CHAPTER – I

INTRODUCTION

The development practices to achieve economic growth, stability and the eradication of poverty in the third world have been said to be in crisis, gridlock, impasse or passé over economic theories and tools of mainstream economic schools and international organizations. Economists (western, conventional and neo-classical) have failed to address the fundamental development perplexities of South because they are hooked with linear economic judgments of the problem and are faced with inadequate experience at the grass root level about the social, ecological and cultural constraints of the problem. Economists of the South have pointed out that developed countries, having only one third of the World's population, consume 80% of the World's resources, and an average consumer of the developed countries uses up almost sixteen times as much of the World's food, energy and material resources as his counterpart in the third world countries. Commercialization of natural resources is prompting this phenomenon and this is a disutility that questions the integrity of the society and the fertility of nature. The poor, have-nots, the marginalized and downtrodden people are forced to pay the cost of commercialization, what the mainstream economists call externalities in production and consumption. Commercialization of natural resources increases the social direct cost, social opportunity cost and ecological cost, and also arrests the development momentum. However, the existing tools of economics are inadequate to address these issues.

Fresh water is a finite and vulnerable natural resource, to nurture life, economic growth and persistence of ecology. But the growing demand and dwindling supply of water transforms it as an economic good, increases its price and denies it to the poor. Over-extraction denies water to the ecology. Water source dependent communities are excluded from their livelihood and the 'public-ness' of the water

sources are under threat. The demand–supply gap, privatization and commercialization, pollution, undermining of environmental concerns and unethical pricing mechanism in the water sector are deepening these problems.

1.1 STATEMENT OF THE PROBLEM

Water resource management has focused on well-defined problems that have grown increasingly urgent during the 19th and 20th centuries as urban population becomes more concentrated and industrial and agricultural activities intensify. Water is likely to become one of the most pressing issues of the 21st century. At present, freshwater is becoming the most important politico-economic strategic resource, essential for ecological life and sustainable development. Now a market existing for water and commercialization has taken hold of it. The problem is that, if water is perceived as an economic good, the environmental/ecological costs, social costs, social opportunity costs and human and ecological rights are snubbed by economic costs of water from the natural resource debates. Besides, governance (in its economic logic) of urban water is comparatively less complicated than rural water valuation and pricing. Ever since the politicization of urban water requirements, the other costs in the water management scenario have been subdued. In addition, commercialisation of rural water for urban needs claim a resource conflict between urban ecology and rural ecology; even if pacified by the political will. Pumping of water to the urban human-industrial ecology is worsening the water scarcity conditions in rural ecology; even then the virtual water trade and water tradeoffs are gagged. This has prompted the United Nations to declare 2005–2015 as the international decade for action with the motto "Water for Life", which is the World agenda with greater focus on water scarcity and related issues.

It is obvious that the human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses; and this is the end of all water discussions. On the other hand, the eco-

centric ethical rights on water emphatically emerge from water discourses. Therefore, questions such as: who should produce water? How is it to be distributed? Is water a human need or right? Is water an economic good? If water is privatized who will buy it for nature? How will it be made available to the poor? What is the role of government in the stewardship of water? Who is the custodian of Nature's livelihood? How do ordinary citizens become involved in the discussion? etc. are commonly raised on water in rural water scenarios.

1.2 OBJECTIVES OF THE STUDY

The following are the primary objectives of the study

1. To examine the features of cost-leading prices and its futility to social and ecological cost assessment of rural water resources.
2. To understand water as a 'public-commercial' good.
3. To identify "water for life" as one of the indicator of development.
4. To examine issues related to sovereignty, livelihood and gender equity on water.
5. To develop case studies and analyse them in support of the above stated objectives.

1.3 SIGNIFICANCE OF THE STUDY

The study elucidates the concepts of social cost[1], social opportunity cost[2] and ecological cost[3] that help policymakers to check the deterioration of common properties. The study also seeks a space in natural resource democracy and green politics. It claims a space in development economics and strives to make a paradigm shift in development theories. The study deals with water economics, which is a subject matter of ecological economics, and examines rural water as a politico-economic strategic good for development. The "water for life" notion widens the significance of the Human Development Index (HDI) and Human Poverty Index (HPI) as development measures that supplements ecological

sustainability to welfare indices. Contemporary Indian socio-economic-political arena is replete with natural resource conflicts. Therefore, the study enables to create awareness among people about the economic significance and democratic space of common properties with particular reference to water. The research particularly focuses on rural well-being questions and thus seeks to emphasize the significance of natural resources in social choices. Finally, the study tries to answer the complex questions as to who are the custodians of natural resources and who will serve the stewardship of natural resources? The conceptual model of this work (New Ecological Economic Model) desires to broaden the development concepts viz. freedom as development, commodity capability approach and sustainable development.

1.4 DIMENSIONS OF RESEARCH

The present study has chosen water as an empirical device to develop a new theoretical framework through case studies. The problems related to water are more severe and visible and have local and global political dimensions than other environmental domains such as air, soil and forests, because water-related issues are more visible than air pollution, more widespread than soil deterioration and have direct impact on livelihood than forests. Due to the dwindling supply of and growing demand for water, the linkages of water to ecosystem have to be understood in an ecological-economics context with a new vision that provides resolution in resource conflicts. To sharpen the insights and to handle the research process in a systematic way, the proposed study is limited to "commercialization of water", considered to be the gravest political and ecological issue in contemporary economic panorama. However, these issues are managed unconvincingly by neoclassical environmental economics and marginalised them to pollution-related economic problems. The present study examines the water-related questions over a wider perspective - ecosystem management and governance for a sustainable future.

1.5 METHODOLOGY AND DATA SOURCES

For the sake of convenience, the study explores the existing theories viz. price theories, external cost theories, opportunity cost, cost benefit analysis, and development indices to achieve a precision in development issues and ecological economics. For the purpose of empirical validity, it takes into consideration specific secondary data, working papers and other sources like research papers, seminar abstracts, articles etc. Human Development Reports, World Water Reports, World Development Reports, Millennium Ecosystem Assessment Report, various government policy papers and statistical reports which have contributed majority of data to the present study. The study has used primary data from the case study areas by participatory research techniques to substantiate the concepts and ideas. Semi-structured interviews and surveys are also applied in this study. The present study not only uses case study methods but also employes explorative and historical methods to collect data from various sources such as books, pamphlets, periodicals, surveys, other case studies and electronic sources. Reports and scientific studies published by various NGOs viz. Vikas Adhyayan Kendra (VAK), Mandan Adhyayan Kendra (MAK) and Attappady Hill Area Development Society (AHADS) were helpful in this context. Overall, it is an attempt to critically revisit the mainstream theories of economics/ environmental economics. The methodology and methods of the study are discussed in detail in chapter three.

1.6 CONCEPTS AND TERMINOLOGIES

The present study "Commercialization of Water: A Study on Development Issues and Ecological Concerns" fundamentally searches for a new conceptual model labelled NEEM (New Ecological- Economic Model) within the water domain. The study confines water as a research tool rather than a problem, while focusing on water scarcity and water trade-offs between ecosystem[4] and market/social system[5]. The following (selected) defined and redefined terms and concepts are the bases of

research that compose the multidisciplinary features of the study and develop a new contemporary ecological-economics paradigm.

Ecology: The present study employs the term *ecology* as a universal set of biotic and abiotic[6] organisms as well as the study of goods and services provided by the natural ecosystems and its integration with the defined "human ecology"[7].

Development: An anthropocentric word, it generally indicates the socio-economic well-being or progress of a society. However, the study incorporates the ecological well-being perception and the term *development* takes on a radical socio-centric line of synthesis.

Radical Socio-centrism: A new terminology exclusively developed for this study, its analytical ideology considering ecology as an asylum of human beings. Thus protection, conservation, management and governance of ecosystem (biotic and abiotic) for a sustainable future of the present and future generation is the ethical responsibility of the contemporary society.

Commercialization: The term *commercialization* indicates production and selling of goods through well-defined market links. According to the political and cultural logic differences (e.g. eastern values, green politics and feminist ideologies), the term *commercialization* seems to be perceived negatively in the vistas of sociology, economics and ecological studies of south.

Commercialization of Water: The rural water debates are always guided by green politics, feminism, environmentalism and Marxist and socialist ideologies that put off 'commercialization' as an efficiency stigma of material-welfare. *Water commercialization* is not synonymous with water privatization or water pricing. The term refers to a broader set of linked transformation related to governance, management and employment of water for socio-economic and ecological well-being of 'social-ecology'[8].

Ecological Economics: The term "ecological economics" is an amalgamation of three Greek words –*oikos* (household) *logos* (study of) and *nomos* (management). Ecological economics, therefore, means the study and management of the "household" (nature or ecosystem). In its extensive academic sense, ecological economics is defined as a *field of study that addresses the relationships between ecosystems and economic system* (Kolstad 2006).

Ecological Concerns: indicate the ecological quotient of an individual as well as the community.

1.7 SOCIO-ECONOMIC-ECOLOGICAL SPACE OF WATER

Forces of demand and supply play a strong role in allocation and distribution of water. Demand for water is rapidly increasing due to population explosion whereas supply, in its entirety decreases by pollution and mismanagement. At the same time, financial, technical and environmental constraints limit our capacity to tackle the demand-supply gap. Without water there is no economic system; in this sense, it may be an economic issue. However, water is a sociological oddity and ecological futurity, and the question is - how do we put water at the core of life; in this regard it must be considered as an issue for development. The services and benefits provided by water resources are immeasurable.

1.7.1 Household

Water is required in households for numerous purposes – drinking, bathing, cooking and washing utensils and clothes. Over the next 20 years, the average supply of water per person is expected to drop by one third. 1.4 billion people do not have access to safe water. The daily per capita water use totals 600 litres in residential areas of North America, while in Sub-Saharan Africa it is just 10 to 20 litres. The amount of water available per person in India decreased to 1250 cm in 1999 and is expected to reduce further to 760 cm in 2050. In 1993, only 78 percent of rural and 85 percent of urban inhabitants had access to drinking water.

About 143,000 villages still have acute water problems, and many more have unreliable water supply (IGIDR 2000). "… Water is precious to man and therefore World Health Organization (WHO) suggests control of water supplies to ensure that they are pure and wholesome, as one of the primary objectives of environmental sanitation. Water may be polluted by physical, chemical and bacterial agents. Therefore, protected water supply is sine qua non of public health of a community (Government of India 1984). So, proper drinking water supply to all is an indispensable duty of the State.

1.7.2 Agriculture

Agriculture is the backbone of every developing country. It provides food and fodder as well as employment and income. 67 percent of the Indian population is engaged in agriculture which contributing 30 percent of GDP. Agriculture has a spiral effect on the economy and plays a credible role in economic growth.

In this context, the availability of water and its uninterrupted runoff increases production of buffer stocks of cereals and vegetables. Scarcity of water adversely affects the production of food grains and the ever-growing population is forced to eke with a little back and half-empty bellies. Irrigation increases people's purchasing power and expands their entitlements to food nutrition and social choices. *Access to reliable, good quality irrigation reduces the cost and the quantum of food production by reducing the risks faced in rain fed agriculture* (Shah 1998).

In 1950-51, the total irrigated land area in India was 22.3 million hectares which increased to 55.1 million hectares in 1996-97 and reduced to 53.1 million hectares in 2002-03. The pattern is pessimistic, as compared to our growing population. There is a correlation between irrigation and food security; it enables farmers to adopt new techniques and intensive cultivation, both of which make possible significantly higher crop yields per acre.

1.7.3 Industry

Twenty eight percent of India's GDP is contributed by industries. While 30 km^3 water was consumed by the industrial sector in 1998, 37 km^3 water is estimated in 2010. For a developing economy, India's industrial growth is significant, which absorbs 15 percent of the total labour force in India. Ensuring the availability of water to this sector is an irrefutable priority in order to enhance the production of goods and maintain the productivity and health of the labour force. So, to provide affordable, acceptable and reliable water in quality and quantum to industry is the responsibility of the State.

1.7.4 Energy

Production of hydro-electric power is largely a post-Second World War phenomenon, and is justified as an economic by-product of irrigation, flood control and navigation projects as also renewable, non-polluting and more economical. In India, water requirement for power generation was 9 km^3 in 1998 and is expected to increase to 19km^3 in 2010 and 33km^3 in 2025. Thus, in a developing economy, the provision of hydro-power is an inevitable need.

1.7.5 Culture

All civilizations and major cities in the world have emerged in river valleys and expanded through water roots. India has a strong historical tradition, as seen in many other older civilizations, to manage, govern and enjoy a healthy relation between man and nature. This tradition is preserved from generation to generation through socio-cultural practices and religious customs. Ethnic groups treat natural resources like water, land, trees and air as Gods and Goddesses. Most of the customs and rituals are related to water and river. Furthermore, water is a mark of incredulous origin of living beings. Our recreational activities, hobbies, exercises and sports also depend on water. In this modern world, people are willing to pay and spend more time in water parks. So, water satisfies our

recreational need. Water has an aesthetic value and the fostering and nurturing of agro-lands, forests, backwaters and aquatic life is directly dependent on availability and quality of water.

1.7.6 Ecology

Ecology is the means of every economic, social and cultural activity. In this context, a policy shift from anthropocentric to eco-centric, which recognises the important role of water in maintaining ecological balance, becomes necessary. Scarcity of water by over extraction, pollution, contamination and mismanagement creates a deep chasm in the relationship between ecology and human existence. Water is indispensable to the sustenance of forests, vegetations, aquatic, riparian and terrestrial species. Lack of water also sterilizes the eco-system, which leads to social insecurity, anarchy and extinction of flora and fauna. Therefore, it is the need of time to provide water to ecology to resist the desertification process.

1.8 WATER SCARCITY AND RURAL-AGRARIAN ECONOMY

The crux of the above discussion can be found in a single statement by Kenneth Boulding -'water is far from a simple commodity; it is a sociological oddity'. Apart from the above discussed matters, water plays a significant socio-economic role in the rural-agrarian economy and in the pace of rural development. Water empowers the capabilities of the rural poor, enriches their resources and widens their social choices. Improper use or poor access to water resources adversely affects the diet and livelihood of the poor. Increase in cost and decrease in accessibility and availability of clean drinking water results in a highly inequitable distribution of income and well-being among rural life.

While considering water as consumption good, lack of drinking water leads to ill health. This leads to low productivity of labour force, low income, and low consumption of food grains and again to further ill health. While considering as a

productive resource, lack of water in irrigation leads to low productivity, low income, low saving, low consumption and investment and again to low productivity of land. While consider water as an environmental good, low availability of water in the ecology will complete the vicious circle, thus exacerbating the spiralling effect of the former two. Pollution of water by fertilizers, pesticides and contamination will also deepen the problem (see Figure 1.1).

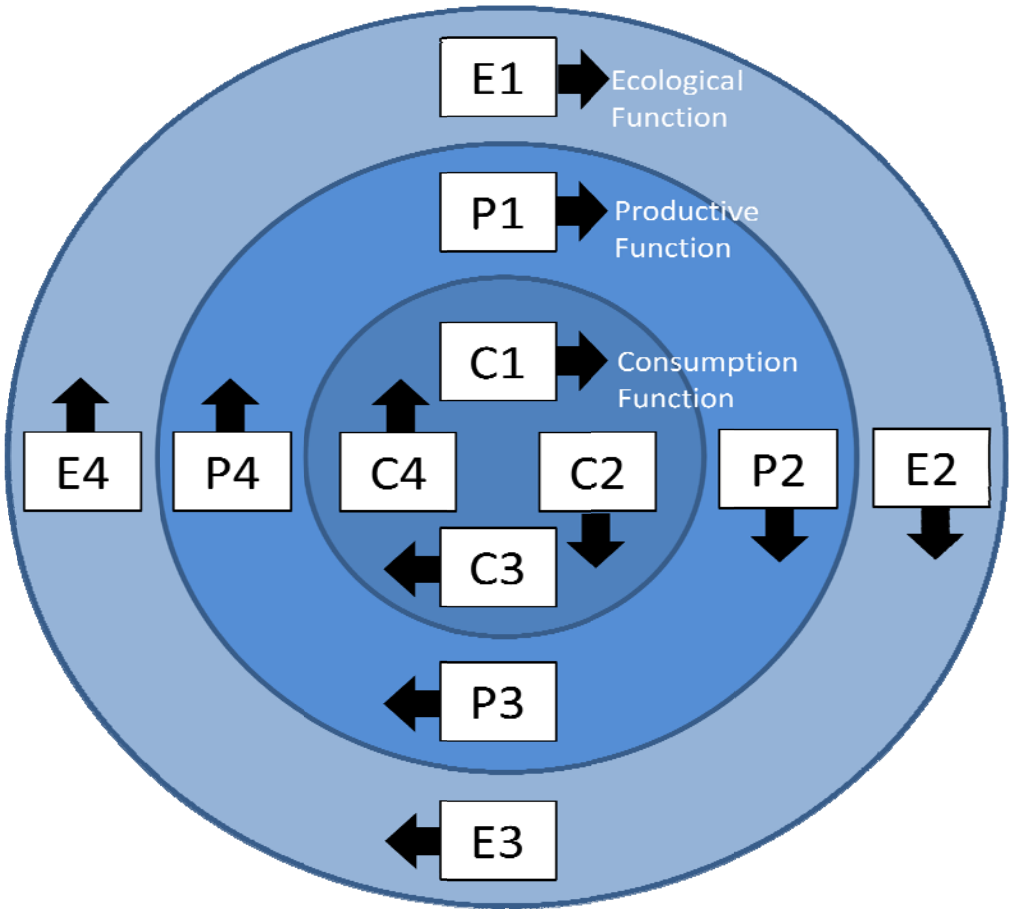

Fig. 1.1 Water Scarcity Driven Vicious Circle of Poverty

The **C**s refer to the consumption function, **P**s show the productive function and **E**s indicate the ecological function of water.

In the consumption function, C_1 indicates the scarcity of water leading to ill health of people which negatively affects the working capacity (C_2) of the people. This

leads to low income (C_3), low savings and low consumption (C_4) of nutritious food and other amenities by the society. While considering the productive function of water, the lack of irrigation (P_1) will entail low productivity of crops and land (P_2) again leading to low income from agriculture (P_3). This adversely will badly affect investment in the agriculture sector for improved irrigation and the productivity of crop (P_4). In the ecological function, E_1 indicates the over extraction of water, E_2 refers to the contamination and pollution of water, E_3 denotes the mismanagement of water and E_4 shows the lack of water availability to the ecology. These have destructive spiral effects on the rural-agrarian ecology.

More extensively, consumption, productive and ecological functions of water, further link with livelihood questions. In coastal aquifers, due to overdraft, saline water has contaminated fresh water aquifers and has pauperized thousands of small farmers (Shah 2000). Assured access to irrigation can boost the livelihood and increase the food security of rural people. It empowers small farmers to diversify their cropping pattern to include a mix of food and cash crops. Reliable water for subsistence agriculture, home gardens, livestock, tree crops and the sustainable production of fish and other foods gathered in common property resources are key to improving the food security of those most vulnerable to hunger. Hence, food security needs to be addressed at the local level, the landless people, women-headed households, rain-fed farmers, livestock herders and other vulnerable groups. *'Water shortage will typically affect the poor more than the non-poor and may force them to migrate in search for livelihoods based on better water supplies*' (Holmberg 1991). Water poverty (difficulty to secure adequate fresh water) is the major cause and effect of rural poverty as well as global ecological imbalance. This leads the rural-agrarian economy to a deprivation trap.

'Deprivation trap' has five sets of factors viz. poverty, physical weakness, isolation, vulnerability, and powerlessness. As discussed earlier, poverty is related to improper water supply; and refers to lack of income and wealth. The remaining

four factors are strongly correlated to this water-poverty puzzle (see Figure 1.2). To escape from this trap, there should be ensured a 'triangular democracy', which is based on the dependent people's voice on water, land and employment. Water is a matter of the very existence of life, land is a matter of power and employment is a matter of social space (Alex 2003).

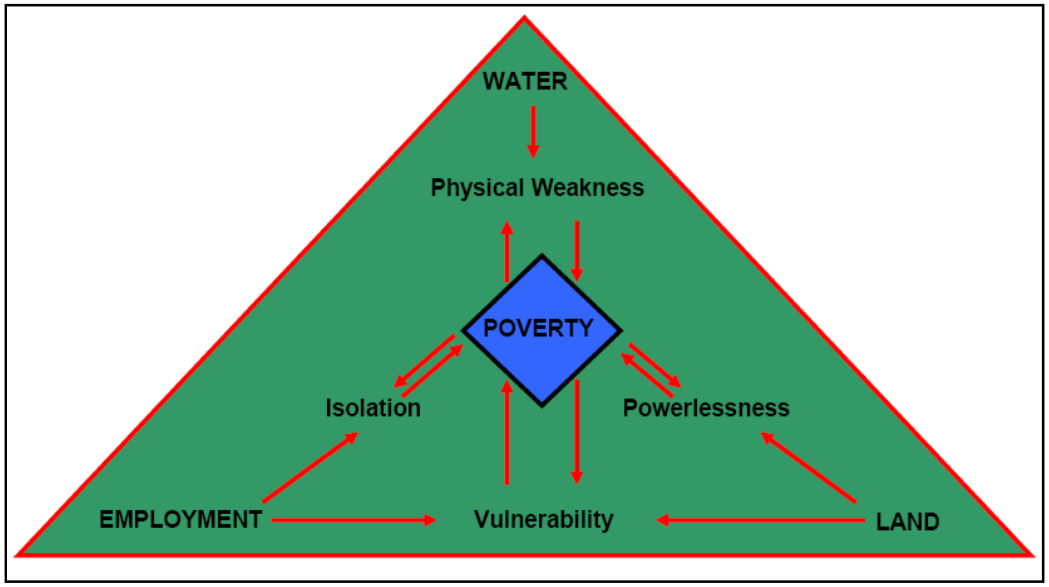

Fig. 1.2 Triangular Democracy and Deprivation Linkages

The three concepts viz. the water related 'vicious circle of poverty', 'deprivation trap' and 'triangular democracy' are correlated to each other and water plays the central role among them. Based on this, one can say water is far from a free good; it is a livelihood matter. So, a good economic and political will to manage the water resources and uninterrupted runoff of this economic development agent becomes necessary. Above all, within the socio-economic-political and ecological constraints, the rural community must revitalize the governance of village water bodies for protecting their multiple use nature and widening people's choices.

1.9 CASE STUDIES

This research focuses on two case studies: The first case is a livelihood question of water exploitation by Hindustan Coca–Cola Beverages Private Limited (HCBPL)

and subsequent pauperisation of the ecosystem of Plachimada- a small village in Palakkad district of Kerala. The second case considers an eco-restoration experiment and the resultant socio-economic and ecological changes in the region of Attappady in Kerala. Besides these ecological and economic issues including topographical differences, both the areas interestingly share a common agrarian socio-cultural pattern of life.

1.9.1 Case Study I- Coca-Colanisation at Plachimada

It is a sensitive water conflict issue between the people of Plachimada and Hindustan Coca–Cola Beverages Private Limited (HCBPL) addressed as the problem of commercialisation of water (Coca-Colanisation[9]). This case study tries to re-address the socio-economic consequences of commercialization of water by Hindustan Coca–Cola Beverages Private Limited (HCBPL) in a water rich region, Plachimada where, villagers are suffering through acute scarcity of safe drinking water and de-development. Over the last six years, the people of Plachimada have been at the fore front of a battle against Coca-Cola to protect their water and lives, demanding closure of the Coke plant and compensation.

The Locality

Plachimada (abode for the schedule castes and schedule tribes) is a little hamlet of Palakkad District, which is popularly known as the “rice bowl of Kerala”. It is a part of the Moolathara Village, which is one among the three villages of Perumatty GramaPanchayat in Chittur Taluk falling in the Palakkad gap area.

The Problem

Perumatty panchayat has 2350 hectare of rice fields out of which 1500 hectare are in Moolathara Village where the factory is located. In 2000 March, the Company began its production of Coca–Cola, Fanta, Sprite, Limca, Kinley Soda, Maaza, ThumpsUp and other soft drinks. As per the information given by the Company, the factory pumped out 5.0 lakh liters of ground water daily from 6 bore wells and

2 dug wells. It is learned that the factory had worked on nearly 16 bore wells apart from the two open ponds. The unit has a working capacity of 15 lakh litres of water based products. After the arrival of HCBPL, the water level in the wells of the surrounding colonies showed a sharp depletion. The quality of the water, its odour, taste and hardness, got worsened. It became non-potable due to contamination, adversely affecting the people, especially the women, forcing them to fetch water from a distance of three to five kilometres. Several uncommon diseases started to show up. Due to severe shortage of water, the farmers around the plant stopped cultivation and lost their meagre daily earnings. They were forced to migrate to faraway lands, seeking work. Agriculture is the most important occupation for the population in this area and 20% depend on other unimportant work for their sustenance.

1.9.2. Case Study II- Eco-restoration at Attappady

Attappady Wastelands Comprehensive Environmental Conservation Project (AWCECOP) is a major watershed based ecological conservation project by Attappady Hills Area Development Society (AHADS). With, a 'nurturing the nature' practice in a water scarce barren land, it has a well defined objective – "*ecological restoration of degraded wasteland in Attappady and development of replicable models of participative eco-restoration, so as to prevent further degradation and promote sustainable method of livelihood for the local people (with special emphasis on tribal population) in harmony with resource base".*

The Locality

Attappady in Palakkad district, Kerala state (location between 76^0 21' & 76^0 48' East Longitude and 10^0 57'&$11^0$15' North Latitude) is a plateau sloping towards east on the north of the Palakkad gap and the south–west base of Nilgiris in Western Ghats. It is separated from North by Nilgiri District of Tamil Nadu State, East by Coimbatore District of Tamil Nadu State, South by Malampuzha and Mannarghat

Block Panchayats of Kerala State and West by a hump-like steeply sloping mountain range of Malappuram and Palakkad districts of Kerala.

The Problem

Once, Attappady was a land of virgin forest which included the world famous bio-diversity hotspot, The Silent Valley, inhabited exclusively by three tribal communities- Irulas, Mudugas and Kurumbas (primitive). By the nineties it had turned into a wasteland facing desertification as a result of in-migration of new settlers from Kerala and Tamil Nadu. The migration process started at the end of 19th century and has continued till date. Since 1950s, Attappady Hills experienced exhaustive tree felling and heavy migration from the valleys of Kerala and the plains of Tamil Nadu that caused ecological deterioration, poverty, ill health and socio-cultural anarchy that hooked them to the wretchedness of life. In this context, AWCECOP of AHADS, since 1996, is a unique experience in poverty eradication, eco-restoration and socio-economic-ecological integrity. Now Attappady Hills have been turning fertile green and damp with soil and water conservation as well as afforestation programmes. Subsequently, the socio-economic scenario of Attappady has improved remarkably.

1.10 TOOLS AND TECHNIQUES

The study employs a three-pronged research approach viz. case study methods, explorative research methods and descriptive methods. The latter two techniques support the former and also work independently for the conclusion of theories mainly for clarity on the issues occupying the central theme of the study. The study uses secondary data from reports and articles and adopts a historical analysis. The primary data are obtained through participatory research techniques[10], semi-structured interviews, focused group discussions, observations and conversation with people and interviews with selected experts. Chapter three comprehensively discusses these methods.

1.11 ORGANISATION OF THESIS

The thesis is organized under eight chapters, as follows:

Chapter I: Introduction

The introductory chapter gives a brief outline of the thesis, particularly the research problem, objectives, rationale and significance of research, tools and techniques, data sources, modus operandi and chapter scheme as well as an introduction of the multiple use nature of rural-water sources.

Chapter II: Literature Review

The second chapter is dedicated to review of related literature with five sub-sections namely readings in environmental and ecological economics, readings in development economics, readings on water issues, readings for creative perception and identification of research gap ending with a conclusion of the chapter. The chapter is well equipped to locate the direction of the thesis.

Chapter III: Research Design and Methodology

The study employs multidisciplinary research analytics to solve the research problems supported by various ontological constructs. Readings in sociology, history, philosophy, ethics, economics, political science, ecological and environmental studies, other physical sciences and participatory action research have helped to develop new ontological constructs for the New Ecological Economic Model (NEEM). The chapter extensively examines the basic economic models, clarifies the concepts and terminologies, describes the data sources, elaborately discusses the tools and techniques as well as the research design and methodology.

Chapter IV: Environmental Domains and Economics

The aim of this chapter is to develop the NEEM as an analytical framework for a rural-agrarian economy or eco-economy. The first part of the chapter critically re-

examines the behavioural pattern of the market economy and economic individuals, theoretical background on cost, production and pricing, theories of externalities and drawbacks of neo-classical environmental valuation with an eco-centric view. The second part discusses the conceptual framework of the NEEM with clear insights on ethics and value norms, human and ecological well-being standards, ecological sustainability and sustainable development.

Chapter V: Water Market vs. Real Economy: Critical Issues

This chapter vividly illustrates the role of water in the ecosystem and the social system - water as an economic, ecological and public good. Human vs. ecological right on water is the subsequent discussion point of the fifth chapter. The chapter explores the global as well as national water demand–supply pattern, international and national hydro-politics and theories of water valuation; examines the economic good argument on water and re-examines the social cost, ecological cost and real value of water in rural socio-economic-agrarian context. The chapter proposes the water district concept and Catchment Area Constituency (CAC) model as a governance tool for water. Investigation on the issue of 'Commercialization of Water[11]' with constructive socio-economic-ecological rationalization is the main focus of this chapter.

Chapter VI: Socio-Economic-Ecological Affairs of Water: Case Studies in Point

This chapter includes empirical studies on water exploitation issues of Plachimada and eco-restoration experiments of Attappady. It explores the socio-economic analysis of Plachimada and Attappady supported by primary data that has been collected through participatory research tools and techniques.

Chapter VII: NEEM with Water Domain

This chapter discusses the ecological sustainability and socio-economic well-being of the people of Plachimada and Attappady under the ecological economics

background. It places the ecosystem services as the key source of socio-economic development. The chapter identifies water as a variable of eco-economic wellbeing and the NEEM analysis reinforces the role of water in rural economic sustainability. The multidimensional approach of NEEM presents water as an economic development device; examines gender and livelihood issues related to water commercialisation; discusses the socio-cultural behavioural pattern of rural life; probes governance and sovereignty issues on water and places water as an indicator of human development. The second half of the chapter probes the question on 'How to make water a Public good' with rural water management techniques and practices.

Chapter VIII: The Water Wisdom: A NEEM Perspective

This concluding chapter incorporates the search for a policy frame on the basis of NEEM; conclusion and synthesis of the research with major findings, limitations and implications of the study; significance of multidimensional ecosystem valuation in economics and suggests water cartel pricing techniques, Catchments Area Constituency model and Bio-index of development for further research.

END NOTES

[1] Social cost is an indirect payment (loss of well-being) by a society to produce a commercial good and this cost is nowhere accounted as a sacrifice of people.

[2] Social opportunity cost may be stated as wear and tear of one significant livelihood or natural resource and its diminishing accessibility by a society due to the production of sophisticated (resource wasting) commercial good, which rules out alternative uses and benefits from the society.

[3] Ecological cost is the foregone benefits, fertility and sustainability of ecology due to reduction, depletion and contamination of natural resources by the over-exploitation and production of a commercial good or service.

[4] A biotic community and its abiotic environment functioning as a system (Odum and Barret-2005).

[5] Human community and its economic functions viz. production, distribution and consumption.

[6] Nonliving components of an ecosystem, such as water, air, light and nutrients.

[7] Human-centric approach to ecology with the recognition that human beings are the centre of nature; human ecology means a system of human beings and their material environment.

[8] Social ecology is an interlinked system as "Society" with the recognition of the often overlooked fact that nearly all our present ecological problems arise from deep-seated social problems. Conversely, present ecological problems cannot be clearly understood, much less resolved, without resolutely dealing with problems within society.

[9] Coca-Colonisation, illustrates the ravage of water by any water business firm; the terminology was introduced by environmentalists and social activists and commonly used by social scientists to illustrate the new imperialistic exploitation of natural resources of the South.

[10] Participatory Research (PR) is "learning by doing" - a group of people identifies a problem, make efforts to resolve it, see how successful their efforts are, and, if not satisfied, try again. Participatory research is commonly using in the fields of agricultural research, ecosystem management, forestry management, tribal development programmes, and watershed management by the support of stakeholder associations or groups.

[11] Trade off of water between ecosystem and social system.

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