to protect their environmental resources (Lopez, 1997). Jodha (1998) states that widespread evidence indicates that many villagers who are currently facing severe environmental degradation were actually poorer in the past, yet they consciously prevented environmental degradation.

The relationship between poverty and environmental degradation is close and complicated, with a built-in potential for escalation (Pinstrup- Anderson and Pandya- Lorch, 1994). The implication of the focus on the vicious circle of poverty and degradation is that poverty alleviation will necessarily reduce degradation of the environment, and its inverse, that arresting and reversing environmental decline will help the poor (Leonard, 1989 and Cleaver and Schreiber, 1994). The major studies and their focuses on the poverty, environment and its impacts can be summarised as follows:

Table 1.1: Summary of the major studies related to poverty, environment and its impacts.

<i>Findings</i>	<i>Authors</i>
There have been important social changes (policies, external events) that have resulted in concurrent increases in poverty and environmental degradation in a number of developing countries	Das Gupta (1995 and 1996b), Lopez (1992, 1997), Lopez and Scoseria (1996), and Heald and Binswanger (1996)
A deterioration of the ambient environment hurts the poor more than the rich (and conversely)	Das Gupta (1995 and 1996b), Kumar And Hotchikiss (1988) and Kadekodi (1995)
Policies that change the environment can hurt the poor more than the rich (or vice versa)	Eskeland and Devarajan (1996), Brooks and Seth (1997), Lanjouw (1997) and Eskeland and Kong (1998)
Increase in economic development has a complex effect on the environment, but in the long term should help reduce poverty and improve the environment.	Grossman and Krueger (1991), and Stern, Common and Barbier (1996)
There are structural asymmetries between rural rich and poor in the Human-Nature relationships. Further accessibility and use of forest resources are related to culture	Chakraborty (1999) Gupta & Gupta (1997)
Access to commons has a substantial impact on rural poverty and inequality, and omitting these activities from the income measure systematically overstates inequality and poverty measures. However, contrary to what one might expect, the inclusion of environmental income surprisingly had very little effect on the analysis of the causes of inequality and poverty.	Cavandish (1999a, 2000);
Poor people become not only positive agents vis-à-vis the environment but environmental activists	Broad (1994)

These studies point to demographic, cultural, and institutional factors as important variables in the poverty- environmental degradation nexus. The links between poverty and the environment are affected by a multiplicity of factors (Reordon and Vosti, 1995). Reordon and Vosti present a framework that highlights the importance of considering different types of poverty-welfare poverty and investment poverty³; the asset categories held by the poor-natural,

³ Welfare poverty refers to standard measures of poverty, which consider, for example, the capacity to attain a minimum level of calorie intake. Investment poverty refers to the capacity to invest in relevant natural resources to maintain or enhance their quality. Welfare poor can be expected to be investment poor, but the converse does not necessarily apply (Reaodon and Vosti, 1995)

human, on farm, and off-farm resources; the different types of environments-soil, water, biodiversity and air; and, the factors that affect their behaviour-markets and prices, infra structure, technology and population pressure. The area is relatively strong on theories, but weak on proper empirical studies in general and context specific studies in particular. There are substantial gaps in the literature that need to be addressed (Markandya, 2000 and Duraippa, 1998). Therefore, the present study is conceptualised with the following objectives.

1.5 Objectives

The broad objective of the study is situating the process of poverty and environmental linkages in a long-term dynamic perspective. The specific objectives in this context are:

- 1) To understand the nature of extraction and collection processes of each user groups (how do they live in the limited scope of environment-economic space).
- 2) To analyse the nature of dependency, accessibility of forest resources and change in the environmental entitlements to forest resources of the people (user groups).
- 3) To understand the behavioural characteristics of each user group as well as their interactions with each other and the natural resource base; and to investigate the impact of natural environment degradation across the user groups and their reactions to these changes.
- 4) To analyse the impact of environmental regulation, institutional innovations and its effects on resource use pattern, the livelihood of the poor, and conservation of environment.

1.6 Methodology

The methodology to be pursued here is from an Ecological Economics perspective. It addresses a domain of knowledge that transcends the established disciplines. Theoretical ecological economics framework is rooted in constructivist methodology (Guba, 1990 and Tacconi, 1995b). In short it is based on 'dialectic, relativist and subjectivist'⁴ understanding. The research process is influenced, for instance, by the inquiries, values and by the theory used

⁴ Constructivism is presented through the writings of Guba (1990), who describes concisely its tenets. The constructivist paradigm has been summarised by Guba as follows: The **ontology** is **relativist**-there exist multiple realities that are mentally and socially constructed.; The **epistemology** (i.e. relationship between the knower and the known) is **subjectivist**-findings are literally the creation of the process of interaction between the two. ; The **methodology** (i.e. method of investigation) is **dialectic--working hypotheses** are tentative and therefore refined by comparison, with the aim of achieving substantial consensus.

to collect and analyse data, and to interpret the findings. Thus taking into account of different perspectives/approaches is the only feasible one for studying of the human impact on the ecological systems and vice versa (Perrings 1999; Dhawan, 1989; Mitra, 1989; Gupta & Asher, 1998; WRI 1998; Soderbaum 1999; David 2000; Daly and Costanza 1991 and Tacconi 2000). The analysis is mainly based on primary survey with structured and unstructured interviews.

1.7 Data Sources

A. Primary Survey: The major data source is the structured and unstructured interviews of the primary survey.

B. Selected Secondary Data sources are from the following:

1. Food and Agricultural organization (FAO, 1992): "Economic Assessment of Forestry Project Impacts", FAO Forestry Paper106.
2. Government of India. (1994): 'Kerala paper 3 (final)', *Census of India -1991 Series 12*.
3. Government of India. (1995): *Annual Report*, Ministry of Environment, New Delhi.
4. Government of Kerala: *Economic Review*, Various Issues.
5. Kerala Forest Department: *Forest Statistics*, Various Issues.
6. Centre for Science and Environment: *India's Citizen's Report*, Various Issues.

1.8 Selection of Study Sites

Most of the hamlets in the fringe area have been identified as areas with high population density by other studies on the area. In the preparation stage, a number of hamlets around the forest fringes were visited and the hamlets with more user groups⁵ were identified. A draft questionnaire was designed and tested through a pilot survey. The pilot survey was carried out among different user groups and also includes those who do not rely currently on forest resources. The Pilot survey gave a broad understanding of the existing class/caste differentiation in the standing area.

On the basis of pilot survey, a final questionnaire was developed. Based on the pilot survey and concentration of user groups, two areas were selected. For the unstructured interviews, all the hamlets in the south side of the Periyar Tiger Reserve and other people living in the fringes of other forest reserves were selected. The respondents includes different political leaders,

⁵ User groups are dependent on forest resources. User groups generally belong to the set of people who are poor, but all groups which are poor need not be user groups.

social and environmental activists, religious leaders, leaders in the different caste groups, members from women's associations, households having highest and lowest land holdings etc, and specifically old persons from the all social strata⁶. The selected hamlets fall in the administrative jurisdiction of both Kottayam and Pathanamthitta districts. The hamlets further do not belong to a particular village or Taluk as per administrative specification. This was one of the limitations to use the secondary data as per their availability.

The study followed the purposive sampling method. The survey questions were addressed to the head of the household and included all the information related to the entire households. The information collected was not only from the head of the households but also from other family members. Information about household composition, size of farm plot, changes in cropping pattern, dependency on forest, frequency of forest visit, extraction of resources, their sales, employment opportunities and income, etc were collected (See Questionnaire in Appendix No.1).

1.9 Chapterisation

The outline of the thesis can be summarized as follows. Following this introductory chapter, the second chapter would deal with theoretical developments of ecological economics along with the methodological differences from other similar disciplines. This would be followed by the details of the study area-meaning and description of the fringes, the socio-economic profile of the house holds etc. After the description of the physical environment of the area, in chapter three, we problematise the issue of poverty- environmental linkages. This chapter divided into two sections. The first section deals with the historical resource use pattern of the households with different phases of migration. The second section deals with current use pattern, sustainability. Chapter four starts with the analysis of different influential factors affecting the forest resources conservation/extraction by the user groups. The environmental regulation (as one influential factor) and institutional innovations and its impacts on resource use pattern, livelihood of the poor user groups etc are then discussed. The next chapter situates one of the user groups who are Tribes, Malapandarm, in the context of the access, constraints and use of natural resources. This chapter focuses on how environmental entitlement changes over the time period. Finally, the study ends with concluding remarks.

⁶ They are the experienced persons from whom details of the early migration, conversion of forest land and forest dependency could be obtained.

Chapter II

METHODOLOGICAL UNDERSTANDING(S) OF ECOLOGICAL ECONOMICS AND PROFILE OF THE STUDY AREA

2.1 Introduction

Integrating ecology and economics is increasingly important as humanity's impact on the natural world increases. Such integration may help to deal with non-monetised values, culture etc. In addition, it also focuses on bio-diversity losses as well as socio-economic life of the people. This Chapter gives a brief analysis on methodological differences of Ecological Economics and preliminary introduction to study area. This chapter is structured as follows; Section I attempts to explain the theoretical developments and methodological differences of Ecological Economics as a new perspective. Section II tries to explain the socio-economic and ecological specifications of the area. It also tries to explain the material conditions of the sample households in the study area.

SECTION I

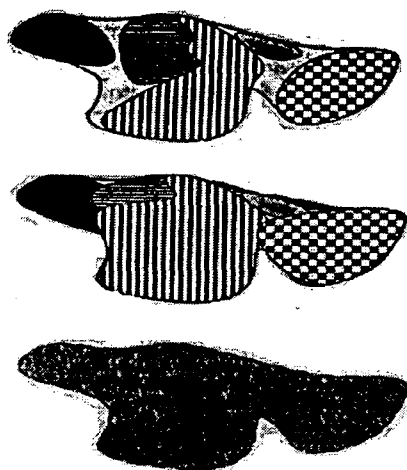
2.2. Methodological Differences of Ecological Economics

Ecological economics is a new trans-disciplinary field of study that addresses the relationship between the ecosystems and economic systems in the broadest sense. These relationships are central to many of humanity's current problems and for building a sustainable future but are not well covered by any existing scientific discipline. There are two closely related themes in the intellectual development of ecological economics. The first is reflected in the work on the structure of joint ecological-economic systems. It is reflected both in changes in the description of the physical dimensions of the joint system, and in the treatment of externality in the economic representation of that system. The second is reflected in work on the evolution of ecological-economic interactions, and on the significance of the relative scale of the economy and its environment for the evolutionary process.

The difference between trans-disciplinary and standard disciplinary vision would aid understanding the difference in methodology being stressed. The following figure (figure 2.1) illustrates how the trans-disciplinary vision differs from the now standard disciplinary vision.

In the upper panel, the standard disciplinary vision is depicted as one that leads to the defining and protecting the disciplinary territories on the intellectual landscape. Sharp boundaries between disciplines, and lack of any overarching views makes the problem which cross disciplinary boundaries or which fall in the empty spaces between the territories, very difficult, if not impossible, to deal with. In addition, large gaps in the landscape are not covered by any discipline. Within this vision of how to organise the scientific endeavour, one might think that the main role of ecological economics would be to fill in the empty space between economics and ecology, while maintaining sharp boundaries between what is economics, what is ecology, and what is ecological economics.

Figure: 2.1. Disciplinary Vs transdisciplinary views



The middle one illustrates an interdisciplinary vision of the problem. In this vision the disciplines expand and overlap to fill in the empty spaces in the intellectual landscape, but maintain their core territories. There is dialogue and interaction in the overlaps between territories, and the picture looks jumbled and incoherent. This vision moves in the direction toward the trans-disciplinary ecological economics vision, but it is still not quite there.

In the case of the vision of ecological economics, the boundaries between disciplines have been completely eliminated and the problems and questions are seen as a seamless whole in an intellectual landscape that is also changing and growing. This vision coexists and interacts with the conventional disciplinary structure, which is a necessary and useful way to address many problems. The trans-disciplinary views provide an overarching coherence that can tie disciplinary knowledge together and address the increasingly important problems that cannot be addressed within the disciplinary structure. In this sense, ecological economics is not an

alternative to any of the existing disciplines. Rather it is a new way of looking at the problem that can add value to the existing approaches and addresses some of the deficiencies of the disciplinary approach. It is not a question of conventional economics versus ecological economics; it is rather conventional economics as one input to a broader trans-disciplinary synthesis (Cumberland, Daly, Goodland, Norgaard and Costanza, 1997).

Costanza, Daly, Norgaard (1997), further delineate the basic points of ecological economics:

1. Human economy is a subsystem of the global ecosystem. Further there are limits to biophysical resources being extracted for energy through the economy system in spite of the fact that they would go back to the ecosystem as waste.
2. The recognition that in the analysis of complex systems like the earth at all space and time scales, fundamental uncertainty is large and irreducible, and, certain processes are irreversible, requiring a fundamentally precautionary stance,
3. That institutions and management should be proactive rather than reactive and should result in simple, adaptive, and implementable policies based on a sophisticated understanding of the underlying systems which fully acknowledges the underlying uncertainties. This forms the basis for policy implementation, which is sustainable
4. The future vision of a sustainable planet is a high quality of life for all its citizens within the material constraints imposed by the biophysical resources

The difference in the major tenets of environmental economics, which is extensively used for addressing environmental issues and ecological economics would further place the role of ecological economics in perspective as evident from the following table.

Table 2.1: Tenets of environmental economics and ecological economics

<i>Dimension</i>	<i>Environmental Economics</i>	<i>Ecological Economics</i>
Main theory	Neo-classical economics	Biophysical plus physiocratic and classical economics
Approach	Allocation of resource use	Scale, distribution and allocation of resource use
World-view	Mechanistic-reductionist	Evolutionary-holistic
Knowledge-acquisition process	Positivist, supposedly value-free	Subjectivist, reflecting values and ideology
Character	Mono-disciplinary (focus on tools)	Multidisciplinary (focus on problems)
Scarcity perception	Relative	Absolute
View of future	Technological optimism	Prudent pessimism
Problem-solving orientation	Based on Market system	Based on laws of nature
Focus	Short-term	Long-term
Method of (e) valuation	Cost Benefit Analysis	EIS, Positional analysis, carrying capacity analysis ¹
Dominant theme	Anthropocentric-- Individual tastes and preferences are taken as given and as the dominant force. The resource base is viewed as essentially limitless due to technical progress and infinite substitutability	Anthropocentric with attempts to include biocentric and ecocentric considerations-- Human preferences, understanding, technology and organisation co-evolved to reflect broad ecological opportunities and constraints; humans responsible for understanding their role in the larger system and managing it sustainably

Notes: 1.EIS- environmental impact statements; positional analysis has been developed in Soderbaum's writings (1987; 194).

Source: modified from Sahu and Nayak (1994, cited in Tacconi L (2000))

The above Table shows that there are significant methodological difference between environmental economics and ecological economics. Ecological Economics as a new assemblage of concerned economists and ecologists is not bound by the historic traditions of NE. It uses the framework of NE but is not constrained to use only that framework, nor it is constrained by the world view, politics, or cultures of economists in the past (Aart 1996). In EE sustainability is a matter of intergenerational and international equity. The neo classical system considers that economic growth will provide the conditions to resolve these inequities.

SECTION II

To situate the research problem, we seek to analyse the local community and their interaction with forest resources living in the border area (the fringe area) of Periyar Tiger Reserve and nearest forest reserves. The people living in fringe area are always under the limiting influence of the Eco system (ceiling effect) apart from environmental regulations. That is, when compared to the other regions, the socio-cultural life is the same but the economic freedom

that can be realised in this area is ecologically restricted. The study area is also characterised by urbanisation, backed by large-scale migrations and the spread of commercial agriculture. The developmental activities envisaged in the area are another potential impact on the ecology. Both these factors set in a series of negative impact on the Eco system, including conversion of forest land and bio diversity loss.

2.3. Eco-system and Economic Functions

By definition, protected areas refer to sites that remain relatively undisturbed by humans and close to their natural state (Dixon and Sherman 1990). Protected areas are designated natural areas such as ecological reserves, national or provincial parks, wilderness areas, and wetlands- any designation aimed at keeping natural areas, relatively intact and restricting commercial development (Cornelis & Bulte 2000). It is possible to minimise the risks of irreversible damage to the ecosystems by human activity through the establishment of protected areas. These facilitate the carrying capacity and longevity of the subsystems and ecosystems. 'The interaction among species typically makes it necessary to protect a number of species to ensure the protection of any one. So even if species are not valued for their own sake, they may be protected because of their role in supporting other species. By the same reasoning ecological services may be protected because they are by-products of habitat. This emphasises that a habitat rather than a species approach to conservation' (Perrings & Lovett 2000). About 4,500 protected areas exist world-wide, of which one-half are located in the tropics covering some 5% of tropical rain forests. During the major part of this century, the establishment of protected areas was the standard approach in biological conservation (Kramer R et al., 1997). Table 2.2 shows the protected area in the continent

Table 2.2 : Protected areas by continent.

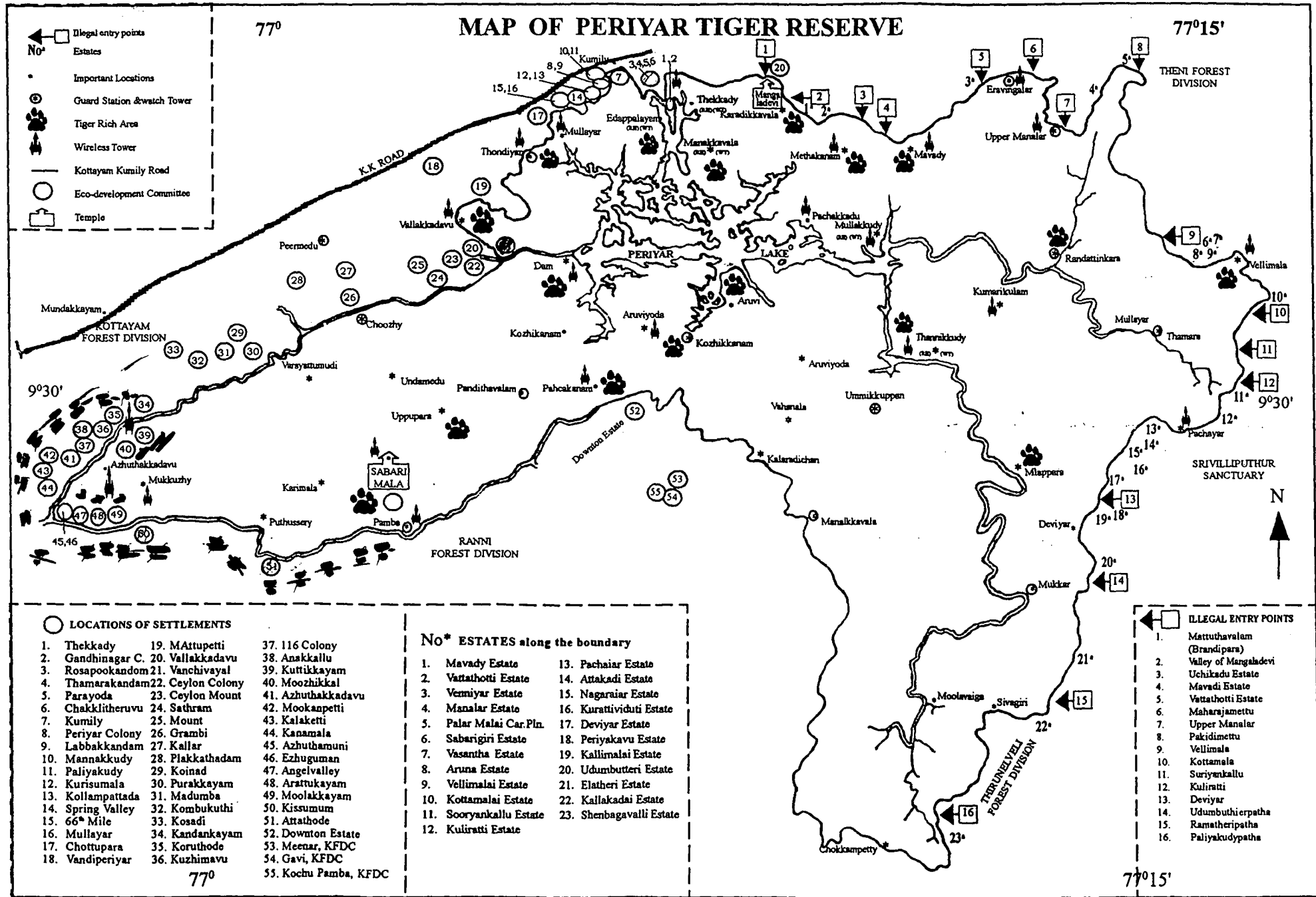
<i>Continent</i>	<i>All protected areas</i>		<i>Totally</i>	<i>Partially</i>	<i>All Categories</i>
	Number	Area('000s ha)			
Africa	727	149,541	2.68	2.08	4.94
Asia	1,774	141,793	1.73	4.13	4.40
Europe	2,923	223,905	2.23	8.57	8.90
N&C.America	2,549	230,199	7.58	4.88	10.23
Oceania	1,087	100,282	4.50	7.34	11.75
S.America	706	112,834	3.77	2.53	6.33
World	9,793	959,568	3.23	3.04	7.15

Source: WCMC (1992), UN Environmental Program (1995) and (Cornelis & Bulte 2000).

With problems mounting over national parks and sanctuaries the present state of India's wild life and protected areas is in jeopardy. The malady, in most of the cases, has been identified as the largely unscientific and anti-people approaches of dealing with the management of these regions. India, today, needs a rational, sustainable and effective conservation policy with the very important task of caring for people's needs and rights (SIE, 1999). Areas that are in some sense "protected", in that access or forms of use are controlled, have existed for thousands of years. For instance, in India, protected areas in the form of forest reserves have existed since the fourth century BC, while hunting reserves have existed in Europe for several hundred years. Although these "protected areas" were exclusively used by the upper classes, they did serve the purpose of preserving bio-diversity (ibid.).

In 1861, the first protected area in the world was created- Yosemite National Park in California (WRI, 1992). The first in India was Corbett National Park in 1935 (Dixon and Sherman, 1990). In India, the number of PAs has increased from 5 National Parks and 60 Wildlife Sanctuaries in 1960 to 80 National Parks and 441 Wildlife Sanctuaries in the 1990s constituting an area of 148.7 thousand sq.kms (Government of India, 1995).

The number of PAs in Kerala has also increased from merely 3 in 1960 to 14 at present, accounting for 4 per cent of the total reserved forest area (Kerala Forest Department, 1994).



The marked area is selected for field survey.

The Periyar Tiger Reserve¹ is one of the seven protected areas in India chosen for the pilot phase of the Eco-development project. The project in Periyar will target about 169,694 out of the 225,000 residents residing within 2km of the park boundary (Anon, 1996). PTR also has the largest forest cover among the other protected areas in Kerala. Table 2.3 gives the list of protected areas in Kerala.

Table 2.3: List of Protected Areas in Kerala

Name	Area (Sq.Km)	Year of Formation
Periyar Tiger Reserve	777	1950
Neyyar Sanctuary	128	1958
Peechi-Vashani Sanctuary	125	1958
Parambikulam Sanctuary	285	1973
Wayanad Sanctuary	344	1973
Idukki Sanctuary	70	1976
Eravikulam National Park	97	1978
Peppara Sanctuary	53	1983
Thattekad Bird Sanctuary	25	1983
Aralam Sanctuary	55	1983
Chinnar Sanctuary	90	1984
Chimoney Sanctuary	10	1984
Shenturny Sanctuary	100	1984
Silent Valley National Park	90	1984
Total	2249	

Source: Kerala Forest Department

Periyar Tiger Reserve is situated in the Peerumade Taluk of Idukki district in Kerala State. It is located between 9 18'N to 9 40' latitude and 76 55'E to 77 25' E longitude and forms a part of the high ranges of the southern Western Ghats, covering a total area of 777 sq.km. The head quarters of the reserve is at Thekkady in Kumili village, which is one of the important tourist centres in the State. The reserve has 90-k.m. inter-state boundary with the three districts of Tirunelveli, Kamarajar and Madurai in Tamil Nadu State. The Ranni reserve forest of Pathanamthitta district in Kerala borders the southern part of the reserve. Pamba River also forms part of the southern boundary till it joins the river Azhutha. The Western boundary of the reserve forms the eastern side of Kottayam forest division. Table 2.4 shows the physical details of Periyar Tiger Reserve.

¹ The PTR was named after the Periyar River, which cuts through the Idukki district of Kerala. The Maharaja of Travancore declared the forest around the lake a reserved forest in 1899. The forest department started managing

Table 2.4: Physical Details of Periyar Tiger Reserve (PTR).

Physical Details	Area (Sq.Km)
PTR	777
National Park Area	350
Sanctuary	427
Buffer Zone	355
Tourism Zone	50

Source: Kerala Forest Department (1995)

The reserve comprises dense woodlands of tropical evergreen, semi-evergreen; moist deciduous interspersed with grasslands and plantations. Tropical evergreen and semi-evergreen forests occupy 75 per cent of the total area of the reserve. Table 2.5 shows the forest type of Periyar Reserve.

Table 2.5: Forest type of Periyar Tiger Reserve

Forest type	Area (sq.km)	Percentage
Tropical Evergreen	305	39.25
Semi Evergreen	275	35.39
Moist Deciduous	99	12.74
Grass lands	12	1.54
Plantations	55	7.08
Lake	26	3.35
Settlements	5	0.65
Total	777	100

Source: Kerala Forest Department (1995)

Natural vegetation in the reserve consists of evergreen and semi-evergreen forests, savanna grassland, and montane grassland, with patches of mist deciduous forests. About 5,000 ha. consists of eucalyptus plantations. In the last 30 years, more than 150 new species and 15 new genes have been found in the area. The lion-tailed macaque, nilgiri langur, stripe-necked mongoose and 15 species of birds are endemic to the region. Other species, like tigers, elephants are also found here. The major Eco system services and various functions in general are discussed in the appendix.

the sanctuary only in 1966. In 1973, the 77,700 ha park was named the PTR, after Project Tiger came into being. In 1982, the 35,000 ha core area of the reserve was notified a national park.

2.4. Socio-economic Profile in General

The fringe area is defined as the immediate surrounding up to 7 km. along the Protected Area (PA) border for the convenience of the Project. There is an unavoidable overlap about the impact range, which varies from below one km., to even above ten km. At certain strategic points along the fringe, natural land marks like rivers and hills separate habitation sites from the PA and at others it remains almost an geo-ecological continuum. The Fringe Area of the PTR is the 7 km. wide strip along the 210 km. periphery. Total Fringe Area Length on the Kerala side is 120 k.ms and in Tamil Nadu side it is 90 k.ms. Total Fringe Area in 2 k.ms. radius is approximately 285 sq.k.ms. According to the official records the PA accommodates about 2,25,000 people. The population density is approximately 750 per sq.km., which is almost the Kerala average.

Present study focuses more on tribal groups especially on Malapandaram, Malayaraya, and Ulladar. The fringe area population consists of a variety of stakeholders of whom the tribals constitute the primary group of displaced settlers. The rest of the settlers who are mainly on the sides of the rivers Pampa and Periyar include the Scheduled and other castes as well as the Christian community. They range from poor households of workforce and small-scale farmers to relatively well off agriculturists who can be categorised as secondary stakeholders. The private estates, the Tourism Department, Hindustan News Print Ltd. and some owners of restaurant constitute the next category of stakeholders. The Sabarimala Temple, which attracts lakhs of pilgrims annually to visit Lord Ayyappa during the specific season, is situated within the PA. The Temple authorities (The Travancore Devaswam Board) and the Ayyappa pilgrims are therefore stakeholders too.

Altogether there are seven tribal hamlets sparsely distributed on the PTR fringe on the Kerala and Tamil Nadu sides. They are Mannakkudi, Paliyakkudi, Muzhikkal, Attathodu, Kosadi, Vanchivayal and Paliyakkudi. Of these settlements, the last is on the Tamil Nadu side. There are five indigenous tribes in the area- the *Mannan*, *Paliya*, *Malayaraya*, *Malampandaram*, *Urali*, and the *Ullada*. The Mannans are primarily fisherfolk, dependent on the Periyar lake. To supplement this seasonal activity (fisherfolk), they collect minor forest produce, work in nearby estates for wages, and cultivate pepper in small patches. The Paliyan tribals work in forestry operations, sell honey and sell fuelwood once in a while to supplement their income. The Urali and Mala Arayan tribals are mostly farmers growing cash crops like rubber, coffee

and pepper. Malapandaram, mostly, depend on minor forest resources. "After the rehabilitation of the tribal communities and with the declaration of the PTR as a PA under the Project Tiger in 1978, the restrictions became severe". Finally in 1982 with the reservation of PTR as Core Area, all the traditional community rights/claims became nullified. The rules began to be strictly enforced since 1984. The common usage is limited to firewood and grass. The tribes generally use the available resources from the forests for their livelihood. The other migrants mainly depend on opportunities of wage labour and agriculture for their livelihood. The spatial and geographical difference reflects on the resource use pattern by the settlers. The various factors like, alternative source of income, job opportunities etc, influence the nature of dependency on forest resources. The next focus will be in the current profile of the settlement. It also includes the forest dependency of the settlers.

2.5 Households Characteristics and Material Conditions of the Sample Households.

This section explains the households' characteristics and material conditions of the sample households from the study area. Household heads were interviewed because their decisions were assumed to determine how local natural resources are used. But it is not applicable in the case of all social groups and class². In the case of Malapandaram among the Tribes, the entire family engages in collection of resources and other processes of forest-use. Among most of the migrants, Christian, Nair and Ezhava households notably, the head of the household decide the procurement of forest-resources. As elsewhere, the real assets (for example, land holdings) are traditionally vested in males. It may be the one of the reason for the land fragmentation in the low-income households in general and tribal community in particular. The household size influence demand³ for forest resources, method of collection of resources and number of the forest visit etc. Table 2.6 explains the household composition of the sample households.

² Social group implies the caste groups in the study area. Henceforth we will use social group to address the different castes.

³ The relationship between household's size and demand for forest resources are emphasised in various studies (for example Roba, 2000; Cavendish, 2000).

Table 2.6: Household composition from the sample households of the study area

	Social groups	Mean value of household size	% of male among the males in the sample	% of female among the females in the sample	% of male and female among the males and females of the sample
Scheduled Caste	TamilSambavar	4.23	7.97	5.77	7.14
	Sambavar	5.1	13.77	15.38	14.71
	Pulaya	5	1.45	1.92	1.68
	Others	4	1.45	0.96	1.26
Tribes	Malapandaram	4.5	12.32	14.42	13.45
	Ulladar	3.4	13.77	10.58	12.61
	Malaraya	3.8	6.52	9.62	7.98
	Koravar	4.42	12.32	13.46	13.03
Migrants	Christian	4	18.84	21.15	20.17
	Ezhava	3.5	2.17	3.85	2.94
	Nair	4.5	5.07	1.92	3.78
	Other migrants	3	0.72	1.92	1.26
Total			100	100	100

Source: Field Survey

Out of total sample population 56.4 % are male and 43.6 % female in the study area. The majority of the sample population is among the age group 35 to 60 years.

Average land-holdings lie between five cents to four acre. Land holdings are relatively more among internal migrants except scheduled castes. The empirical evidence shows that size of land holding is one of the important factors determining use of forest resources. The table 2.7 presents the summary measures of the land holding of the sample households.

The results indicate that the average land holding of the sample households is 122.65 cents. From the boxplot (figure 2.2), it is clear that the distribution of the land holding is a positively skewed one. Further from the summary measures also one can infer that the average holding of land by the sample households is greater than the median (100 cents) holdings. This indicates that distribution of land holdings across households in the area is distributed unequally (positively skewed). In other words, a few number of households in the sample owned the substantial area of land while most of the other households have very minimum or negligible area of land. The detailed analysis of land distribution can be seen from the table (Table 2.A.2) and Figure (figure 2.A.1) in the chapter appendix (Appendix 2.1)

Table 2.7: Summary measures of land holdings of the sample households

Mean	122.6531
Median	100.0000
Mode	100.00
Standard deviation	107.24
Minimum	5.00
Maximum	400.00

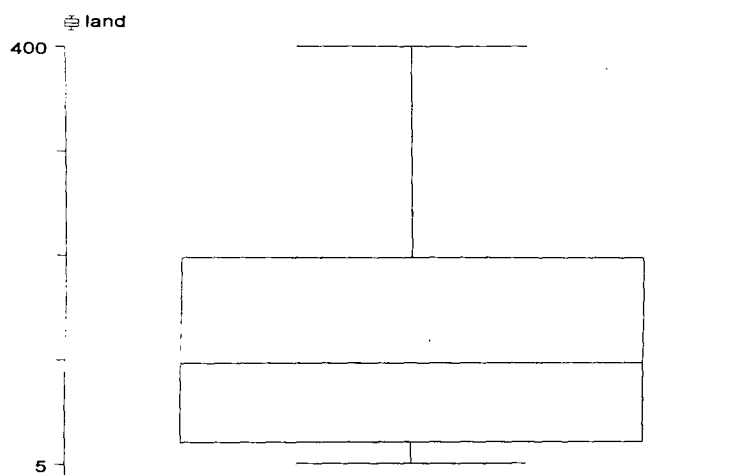


Figure: 2.1 Box plot of the land distribution of the sample household

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2.6 Physical Environment of the Sample Households

As mentioned earlier, the survey focused on poor income groups who relied or rely on forest resources. Here we consider the basic physical environment such as nature house, water and sanitation facilities etc.

The houses were built by government (panchayats), non-governmental organisations (NGOs) or by individual effort. Houses built by individual effort are generally with the use of forest products for roof and wall. Generally they takes eatta leaves for making walls. The Table below (Table 2.7) describes Government and NGOs efforts for constructing homes for fringe area people.

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Table 2.8: House given or built by different agencies

Social Groups	House Construction				Total Percent
	Govt.	NGO	Own	Rented	
Tamil Sambavar	14.3	0	0	85.7	100
Sambavar	11.1		88.9	0	100
Pulaya	20	19.58	48.1	12.32	100
Others	9.72	6.38	83.9	0	100
Malapandaram	29.54	39.06	31.4	0	100
Ulladar	10	26.3	63.7	0	100
Malayaraya	40	0	60	0	100
Koravar	33.3	16.7	50	0	100
Christian	9.1	9.1	78.19	3.61	100
Ezhava	29.3	9.63	51.71	9.36	100
Nair	13.3	7.25	76.36	3.09	100
Others migrants	18.25	32.49	37.9	11.36	100
All	23.8	8.5	59.2	8.5	100

Above Table shows the type of house of the local community in terms of different social groups. 23.4 % of the people live in the house, built by roof, thatched with leaf wall. Among Tamil Sambavar, most of them stay in rented house. Table 2.8 and 2.9 shows the nature of house and types of the floor.

Table 2.9: Type of house

The percentage of the type of house of the sample population by different social groups							
Different social groups	Roof thatched with leaf wall	Roof-thatched	Tiled	Tiled with furnished	Concrete	Rent	Total Percent
Tamil Sambavar	0	0	14.3	0	0	85.7	100
Sambavar	11.1	33.3	33.4	22.2		0	100
Pulaya	40	40	20	0	0	0	100
Others	0	50	50	0	0	0	100
Malapandaram	37.5	37.5	25	0	0	0	100
Ulladar	30.5	37.25	32.25	0	0	0	100
Malayaraya	0	8.2	58.2	18.8	14.8		100
Koravar	20	20	60	0	0	0	100
Christian		19.2	47.2	12.3	21.3	0	100
Ezhava	3.7	23.65	49.26	12.74	8.29	2.36	100
Nair	0	33.3	0	33.4	33.3	0	100
Others migrants	9.14	14.26	26.38	28.2	9.77	12.25	100
All	23.4	25.3	29.6	2.9	7.2	11.6	100

Source: Field Survey

Table 2.10: Flooring conditions.

<i>Different social groups</i>	<i>Type of floor</i>	
	Mud	Cement
Tamil Sambavar	42.9	57.1
Sambavar	88.9	11.1
Pulaya	60.0	40.0
Others	50.0	50.0
Malapandaram	75.0	25.0
Ulladar	60.0	40.0
Malayaraya	40.0	100.0
Koravar	80.0	20.0
Christian	45.5	54.5
Ezhava	50.0	50.0
Nair	33.3	66.7
Others migrants	50.0	50.0
All social groups	58.2	41.8

Source: Field Survey

The people in the fringe area are facing the problem of lack of drinking water availability. Most of the people rely on river and small streams for their water requirement. Most of the tribes in Attathodu, which is one of the hamlets in the field survey, depend on streams but in dry season they rely on Pamba River. As well known, the Pamba River is getting e polluted during this season because of the Sabarimala pilgrimage Season. The use of polluted water creates health problems in the local community. Some people own their own well, but it is very less in the case of tribal community⁴. Table 2.10 and 2.11 shows the different source of water availability and sanitation of the people in the study area.

Table 2.11: Water Facilities of the households

Social groups	Own well	Others well	Streams/River	Water authorities	Total Per cent
Tamil Sambavar	14.3	28.6	0	57.1	100
Sambavar	23.3	22.28	37.56	16.86	100
Pulaya	19.56	36.54	32.65	11.25	100
Others	22.36	15.23	35.36	27.05	100
Malapandaram	10	8.65	47.5	33.85	100
Ulladar	30	10	40	20	100
Malayaraya	76.96	6.3	12.35	4.39	100
Koravar	36.35	12	36.84	14.81	100
Christian	81.8	9.1	9.1	0	100
Ezhava	62.32	12.2	9.65	15.83	100
Nair	66.7	13.3	9.42	10.58	100
Others migrants	33.3	16.3	33.4	17	100

Source: Field Survey

⁴ Government and NGO's are providing financial assistance for water facilities (for example to well) to tribal community but they are not aware and users of these financial assistance. The other people, in the name of tribes, are using the financial assistance.

Table 2.12: Sanitation Facilities of the households

Social groups	Latrine with flush	Latrine without flush	Common facilities	No Common facilities	Total Per cent
Tamil Sambavar	0	57.1	14.3	28.6	100
Sambavar	0	33.3	22.2	44.5	100
Pulaya	0	19.96	20.33	59.71	100
Others	0	12.35	39.36	48.29	100
Malapandaram	0	13.68	32.96	53.36	100
Ulladar	0	14.32	48.69	36.99	100
Malayaraya	0	57.1	14.3	28.6	100
Koravar	0	20.65	38.96	40.39	100
Christian	28.95	53.25	9.1	8.7	100
Ezhava	14.34	35.1	40.21	10.35	100
Nair	30.35	33.33	36.32	0	100
Others migrants	12.32	35.12	48.2	4.36	100
All	7.16	32.11	30.41	30.32	100

Source: Field Survey

Most of the people use firewood as fuel energy for cooking. Out of total sample population, 61.4 per cent of households use firewood only and the remaining households use firewood and kerosene for cooking purposes. Among other households, 3 per cent and 8 per cent of the households use gas and electricity as energy for cooking.

2.7 Ecological Disturbances and Existing Scenario

As in the other protected areas and reserve forests, PTR is also exposed to certain disturbances. Some of them have been already described in earlier reports, for example Reconnaissance Report (1979)⁵. Some of the disturbances are mentioned below.

Fire: Activities of the people, both inadvertently and deliberately, are the major causes of the fire. The fire sometimes might be to clear footpath for outsider's entry to extract timber and other commercially valuable minor forest products (MFP).

Fishing: Some of the tribals and villagers are doing fishing for commercial purposes. Fishing by outsiders consider illicit is also a regular feature in the area.

Poaching: It affects the population of Bull, Elephant, Guar, Sambar, Languor, Liontailed macaque, Giant Squirrel etc. Outside villagers are supposed to perform these operations which are considered as illegal.

⁵ See Thekkady Development Authority (1975) and V S Vijayan, M Balakrishnan, P S Easa. (1979). Periyar Tiger Reserve: A Reconnaissance Report, KFRI. Thekkady

Private land holdings: There are 27 privately owned cardamom estates, scattered along the north-eastern boundary. Estates and other private holdings in and around the Reserve are considered to provide opportunities for poachers and other miscreants who pretend as estate workers⁶.

Eucalyptus plantation: it adversely affects the grass land ecosystem.

Collection of Minor Forest Products: Regularly people take more than 10 items from the reserve. The people are, both illegally and legally, collecting forest products both from the Tamil Nadu side as well as from Kerala.

Collection of firewood: firewood is collected in large quantities from the reserve. The excessive collection of firewood is for both household purpose and the commercial purposes.

Pilgrimage and Tourism: The area covers a tourist spot and a pilgrim Centre. The notable Thekkady wild life sanctuary and the Sabarimala temple are situated in the Fringe area of Periyar Tiger Reserve.

The forest products like firewood have high demand in the peak seasons of pilgrimage and tourism along with other minor forest products.

The environmental regulation in PA adversely affects the social and economic well being of the poor. There is a change in the resource use pattern, on the basis of the socio economic status, available alternatives etc. for livelihood of the people. The environmental entitlements approach emphasises the alternative policies rather than on enforcing the restrictions on poor. Empirical analysis also tries to look whether the improvement in the socio economic status of these people would help to reduce pressure on protected areas by providing them with sufficient alternatives for income and quality of life. At the same time, the establishment of protected areas has often involved conflicts with local residents living within and adjacent to these areas. For example, traditional societies have suffered land losses with subsequent loss of cultural identity. Thus, the expansion of protected areas has often taken place at considerable social costs to local communities in terms of access to land, wildlife, and other resources (Gadgil and Guha, 1993).

Designation of the protected areas has been useful for the promotion of the Eco tourism in the country (Perrings, 2000). Some of the earlier studies, which tried to value biodiversity, used the

⁶ Reconnaissance Report, 979.PP 86.

estimate of the "willingness of eco-tourists to pay" to visit protected areas (Tobias and Mendelsohn, 1991; Munasinghe, 1993; Kramer et al., 1994). It showed the potential of the ecotourism and protected area and other possibilities. Developments in eco-tourism promotion capitalise on the existence of the wild life Sanctuary and biodiversity in the area. Local communities have generally benefited from tourism directed towards adjacent protected areas. They provide accommodations and other facilities. It includes selling handicrafts, functioning hotels, and small business shops, stationary shops and *viri* system⁷. The employment and income during tourism and pilgrimage motivates and strengthens local residents struggling against environmental threats from external agents. Lindberg and Enry' Quez (1994) study based on Belize's protected areas pointed that besides local inflation effects created by the tourism derived from competitive demand for local resources (rising prices for labour, food, land), impacts are generally positive, including a gradually more equitable distribution of tourist income among village households.

2.8. Conclusion

In this chapter, we tried to explain the methodological differences of the ecological economics from the other disciplines and how to empirically situate the research issues in an eco sensitive region like forest fringes. As a new methodology, ecological economics provides new way of thinking about the linkages between ecological and economic systems. The issues involve values and ideology rather than the application of valuation or extend-of-degradation techniques. The study mainly focused on fringe area of PTR and fringes of other nearest forest reserves of central Kerala. The settlers include migrants and tribes. The people living in fringe area are with high density of population. The material conditions of the households explain that most of the people live in a poor condition / low standard of living. Minor per cent of the community lives in a relatively high standard of living. The present environment and development context is discussed more in terms of environmental regulation, restriction and conservation practices of natural resources. The theoretical debate, such as whether economic growth, or reduction of poverty, is important and how environmental regulation could contribute to such an end will be discussed in addressing the poverty-environmental linkages in the following chapters. We have to look at the resource use pattern in different time periods to understand the poverty-environmental linkages. The analysis of nature of extraction, uses,

⁷ Temporary arrangements by the native residents in their own house or nearby without much investment.

influential factors affecting dependency etc have to be further done historically. The following chapter deals with these issues in detailed manner.

Appendix 2.1.

Table 2.A.1: Eco system services and functions

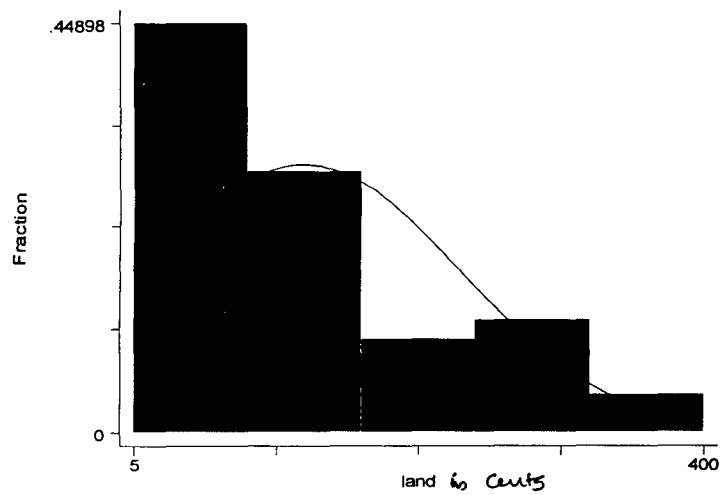
<i>Eco system service</i>	<i>Eco system functions</i>	<i>Examples</i>
Gas regulation	Regulation of atmospheric chemical composition	CO ₂ /O ₃ for UVB protection and, SO _x , levels
Climate regulation	Regulation of Global temperature	Green house gas regulation, DMS production affecting cloud formation.
Disturbance regulation	Capacities, damping, and integrity of Eco system response to environmental fluctuations	Storm protection; flood control, drought recovery and other aspects of habitat response to environmental variability mainly controlled by vegetation structure.
Water regulation	Regulation of hydrological flows	Provisioning of water for agricultural (eg. irrigation) or industrial (eg. milling) processes or transportation
Water supply	Storage and retention of water	Provisioning of water by watersheds, reservoirs, and aquifers
Erosion control and sediment retention	Retention of soil within an Eco system	Prevention of loss of soil by wind, run-off, or other removal processes, storage of silt in lakes and wetlands
Soil formation	Soil formation processes	Weathering of rock the accumulation of organic material
Nutrient cycling	Storage, internal cycling, processing and acquisition of nutrients	Nitrogen fixation, N, P, and other elemental or nutrient cycles.
Waste treatment	Recovery of mobile nutrients and removal or breakdown of excess or xenic nutrients and compounds	Waste treatment, pollution control, de-toxification
Pollination	Movement of floral gametes.	Provisioning of pollinators for the reproduction of plant populations
Biological control	Tropic-dynamic regulations of populations	Keystone predator control of prey species, reduction of herbivory by top predators
Refugia	Habitat for resident and transient populations	Nurseries, habitat for migratory species, regional habitats for locally harvested species, or over wintering grounds
Food production	That portion of gross primary production extractable as food	Production of fish, game crops nuts fruits b hunting gathering subsistence farming or fishing
Raw materials	That portion of gross primary production extractable as raw materials	The production of lumber, fuels, or fodder.
Genetic resources	Sources of unique biological materials and products	Medicine, products for materials science, genes for resistance to plant pathogens and crop pests , ornamental species (pets and horticultural varieties of plans)
Recreation	Providing opportunities for recreational activities	Eco tourism, sport fishing, and other outdoor recreational activities.
Cultural	Providing opportunities for non commercial uses	Aesthetics, artistic, educational, spiritual and/or scientific values of ecosystems.

Source: Costanza R et al. (1997).

Table 2.A.2 Distribution of land holdings of the sample households

Land holdings (in cents)	Percentage of the households	Cumulative Percent
5.00	2.0	2.0
7.00	4.1	6.1
10.00	4.1	10.2
12.00	2.0	12.2
15.00	4.1	16.3
20.00	6.1	22.4
25.00	4.1	26.5
30.00	2.0	28.6
50.00	4.1	32.7
60.00	2.0	34.7
70.00	2.0	36.7
74.00	2.0	38.8
75.00	2.0	40.8
80.00	4.1	44.9
100.00	16.3	61.2
150.00	12.2	73.5
200.00	10.2	83.7
250.00	2.0	85.7
300.00	10.2	95.9
400.00	4.1	100.0
Total	100.0	

Figure 2.A.1: Distribution of land holdings across of the sample households



Chapter III

PROBLEMATISING THE POVERTY- ENVIRONMENTAL LINKAGES

3.1 Introduction

As well known, the multidimensional issues of poverty and environmental linkages cannot be situated in a simple context-free generalisation. The interactions between people and forests if placed in a historical perspective, would enable to contextualise the linkage. As we discussed in the previous chapter, the people in the study area include migrants and tribes. Historically they relied on forest resources for their livelihood and subsistence. The local communities considered the forest resources as common property resources for their livelihood and other alternatives. Most of the theoretical discussions about the biodiversity loss or forest depletion are related to resource use pattern of local community. The micro level understanding of the different factors and specificity of the resource use would enable us to understand some dimensions of the poverty and environmental linkages.

The activities engaged in by the poor user groups are likely to be simple, labour intensive, and household-based processes such as mat making. Production based on forest products (for example, basket making from eatta, bamboo etc.) and marketing of forest products are important sources of income for the landless as well as those with access to the land. Ease of physical access and problem of proximity to widely dispersed rural markets enable very large numbers of people to generate some income from forest products (Arnold and Bird, 1999). Income from forest products may, for example, finance the purchase of seeds for the new crop season, or hire labour for cultivation, or generate working capital for trading activities (Leach and Fairhead, 1994). The changes in the resource use pattern further affect the current resource pattern.

This chapter is arranged in two sections. Section one deals with the different phases of migration and resource-use pattern, changes in the cropping pattern of the migrants in the forest and its impacts on forest eco system. Section II deals with the current resource use pattern, relationship between poor groups and forest resources, share of income from different kinds of forest dependence and the processes through which different dependence occur.

SECTION I

3.2 A Historical Reading of Resource Use Pattern: Inferences to Current Controversy

The changes in the agricultural practices of the migrants and settlers in the study area were accompanied by changes in forest resource-use and dependency on resources. This section, in problematising poverty and environmental linkages, would try understanding such changes from the earlier phase of migration.

The prevalent understanding portrays how different factors, for example migration, roads, nature of settlement, population pressure etc, influences the environmental depletion and conservation. The new way of looking at the deforestation is to find out the final cause of the issues. Bromely (1999) illustrates migration as the original cause but the government rules and institutional structures are equally significant as leading to the major reason--final cause (teleological explanation) of deforestation and conversion of forest land into cultivable land. Bromley exemplified the concept of deforestation as the intended permanence of a change in land-use from the growing of trees to some other purpose. " In that sense, deforestation is a land use issue more than it is a forestry issue--though the implication for the practice of forestry on the parcels under consideration is profound"(Bromley, 1999). The idea of final cause requires the establishment of a connection between events and the purpose or intent behind those events. Bromley quoted in Russell explains better the situation understanding as *" the 'final cause' of an occurrence is an event in the future for the sake of which the occurrence takes place... Things are explained by the purpose they serve. When we ask 'why?' concerning an event, we may mean either of two things. We may mean: 'What purpose did this event serve?' or we may mean: 'what earlier circumstances caused this event?' The answer to the former question is a teleological explanation or an explanation by final causes: the answer to the latter question is a mechanistic explanation"* (Russel, 1945: p.67).

The time frame of the changes in resource use in the study area is divided in terms of changes in agricultural practices from the early phase of migration. This may help to understand the current trend of resource pattern and controversy linked to that. In the analysis, major factors like dependency, accessibility, deforestation, legal rights, depletion, conservation practices and restriction to forest entry and its effects etc are also consequential. It may provide different dimensions to understand the poverty environmental linkages.

3.2.1 Early Phase of Migration (1948 - 60)

During the post world war II period which was considered as the famine period, people were encouraged by the Travancore Government to settle down on vast tracts of government land (forests) in different parts of Kerala. The village, which constitutes the study area, was part of such a region to cultivate more food as per the *Grow More Food* campaign. It was comprised of different groups of people and the beginning of the settlement goes back to late 1940s.

During the initial stage of migration, people followed shifting cultivation. The shifting cultivation is generally known as slash and burn, and, bush fallow agriculture (Husain, 1996). Shifting cultivation has been described with the main characteristics of rotation of field rather than rotation of crops, absence of drought animals and manicuring, use of human labour and employment of dibble stick or hoe and short period of occupancy altering with long fallow periods. The nature of cultivation itself caused the sustainability and resilience of the forest resources. "Tribal agriculture sows several crops of grain and one crop of forest in a clearing. In its traditional form shifting cultivation is based on a detailed, practical knowledge of the forest. Where the pressure of land has grown, the rotation cycle gets shorter, and a dependency arises to create fields by permanently clearing the forest. In other words, the causes of deforestation lie outside tribal society, in the pressure to generate an economic surplus from the forest that began, or was hugely intensified, during British Rule"(Felix Padel, 1999).

We find an influx of cultivators who cleared forest tracts and cultivated seasonal crops in the forestland since 1948. The crops included paddy, elephant yam, colecassia, cassava and different other tubers and roots. Immediately before that the Government had directed private campaign to fell trees for Government purposes and it was in such lands which were cleared that the new cultivation came up. Gradually the peasants made incursion into the forest and brought new patches of land under cultivation. During the early phase they concentrated more on shifting cultivation and seasonal crops mainly food items. During the same phase, the migrants used to have firearms and such weapons for protecting themselves from wild animals. They used to hunt wild animals for food and also hunted wild animals that destroyed the crops. While economic factors are obviously basic to migration the socio-cultural and political factor shaped the configuration of power in settlement. Socio cultural, political factors were structures that determined the agriculture land use and even cropping pattern as

per the social distance prevailing among the migrants. The seasonal crops like ginger, turmeric etc caused soil erosion. Adding green manure was another means by which forest products were used for the cultivation of this type of seasonal crops. The size of the landholding also influenced the productivity and profitability of the seasonal crops mentioned above. The fragmentation of land caused deforestation and changed the cropping pattern. The fall in the profits of the seasonal crops later forced them to start permanent cultivation with coffee, cocoa, arecanut, and after sometimes, the cultivation of sugar cane. They attempted to expand the areas under cultivation and moved up to the unsuitable higher slopes and destroyed the remnant fragile vegetation. The process of the conversion of the forest lands into agricultural lands started from the beginning of the cultivation of permanent crops (which were also cash crops).

3.2.2 The Period of Extensive Cultivation and Natural Resource Use (1960s-mid 70)

The phase of shifting cultivation and the multicrop cultivation experienced the introduction of paddy, arecanut and coconut. Gradually the peasants became disenchanted with their crops and shifted to rubber plantation in this region. The processes of changes from one crop to the other explain the implicit trend of the decline of the forested land. Productivity of the paddy depended on the fertility and the nature of land. Earlier they used to cultivate the slopes of the hill and riversides. Re-use was not possible, because of irrigation being a constraint. Most of the cultivation was based on monsoon, rains etc. Population pressure and low size of the landholding prevented them from cultivating paddy. This was one of the reasons for the introduction of sugar cane cultivation instead of paddy cultivation.

The process through which infrastructure created new space for shifting the existing economy is the next focus. The lack of transportation, market price and extension of market prevented them from cultivating certain crops that was non-economic and they were forced to shift to new ones. During this phase, there was a substantial development of infra structural facilities including markets, road construction, and bus services. Regular bus service connecting this region with Kottayam (nearest developed market) started in the late 1970s. Availability of market also affects the more effective extraction of the resources. More than 10 items were extracted as forest resources including bamboo (*eatta*). These were extracted irrespective of season. The intensive cultivation with more labour and capital, and, animal husbandry started in the last phase of this period. Almost every household had domestic animals and fodder was

either collected from the forest, or the cattle were let freely to graze in the forests. Women and children were the main resource collectors for the household purposes, and for up-keeping the livestock.

In the second phase of the settlement, coconut became a major crop of cultivation. The fertility of land and mixed cropping pattern increased the possibility of coconut cultivation. The depletion of the natural fertility of soil made coconut cultivation unattractive later. During the period of 1965-75 migrants turned to the cultivation of sugar cane. Sugar cane was continuously cultivated for 8-10 years in deforested land. The sugar cane was processed to make *jaggery*. The processing of *jaggery* required large quantities of firewood¹. Gradually, non-availability of firewood² led to the decline of the processing of *jaggery*. The gradual depletion of the natural nutrients of land led to the progressive deterioration of the return from the land that affected the cultivators of Paddy, Ginger, Turmeric, and commercial crops. The gradual loss of attractiveness of paddy, arecanut and coconut cultivation led to the large-scale cultivation of Rubber by small and middle peasants from 1975 onwards.

3.2.3 Mid 1970 to 1990: Intensive Cultivation and Settlements

From Mid 1970 onwards Rubber plantations began to make headway in this region. Rubber cultivation spread mainly because of the relative merit it had viz. the resistance to plant diseases and the possibility of cultivation of annual crops in the Rubber plantation during gestation period for at least 2-3 years. With the spread of the plantation crops people began to demand title deeds to their land, which was supported by most of the political parties and social organisations.

The plantation crops like Rubber will be cleared again and replanted once in every 30-32 years. It brings about substantial changes in the structure of the soil. The change becomes significant in long term perspective as the land became unsuitable for any other cultivation. The study about the nitrogen change due to the effects of continuous cultivation of Rubber pointed out that the major factor of depletion of soil nitrogen or deterioration of vegetation is the exceeded rate of inputs in the soil through fertilisers. (Suresh et. al, 1996).

¹ All cultivators were depended on firewood from forest for *jaggery*-making.

² In the later period the intensive use of firewood from forest was restricted by enforcement of law.

Mixed cropping pattern generated bio-diversity and the balance of Eco-system. With the introduction of Rubber cultivation mono-cropping came into being in a big way. The nature of rubber cultivation reduced the vegetative cover of the land. The other crops and plants have to be removed for the intensity of the rubber plantation and is advocated by the Rubber Board. The plantations in the deforested land mainly belong to rich peasants; poor peasants and adivasis continue to depend on extraction of forest resources.

3.2.4 The Period of 1990-1997: Resource-use before New Form of Constraints (Environmental Regulations)

Following the intensive and extensive use of forests, we find that government intervention for conservation coming up again in the form of environmental degradation. The changes in the consumption of forest resources, which led to such environmental degradation, can be located in the following reasons:

1. Sabarimala becoming a pilgrim site led to increased inflow of people leading to unsustainable use of resources and water pollution.
2. The construction of roads and buildings has brought in many problems to ecological balance of the region.
3. Though the intensive cultivation increased food grains, it led to environmental degradation, like soil erosion, loss of soil nutrients and ground water depletion. The shift in the pattern of agriculture from food production to cash crops has serious consequences for food security and self-reliance at the village level.

The process of deforestation is as old as migration itself. Irrespective of the socio-economic differentiation, most people in the area under study use forest resources only to supplement their income. The intervention of the outsiders (politicians and forest officers) with a view to regulate these people had its own consequences. These regulations pushed Adivasis and other poor user groups further to the marginalisation leading to new economic and social confinement. They feel themselves alienated from resources and their rights to claim. Their right to live beyond deprivation and within a milieu of socio-cultural freedom was thus jeopardised. The following table shows the different possible interpretation of the changes in the environment resources and depletion.

Table 3.1: Interpretation of changes in the forest land

Mechanical Explanation	Teleological Explanation	Effects
Migration	Government rules,	Deforestation
Cultivation practices	Land hunger, Use of land for govt. purpose	Decline of natural fertility and vegetation loss, conversion of forestland to cultivable land, soil erosion, structure etc.

Though in terms of physical accessibility, resources are nearby adivasis and other poor user groups, only others have access to it because of various reasons discussed above. Eradication of poverty by addressing the potentiality of the choice through alternative sources of income is attempted. But the question that remains unanswered is that poor are more vulnerable to environmental problems and that the environment is to be protected for their future even if their relationship with the environment is complex.

SECTION II

As we mentioned in the first section, in the period of migration almost all households used the forest resources irrespective of caste and class. Obviously, there is a change later in the dependencies on forest resources in terms of different social groups. Further, the demand and nature of extraction on forest items also changes between different time periods, as can be seen from the phases of migration. The following table shows the nature of dependency on forest products of different communities in two different time period.

Table 3.2. Use of forest products in a different time period

Dependency On Forest Products In Different Communities								
Forest products	Tribal communities				Migrants			
	Poor ^{2a}		Rich ^{2b}		Poor ^c		Rich ^d	
	1950s ^{1a}	2000 ^{1b}	1950s	2000	1950s	2000	1950s	2000
Use of products ³	High	High	High	Low	High	Low	Moderate	low
Share of income ⁴	100 %	80 %	100%	Nil	100%	>50%	50%	Nil
Markets(open and credit society) ⁵	Open	Society	Open	Society	Open	Open and society	Open	Society
Items ⁶	Available items	Available items	Available items	Mainly firewood	Available items	Available items	Available items	Firewood, grass
Causes of use Of resources	No alternatives <i>Kulathozhil</i> Vicious circle of Dependency		Finds alternative Income from different Sources Legal problems		No alternatives Shifting Cultivation, conversion of forest lands to agricultural land		Conversion of forest land in to agriculture land, alternative source of income	
Problems ⁷	Market failure, institutional structure and failure, internal migration, environmental regulation and government policies, timber business etc							

Source: Field Survey

Notes: 1a. Period used on the basis of migration/settlement pattern

1b. To understand the current scenario

2.a. poor groups: those who have no alternative income sources--100 %dependent on forest resources

2.b. relatively rich groups among tribes: especially Malayaraya who own relatively more land, and they have more access to other employment opportunity.

3. use of products in terms of level of dependency: high level or low etc

4. Share of income: share of income from the forest resource to the total households income

5. markets: open market, credit society organised for the forest product transaction and business.

6. Items: resources available from forest to derive income, and as a material to make other out put.

7. Some of the reasons and factors towards the use of forest resources

3.3 Dynamics of Alternatives and Accessibility: Poor-Rich Dichotomy

Who are the groups who continue to rely on forest resources from early migration period? The question reveals the complexity of the influential factors and resource use pattern of the local people. As mentioned earlier, all poor households do not necessarily come under the user groups. User groups further can be from different castes and tribes. Dependence on forest resources can be for livelihood. Dependence can also be for additional source of income, for example, firewood collection and for aiding forms of seasonal employment. Let us consider these factors for further analysis of the resource use pattern. The theoretical debate about the biodiversity loss in terms of resource use occurring because of poverty can be examined in terms of current resource use pattern of the user groups. Theorisation reflects the structural asymmetries between rural rich and poor in the human-natural relationships, as explained in the following table (Table 3.3)

Table 3. 3 : Structural Asymmetries between Rural Rich and Poor.

<i>Criterion</i>		<i>Poor</i>	<i>Rich</i>
Resources Endowments	Endowment with productive assets: land, capital, natural resources(production/quantity)	Low	High
	Ecological vulnerability	High	Low
	Changes in endowments with natural resources prior to degradation	Deprivation	Enrichment
Position in Markets	Access to credit, information and technology	Low	High
	Access to output markets (transport and information cost)	Low	High
	Monopolistic market structures (factor, goods, and credit, markets; interlinked markets)	Weak side	Strong side
Political economy variables	Capacity for collective action (transaction costs)	Low	High
	Influence on state action (policy design and implementation)	Low	High
	Insecurity of property rights	High	Low
Derived variables	Economic alternatives	Few	Many
	Dependence on local natural resources for survival	High	Low
	Ability to appropriate common property resources	Low	High
	Ability of protection against detrimental effects of environmental degradation	low	High

(Source: R N Chakraborty, 1999)

Alternatives and possibilities, both at the socio-economic and cultural level, are very limited to the poor, as evident from the above representation. The relatively rich have economic freedom to be benefited both by the move towards or against environment conservation in a specific time and cultural context. The poor on the other hand, are affected both by the steps towards conservation because of the restriction and also are affected because of degradation of forests. The rate of dependency on forest resources for the poor households is more than for the relatively rich households. Forest dependence among the poor households further contribute to a high share of their low income. An important finding of Cavendish's (2000) study is that poor households are much more dependent on environmental resources than richer households. While poorest quintile generate 40 per cent of their income from environmental resources, the figure for the richest quintile is 29 per cent. However, even though the poor are more resource dependent than the rich, in quantity terms they are not the main users of environmental resource than the rich. Data shows that the richest quintile consumes approximately 3-4 times the value and hence quantity of environmental resources compared to the poorest quintile. This suggests that comparative affluence rather than comparative poverty could be the main issue of concern. The study affirms the importance of maintaining the commons especially from the perspective of the welfare of poorer households.

The accessibility and use of the forest resources are related to cultural transition also (Gupta and Gupta, 1997). Of much greater importance is cultural change among the adivasis who had developed a tradition of constructive dependence on forests. Earlier they had built cultural and religious myths, rituals and social control mechanisms, which were geared to maintaining a balance between human and ecological needs. Through the use of social control mechanisms, protection of the entire Eco system was ensured, and, the cutting and distribution of forest produce needed for daily use regulated.

The focus could be on the nature of dependency and whether all form of dependency will lead to constant destruction of the natural resources. The process and mode of collection of the natural resources along with the threat of constant decline of natural resources will add on to the deprived condition of the poor.

3.4 Nature of Forest Resource Use: An Empirical Evidence

There is change in resource use pattern within the local communities. Tribes (Adivasis) rely on forest resources comparatively more than other social group. Within the tribal social groups, the nature and purpose of resource-use pattern is entirely different.

Historically, the tribes depended on forest resources some of them representing themselves as defenders of forest. They observed that their use methods and access to forest were not detrimental to the environment,

"Our ancestral work (kulathozhil) and our use or collection of resources will not lead to continuous degradation of forest...we are taking eatta and other resources like Flowers etc, and if we do not take the resources the longevity of the resources may be affected after some time..."

Thus, tribal cultures are based on a detailed knowledge of how to gather forest resources, hunt animals for food, and how to make things out of natural materials. The species of plants and animals that live in the forest are thus known in their own cycles of growth as well as their inter relationships, as a result of their keenest observation. Children in a tribal village grow up learning from adult's customs and through their contact in the fields and forest about a variety of plants and their use for treating different kinds of wounds and sickness. In the material culture of objects that they make themselves, the forest is a kind of store house: Forest does not fail to give food and water, even when drought afflicts the plains nearby, so long as one does not take more than one needs. For example, bamboo plays an important part in tribal culture, for making mats and baskets etc, and the different species of bamboo are harvested with maximum care taken to leave intact the shoots for the clumps to come up again. But, due to exploitation all over the forest now, people who are non-tribals rip out the bamboo to sell it, and they do not have the knowledge to understand the necessity of regenerating bamboo. The decline of the fauna in the deep forest started from the colonial period itself. The British rule encouraged hunting as adventure and it came to be accepted as a habit. They used tribes as a manoeuvre, and the implicit idea was knowledge about forest could be used from them. Tribes were used as guides in hunting to facilitate the adventurous spirits of the British man. The field experience shows that the practice of hunting and extraction of forest resources is dominated by outsiders. Outsiders made use of tribals for hunting and extraction of resources. Tribals may get money, cultural exposure, and influence of dominant languages.

Over a long history, tribes have experienced the outsiders as exploiters. In general they have learned the incorrigible attitude of outsiders who refuse to learn from them, are not open of hearing their views and perspective. Outsiders think that forest resources are free goods to tribals and the revenue that they accrue out of this is a kind of quick money. The general view of them from colonial times up to the present shows an incredible narrowness and uniformity, and bears hardly any relation to the reality (Felix, 1999). The assumptions are still that tribal cultures are backward and that knowledge about them consists of information collected and presented as detachedly and impersonally as possible. Adivasis are not so much in consensus with the reform policy that materialises dominant concern as a part of continuous and constant strategy³. Further, the social transformation of some tribal groups results in the new equation of the exploitation of tribes themselves. The extraction in terms of threatening the sustainability comes from the 'developed' tribal social group⁴. The understanding of the intra tribal relations and exploitations would enable us to understand the different dimensions of the resource use patterns, environmental regulations and its impacts on local community. Intra tribal exploitation is a very significant trend in the region. Mostly, relatively progressive tribal groups exploit the economic and social potentialities of their group.

Practices of lifestyle, physical environment and nature of dependency of different tribal communities in the study area are presented in the table 3.4, below. The table shows the average picture of the socio-economic profile of the three tribal groups, Ulladas, Malayaraya, and Malapandarams⁵.

³ As one respondent said "*most of the reform expect change in a short term period, reforms generally do not consider our deprived physical condition and well being*".

⁴ Malayarayan (one of the tribal group in the study area) are comparatively with a high standard of living. Other tribal groups use forests in a sustainable way. But Malayarayan community is not concerned about the sustainability of the resources as evident from the case of cardamom extraction to be discussed soon.

⁵ Some of the information are same as in the chapter 3.

Table 3.4 : Socio-economic and environmental profile of Tribal communities in the Study area.

Indicators		Tribal Communities				
		Different communities ^{1a}			All communities	
		Ulladas	Malayarayans	Malapanadarams	Poor ^{2a}	Rich ^{2b}
1.	Average Land size(in cents)	< 50	200-400	<50	<100	>100
2.	Land Fragmentation rate	High	Low	High	High	Low
3.	Reasons of fragmentation ^{5a}	<i>a.b.d</i>	<i>a.c</i>	<i>a.b.d</i>	<i>a.d</i>	<i>a.c.d</i>
4.	Type of house	Thached ^{6a}	Tiled	Leaf wall ^{6b}	Thatched	Tiled
5.	Sanitation and other basic facilities	Poor	Satisfactory	Poor	Satisfactory	Good
6.	Literacy rate (>15)	<50%	60%	10%	< 20%	>60%
7.	Health and education facility	Low	Average	Low	Low	Average
8.	Credit availability	Money lenders, <i>chitties</i>	Banks, <i>chitties</i> (credit practices)	Money lenders, co-operatives	Money lenders	Banks, co-operative societies, and from others
9.	Nature of job	Forest based, wage labours	Govt services, wage labours, and seasonal and forest based	Forest based	Wage labourers Seasonal works	Business, teachers, agriculture etc.
10.	Labour mobility	Limited	High	Limited	Limited	High
11.	Uses of products	Available items (for livelihood)	Firewood, resources for as additional source of income	Available items (for livelihood)	As a source of income	Firewood, grass, and other woods
12.	Debt trap	Always	Once in year	Always	Some times	Nil
13.	Nature of dependency	Always	Once in a year	Always	Necessary items	Once in a year and firewood
14.	Alternatives to forest products	Low	Relatively high	No	Low	High

Source: Field Survey.

Notes: 1. Communities explained in terms of the caste, community

2. The Rich and poor have identified in an operational approach. Based on some indicators, explains the relatively poor and rich communities.

5. major reasons are [*a*. debt trap; *b*- for health care ; *c*. partitions ; *d*. no specific reason , through the interaction with outsiders, encroachment by the outsiders

6. 6a- Roof Thatched; 6b-Roof Thatched with leaf wall.

The table (3.4) shows that the socio economic condition drive the tribes to rely on forest resources. As mentioned earlier, alternative use and economic and social capabilities are very

limited to poor households. This process leads to continuous reliance on forest resources. The forest dependence is also based on the extent to which forest items can be marketed. In the next section, we will discuss about the forest resources extracted by the user groups.

3.4.1 Forest Resources Extracted

Dependency on forest items is very restricted on specific Items. Different factors influence dependency. Marketability, restrictions on extraction etc are the some of the factors. These factors will be taken in a detailed way in the next chapter. Availability of forest items demanded by the user groups with its different use is summarized as follows.

1. Kunthirikkam : it is of two types: one is black and the other white, it is also known as *thelli* . This is a final product, which can be directly sold.
2. Eatta (Bamboo): used as raw materials for making baskets
3. Eatta leaf- used for roofing of houses
4. Flower- Two types of flower are extracted in different seasons--*chithira poovu and ponnum poovu*.
5. Ginger: Possible to sell it directly. The price is very less in credit society.
6. Turmeric: Two types available could be directly sold.
7. *Incha, other small minor forest products*: Some of these items they take only in the rainy season and only if other items are not available.
8. Cane: Considered as raw material for making baskets (*kotta*)
9. Firewood: Used for domestic consumption as well as for sale. In Sabarimala season firewood is most demanded.
10. Cardamom: possibility for direct sale.
11. Honey: obtained seasonally and sold.
12. Timber other than the firewood: People use this for construction of house, for agricultural implements and other minor household purposes.

Local communities use the reserve's resources for an array of purposes. They include economic goods, food items, firewood, grass and pasturing. Following table (Table 3.5) shows the forest products collected by households in each social group (categorizes in three different social groups).

Table 3.5 : Forest collection in each social group

		Local use of forest products by different social groups														
		Varieties of forest products ¹														
Social groups	@	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	TamilSambavar										√		√			
Sambavar	√									√		√				
Pulaya										√						√
Others										√						√
Malapandaram	√															√
Ulladr	√					√										√
Malaraya		√				√	√			√						
Koravar	√					√				√						√
Christian										√	√				√	√
Ezhava						√				√						√
Nair						√				√						
Other migrants						√				√	√		√	√		√

@ all available and marketable produce from forests.

¹— 1-Kunthirikam, 2-Honey,3-Turmeric,4-Ginger, 5-Incha, 6-Flower, 7-Cardomom

8- Food items, 9-Firewood and 10-Grass,11-Eatta, 12-Cane, 13-Bamboo, 14-Timber, 15-Eatta Leaves

Table 3.5 shows that there is a relation between belonging to a social group and collection of items. The major source of income for households include land, government jobs, forest products (it includes direct sale as well as sale of products for which forest produce become raw material), seasonal employment, wage, for example casual and agricultural, labour and business. Various source of household income are presented in the following table:

Table. 3.6 : Share of Total Income from Different Income Sources for all Major Social Groups (all figures in terms of per cent)

Social Groups		Income share from different source of income						
		Land	Coolie	Forest products	Livestock	Seasonal	Business	Total share
Scheduled Caste	TamilSambavar	0.00	0.00	91.07	0.00	0.00	8.93	100
	Sambavar	31.43	29.41	27.57	0.00	11.60	0.00	100
	Pulaya	15.80	53.7	23.25	0.00	27.20	0.00	100
	Others	11.11	20.25	48.89	0.00	19.75	0.00	100
Tribes	Malapandaram	8.75	13.44	77.81	0.00	0.00	0.00	100
	Ulladr	42.40	27.32	18.80	1.04	0.00	10.44	100
	Malaraya	37.19	11.26	10.23	0.00	41.32	0.00	100
	Koravar	16.74	53.04	0.00	1.69	28.53	0.00	100
Migrants	Christian	44.32	12.29	0.62	6.60	10.72	25.46	100
	Ezhava	11.22	76.41	13.26	0.00	0.00	21.11	100
	Nair	58.82	23.53	0.00	0.00	0.00	0.00	100
	Other migrants	20.03	18.25	07.03	1.82	24.72	28.18	100

Source: Field Survey

Tamil Sambavar, one of the social group belongs to the Scheduled caste) having 91.07 per cent income from forest products. As mentioned in the earlier table (table 3.5), it is clear that they takes mostly the *eatta*. They make different varieties of baskets from *eatta*.⁶ In Mala pandaram community 77.81 per cent of the share comes from forest products. They rely on forest for all available marketable resources. Christian community relying on forest products. But most of them use forest for firewood and grass. In the seasonal employment, period of Sabarimala season, they collect firewood, and bamboo for maintaining hotels. They benefited from forest from an indirect way.

3.4.2 Socio Economic Differentiation of Resources

A number of environmental resources are straightforward consumption goods, especially wild foods, wild medicines, and wild goods. Others form inputs to a wide range of consumer durables, include both households' and leisure goods. A range of resource can be used as production inputs, for example as fertilizer inputs in agriculture, firewood as general energy input, wood used to make agricultural implements and various grasses and reeds used to make basket. Finally very substantial number of these resources can be sold for cash. Table (3.7) shows the different type of resource, collection time, and their economic characteristics.

Table 3.7 Socio economic differentiation and environmental resource use

	Resources	Minimum days to collect	Consumption	Durable	Input	Asset formation	Sale
Food&minor uses	Honey	7	*				*
	Fish	1	*				*
	Wild animals	1	*				*
	Vegetables	1-2	*				
	Pulses	1-2	*				
	Mushrooms	1-2	*				*
	Multiple use of wood	Timber (commercial use)	2-3		*	*	*
Firewood(fuel cooking)		1	*		*		*
Construction of wood (huts, livestock pens, border making, for roof,)		1-2		*	*	*	*
Agriculture implements		1-2		*	*		*
Furniture		1-2		*		*	*
For resources collection		1			*		
Grass	Thatching grass, leaf	1-3		*	*		
	Woven goods		*	*	*		*
	Leaf litter(as fertilizer)	2-3			*		*

⁶ The nature of collection, impacts on environmental regulation on Tamil Sambavar etc. are discussing in the next chapter.

Minor Products	Cane	7			*	*	*
	Eatta	2	*	*	*		*
	Bamboo	2	*	*	*		*
	Flower	15					*
	Cardamom	15	*				*
	Turmeric	15					*
	Wild ginger	15					*
	Kunthirikkam	15					*
	Other MFP products	15					*

Source : Field Survey

Every household uses wood as a source of energy. Most trips to the forest were made for the collection of fuel wood. After the strict environmental regulation it is often assumed that provided the fuelwood is collected from fallen dry/dead wood, then firewood collection has no impact on forest ecosystem. Environmental resources are also key inputs into the major assets of housing and livestock. Most of the tribes and lower income group use bamboo leaf for making roof for their house. Wood is used as pillars for houses and in livestock sheds. These resources can be found in PTR and other nearest forests. Some of the goods and uses are river-related, like sand-grinding, fish, etc.

The issues underlying the resource-use pattern and forest dependency is whether these practices lead to biodiversity loss or not. The resource use practices are discussed in terms of theorisation of 'sustainability'. Sustainability becomes more meaningful in specific context and catering to specific interests. The next section will deal with conceptualisation of sustainability and its determinants on dependency and degradation.

3.5 Issue of Sustainability of Resource Use

The literature generally discusses sustainability of resource-use relating it to the concept of sustainable development. The concept of sustainable development could be possible only by taking into account the context, time, space and socio cultural differences. The validity of the concept of sustainable development is thus limited and therefore generalisation for all countries substantially affects the pattern of growth of a country and its development. The empirical operationalisation of sustainable development needs a separate analysis or a study in depth. An attempt is made here to situate the different dimensions of the concept of sustainable development and its linkages in the present analysis.

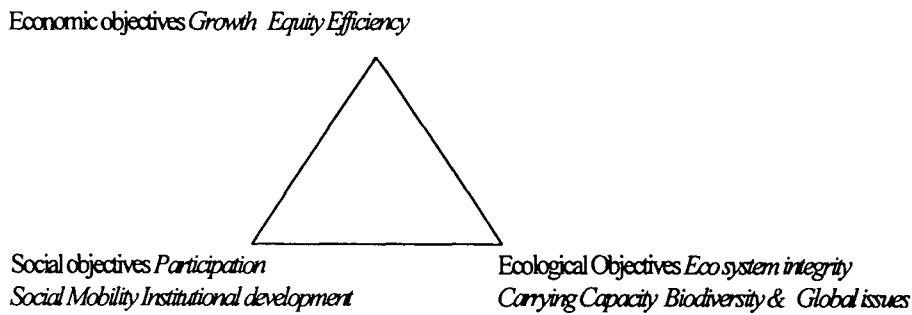
The standard definition of Sustainable Development given in the Brundtland Report (1987) is that sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs⁷. The Brundtland definition of sustainable development has been interpreted by economists as that requiring an economy's wealth not declining through time, i.e., that each year investment should exceed the consumption of all forms of capital (DFID, 2000). It is a process of increasing average material well-being and not irreversibly damaging the natural environment. The ultimate challenge for research on sustainable development is to integrate environmental, economical and social dimensions into a common socio-environmental system (de Graaf et al, 1996) that could be guided towards some kind of an equilibrium state, i.e. sustainability (Baular, 1998). The scope of bio-geophysical, economical and socio-cultural exchanges is stimulated to adopt a regional approach rather than a purely national one. The philosophy and concept of sustainable development is further based on social justice. It is the human right of individuals to achieve self-sufficiency in food and employment. The concept does not aim at maximizing production, but it has the goal of achieving proper distribution of production and consumption of food through proper management of all regional resources to attain self-sufficiency. The sustainability discussion can be traced back to basic resource management decisions of how to manage renewable resources such as forests, fisheries, or clean water for sustained yields. The carrying capacity⁸ and resilience are considered as indicators of sustainable development, which is one of the main contributions of Ecological Economics. Resilience determines the persistence of relationships within a system and is a measure of the ability of these systems to absorb changes and still persist.

The process of sustainable development could be conceptualized in a different theoretical and methodological perspective. The interrelationship between social, economic and ecological objectives in the attempt at sustainable development is given in the illustration below.

⁷ Report of the World Commission on Environment and Development (the Brundtland Report) 1987, p.8.

⁸ The notion of a carrying capacity is drawn from biology. It states that a given area can only support a given population of a particular species and at this upper limit- the carrying capacity- population will have reached its

Figure:3.1 : objectives of environmentally sustainable development



Source: (Serageldin and Steer, 1994; Desmond MCNeill, 2000).

The concept of sustainable development is a process that encompasses environmental, economical, social/cultural sustainability. An effective sustainable development process would help poor people pursue sustainable livelihoods. This would mean creating opportunities for the marginalised and vulnerable groups to participate in decision-making processes that affect their livelihoods and promote economic wellbeing of the poor and also sound environmental management.

3.5.1 *Sustainability: Degradation*

Sustainability of any economic system can only be observed in addressing the questions of sustainability of what, which culture, whose ecological system, whose bio-diversity?. Sustainability thus cannot mean an infinite life span or else nothing would be sustainable (Costanza and Patten, 1995). The knowledge of sustainability is that it can't mean maintenance forever. Sustaining life requires death. Further sustainability of the population and an individual is different. The life span of the ecosystem is longer than the individual species. Unlike the species as a whole, one subsystem is different in terms of life spans and time and space. The dilemma about sustainability and the rationality of depending on natural resources comes from the logic of life security of the human species. This could be seen from the use and sustainability of the bamboo (eatta) as reported in the field.

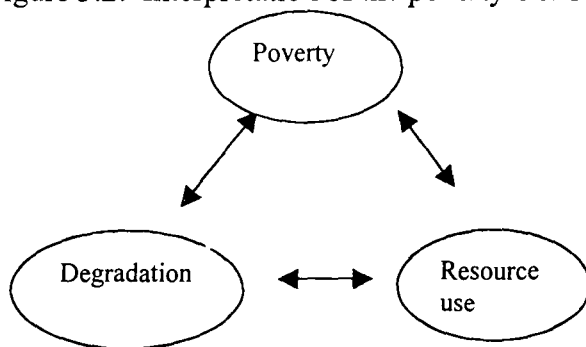
" if we cut the eatta, the next time it will grow abundantly. Otherwise, this would not happen. After its natural life span it gets destroyed"

maximum sustainable level. More usually within ecological economics, carrying capacity is defined in terms of exceeding limits- to be set by ecological criteria. (Atkinson, Dubourg, Hamilton, Pearce Young et al, 1997).

Absolute control over forest resource was obtained by the State with the claim of sustaining the forest resources. During the colonial rule and in the post colonial period, at least up to the late 1970, forests were viewed by the state primarily as a resource for commercial exploitation. Large tracts were cleared for timber, or cleared for agriculture (especially under colonial period) for tea and coffee plantations (Guha, 1983; Agarwal, 1997). Jodha (1986) showed a decline in village common by 26-63 per cent points across seven state during 1950-84. Population pressure apart, this is attributable mainly to state policy acting to benefit selected groups over others, including illegal encroachments by farmers made legal over time. The auctioning of pastures of village commons to private contractors for commercial exploitation and the distribution of common land to individuals under various land reform and anti poverty schemes whose stated intention was to benefit the poor, benefited in practice the well off farmers.

The empirical evidence shows that the tribal communities are living in a vicious circle of dependency on forest resources due to different reasons. The following figure 3.2 illustrates usual interpretation of poverty induced environmental degradation.

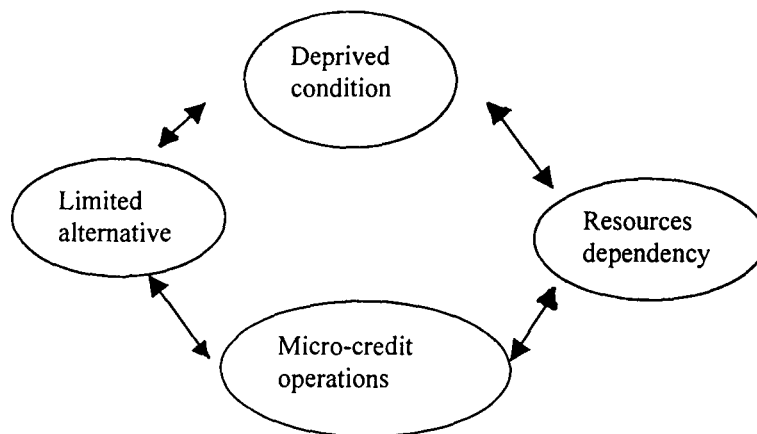
Figure 3.2: Interpretation of the poverty-environmental linkages



The general understanding of the poverty-environmental nexus is naïve. The difference between first cause and final cause discussed in the beginning of this chapter is missed in portraying such a nexus. The control over resource-use by non-poor and developmental projects and, degradation that ensued is missed in such an understanding.

The process by which the dependency is created becomes important here. The institutional structure and the way market allocates benefits differentially create constant and continuous dependency. The political and cultural domination of the communities (socially and economically well off) over the landless people create the feeling that dependency is an

immutable fact. The following diagram includes these additional dimensions of the process of the constant dependency from the deprived condition of households.



The extraction by the outsiders and the conflicts between local people and forest officers and between the outsiders and the local people are regularly reported. Further, outsiders (higher income households, private groups) use environment for short-term gain. In the long-term perspective, sustainability of the resources is affected. But poor people do not have the institutional mechanism and resources to use natural resources for short-term gain, even if they want to when affected by the worst conditions. Further, Tribes, for example, have the knowledge of taking into account regeneration of the resources in using resources--sustainability of the resources from their point of view.

A striking feature of deprived condition and environmental vulnerability of the area is its regional and caste wise variation. Variation becomes more complex when we consider it historically. During the early phase of migration almost all people depended on forest resources irrespective of caste, religion and region. The nature of collection was also different. The migrant Christian will go to forest and stay one or two weeks there and come back with raw materials to make *cotta* (baskets).

“Today it is not possible. Forest officials questioned it and we had to give tip”, “ The weeks that they spend in the forest was separately earmarked to cutting bamboo and also for small tree for hunting, by that time bamboo will be ready for processing and weaving baskets”.

The alternatives are very limited for poor people in the fringe area than rich. This is in addition to the social distances that the poor have to face in terms of caste. The alternatives

like other income source, work, job opportunities, market efficiency, more benefit through the price hike of the resources, etc are very rare possibilities to them.

The figure 3.1 describes the poor-rich user groups and forest resource interactions. As we mentioned in the earlier section poor user groups are dependent on forest resources for their livelihood. The theoretical discussion about how the resource use pattern leads to the bio diversity loss in a short-term period. Both groups rely on forest in a different purpose. In a short period the bio diversity loss occurs from richer user groups use pattern and from other development projects, or government initiated programmes. But in the short period the impacts will be more on poor groups.

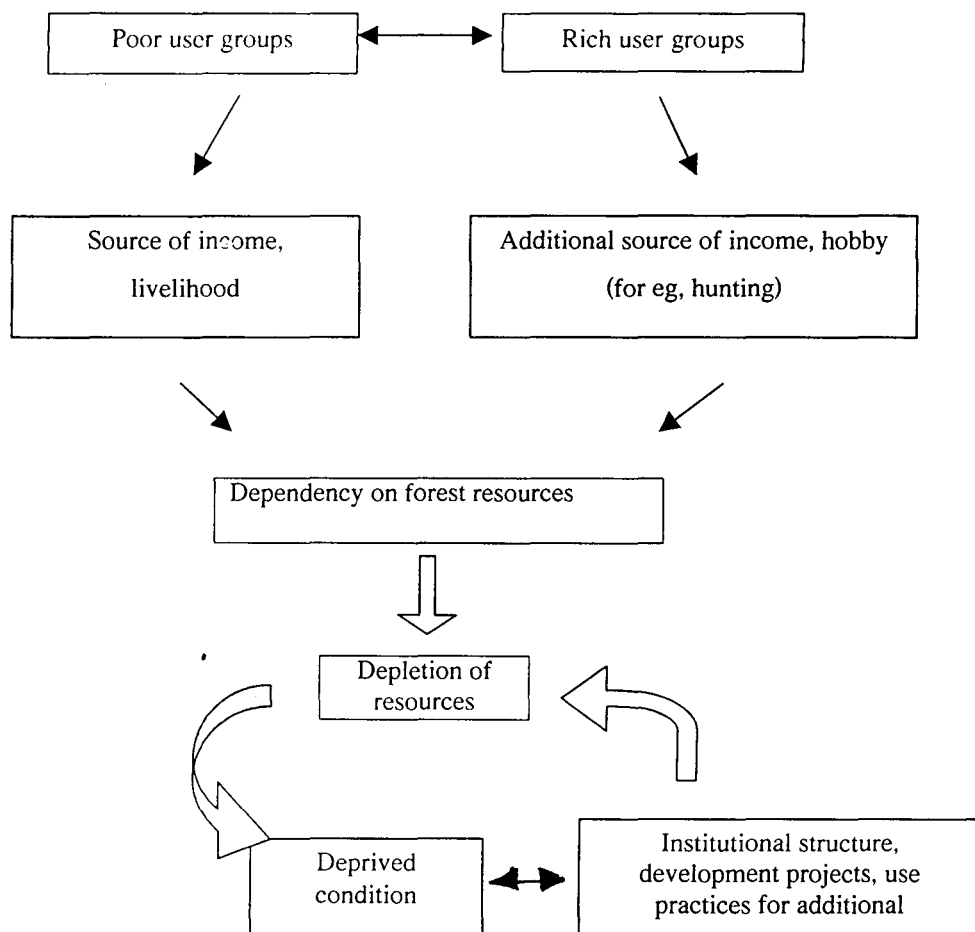


Figure 3.3 : User groups and forest resource interactions

3.6 Conclusion

This chapter discussed forest resource use pattern of the local community and its consequences on current controversy of sustainability and environmental depletion. Since the study area is migrated and settlement area, we analysed how the local people used the forest resources in terms of different phase of migration. The nature of extraction varied according to the cropping pattern. The availability of the forest resources are also influenced by the shift in the cultivation of crops. In the earlier phase of migration every household relied on forest resources in direct or indirect way. Most of the households used forest resources for their livelihood. Migration, population pressure etc, comes as an immediate cause of forest conversion to agricultural land. But Government policies and external factors become the major reason (teleological explanation) for the deforestation. There are structural asymmetries between poor and rich groups in terms of forest interactions. The alternatives like resource endowments, position in the market, political economy variables, other source of income etc are very limited to the poor user groups. Within the poor households there is variation in dependencies on forest resources according to different social groups. At present the user groups extracts more than 10 different varieties of resources from forests. The resources are also used for different economic characteristics like food items, inputs, direct to market etc. The intensity of dependency is high in poor user groups especially in tribal groups. In the poor households the greater part of the income share comes from the forest products. The resource use pattern and nature of extraction does not bring the bio diversity loss in the long run. There are different influential factors on dependency on forest. All influential factors are relevant on certain specific social groups. The next chapter starts with detailed discussion about the different influential factors on dependency.

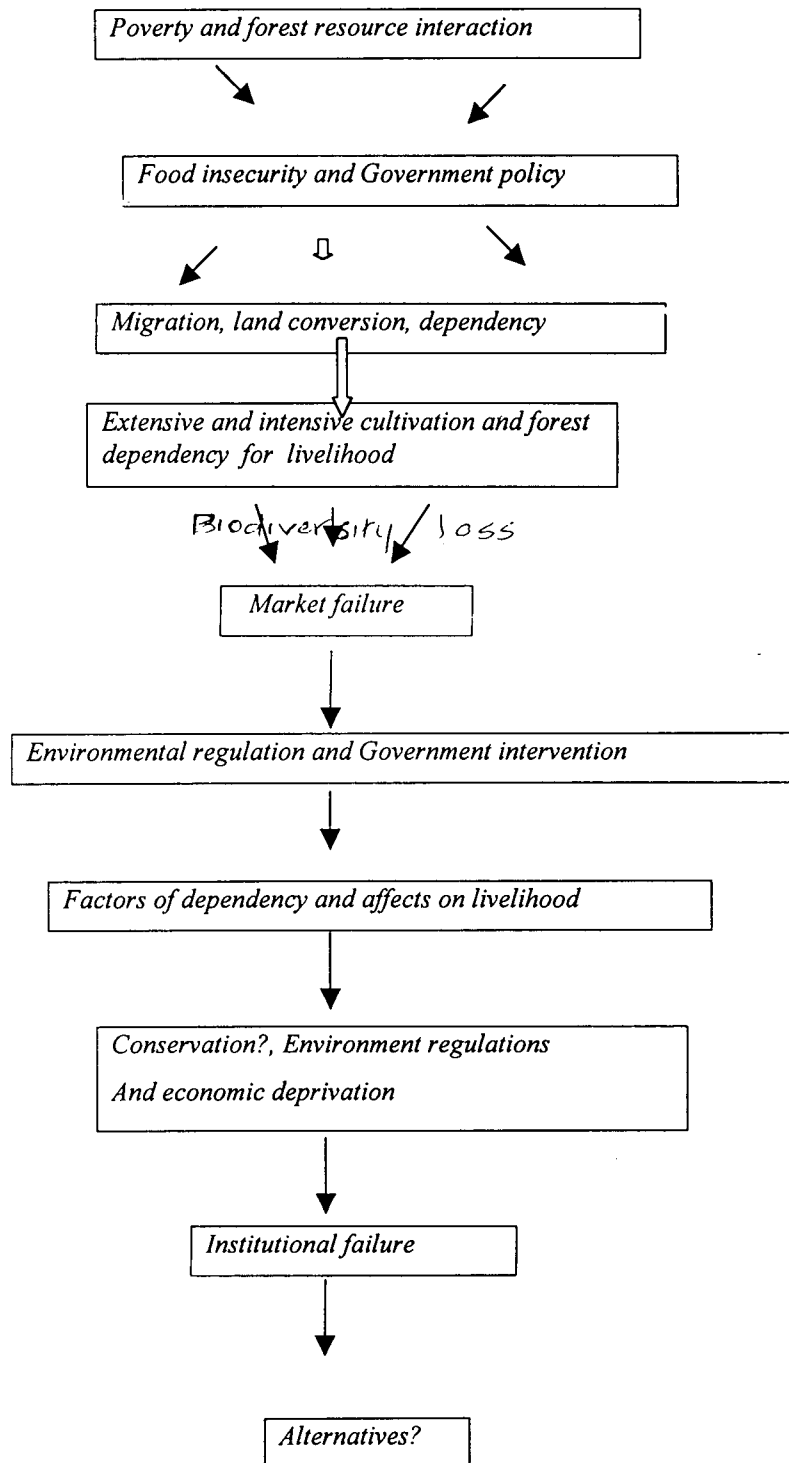
Chapter IV

ENVIRONMENTAL REGULATION AND FOREST RESOURCE USE PATTERN: CONTESTING THE CLAIMS

4.1 Introduction

This chapter examines as to how environmental regulations are shaped and as to what it implies for the conservation programme. Besides this, how control over forest resources was defined by environmental regulation and contested among different user-groups and at different levels would also be the focus. The chapter starts with the description of the different influential factors of resource use and change in the use pattern. The next section tries to situate the issues of change in the environment as a natural capital. It concerns the general view of environmental degradation: does change occurring result in biodiversity loss and change in the environmental entitlement? The concept of environmental entitlement considers how the accessibility and ability to use natural capital affects the poor user groups. This facilitates the different form of interaction between poverty and environmental degradation. Next part situates the possible reason for biodiversity loss and its impacts. The various possible causes of bio diversity loss lead to contemplate the question and appropriateness of environmental regulation and protection. The environment regulation is one among different forms of government intervention leading to different forms of institutional innovations. Institutional innovations such as EDC, entry fee, credit society etc considered as various form of regulation affects the conservation and livelihood of poor groups. Most of the innovations aim at short time period and implement universal generalisation. The next section analyses how the environmental regulation affects livelihood of user groups. This discussion can be contextualised with possible linkages between livelihood, vulnerability and possible alternatives of source of income. The environmental regulation and its impacts on accessibility and ability to use the resources etc, leads us to think about the basic phenomena of market and institutional failure (Government intervention and failure). The institutional innovation aims at solving the market failure. Problems are related to the available alternatives of the people in terms of source of income. The following figure (figure 4.1) describes the structure of the analysis of the previous chapters as well as this chapter.

Figure 4.1: Structure of the analysis



4.2 Factors Shaping Dependency on Forest Resources

From the early phase of migration to the contemporary use-pattern, the influential factor that determines land-use has changed. Here we try to identify some of the factors. These factors are inter-linked. The significance of some of the factors is that they affect social groups differentially. This will again depend on the specificity of the hamlet to which the social group belongs.

1. Historical Continuity

One of the reasons of forest-use of the user groups is the continuation of past practices.

"Historically we are born here, and we believe that the forest resources are for us, we have even spiritual relationship with nature, we can't accept the restrictions to enter the forest".

As we mentioned earlier, the people of the area are internal migrants and tribals who live in tribal settlements. Migration had started from the early forties. The nature of cultivation varied from time to time. There was a change in the nature of agriculture and crops cultivated. Initially there was slash and burn cultivation and later on perennial crops came to be cultivated. The process of continuous cultivation, discontinuous in the long-term perspective, had always affected the vegetation cover of the forest. Transformation of forest to agricultural land was the major feature of that time. Tribes also started to cultivate different forms of crops and ended up with plantation crops like rubber, coconut etc. Mainly rubber was cultivated in the deforested land. The trend towards the cultivation of plantation crops like rubber adversely affected the natural environment. The changing resource-use pattern affected the forest-use of some of the tribals. But they anyhow were fully dependent and like to depend on the forests for their sustenance.

"The people who live in the seashore have the right to catch fish; we are in the forest but we can't. The officers coming from the town do not know the forest and its products, they regulate us, and we cannot collect resources. We know how to take resources, without destroying them. All this may affect our children. They will not allow them to go out and take some other job. We can only store some honey, and meat, and use it later. But the controversy is that we will destroy the forest, how is it possible? "

The nature of extraction is an important factor determining the sustainability of the resources. The argument is that resource-use by the poor is more harmful to the environment, because

their time preference is less (social rate of discount). The empirical evidence indicates that they are aware of the sustainability question as discussed in the previous chapter. Further, their deprivation will prolong as long as the institutional structure of the society obstructs the change in their material well-being.

2. Domestic Use

Grass, leaves of bamboo (eatta), and other minor products are used for domestic purposes. Generally, livestock rearing is widespread in the households. To a certain extent, people collect fodder from their own land. Others collect grass and other fodder items from forests. The pastoral operations are more widespread in *Mukkempetty* and *Kalaketty*¹ than other areas. Most of them (those who rely on forest and MFP for livestock) are migrant Christians who come from a relatively higher income background. For the cultivation of seasonal crops like ginger and turmeric, they take minor resources from forests like green marine. The tribal households and lower income groups use the bamboo leaves for building roofs, which will stay intact for 2-3 years. Tribes also use bamboo and other small trees for constructing houses. They also use sticks and stumps of small plants for fencing their land.

3. Source of Income

In the early phase of migration, there existed complete dependence on forest-use. Forest resources used to be a predominant source of income for all households. The share of income from these resources is above 90% for the poor households even now. The possible conversion of forest lands into agricultural lands and, the different forest resources were the major inducement to the migrants. Our survey documented that among the tribes almost all of them, especially malapandaram, ulladar, and koravas, were dependent on forest resources as a major source of income. Resources were used as raw materials or sold directly as output in the market.

4. Pilgrimage and tourist season

The inflow of the increasing proportion of the pilgrims to the Sabarimala directly led to certain employment opportunities to the local people. About 60 per cent of the people of the Sabarimala region could supplement their income through different kind of seasonal roadside

¹ These are the two hamlets surveyed. The average households are relatively high-income groups. In Kalaketty most of the people belong to Malayaraya (Scheduled Tribe); they are engaged in agriculture, as wage-labour etc.

business along the pilgrimage route to Sabarimala. For these seasonal business most of them depend on the forest for firewood in addition to timber required for the construction of shops. Demand during the season is for leaves², firewood and timber. It is frequently reported that during the season, the dependency on forest will be high from local people and tourists, and, as a result various impact on environment affecting health of the local population for example, is observed.

5. Illegal operations

Forest resources are also appropriated through illegal operations. Hunting and logging could be classified as the main illegal operations carried out in the forests. Most of the illegal operations take place with the tacit understanding of some of the forest officers. This understanding between the forest officials and high-income groups make it easier to exploit the forest resources³. Further, the outsiders use tribes' knowledge of forest accessibility for the extraction of resources and may give some money and food in return. Historically, the tribes have a fairly better knowledge of the forest and its products, and, forest officers and others thus use them as guides.

6. Differential Accessibility

Over the years, there had developed a disparity in the access of people to the use of forest resources. During the early phase of migration all households had access to it. With the expansion of illegal operations others began to get more access to the forests than some of the tribes who were completely dependent on it. There are several factors that influence the accessibility to forests and its resources.

7. Unequal land distribution and fragmentation

Land distribution is skewed in this region. Deforestation was induced by the land hunger of the people. The teleological explanation may be that the government policies and social structure was responsible for deforestation. In the initial stages of migration, encroachment was possible; the wealthy and the powerful obtained more land. The land that the poor could obtain was thus affected. At present, the fragmentation rate of land among the user groups in

² As mentioned in the earlier section *eatta leaves* are used for roof of seasonal shops. Pilgrims use a kind of leaves for their religious practices. Small type of sticks, other products based on bamboo and cane will be most demanded in the peak season of pilgrimage.

³ Information collected from the discussion with villagers in the field area.

the fringe areas is high. Marriage practices, diseases, partition, debt trap are the major determinants, reported in the survey, leading to fragmentation of land. The introduction of the monetisation practices and poverty led the tribes to sell their land to the internal migrants to earn money. The transitions towards commercialisation of agriculture and the value of land or produce exchanged with a non-tribal buyer not being fixed as per the potential benefits acquired by the buyer, are the notable factors that affect the tribes' community. The landless in the tribal communities as well as migrants, especially the Dalits, also experienced similar problem.

8. *Kulathozhil as cultural practices*

" It is our family or community's work which we have to maintain and continue. If we get some work in agricultural field, we are not ready to go for that. We will get contentment only from this work. All family members get engaged in the making of baskets in different processes. It starts from collection/cutting of bamboo, drying and in making small pieces, and the final work of weaving the basket".

The Sambava Community (one among the Scheduled Caste in the fringe area) considered making baskets (*kotta*) as their ancestral and inherited craftsmanship. Above 70 per cent of such households reported that they are interested in continuing this work. This approach persists even among the younger generation. The limited job opportunities and the cultural capabilities constrain their experiences and practices.

9. *Limited Alternatives*

"We do not know any other vocation (for example, agricultural operations). Some times we will get some works in the forest department like replantation etc. If we cultivate some thing here the marketing facility is limited. Lack of adequate transportation prevents us from going outside in search of work. Forest Produce collection often co-exists with the availability of agricultural employment, which is hard to perform simultaneously. Time and season are important factors that determine the collection of forest resources. We cannot go for it any time".

Historically, dependency has varied from time to time and there is a declining trend among the high-income group. The alternatives available decided this trend. This is part of the process of the material development of the dominant groups. The low-income groups irrespective of

the community they belong to depended on the forest from the early migration period onwards. The low returns of the alternative they have to take marginalise them in the process of development. These factors adversely affect the tribes, which include *Malapandaram*, *Ulladar*, and *Koravar*. This is also true of developmental process of a macro-region.

10. Social Capital and Capabilities

The social distance sustained by the power structure of the society affects the poor user groups' opportunities and freedom even though some of them already have attained economic mobility and freedom. The inadequacy of equal opportunities and the many impediments that they face, led them especially dalit and tribal groups like *Malapanadaram*, *Ulladar*, *Koravar*, to depend on the natural environment even for their economic mobility. This interaction with nature due to necessity may not lead to a casual relationship--utilisation leading to ambient environment depletion.

One important conclusion that can be arrived at from the discussion of the influential factors is that the question of sustainability of resource-use can be addressed only by taking into consideration the differential accessibility and specific ways in which it manifests in a particular area in a given period. The next section would try to address the intervention of Government in trying to reduce the dependence on resource of the user groups.

4.2.1 Towards Reduction of the Uses: Low Rate of Dependency

There are different factors involved in the reduction of the use in forest resources. Let us categorise these factors into five. We will now discuss these factors and its impacts on the changes in the use of forest resources.

I. Available alternatives to livelihood: As mentioned in the earlier section, the alternatives to different sources of income are a determinant factor in the forest dependency. Important factors include other source of income, land holdings etc.

Source of Income : Historically households used to extract forest resources mainly for income. The cultivation led to large-scale deforestation in the area. Plantation crops were mainly cultivated in the deforested land. The rate of dependency always depends on the contemporary use practices. The households that have more land, take on other jobs, including government service, and also use forest resources, but not as a source of income. If

the households do not have any other source of income, however, they sustain with the forest resources as their only source of income.

Job Opportunities : For the user groups who are completely dependent on forest resources, the availability of job opportunities, which include casual labour, reduces the dependence and therefore extraction of forest products.

2. Price Fluctuations on Forest Resources

Fluctuations in prices of forest resources are factors indirectly contributing to the low rate of dependency. The price of the forest products is varying from time to time. Fluctuation of the price affects their profit from the forest products. This affects their constant extraction of resources practices.

3. Changes in the agricultural practices

Changing Nature of Cultivation : As mentioned in the earlier section, the migrants and tribes followed diverse cropping pattern. For example, from shifting cultivation, paddy cultivation, cash crops to plantation crops. The demand for the forest land and forest products for agricultural practices also changed accordingly.

4. Risk and availability

risk and Availability: The general understanding about forest dwellers could be summarised as below:

"They gets every thing free from the forest, they do not work hard. What ever they get from the forest is a gain for them.

But the user groups experience seem different:

Going for resources is very risky, and some days we would not get any thing before the expiry of the pass (15 days) we have to come back, otherwise forest officials will give punishment because they suspect us as doing illegal operations. Identity of being tribes wouldn't help them to prove that they are dwellers."

When millions of people are heavily dependent on biomass sources for their daily existence, the destruction of the environment or any policy that reduces access to biomass resources-like the creation of a wildlife sanctuary or enforcement of forest conservation legislation will have an extremely adverse impact on the daily lives of the people (Agarwal, 1999).

“There is no guarantee to get resource at all times. Sometimes, others might have already extracted. This usually happens, as in the case of ‘kunthirikkam’, forest produce. Disturbances of wild animals, climatic problems etc., may also affect our resource collection. Even if we could not get any thing from forest, we have to repay the money to the credit society. We have enough experience of coming back from forest with free hand. The entry pass further would not be valid for another time”.

In spite of risk in availability, the user groups, especially the poor among them continue to make efforts though increasingly resulting in low dependency.

5. Environmental regulations

Another important factor affecting extraction of forest resources is environmental regulation. Almost all user groups reported that restriction on the forest entry and regulation affects their resource use pattern and dependence on forest products. So there is a necessity to analyse this factor in details. The next section focuses on this factor and its related aspects.

4.3 Environmental Regulations

. Environmental regulation affects them in terms of different institutional innovations like Eco-development Committee, Entry pass, control on certain forest items, changes in the market etc. The next section analyses influential factors and institutional innovations of the environmental regulations on user groups.

4.3.1 Institutional Innovations in Environmental Regulation

Most of the environmental regulation is related to government intervention, policy implementation and conservation of natural resources. The process of implementation, initiated to sustain natural resources, curtail the reliance of the poor on forest resources. There is evidence that the protection and environmental regulation reduces the use and dependency on forest resources by user (high as well as poor income) groups. Thus environmental regulation is linked with environmental entitlement, accessibility, and vulnerability of poor groups. This section tries to explain the institutional innovations that the Government has adopted to control/reduce intervention in the forest by the user groups. The issues of environmental regulation can be conceptualised along with market failure, government

intervention and institutional failure. When we consider environmental regulation and policies as a political or social factor, then how do we perceive the issues related to the livelihood of the poor? The intention of the analysis is to elucidate that the experience of the poor user groups and their concerns cannot be ascertained from the cost-benefit analysis of the State/World Bank or Forest Department. Thus, 'cost and benefit' estimation in not taking into account the perspective of different social groups reflects the limitation of innovations and thereby government failure. Government and other institutional interventions consist of many different aspects. One of the aspects is related to the question of how we conceive government intervention and other institutional innovations as a failure--in terms of conservation or from the livelihood perspective. This section presents an analysis of institutional innovations such as Eco Development Committee (EDC), entry pass, and credit society, NGOs etc. to understand the practices of government intervention to solve the problem of market failure and to assure forest conservation.

4.3.2 Functions of Eco Development Committee

Current approaches to bio-diversity conservation have been shaped by discourses on sustainable development and participatory development over recent decades (Wright, 1994). ICDPC (Integrated Conservation and Development Projects Committee) is one outcome of the international quest for appropriate conservation models in this vein. The Periyar Tiger Reserve is one of the seven protected areas in India chosen for the pilot phase of the Eco-Development Project. The project in Periyar will target about 169,694 out of the 225,000 residents in 2 km of the Reserve boundary (Anon, 1996). The requirement of the selection of Eco-Development in PTR is questioned by the Chief Wild-Life Preservation Officer, as the report prepared by the World Bank says that while very few humans reside in the area, the critical environmental issues for reserve authorities concern the impacts of a large number of visitors and of commercial forestry within the reserve (Anon, 1995). This indicates that the reserve is not under pressure from the population on periphery. The question that arises then is how does the eco-development project, tailored to reduce people's dependence on the forest, help in conserving PTR.

Major objectives of the Eco Development Project:

1. Improved Protected Area management through capacity building and local participation

2. Village Eco-development to simultaneously reduce negative impacts of local people on PA's (Protected Areas) and of PA's on local people; and
3. Developing more support for Protected Area management and Eco-Development through environmental awareness and research activities.

By studying historical and contemporary documentation, a picture can be compiled of people in their landscape, and mutual influences between people and place, referred to by cultural geographers as the cultural landscape (Anderson and Gale, 1992). This historical cultural landscape context helps to understand the starting passage of project intervention like Eco Development Project. The project does not commence on a clean state, but encounters the struggle between actors for control over resources and to promote their perspective on the relationship between people and landscape (Mahanti, 2000).

The main function of the EDC is to conserve forest resources. Conservation practices are implemented with the help of local people. Local groups include user groups and others. Programmes are undertaken for creating awareness and imparting training. Conservation of forest by local people can happen if they use resources in a sustainable manner and at the same time prevent outsiders from intervening. Initiatives taken to prevent fire, hunting, timber extraction etc could be made more easier and manageable with people's participation. EDC gives money to the members⁴ through the EDC committees, to find out substitute practices instead of reliance on forest resources. In the first year Rs.100/- is granted then Rs.3000/- and Rs.5000/- in the fifth year for each households. The underlying assumption is that this money would be utilised by the user groups as investments that would yield a new source of income and thereby would be feasible alternatives to forest dependence. The understanding of the user group on the monetary transactions is needed. In most of the EDC committee and meetings the poor user groups does not have a major role. The forest officials and Secretary of EDC carry out the role of decision making and implementation. Thus, the people's participation in decision making is limited. The restrictions and discovery of alternatives should have a long term perspective. The enforcement of law in the short-term period adversely affects the poor user groups. The environmental protectors and activists are proud that they could collect a number of unlicensed pistols from the locals. They consider this as one of the practices

⁴ EDC is constituted with the local people as members to form local level committee/groups. Those who own land or are permanent settlers can be members of EDC group.

necessary for conservation. As the role of forest officials becomes more powerful, they find it easy to use their power on the powerless users groups. There are a lot of loopholes in the law related to the extraction /conservation of forest resources. A number of households reported that the high-income groups might not follow the restrictions. Providing seasonal employment is one of the important economic functions of the EDC, which gains prominence during the pilgrim season of Sabarimala. They provide initial investment for starting businesses like opening of teashops, stationary stores, cool bar etc. Money is provided for a group of people, who come in the guise of natives to start businesses. The evaluation and reports⁵ mention that the participation in the seasonal employment is more efficient. Efficiency is evaluated in terms of price, quality, and management. But can the efficiency in the seasonal employment be generalised to imply overall efficiency of the EDC? The participation of the lower social groups in the seasonal employment was relatively low. The place suggested for business was not convenient for native poor social groups. EDC's and the Forest Officials' perception and strategy towards poor social groups were more or less same.

EDC provides financial support to local people for finding out alternative source of income other than forest-based. They give money to all local people who are staying in the forest fringe irrespective of users, non-users etc. They give money through different instalments. As discussed, the general scheme of instalments is Rs.1000, Rs.3000 and Rs.5000 in a time span of 5 years. Beneficiaries have to return back the amount within the year. Since the condition of the poor user groups is deprived, most probably they may not able to return the amount in proper time period. Gradually poor user groups become excluded from the beneficiaries groups. As one of the female respondent, from *Ezhava* community, said,

"Our main source of income comes from forest products. We have only 5 cents of land. We will make Moram (husk-separator) from the Eatta, which is collected from forest. Through EDC an amount of 1000-5000 is given, forcing us to find out other source of income. They warn that after some time period they restrict us to enter to forest, even from fire wood collection. What can we do with this money, how people can find alternative source of income? If they allow sell the land, it might be relatively useful". One among the problems is that does financial help provide feasible alternatives for local people in a shorter period?

⁵ Information collected from some of the forest official who were engaged in EDC Seasonal Employment Programme. Evaluations and Reports were conducted by Kerala Forest Department.

There is no plan to rehabilitate the tribes, since most of the groups, which live in the forest, have already been displaced in the 1940s. They now live in settlements on the periphery of the reserves. Most of the tribes and villagers are aware of their rights, and are unwilling to let the forest department take decisions on their behalf. They have few expectations from the project itself. Livelihood suggestions made by the people of Mannankudy (one of the Tribal hamlets) in the micro plan (a set of separate plans, one for each settlement), for example, include request for more land, employment in the forest department, fishing rights, and training as tourist guides. Most of these were dismissed on grounds of either being illegal or because of shortage of funds. Fishing rights were granted to 30 out of 61 families in the village. The activities that were mutually agreeable to the villagers and the authorities include vocational training in bee-keeping and mushroom cultivation.

4.3.3 Entry Pass and Changes in Use Pattern

Forest dwellers have to collect the entry pass before engaging themselves in the collection of forest produce. There are several issues arising out of the introduction of entry pass such as collecting, renewing the pass etc. The validity of the entry pass is 15 days. All forms of collection are to be done within that period. The nature of collection and procedures are different for different produce. The difficulty of the use of the entry pass can be perceived from the illustration of the collection procedures of flowers⁶.

Generally dwellers have to stay in forest for a minimum of two weeks. It may vary according to the season. The tribes, for instance, go with the entire family members to collect the flowers. One week is needed to dry the flowers if the flowers are available. Earlier, staying in the forests for the whole month, for example, and extending it if necessary depending on the availability of resources was possible. But the restriction in stay now does not take into account the uncertainties in regeneration of the flowers. The entry pass also emphasises accessibility to a particular forest division whose legal boundaries may not coincide with the boundaries of resource-spread in the forests. Most of the users reported that after restriction through entry passes the nature of extraction and collection of items changed.

⁶ Generally there are two types of flowers--*ponnum poovu* and *chithira poovu*—are collected from the forests by most of the dwellers.

4.3.4 Legal Rights: Impacts on Poor:

Legal rights restrict the forest use of user-groups. This happens along with private groups being enabled to use forest-resources. If poor people are more affected under such circumstances, this affects their livelihood. The local people say that

"Nowadays there is no sound from the gun, or from hunting"

Forest officials are proud of this as they consider it as their policy success. It is important to ask how legal restrictions become a negative impact on the rural poor. Legal restrictions reduce their accessibility to forest resources. The restriction on resources directly affects subsistence level (livelihood) of the poor, as there is a considerable reduction in their income.

Timber cutting and hunting that lead to depletion of such resources are mainly controlled by outsiders, and poor people do not have any power to control it. The restriction on extraction of forest resources by the enforcement of law will not affect the rich people, as they do not depend on it for their livelihood. Privatisation (specifically refers ownership of natural resources by private groups) with new legal/illegal rights, further affect the forest-use practices of the marginalised community especially with limited alternatives that are already existing.

4.3.5 Credit Society and its Function

Credit society is meant for the efficient use and marketing of the forest resources by the local community. Credit society is undertaken by State Co-operative Society, and is functioning with the management of the local community. The Society, as it is often called, provides consumer items and necessary food items (for example rice, household necessities) to members of the Society by loan. The local people who rely on forest resources can register themselves with society. The Society also provides the entry pass to them. As we mentioned in the previous section, entry pass is necessary to enter the forest for all purposes. All forest products are supposed to be given to the society. The structure and functions of credit society directly affects the resource-use pattern and their livelihood. The restriction directs forest dwellers to extract different products. It affects the nature of collection too.

4.3.6 Role of NGO

Economists have begun to pay increasing attention to non-profit organisations during the last twenty years (Powell, 1987 and Rose -Ackerman 1986). Civil society has been a powerful voice in the *developed world* for raising awareness of environmental issues and campaigning for action to address them. NGOs in *developing countries* have taken the lead on environmental issues within civil society. The intervention of NGO is a factor leading to the processes of the material development of this region. They influenced and initiated the construction of typical form of development activities like construction of roads, bridges, causeway etc. The infrastructure development of the hamlets influenced the change in the resource use pattern. In a narrow sense, the infrastructural developments opened new job opportunities outside for the natives. The causeway, bridges could bring about free movement and interactions with outsiders. This is obviously evident in one or two hamlets like Kanamala, Pambavalley, Thulapaally, Kuttikayam etc. The transformation of agrarian culture and settled form of cultivation etc shows the vital role of the NGO in their forest -human interactions.

The informal arrangements of imparting training to the native people, discussions, gathering etc creates the social and environmental awareness and individual development among the native people. They reported frequently that they are beneficiaries of some NGO. They agree that the reduction in the dependency on forest resources was protected to a certain extent by the alternative opportunities created by the NGOs. *"We are not taking more bamboo than that we need each day; we could use only 25 per cent of each bamboo. We will take one week to make the material ready after different processes. And there is some limit to the use of bamboo by one man. We will not take more than that. We are interested to learn some handicraft works, so that we can use the remaining bamboo."* Creating alternative job opportunities and training for handicrafts etc helped them to find an alternative source of income. But universal generalisation of the influences of the NGO is not possible. The externalities are significant only for one or two social groups in a small geographical space. The influential atmosphere varies within and between hamlets and caste groups.

4.4 Impacts of Regulation and Change in Resource Use: Implication on Different Social Groups

The analysis shows that the enforcement of environmental regulation adversely affects the poor, especially their livelihoods. One of the alternative possibilities is to attempt the possible linkages between livelihood, sustainable resource use with bio-diversity conservation. One of the impacts of environmental regulation, is loss in environmental entitlement⁷ of the poor user groups. This is considered as a part of the continuous development process. This reflects the linkages between the development, poverty and the environment.

The major causes affecting terrestrial and marine bio-diversity include: habitat loss, attraction and fragmentation, pollution, species over-harvesting; invasion by exotic species; global climatic change; and the development of industrial agriculture, fisheries, and forestry (Norse, 1993; Perrings et al, 1992 and WRI, 1992). Knowledge of the multiple causes of biodiversity loss helps in identifying the specific causes pertinent to the particular case studied (Tacconi, 2000). Factors or causes of bio-diversity loss will vary from case to case, depending on the specific ecological, cultural, political and economic conditions.

Sustainability of the ecosystem depends on the diversity of the species and resistance and carrying-capacity. Bio-diversity and its carrying capacity increase the resistance and productivity of ecosystems over a range of environmental conditions. This underpins the security of livelihoods of poor people who rely on natural resources. However, conservation through the rigid enforcement of a protected area has often proved ineffective in preventing the loss of biodiversity. Poor local communities derived access to such areas and have little incentive to support protected areas regulations or employ their local knowledge of the conservation and sustainable use of bio diversity.

One of the main environmental threats to the livelihoods of the rural poor in developing countries is social degradation, estimated to effect some 1-9 billion hectares of land globally and the livelihoods of more than one billion people (WRI, 1998). Many of the households of the rural poor are fragile and can be easily rendered non-viable by small changes in their ecology. Poor people are vulnerable to the effects of natural - and the impact of conflict on

⁷ The concepts and significance of environmental entitlement is discussed in detail in the next chapter.

their lives. The number of major natural loss - over the past decade has tripled when compared with the 1960s, while the rate of economic losses associated with them has increased by a factor of almost nine during the same period (UNEP, 2000).⁸

In our survey, the insufficient alternative to the source of income or alternative to forest dependency describes the vulnerability of the poor groups. Most of the poor groups reported that there are no alternatives to forest use. During the period of early migration and before the enforcement of restriction all of the natives relied on forest as a source of income, food and indirect use⁹. When we enquired about the current dependency, about 82.8 percent are still using forest resources for different purposes and 17.2 per cent of the people are not using forest resources¹⁰. Out of total households, 88.1 percent does not have any other alternative. Only 11.9 per cent households have some feasible alternatives. The alternative available for specific products, for example fire wood, is relatively more for high-income groups. The households are ready to use kerosene, gas, and other forms of fuel. Even though the alternative is limited, the number of households that use firewood is less in the tribal community. It is applicable especially to specific social groups such as *Korava* and Malapandarm.

The magnitude of environmental problems occurring throughout the world is a testament to the complexity of the interactions taking place between human populations and their environment. Environmental problems are mostly regional specific and do have trans-boundary effects. Air pollution from one country lead to adverse environmental and health impacts in another country. Major environmental problems are *rarely* the result of a few large, bad projects, but rather the cumulative effects of many small decisions taken separately by millions of individuals. It is important to understand both the immediate and underlying causes. The immediate cause of pollution by an inefficient factory, reduced tree cover leading to soil degradation etc.- is generally evident and measurable. But the underlying reasons are usually a complex mix of social, economic and political factors.

4.5. Analysis of Market and Institutional Failure

Causes of environmental degradation are normally multiple and complex. Different causes may be operating at the same time depending on the specific case. Poor and effective

⁸ Emerging environment issues, paper presented to the UNEP Ministerial Special Sessions

⁹ Indirect use is defined here in a narrow sense, for example, forest resources used as inputs for agriculture.

¹⁰ We have already discussed the reason and factors towards dependency in the previous section.

governance, changes in consumption pattern etc are considered as some of the reasons for environmental damages. The market and government are institutions most commonly considered in environmental analysis. Generally, most of the studies argued that market failure and its dimensions are the causes for environmental issues. This section discusses some of the concepts related with market failure.

Market failure is said to occur when the market does not achieve socially efficient allocation of resources. The existence of externalities, lack of information, uncertainty, irreversibility, market imperfections and non-defined property may cause market failure rights. Government failure arises when policy interventions are either not under taken (to correct market failure) or create distortions that lead to socially sub-optimal outcomes (see Tacconi, 2000). Externalities, uncertainty (limited knowledge of many ecological processes and our effect on them). Myopia (individuals have shorter time spans than society and pursue activities whose returns are higher in the short run, but lower in the long run, than more sustainable alternatives. Irreversibility (some kinds of ecological damage are irreversible, but many decision-making processes undervalue this loss of options (Panayoton, 1990)).

While the poor are not generally a major cause of environmental degradation, they are usually the most vulnerable to such changes because of environmental degradation depriving their livelihoods (DFID, 2000). Sustainable poverty reduction is achievable only if external support focuses on what matters to people's lives, understanding the difference between people and, works with them in a way that is consistent with their current livelihood strategies, social environments and their own ability to adopt.

'The struggle over control of local natural resources is seen as a complex process of development and power involving diverse social actors, from agrarian politicians and development agents to heterogeneous group of local settlers, absentee cattle risers, timber dealers, transnational corporations and non governmental organisations' (Nygren Anja, 2000). The net result of resource use management and protection is a net result of processes, conflicts and decision making of local user groups, NGO, Government, forest department and Eco Development Project. The 'powerless or voiceless' (Narayan, 2000) poor user groups become part of protections due to lack of information and part of decision-making processes. Institutional analysis have observed that the interactions and decisions of actors take place

within a web of institutions-rule, equipment, systems and norms of behaviours, that structure repeated human interaction (North, 1990). Different forms of institutional factor construct the implementation of environmental conservation for a particular regulation. The nature of regulation and protection on the different user groups involve different conflicts between environmental regulation and protection practice through the various institutions. Further, the practice shows the diversity of actors and interests involved in the nature-based conflicts on this forest-frontier making the whole struggle over conservation and sustainability extremely complicated.

Environmental regulation, institutional innovation and its impacts on livelihood are complicated, even in the regional level. From the experience of the different user groups, it is clear that issues are more context specific, spatial and time specific and it is often based on caste (different social group) in this region. Caste is a major determinant of the specific use practices.

While engaged in their employment, the different caste groups use the different forest produce in a defined pattern and methods. For example Malayaraya, Malapandaram and Korava (Tribes) hardly extract bamboo, canes etc (material inputs) unlike other social groups like Scheduled Castes and other migrants. It is also evident that use practices of same products are different for different groups

The multiple use pattern and collection methods become more complicated when we apply the same law and alternatives. The heterogeneity in terms of literacy, caste, jobs, income, land etc, and interaction with other determinants is to be taken into account for the implementation of the regulation. The heterogeneous nature among the social groups limits the implementation, for example, tribal participation in EDC, of the institutional intervention at the universal level within the short-term period. The long-term objective focuses on sustainable use, which is ensured by law. The question is as to why those who hold the power to control resources and as to why environment is more significant, in a very specified sense, rather than people. Most of forest officials were of the opinion that local people exploit the forests in order to make profits, rather than conserve because of a lack of alternatives to meet their basic needs of living. In a new development experience, period of decentralisation, local people are supposed to develop a sense of ownership about the rules regarding resource use and more inclined to

obey them. Local social structure would make the power structure more vulnerable to political pressure from the regional power holders¹¹. The empirical evidence emphasises that environmental regulation and protection cannot be situated in a context free generalisation.

Each specific case could be analysed in its own right. However, it is not possible to make broad generalisations about the overall causes. As discussed, causes of environmental degradation are normally multiple and complex. Different causes may be operating at the same time depending on the specific case. Development of Market and demand for forest products are related. It is not the market in itself that leads to environmental problems but the dynamics that entails the economic process.

The role of market, as considered in the neo-classical environmental economics, has serious limitations in solving these dynamic issues. The mainstream environmental economist believes that market have a role in influencing human-nature symbiotic relationship. The complexity of the dynamics of different power relations within various social groups brings the scope and need for an evolutionary comprehensive analysis. This leads to the focuses on sub system rather than the whole eco-social system. However, there has been a rising trend in the economic literature which disputes the conventional theory and argues that simple generalisations of this multidimensional problem are erroneous and that a more complex set of variables are at play (Leach and Means, 1993). The analysis shows those demographic, cultural and institutional factors as important variables in the poverty-environmental degradation nexus.

The analysis also tries to problematise the different levels of perception, complexity of the power structure and social relations within the user groups and other localities and the resource utilisation. The issues are global in nature and local in characteristics. The importance is thus for analysing local resources-related narratives and actions and their links to the larger political economic processes and environment-development discourses. Although local environmental discourses and social relations are given special weight, the relations of power cannot be understood within narrow local boundaries. Rather it is through a process of

¹¹ One of the EDC Secretaries in the regional level, for example, holds sizeable land and has plantations. He maintains contact and gives support to the forest officials and gets some personal benefits. He is able to decide the time and place of the seasonal employment, and the workers who will participate in it. In fact, some tribes got less opportunity to engage with seasonal works.

struggle, negotiation, and resistance at different levels from local to global, that the multiple environmental discourses and nature-society relations are created. (Fair and Leach, 1995). The heterogeneous nature within the small homogeneous group (for example Malayaraya -- one relatively well off tribal group), makes more complex the resource use pattern and the effect of environmental regulation.

Social discourses, on natural resources also include the cultural and political stance. Any *Truth* is socially constructed, and concepts and categorisation play a vital role in how we perceive, think about and act up on the world (Gerber, 1997). In this respect, perspectives which are based on the notion of development as discourse, but which incorporate a stronger focus on struggles of power and how they relate to resource access and control, may be helpful (Agarwal, 1997; Neumann, 1997 and Ribot, 1995).

4.6 Environmental Regulation and its Effects on Different Social Groups: A Case Study of Tamil Sambavar, a Marginalised Community in the Fringe Area.

This case study explains how environmental regulation affects the poor user groups and their livelihood. It also looks at the relevance of 'participation' of the poor groups in decision making and conservation process. The Tamil Sambavar is one of the marginalised social groups in the Study area. They belong to the Scheduled caste. They live in fringe area known as Kuttikayam, southeast of the PTR.. It is important to discuss these social groups because the direct effects of implementation of the EDC mostly influence their resource-use pattern and socio economic condition. The EDC and its practices use the existing power and social structure of the society to implement their action. The participation and membership pattern etc in EDC marginalised this social group from the other user groups belonging to EDC. The analysis will focus on their socio-economic characteristics, livelihood and sources of income, nature of forest dependency and effects of EDC on their subsistence.

***Socio Economic Characteristics:** Total number of households is not more than 15. But it was 60 before three years, i.e. before the establishment of EDC. They migrated from Tamil Nadu (the neighbouring State of PTR) 30 years back. Only one of the households have a landholding (5 cents, and a house), which is built by the panchayat (Government loan scheme). All others were staying in rented houses, those owned by the 'local (native) people'. All the native households are also migrants from various places in Kerala. They have their*

own land and depend on agriculture. In Tamil Sambavar households, the average family household size is five. The literacy level is also low. Within the different age groups, the above 40 are illiterate. The literacy rate among the children is relatively high. The education status also varies from 7-10 (upper primary to high school) among the children. Since they stay near (or in) town they get access to education and other basic facilities. Even though they stay in rented houses, the conditions of the houses are very bad.

Livelihood and Source of Income: The major source of income comes from forest. Employment is based on forest resources. All of them are engaged in basket-making using Eatta (Bamboo) as inputs. They generally make different types of baskets for different purposes. Once in a week they collect the bamboo from the forest. The entire family participates in the processes of the basket-making. Usually, the baskets are sold in the local market. If the local demand is low, they supply to other markets and to houses nearby. The average prices of the baskets show that they obtain a maximum of Rs50 only per day from basket-making. Even though the monetary benefits are low they wish to continue this work. They consider this work as their hereditary occupation. They expressed the feeling that they get satisfaction if they are engaged in basket-making. Most of the workers do not have any experience or training in any other work, and can't even work as casual labour in agricultural field. These groups use the bamboo, which is already used for some other purpose. For example in Sabarimala season, bamboo poles are mostly used to construct temporary shops. They collect these bamboo and make different kinds of baskets. Other basket makers deny to use this and they agree that "fresh bamboo is always good to make big (valla kotta) baskets, that brings in more money".

The members of EDC alone get permission to take bamboo from the forest. All households from this social group, except one household, which holds land and owns a house, are not members of the EDC. One of the requirements for membership is that the member should be a native of the land. EDC do not consider Tamil Sambavar as natives and do not give them membership. The people who actually are members in the EDC can collect the forest resources. The migrant Christians, who are the majority of the native people in this hamlet, collect bamboo and sell it to this community. They have to pay for the bamboo. This reduces the benefits of basket-making and adversely affects their livelihood. Some of the households had migrated in the same year as some of the 'native people in the hamlet'.

"We can't extract bamboo from the forest directly. The problem here is the system of buying/getting raw materials. There are people who have the right to extract bamboo from the forest. When it reaches us, the price is already high. Because of the problem, we would like to join EDC. But the formalities and our identity prevent us".

They say that membership is only given to the natives. But the question is who are the native people. People, who are the members of the EDC are also migrants; they make the difference in terms of supporting the hierarchical power and social structure. Further, EDC provides money for the native people so as to minimise the rented people from their house within the stipulated period

Effect on Socio Economic and Cultural Life of the Society

The loss in their environmental entitlement affects not only their income sources but also their socio, cultural life and material well being. They are forced to migrate from the region. Since their livelihood is dependent on availability of bamboo products, they can't sustain themselves in Kerala. They are forced to go to Tamil Nadu. This forced migration affects their children's education; they have to discontinue their education. The issue was once reported to Government and other institutions, but it ended up as a social and environmental movement. The whole transformation gives the description of how voiceless and powerless people are marginalised by the dominant power structure.

4.7 Conclusion

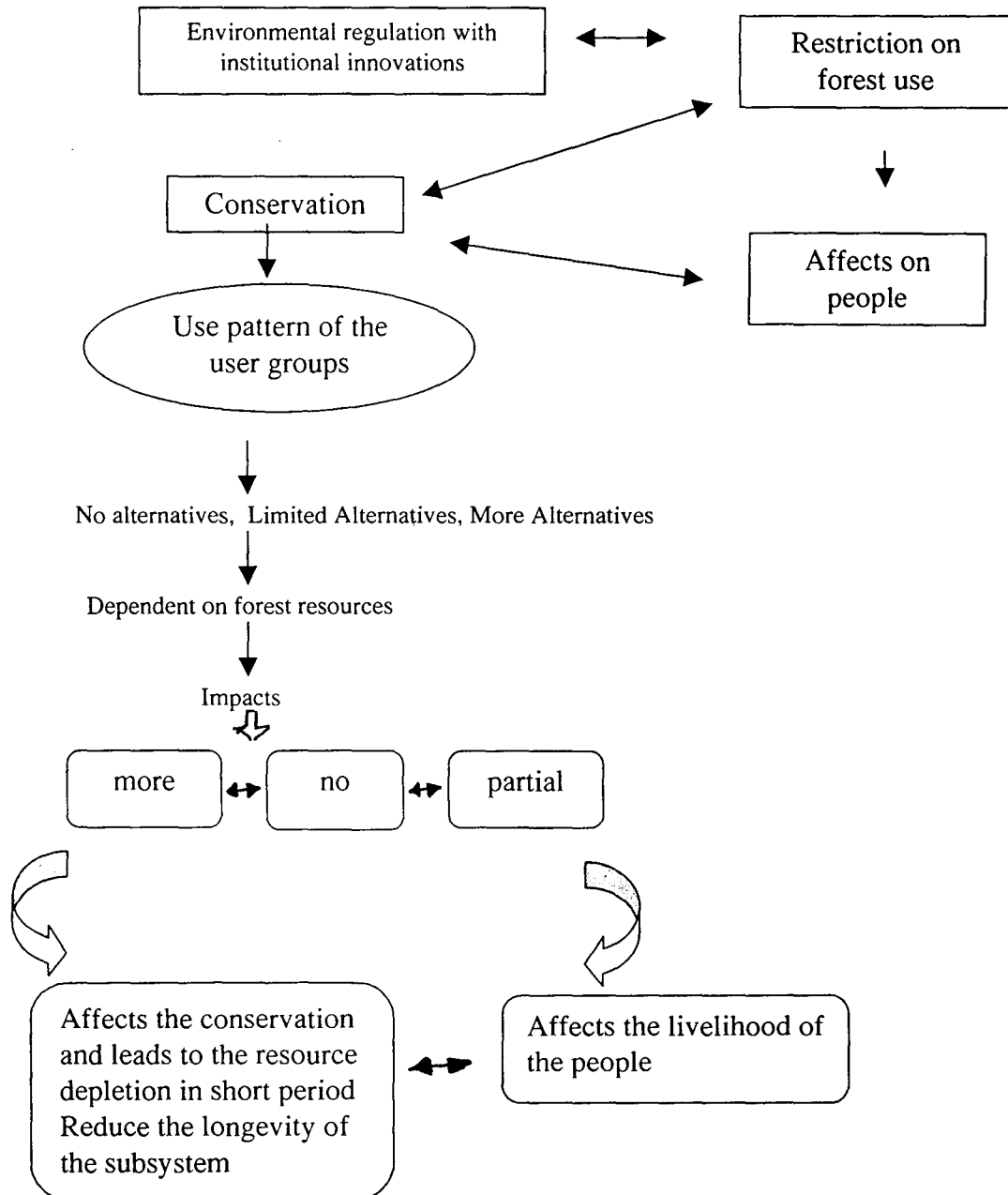
There are different influential determinants in the dependency and extraction of forest resources. Use practices and thus the type of dependency vary with respect to different social groups. Lack of alternatives to additional source of income, accessibility etc is some of the major factors affecting the type of reliance on forests. Different institutional innovations of the environmental regulation are more influential in the low rate of dependency on the forest resources. Functions of restriction through the Eco development committee, entry pass, etc affects user groups' resource use pattern. Since most of the user groups relied on forests for their livelihood, the regulation adversely affects the poor. Institutional innovations are looked at from two different perspectives - the livelihood approach and the resource conservation approach. Empirical evidence shows that environmental regulation influences resource use

pattern and conservation practices. The linkage between regulation policies and conservation practices adversely affected the livelihood of poor user groups. It is evident that environmental regulation affects the resource use pattern of the people generally and it directly affects the livelihood of the poor user groups particularly. The restrictions imposed on access to forest resources and availability of limited alternatives to other sources of income drive them to further deprivation. Institutional innovations and conservation practices in the long term, with the participation of the local people, may reduce the extraction of forest resources. But it becomes a serious problem when looked at from the perspective of the livelihood of the poor. Institutional innovations and government interventions tend to be a failure in resolving the livelihood problems of poor user groups. Both market and institutional failure become the determinants of environmental depletion and the consequent deprivation of the poor households who live in the fringe area of PTR and surrounding forest reserves. The externalities generated by the 'creation of market and its function', at the time of Sabarimala pilgrimage season, is a significant source of income to some of the local communities. The initial investment by EDC created opportunities of self-employment for the people. The short-term benefits and employment generation provided income to other groups but completely excluded some of the tribal groups and endangered biodiversity. As pointed out in other studies, the pilgrimage season creates different types of environmental pollution, including water and air pollution along side forest depletion. This has an adverse impact on the health status of the user groups.

Appendix 4.1

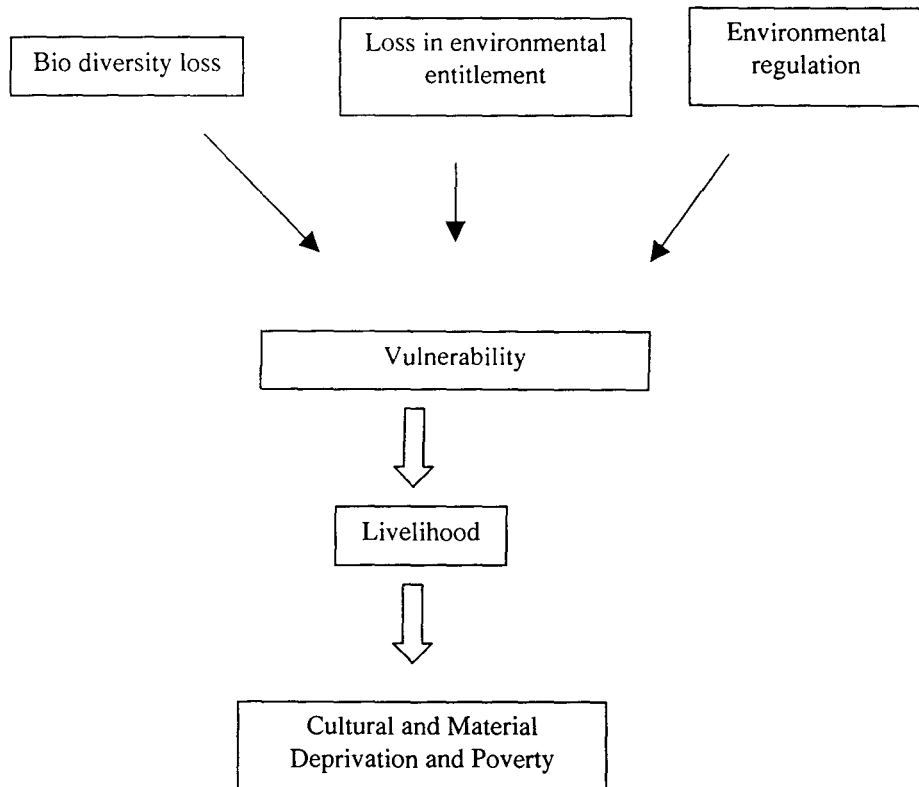
The following figure (4.A.2) explains the environmental regulation and its impacts on resource use pattern and user groups. Resource use depends on available alternatives, it includes more, limited and no alternatives.

Figure 4.A.2: Environmental regulation and its impacts on user groups and resource use pattern



The following figure (4.A.2) shows the interlinkage between Loss in environmental entitlement, environmental regulation, and livelihood as different factors affects on poor user groups.

Figure 4.A.2: Effects of different factors on poor user groups



Chapter V

CONSTRAINTS TO ACCESS AND USE OF FOREST RESOURCES: SITUATING THE MALAPANDARAM

5.1 Introduction

In this chapter, we analyse the processes of environmental entitlement loss and its effects on the livelihood and resource use pattern of Malapandaram, a marginal tribal social group¹. The analysis will enable us to understand the poverty-environmental linkages. So, we focus on the interrelationship between poverty/vulnerability and environmental entitlements. Poverty and environment linkages are multi-dimensional rather than unidimensional. In the light of a variety of work done in different areas, the evidence for direct, unilinear causal linkages appears very weak. The very fact that the links are usually very complex and indirect implies the need for a better understanding in order to make such efforts more meaningful. (Leach and Mearns, 1991). This situation is also a part of the process of marginalisation of vulnerable social groups from the mainstream development activities. The problems vary among different social groups but it will be easier to open up the problem using a relatively homogeneous group. The analysis focuses on a particular tribal community known as *Malapandaram* by looking at two images of knowledge² of human-nature relationship between the Malapandaram, and the other communities.

The inquiry starts with the premise that the tribal communities are 'historically exploited' groups. Earlier studies have located their socio economic deprivation and marginalisation in the development 'dilemma' (for instance Menon, 1991; Morris, 1999). Their deprived condition has been evolving historically. Their socio economic and cultural practices are more or less related with forests. It is difficult to separate their dependence on the forest into economic and cultural categories. Even though most of the groups live a settled life, some of

¹ The Malapandaram are a nomadic community living in the Montana forests of Kerala (Morris, 1999). They are seen in the high forests of Pathanamthitta (fringe area of Periyar Tiger Reserve) and Quilon districts. They belong to the Scheduled tribes community as per the Scheduled Castes and Scheduled Tribes order of the Government of India (Menon V 1991). Earlier studies point out that *Hill Pandaram*, traditionally prefer to live in deep forest, isolated to a large degree from the mainstream culture (Iyer, 1973; Mateer, 1983; Morris, 1976)

² There is a difference in interpretation of outsiders and what perception the tribal group have about themselves. Outsiders, relatively upper class, always make generalization about the tribal group based upon their ideology and cultural practices. As an alternative, an attempt can be made to situate the findings from the interactions of the different perceptions of the peoples.

them still live in the forest. They lead an unsettled life, wandering around the forest reserves. Remembering their lifestyle, Iyer notes that “They do not stick to any one place. They remain for a week and move on when the food supply is exhausted” (Iyer, 1937).

5.2 Linking Poverty and Environment: Dynamic Relations

Dynamic characteristics and effects of poverty-environment interactions among Malapandaram depend on many factors that may be drawn upon to reflect on the condition of similar social groups. This includes the availability of environmental resources and access to them and their effective use. Theorisation of this dynamism can be analysed within the framework of environmental entitlement. Environmental entitlement can be defined as the combined outcome of both: (a) the environmental resource bundles that people command over as a result of the ownership of their own production, or as a member in a particular social or economic group; and (b) People's ability to make effective use of those resource bundles (Leach and Mearns, 1991). In explaining hunger and famines, Sen focuses especially on (the failure of) entitlements of food, acquired by production and trade activities, usually through a market mechanism (Sen, 1981; Drez and Sen, 1989). Unlike food entitlements, the concept of environmental entitlements encompasses the ability to make effective use as well as to access (environmental) resources. Both in terms of accessibility and ability to use, the poor often suffer from different processes of environmental entitlement loss. Empirical evidence shows that there is a change in the accessibility and use of forest resources of all people, who live in the fringe area. It adversely affects the livelihood of tribal communities such as Malapandaram. The analysis of the social and economic situation of the Malapandaram tries to understand how the different processes of environmental entitlements work. One of the processes, as argued by Kates (1990), is that throughout the developing world, the poor often suffer from the loss of environmental entitlement, by way of displacement from their traditional entitlement to common resources by development activities or by the appropriation of their resources. Further, the remaining entitlements are divided and reduced by their need to share the resources among their children or to sell off bits and pieces of their resources to cope with extreme losses, social obligations or subsistence. Also, the institutional structures being introduced to protect the environment often affects the tribals adversely. These include environmental regulation, Eco Development Committees, and the Credit society. The analysis that we undertake here focuses on these processes and their effects on environmental entitlement. Also it explains as to how these changes force Malapandaram to perpetuate their reliance on forest resources. The settlement

history and the socio-economic background of the Malapandaram community relate to these processes of environmental entitlement and changes in the resources use pattern.

5.3 Displacement from the Traditional Environmental Entitlement

The displacement of Tribal communities like Malapandaram from the fragile ecosystem to the 'new space' creates deprivation of their intimate physical and social conditions. Some of the Tribal groups were already displaced from the development project by 1940. The Government has resettled the Malapandaram community away from the forest area. The resettlement from the forest leads to the loss of environmental entitlement to the community that is resettled. The existing social and physical environment contributes to the loss of free accessibility to environmental resources. In this section, we intend to analyse the current socio economic situation to site the environmental entitlement loss of the community.

5.3.1 Socio-economic Profile and Physical Environment

Malapandaram have largely been reluctant to take up agriculture, and largely retain a nomadic hunting- gathering way of life (Morris, 1999). With the establishment of the colonial administration and the formation of the Travancore State, the forested hills became reserves under the jurisdiction of the Forest Department; all tribal communities living within the forests were deemed to be under the "control" of the Department (Morris, 1999). Rules were drawn up for the "Treatment and Management of Hillman"(1911)³. The social condition and resource use pattern of the Malapandaram reveal the limitations of the generalisation of the poverty - environmental linkages. The contemporary situation shows that there are intra tribal differences, which also leads to further exploitation. There are differences in practices such as the nature of resource use and collection methods among the tribes. Thus their perception of themselves in the social hierarchy is reflected in the perceptions of the problems that they face in the social life. The problems that Malapandaram experience show how they are marginalised and pushed away from the mainstream development programmes signalled by Government schemes. Now, let us analyse the plight of the settled tribals. There are 135 households living in Attathodu tribal colony. Out of 135 houses 90 do not have enough rooms for accommodation⁴. 40 houses need

³ The Travancore Government Proclamation of 1911 regarding the 'Rules for the Treatment and Management of the Hill Men' brought all those tribal communities living within the forest reserve under the control of the Forest Department.

⁴ Some of the houses are built by NGO and some of them by Panchayat. They follow a uniform size irrespective of household size, geographical specificity's etc.--with only two rooms, including kitchen.

immediate repair. The houses constructed as part of Government schemes are with inferior quality materials and are not habitable. Moreover, such houses have only two rooms. 62.5 per cent of the houses built by Panchayat (under Government Scheme) and NGOs⁵, rest of the houses built by them. 37.5 per cent houses come under the roof thatched with leaf wall. Sanitation facilities are limited in the colony. 120 households have no formal sanitation facilities. They depend on the nearby stream for water. The community continues to depend on forest resources as a source of income and livelihood. Only some of them own land. The tribal houses and its environs are in a very bad state. The houses are thatched and their walls are made up of leaves and grass. There is not much difference in the quality of the houses from that of early settlement period. The thatched huts in the “settlements” remained deserted (Menon, 1991). The literacy levels are below 10 per cent within this community. Literacy rate in the younger generation is very low. Only some members of the older generation learnt to read and write by interacting with forest officers and outsiders. Some of them cannot identify currency notes. Moreover, the perception of being the victims of exploitation worsened their lives. To quote one respondent:

Earlier, we did not know that others were exploiting us. Today we know, but we can't respond because of illiteracy that prevents us to free ourselves from the exploitation. We were collecting the forest resources from earlier period itself; in spite of the agricultural production, particularly of black pepper. We never knew that it was marketable. Generally outsiders come and collect black pepper from our land and they give us some money. We did not realise that there is market for black pepper and market price. This continued for quite a long time. We never get high price and proper returns from the credit society. Even now we are ignorant about weight techniques. The functions of the credit system and market forced us to depend on forest resources. Our peculiar lifestyle prevents us from learning any other works that are locally demanded".

Now the tribal communities realise that they can't escape from this kind of exploitation, and also they realise that they are caught in a vicious circle of dependence on forest resources and poverty. It seems that lack of education is one of the factors that forced them to depend on forest resources for livelihood and that determined their resource use pattern and way of life. This shows that the development of the basic education in the state level did not have a trickle down effect, especially in the tribal community. Education plays a major role in achieving freedom

⁵ World vision, CARD, etc are the some of the active NGO's functioning in the area.

from exploitation. Also the condition of illiteracy forced them to be away from the mainstream development path and development schemes. The available education facilities in the region do not allow them to study beyond lower primary level. This won't help them to join any other school to continue their education because the institute does not provide a valid certificate. *"They do not have any problem and after tenth they will get any government jobs⁶"* type of public discourse maintain the typical understanding, even if the reality is different. Other factors like social obligations (marriage practices) skewed land distributions and social compositions of labour force them to divide the remaining the entitlements to others too.

5.4 Division of Environmental Entitlement

Division of the environmental entitlement is the major reason for the loss of the already limited accessibility and their effective use from the perspective of Malapandaram. The land fragmentation and internal migration are determinants that affect their livelihood based on natural capital. Increasing rate of migration forced them to share the existing entitlement with a larger group. The limited job opportunities and other skewed alternatives lead to resource dependency on forests as generations pass on.

5.4.1 Social Condition and Marriage Practices

It has been observed that the dominant groups create the space for the exercise of their power on the tribal community. The marriage practices there can be cited as an example of the external factors that determine Malapandaram social and economic life. Outsiders (relatively higher caste from nearest village) come and marry the tribal women and begin to live in their settlement area. The law prohibits others to stay in the tribal settlement area, but through the marriage relation they get access to the land in the tribal settlement and gradually take over the ownership of land. It was strictly put by one of the informants; *"Others come and marry tribal girl. We are forced to transfer our land rights to them. They try to get all the govt allowance and other opportunities in the name of the tribe. Also they force us to do more extraction of resources and sell them in black market. It affects our way of extracting forest products."* The processes changed the accessibility of the tribes on natural resources and their use. There are many practical difficulties to get benefits from the government development schemes for this community, but others in the guise of adivasis capture the benefits. There is a general consensus among others about the dress

⁶ This is the kind of opinion that other natives have about the tribal social groups,(information collected from field survey)

code, language etc. as markers of the identity of 'Malapandaram'. The Government officials will not consider the tribes who speak good Malayalam (regional language) and wear modern dress etc. as members of this particular category and then they are not entered as Scheduled Tribe in the Government documents. For example, one of the criteria is that their language must have Tamil influence. It has been observed by one of the informants that one officer asked them about the specific tribal medicine for the treatment of cancer. Romantic attitude towards the tribe's culture and practice that the mainstream society upholds creates the imaginary location for tribal identity and culture.

5.4.2 Land Alienation and Fragmentation

The adivasis' relationship with the forest is precious as one of extractor rather than a conservator like the non-adivasis. Outsiders⁷ perceive the relationship of adivasis with forest in a different way. According to outsiders adivasis "*would like to stay in the forest as they will get everything free*". It is true that some of the adivasis prefer to stay in the forest. The land alienation and fragmentation rate is high in the community. The factors that contribute to this trend are different from other similar communities. As a less monetised community, this group transacted their land far below the market price. Agreements of transaction were signed, in most cases, when they were in a drunken state. The size of the family forced them to partition the land, which consequently result in land fragmentation. The intervention and disturbance of the outsiders led some of this group to go back to forest. Both the trends have been identified in the course of the research.

5.4.3 Labour

Cultural diversity in tribal discourse equalises the labour participation in day to day employment activities. It is significant that compared to other tribal communities and other forest dwellers, the uniqueness of the Malapandaram is that the entire family goes to collect forest resources. Irrespective of time and place they go out as a family unit for labour. In certain cases the forest department employs them in works such as replantation, for a maximum of 60 days. Even in the Government department there is wage difference for male and female. Besides, sometimes wages are not disbursed in time. On certain occasion they are forced to wait, for example for one month, which is too long a period for them. The seasonal

⁷ Outsiders includes high income households and households from high social strata. They include Christians, Malayaraya and other Hindus.

employment in the Sabarimala is a male preserve, as women are not permitted to participate in the work there due to certain restrictions. Even the employment opportunities offered by EDCs women are excluded from taking jobs. The problems in the labour market induce them to rely on forest resources.

5.5 Institutional Regulations

This section analyses the third process of environmental entitlement--the effect of different forms of environmental regulations imposed on the resource use of Malapandaram. Alternatives to forest resource use and the dilemma of sustainability provide the new discourse of environmental regulations. This section also looks in the nature of collection process and possibility of the sustainability. Market failure⁸ is the one of the reasons for the implementation of different forms of institutional restriction on use of forest resources.

5.5.1 Collection of Resources and Nature of Extraction

Generally they collect almost all-marketable items from the forest. Currently they are taking about 10 items from forest. The following table shows the average picture of the resource use pattern and nature of collection process of this community. Generally they collect all available and marketable products from the forests depending on the season.

⁸ The resource use pattern, high stage of forest depletion and some specific species due to the use of native communities created negative externalities to the outside community and governments. The local community's "costs and benefits" however, usually does not consider the outsiders' benefits and costs by their different forms of economic activities by them. To reproduce the carrying capacity, Government implements institutional policies through environmental regulations.

Table 5.1: Nature of Forest Dependency of Malapandaram.

Items	Frequency of visit	Nature of collection	Distance/ days*	Labour participation / no of workers	Quantity	Purpose	market	Price (Rs)	Out side price(Rs)
Food items ¹	Once in a month	Collection	Not specific #	women	-	Own	-		
Flowers ²	Every moth	Cut/ collection	15days	Entire family	125	Sale	Society	125-140	200-225
Honey ³	Season	Collection	15days	with neighbours	100	Sale	Society	40-50	100-150
Kunthirikkam ⁴	Every month		15days	Entire family	50 kg	Sale	Society	45	75
Turmeric ⁵	Season	Collection	10 days	Entire family	30kg	Sale	Society		
Ginger ⁶						Sale			
Cardomom ⁷						Sale			
Incha ⁹	Rainy season	Cut	15days	Entire family	50	Sale	Society	8-10	25- 40
Fire wood	Once in a week	Collection	3-5km	Women		Own			

Source: Field Survey

Notes: * days to collection of resources.

Quantity: the average value calculated from the total quantity collected by the households during the last period.

1. Food items: They are not relying on forest for food items specifically. For the collection of other items they were staying minimum 15 days in forest. They collect available food items nearest from the place of the stay in the forests.
2. Flowers include two varieties, knows as *chithira poovu and ponnum poovu*. This is the most common resource they collect regularly.
3. Honey is a seasonal produce
4. kunthirikkam: generally it seems to varieties, it known as thelli (white kunthirikkam) and black variety.
- 4a. Nature of collection: people collects and they will cut the trees to make the kunthirikkam.
- # They collect food items when they are staying in the forest for collection of other forest resources.

NGOs try to provide basic facilities and opportunities for some of the tribal communities. The derogatory comments by outsiders force NGOs to limit their functions in the tribal community. One of the informants pointed out that if they (tribals) get a goat it would reach the nearest market next day⁹. This shows the common perceptions of outsiders about the problems of Adivasis. It provides certain stereotypes of the tribal life and experience, which is uncritically, accepted as tribal identity by outsiders. But tribal identity has to be analysed in a much deeper manner considering the transformation of tribal communities over a period of time. This might lead to some reflection on their notion of class/caste differentiation that is evolving. This

⁹ Do they need goat or something else? This question is significant. Generally they stay in forest for resource collection. As mentioned earlier, in Malapandaram community entire family goes for resource collection. The current social life may not be appropriate for livestock practices. Demand from the tribes and willingness to supply from the NGOs is entirely different. The uniform practices by the NGOs may not help each social group.

becomes particularly clear when we focus on the interaction space of development and tribal communities. There is a need to realise that tribal culture and development processes have their own specificity (rather than accepting the 'generalisation') and it is beyond mainstream perceptions and interpretations. As noted in the case of Nagarhole, in our study area also, we have noted the problems brought in by the official intervention in the process of resource collection. It has been noted that in most protected areas, forest officials take on the tone of benefactors while talking about minor forest produce collection by the Adivasis. As the deputy conservator of forests in Nagarhole says, "it is forbidden under the Wildlife Protection, Act, but we allow them some times." (CSE, 1999).

5.5.2 Sustainability

The collection processes show disagreement with the general consensus of the sustainability theories. Sustainability considered here in a narrow sense, for example, refers to the changes in resource use pattern and the availability of the resources in the long run. They are aware of the longevity and continuity of the ecosystem and resource availability and was succinctly put by an informant. "*Since we started settlements, there was no structural change happening in our physical and cultural environment. The contemporary dilemma necessitates us to continuously depend on forests. If we extract more resources our new generation may not possess these properties of the forest resources*". Though living on the margin of society in distinctions and deprivation, they are able to substantiate their views of the future generation in relation to natural forest resources. This deprivation in terms of physical and social capital on forests in livelihood capabilities makes them a powerless group. Deprived condition makes them rely on forest and the inadequacy of physical and social capital and capabilities constitute them as a powerless group.

5.5.3 Entry Pass

The forest department regulates even the entry of tribals in to the forest by resorting to entry pass. For entering into the forest they have to take entry pass. The validity of the pass is for 15 days. After the expiry of the aforesaid period they have to renew it. Permanent pass is also available, but it is issued for a very limited number of people. Generally they stay in the forest till they gather enough resources. But they are not permitted to stay for more than the stipulated days. They have to come back before 15 days even if they couldn't get anything from the forest otherwise the forest officials will punish them. Resource collection is always a

risky business. There is always uncertainty in getting resources. Some times some other groups might have already collected the resources. Besides, wild animals in the forest also prevent them from collecting resources. The entry pass argument does not address these practical difficulties in the process of resource collection. Another problem is related to the administrative division of the forest. They are not supposed to collect materials from any other area of the forest, but only from the permitted area that are classified for the administrative purpose, but in most cases they can't keep the administrative distinctions in deep forest. This always leads to problems with forest officials and the tribal people are often punished for the violation of rules and regulations of the forest department.

5.5.4 Eco Development Committee¹⁰ and Tribal Participation

"We can't take any thing from forests, especially after EDC. Forests is divided and categorised for different administrative purposes. Our accessibility is constrained and limited by these restrictions" After the setting up of EDC and their functioning, the tribal people are facing a lot of problems. Now they can not take anything from the forests as forests have now been classified for administrative purposes. Restrictions have been placed on uses to forest. As part of the EDC programme, the tribal groups are forced to be active in the environmental protection moves of the Government. EDC and the forest officers are supposed to make tribal participation in programmes but they are only using their knowledge of the forest to conserve the forest resources. The contradiction is that nobody is accepting tribal knowledge while considering the use and utilisation of the resources. A study conducted on the Nagarhole National Park has emphasised the role of tribal communities in the EDC and that appeared to be insufficient. "Though words like 'people participation' and 'ecodevelopment' are administered like palliatives in official reports, there have merely been changes in their terminology. The power equations remain unchanged- the *adivasis* must do as the forest department commands" (കുട്ടി, 1999).

The lack of representation in the EDC programmes proves the alienation of the people from the mainstream activities. One example can be cited from the participation rate in the Sabarimala seasonal works. Generally, EDC provides money to do business to a group of people. But the experience of the tribal people is that being illiterate they do not have any role in decision

¹⁰ Eco Development Committee, The integrated Afforestation and Eco development project supported by national Afforestation and Eco development board under the Ministry of Environment and Forests is under implementation in Kerala from 1998-99 onwards (Kerala Forest Department).

making. They are forced to fall blind folded what ever they suggest. Besides they are forced to do strenuous work. This fact points to the complexity of the problems and existing practices. They believe and realise that most of the money that is spent on seasonal business will benefit only landed peasantry and not the land less adivasis. *“They are not interested in these kind of works, and they will get everything free from the forest without effort and spending much time and hard work”*. This is the standard interpretation that tends to divert the focus of attention from the real problem of the tribal dependency on forests, to other less important ones. Consequently the function of EDC also seems to neglect the problem of tribals. However, the final impression is that EDC functions efficiently and the problem is that of the tribals themselves.

5.5.5 Credit Societies

The forest dependency, indebtedness and deprivation of these groups make them dependent on credit society. They have to give the product to the credit society. The society provides them with all the necessary items by credit. Before going to the forest they collect necessary commodities from society, promising that they will give the forest resources to society to match the value of the commodities that they bought from the credit society. But the price for the produce accepted is very low when compared to the rate prevailing in the open market. Sometimes difference is as high as 50%. They are always in a debt trap and this situation makes them trapped in a vicious circle of dependency. The analysis of the nature of collection (the process of collecting forest resources) provides the knowledge of the depths of collection, and conservation/extraction. It helps to clarify the contradictory consensus of common perception of environmental depletion-poverty linkages. The vicious circle of credit system prevents them from using the Public distribution system. Accessibility and availability coincides here. The lack of purchasing power forces them to remain indebted with the credit society. Processes of resource collection, use and nature of market leads them further into this vicious circle of indebtedness. The complete transaction of the resources - collected from forest - is possible only through the net working system of credit society. Functioning of the credit society in the region sets a pattern of natural and constant exploitation. The functioning of the credit society, the nature of resource collection and marketing create constant indebtedness of the tribal community that produces the web of inter dependency and related problems. These situations point out the dilemma of tribes depending on forest for their livelihood or living for resource collection.

5.6 Conclusion

There is no exceptional change in the tribal discourse in relation to the problems of the socio-economic exploitation by development processes. The people are socially deprived in terms of the basic needs such as education, health, employment, food, and accommodation. The existence of the current social structure causes further marginalisation from the development programmes. They are dependent on forest resources for their livelihood. It depends on the available environmental entitlements. Environmental entitlements mediated to the dynamics links to poverty-environmental linkages at the micro level. A wide range of factors stresses on environmental entitlements, which adversely affects their accessibility and effective use of resources. The empirical evidence shows that there is a loss in environmental entitlement in the case of Malapandaram. It affects people's livelihoods through different factors. Endogenous and exogenous factors attribute to the entitlement loss of the Malapandaram. The variability of income and limited alternatives to other source of income is an important feature of the community. Limited alternatives and socio-cultural factors force them to rely on the available environmental entitlement. The scenario shows that next generation also will have to rely on forest resources for their livelihood. If they can possess enough alternatives some of them wish to maintain the cultural and hereditary relationship with the forest. The functions of the EDC, Credit Society etc, as institutional features, adversely affect their well being. They experience different form of exploitation and vicious circle of indebtedness by the functions of credit society. The participation rate in the EDC is very low for this community. Nature of contemporary use and extraction and reliance on different items determine the constraints for the sustainability of the resources. Further, the nature of extraction does not affect the sustainability of the resources in a longer period. The policy orientation and institutional arrangements should focus on the basic social structure, for changing the different form of exploitation. Also it should focus on the regional variation of the resource-use pattern. The empirical evidence also shows that the effect of environmental depletion and various regulations adversely affects the poor social group, especially the Malapandaram.

Chapter VI

CONCLUDING REMARKS

The present study tries to understand the dynamic nature and processes of environment and poverty linkages. As we know, the issue is a complex phenomenon. Different schools of thought consider the issue in different contexts like different time, geographical specification, cultural specification etc.

The general consensus is that the conditions of the poor and environmental depletion are positively related (for example, Brundtland Commission Report, 1987; Das Gupta and Maler, 1997; World Bank, 1992 etc). One part of the study was an analysis of the mainstream understanding of the interactions between people and environment. The fact that the links are usually complex necessitates an in-depth analysis in order to target such efforts in an effective manner. Poor user groups' livelihood strategies are structured to manage trade-off and 'downward spiral' of different capital assets. The conceptualisation of alternatives and sustainability is particularly important when considering poverty -environmental interactions. An analysis of earlier studies identified substantial gaps in the literature, which needed to be addressed. The studies (example, Markandya, 2000; Duraippa, 1994) highlighted the lack of empirical research in the area. The literature review directed the need for new methodologies to conceptualise the emerging issues related with environment and development.

Following the introductory chapter, the second chapter starts with an analysis of the discussions on the methodological framework (ecological economics) and its uniqueness from other methodologies. Ecological economics is a new transdisciplinary field of study that addresses the relationships between ecosystems and economic systems in the broadest sense. It emphasises an understanding of the issues (issues-driven) rather than an application of the economic techniques (tools-driven). It further deals with the specificity of the region and discusses its significance for the present study. The study focused on the fringe area of the Periyar Tiger Reserve and other surrounding forest reserves. This chapter also discusses the socio-economic profile of settlers, their deprivation, employment opportunities, seasonal employment during the pilgrim season, externalities etc. The people living in the fringe area are always under the limiting influence of the Eco-system. The area is early-migrated place

and settlers include migrants and tribes. The material conditions of the households explain that most of the people lives in a poor condition / low standard of living.

The next chapter problematises poverty and environmental linkages. The first section of this chapter attempts to understand the resource-use pattern, dependencies and accessibility from a historical perspective. It starts from the early phase of migration and extends to the current-use pattern.

In the earlier phase of migration, every household used forest resources in direct or indirect ways. Government policies and institutional structure were major reasons for earlier biodiversity loss and conversion of forestland in this region. There are structural asymmetries between poor and rich groups in terms of forest dependencies. Nature of current resource-use pattern is more influenced by the positioning of different social groups rather than the needs of the deprived. A major share of the poor groups' income comes from the forest products and related works. The nature of extraction and intensity of the use pattern influences sustainability of the forest eco-system.

The fourth chapter tries to analyse the impact of environmental regulations and institutional innovations on poor user-groups in terms of resource-use pattern and conservation practices. It starts with identifying the determinants of resource-use and conservation practices. Market failure, as noted in the earlier studies, is one of the reasons advocated for government intervention by way of different forms of institutional innovations. Institutional innovations are looked at from two different perspectives -- the livelihood approach and the resource-conservation approach. Empirical evidence shows that environmental regulation influences resource-use pattern and conservation practices. The linkage between regulation policies and conservation practices adversely affected the livelihood of poor user-groups. It is evident that environmental regulation affects the resource-use pattern of the people generally and it directly affects the livelihood of the poor user-groups particularly. The restrictions imposed on access to forest resources and availability of limited alternatives to other sources of income drive them to further deprivation. Institutional innovations and conservation practices in the long term, with the participation of the local people, may reduce the extraction of forest resources. But it becomes a serious problem from the perspective of the livelihood of the poor. Institutional innovations and government interventions tend to be a failure in resolving

the livelihood problems of poor user-groups. Both market and institutional failure become the determinants of environmental depletion and the consequent deprivation of the poor households who live in the fringe area of Periyar Tiger Reserve and surrounding forest reserves. The externalities generated by the 'creation of market and its function', at the time of Sabarimala pilgrimage season, is a significant source of income to some of the local communities. The initial investment by Eco-Development Committee created opportunities of self-employment for the people. The short-term benefits and employment generation provided income to other groups but completely excluded some of the tribal groups and endangered biodiversity. It has adversely affected the longevity of the forest ecosystem. As pointed out in other studies, the pilgrimage season creates different types of environmental pollution, including water and air pollution alongside forest depletion. This has an adverse impact on the health status of the user-groups.

The fifth chapter, as a case study, focuses on the change in the environmental entitlement of poor groups and analyses how this affects their access and use of forest resources. This analysis is focused on a particular tribal user group, Malapandaram. Their deprived, social and economic conditions force them to rely on forest resources for their livelihood. The loss of environmental entitlement is explained in terms of different historical processes. Through displacement or resettlement they lose their accessibility (traditional rights) to forest resources. Factors such as social obligation, family size, land-fragmentation etc force them to divide whatever resource they are able to access. The next focus is on their limited accessibility (restricted by the enforcement of law), for example environmental regulation. Government intervention was practised through different forms of institutional innovations, for example, Eco-Development Committee, Entry pass etc, which have led to the loss of environmental entitlement to the poor groups.

It is clear that any assessment of changes in forest, either quantity wise/quality wise or beneficial/ harmful has to take into account the political, social, and economic factors related to local circumstances. The issues encountered are significant in the context of the poverty and environmental linkages. Whether poverty directly or only indirectly leads to environmental degradation seems a less relevant concern when compared to the implications of pervasive environmental degradation and regulation for the livelihoods of the poor. There is limited scope for arguing that poverty induces environmental depletion or vice versa. The study shows

that linkages are both ways. The nature of resource use and other forms of dependencies are distinct for different social groups. The issues are more complex, even within the same region and social group, and not amenable to context-free generalisation. Rather the issues concern a development dilemma of livelihood, conservation, sustainability and environmental regulations. Valuation techniques such as cost-benefit analysis, contingent valuation etc. consider environment as a technical factor. The application of these valuations on development processes would imply that serious issues are looked at in a very narrow sense, seeing conflicts between livelihood and conservation. One of the arguments put forward (e.g. Maler, 1997) was that there was a need to value resources to study environment and development issues. There are other studies that have discussed the limitations of resource valuation. The issue of valuation and scope to solve conflicts between livelihood/conservation practices suggest the need for further in-depth analysis.

Environmental degradation as well as environmental regulation seriously affects poor groups. Poor are more closely related to the environment, as they live in an ecologically fragile area and dependent on it for their livelihood. Thus they are vulnerable to loss in environmental entitlement when entry is restricted to the forest. The entry restriction and environmental regulation may not be a sustainable way to conserve the eco- system unless it solves the livelihood conflicts of the people. Options need to be multifaceted rather than uni-dimensional. It is significant to note that (example, changes in income), cannot ease the dependence on forests. However, after the institutional innovations, (for example, after Eco-Development Committee), some of the user-groups from poorer groups become environmental activists and protectors. They encouraged the sustainable use of resources and prevent outsiders from entering the forests. The effects of regulation and bio-diversity loss are not experienced uniformly across all social groups in the region. Non-Government-Organisations and other institutions have worked to improve the material well being and the social opportunities of the poor groups.

A long-term perspective is required, to take advantage of environmental opportunities and are particularly relevant when dealing with environment and development issues. The issue of alternative sources or substitution and the environmental definition of sustainability are particularly important, when considering the poverty-environmental interactions. Another

implication is that sensitivity to specific conditions and factors is essential rather than a direct target-oriented programme for poverty eradication.

The negative externalities generated by the Sabarimala pilgrimage affects their health and means of survival though it generates positive externalities by way of income for other groups. An in depth analysis focusing on this dimension may capture the diverse nature of poverty and environmental linkages. Since the issues are more related to policy questions, the different approaches would be helpful for 'compromise' decision-making process. The policies and investments to improve sustainability in management of natural resources could take into account the interactions between poverty and environment, different influential factors and their impacts on livelihood and conservation practices.

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Appendix I

CENTRE FOR DEVELOPMENT STUDIES
M.Phil Programme in Applied Economics, 1999-2001

INTERVIEW SCHEDULE FOR FIELD SURVEY
*Access, Constraints and Use of Natural Resources: A Study on Poverty-
Environmental Linkages of Forest Fringes In Central Kerala*

Name of the Investigator:

Date

I. Identification

Name of the Hamlet []	House No. []	Category ¹ []
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1. 1-SC,2-ST,3-migrants,4-Tribe

II. Household particulars

II.1 Type of the house

Respondent	
Type of the house ¹ []	Obtaining water facilities ^{II} [] For Drinking []
Sanitation facilities ^{III} []	Elctrification ^{IV} []
Using LPG/other equipments ^V []	Other kitchen equipment's ^{VI} []

I. 1- Roof thached with leaf wall, 2 - Roof thached, 3- Tiled; 4- Tiled with furnished. 5- Concrete, 6-Rent

II. 1-own well,2-others well,3-river,4-borewell,5-other

III. 1-good,2-satisfactory,3-poor

IV. 1-full electrified,2-partial-in one room-electrified,3-not electrified

V. 1-LPG,2-elctrified cooking equipments,3-kerosene 4-firewood,5-using different equipments including 3 & 4, etc

VI. 1-phone, 2-radio,3-TV,4-vehicle ,etc

II.2 Family particulars

No	Age	Sex	Edn	Occupation

III Sources of Income of the household

Sources of income	
Land	
Wage	
forest products	
Fishing	
Livestock	
Others	
Total income	

IV. DETAILS OF THE LAND

1. Size of the land
2. Secure of title deed [yes/no]
3. Importance of title deeds [1/2/3/4/5/6/7/8]

[Notes: 1- Get assurance ; 2-Acquisition of commercial loan, 3- Give proper land ownership, 4- Can be used to settle land disputes; 5- Enables owner to lease land to others; 6- can be used to plantation crops; 7- more dependency on forest resources; 8- other reasons]

V. Credit facilities

1. Do you getting any credit facilities for short/long term needs

Source of credit	Nature ¹	Availability ²	Purpose
Money lenders			
Co-operatives			
Credit societies			
Banks			
Others			

2. Are you facing any problems from credit facilities e.g., from money lenders[yes/no]
3. If yes/no problems

VI NATURE OF DEPENDENCY ON FOREST RESOURCES

1. Do you have any dependence on forest products [yes/no]
2. If yes/no reasons :
3. Details of the forest products of the last one year or from last collection

Items	Purpose ¹	Distance (km)	Nature ²	How much ³	Legal/illegal	Market ⁴		Cost ⁵	Revenue
						1	2		

Notes: 1 own purpose/others/for sale; 2: daily(1),weekly(2),monthly(3), seasonal(4),once in a year (5); 3. Kg/kettu in case of firewood/any other

4. 1- credit society, 2- other markets: direct to market/through money lenders/etc co-operatives, other mediators, transfers

5- cost in terms of daily wage of other jobs, time period for get money from the products, in terms of whether direct/indirect

4. Are you collecting forest products for different purposes, is there any difference in nature of collection, e.g., every day, once in a year etc.

5. Which are the purposes for collection of forest products [own/for others/ sales/sabarimala and tourist season]

6. Details about the collection

Itmes	Purpose ¹ , how much ² , and nature of collection ³																	
	Own			Others			For sale			Sabrimala			Tourism					
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	4	4	4
	4			4			4			4			4			4		

1 forest products collection [yes-1, no-2]

; 2-distance from border area to collect the resources

3 – how much, size and quantity depends on products,e.g.firewood in terms of *kettu*

4. nature of collection: 1-daily,2-weekly,3-monthly,4-seasonal,5-once in a year, 6-no time specific

7. Is there any difference in collection and method of forest products depends on the use and purposes [yes / no]

8. If yes,

Purpose*	item s	Use	How to collect	Labour time	Reasons for collection	Any alternatives to products/use

Notes:

* - own purpose, for seasonal, for others, for sale etc

@ items: firewood, honey, mfp, grass etc;

\$: different use: 1-own use;2-for others;3-for sale;4-sabarimala season,5-Tourist season

2. sabarimal and tourist season

3. distance from border area, it may change depends on the products, purpose and quantity of resources.

9. Do you have any legal right to collect forest products [yes / no]

10. Did you used any kind of rights to access

11. Is there any law to restrict to enter the forest

12. Is there any difference in collecting the forest products with or without rights

13. Is there any illegal collection of forest products

14. If yes,or no

15. How, who will collect

VII. ACCESSABILITY OF FOREST RESOURCES

1. Do you feel any difference in accessibility of forest resources [yes/ no]

2. If yes,

3. Since, when

4. How did you feel it, on which items

5. Now how people are using forest products

6. Is there any government policy to influence the pattern of use

7. Is there any periodisation for pattern of accessibility

8. Which are the items used to take from forest resources:

9. Items distance how to collect

Items	Time	Distance	How to collect	Is there any different in nature of use (Yes/no) If yes, difference and reasons

10. What are the difficulties happened because of the restriction on forest entry.

difficulties	any alternative	affects on income [yes / no] if yes, how and what are the reasons