



SUSTAINABLE DEVELOPMENT OF KERALA: A RETHINKING FOR THE 21ST CENTURY

ABSTRACT



Ismayil P¹

¹Research Scholar,
Department of Economics,
Jamal Mohamed College
(Autonomous)
Tiruchirappalli, Tamil Nadu,
India

The term sustainable development is one of the most important concepts which are widely discussed throughout the world. It discusses the fulfilling of the needs of present generation considering the necessities of future generation. The present scenario of the world is limited resources, but amazing increase in the wants of people. As a common challenge all over the world faces, the state of Kerala, one of the smallest states in the republic of India also faces the same situation. Sustainable development is the level of development sustaining limited resources necessary to satisfy the needs of future generations on the planet. Sustainable development has long term potentials and is the only way desirable for a growing economy. People already use a huge amount of the earth's non-renewable resources to maintain their everyday lives. The higher the number of people, the more will be the resources needed and it makes resource depletion faster. The greedy minds of the people and his wasteful consumption style have been creating irreparable damages to the environment. The objective of this paper is to construct a coherent vision of sustainable development in the twenty first century in Kerala and bring the necessity of sustainability in to the minds of present generation. Also it aims to provide a better understanding on the current challenges which are being faced by our ecological system and environment.

KEY WORDS: Environment, Pollution, Sustainable Development, Sustainability, Clean Water, Ground Water.

INTRODUCTION

The concept of sustainable development has been discussing from earlier decades by environmental movements. But the term sustainable development was brought into the main stream by the summits such as the Earth summit in Rio, Brazil, in 1992. Sustainable development is an approach to development that takes the finite resources of the earth into consideration. At present, environmental issues are arising globally. Humans depend on a sustainable and healthy environment, and but the same human beings have damaged the environment in numerous ways. Sustainable development is an approach to economic planning that attempts to foster economic growth preserving the quality of the

environment for future generations. Ban Ki-Moon the secretary General of United Nations has declared recently, Sustainable development to be at the top of the global agenda. Robert S. McNamare, the President of World Bank and US Secretary of defense, formulated the concept of "sustainable development" which attempted to reconcile economic growth and environmental protection in developing countries. When Gro Harlem Brundtland (prime minister of Norway) became the chair of the UN World Commission on Environment and Development, introduced the idea of "Sustainable development" through "Our Common Future".



The most frequently quoted definition of Sustainable development is from 'Our Common Future', which also known as the Brundtland Report. It says: "Sustainable development is development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs". United Nations says that there will be more than 10 billion people living on the Earth by the year 2100. This explosion in population is one of the greatest reasons why sustainable development is most important. The definition includes conserving an ecological balance so that depletion of earth's natural resources can be avoided. To understand the human right violations in their legal, social and political aspects.

RESEARCH OBJECTIVES

- 1) To understand the environmental challenges of Kerala
- 2) To examine the implications of environmental protection acts
- 3) Frame the strategies for redressing environmental challenges and over coming environmental problems.

RESEARCH METHODOLOGY

A descriptive research methodology was used for this study. The study was conducted taking data from various secondary sources.

ENVIRONMENTAL CHALLENGES OF KERALA

Kerala State is situated at Western Ghats of Indian Peninsula. The State Kerala is located in the tropical region of Indian Peninsula and has the area of about 38863 km², which accounts for about 1.2 per cent of the total geographical area of the country. The State has a total coastline of about 560 km. Kerala enriches with 44 perennial rivers, of which three are East flowing and the remaining 41 are flown into the Lakshadweep Sea, along the western side of the State. The four medium rivers, namely Chaliyar, Bharathapuzha, Periyar and Pamba have a total drainage area of only 8250 km² with length 169 km, 209 km, 244 km and 176 km respectively. The length of rest of the rivers varies from 16 km to 130 km, with an average length of 62 km and total drainage area of 19,485 km². There are two fresh water lakes in the State namely the Pookot and Sasthamkotta. The State is also having a total of 46.13 km² of estuaries and backwaters. The important backwaters are Vembanad and Ashtamudi lakes. Ten broad groups of soils see

are red soil, laterite soil, coastal alluvial soil, riverine alluvial soil, grayish Onattukara soil, brown hydromorphic soil, hydromorphic saline soil, acid saline soil, black soil and forest soil. Thus At present, Kerala is rich with its environment. However, Kerala has been facing severe threat to its environment. Major environmental crisis which are being faced by Kerala can be titled as follows.

Declining of water quality

Kerala is rich with 44 rivers which together yield 70300Mm³ of water annually. However, the total utilizable yield is estimated to be 42000Mm³, only 60% of the annual yield. Kerala is one of the states having abundance of clean water. The major problems associated with water quality are seen in rivers and open wells. Quality of water is deteriorating due to bacteriological pollution, the dumping of solid wastes, bathing and discharge of effluents. Since clean water is a precious commodity for human beings are concerned managing and protecting surface and groundwater is essential for sustaining life. But now the quality of water in Kerala is threatened by activities such as discharge of effluents, domestic sewage, municipal solid wastes and industrial affluent.

Declining of ground water quality

Groundwater has been the main source for meeting the domestic needs of more than 80% of rural and 50% of urban population. Besides, it fulfills the irrigation needs of around 50% of agriculture. Recent problems are decline in water table, contamination of ground water, seawater intrusion etc. The ground water potential of Kerala is very low as compared to that of many other states in the country. The estimated ground water balance is 5590Mm³. Dug wells are the major ground water extraction structure in Kerala. The open well density in Kerala is perhaps the highest in the country - 200 wells per sq.km in the coastal region, 150 wells per sq.km in the midland and 70 wells per sq.km in the high land. The ground water withdrawal is estimated as 980Mm³ and the State Ground Water Department calculate the effective recharge as 8134 sq Mm³. This creates crucial environment problems such as drying of nearby wells, intrusion of salt water due to lowering of underground water level, and drying up of a large number of tube wells themselves. Generally, the ground water problems in Kerala in coastal areas are due to the presence of excess salinity, high fluoride, hardness, and coli forms, low pH, high iron content, high TDS (Total Dissolved Solids) and excess chloride

concentration. Besides, the contamination of soil also results in the pollution of groundwater due to heavy metals and toxic organic compounds. The use of such polluted water will affect the health of the people adversely.

Death of the rivers

Kerala has a large network of 44 living rivers. But now our rivers are on the face of death due to various reasons such as lack of rain, deforestation, indiscriminate mining of sand, encroachment of the banks by unauthorized settlers, Wet land filling, construction of dams and barrages, deepening of land along the river banks to manufacture bricks, indiscriminate use of fertilizers and pesticides, pollution caused by the discharge of effluent from industries, civic bodies and domestic wastes, salinity intrusion, soil erosion, siltation and drying up of rivers in the summer season. Industries discharge hazardous pollutants like phosphates, sulphides, ammonia, fluorides, heavy metals and insecticides into the downstream reaches of the river.

Mining of Mineral Resources

Kerala State is rich with deposits of minerals such as heavy mineral sands (Ilmenite, rutile, zircon, monazite, sillimanite), gold, iron ore, bauxite, graphite, china clay, fire clay, tile, brick clay, silica sand, lignite, limestone, limeshell, dimension stone (granite), gemstones, magnesite, steatite etc. However, mining activities on large scale are confined mainly to a few minerals—Heavy Mineral Sands, China Clay and to a lesser extent limestone, silica sand and granite. In fact, heavy mineral sand and china clay contribute more than 90% of the total value of mineral production in the State.

Sand mining

The greatest single factor that led to the destruction of river ecology in Kerala is indiscriminate and unscientific sand mining from rivers. All the 44 rivers in Kerala are facing a big crisis because of sand mining. The construction boom, fueled by the inflow of remittances from non-resident Indians and the inherent nature of people to construct ostentatious residential buildings, leads to indiscriminate mining of sand from rivers. This has pushed the water table down, reduced the water holding capacity. The sand holds water and fills the nearby ponds and lakes by raising the water level. When the sand is removed from the river bed it reduces the availability of water in the wells and canals near the river. Removal of sand has resulted

in lowering or sinking of riverbeds which encourage the intrusion of saline water into fresh water, causing serious threats to drinking and irrigation. Indiscriminate sand mining in some rivers systems in the state is posing severe threat to the stability of bridges and banks.

Deforestation

Another area faces threat is forests of Kerala. High population density, artificial fires and corruption even among the law enforcing agencies is encouraging illegal encroachments of the forest. Deforestation has resulted in the destruction of forests. As forests are destroyed, the sustainability of the habitat for their wild animals is also seriously in danger.

Pollution

Another environmental issue affecting Kerala is pollution from various sources. Major pollutions Kerala faces are listed as follows.

Plastic pollution

In Kerala the use of plastics is increasing day by day. Plastics cause deadly pollution whose ill effects are irreversible. The chemicals which are used for making of plastics are highly toxic and cause serious threats to public health. Besides, constituents like benzene and vinyl chloride cause for diseases like cancer.

Vehicular pollution

Rapid urbanization and industrialization have led to the declining of quality of air. The number of motor vehicles in Kerala goes on increasing. This increase in the number of motor vehicles has led to the pollution of air. The pollutants released from the exhaust such as carbon comes from petrol vehicles, hydrocarbon, nitrogen oxides, lead, sulphur oxides etc. have resulted in the pollution of the air. Vehicles and industries are mainly responsible for the deterioration of air quality in the state. Both create noise and air pollutions. The number of vehicles on the roads in Kerala has increased more than 20 times since 1975. The last decade has been rapid increase in the number and diversity of vehicles on the roads of Kerala. Personal transport vehicles constitute 72% of the total vehicles in the state and 77% of these personal vehicles are scooters and motor cycles. Vehicular emission and noise from these vehicles are severe in the three major cities of Kerala namely, Thiruvananthapuram, Kochi and Kozhikode.

Noise pollution

Noise pollution caused by man made sources is the major contributor and needs urgent attention. These sources include industries, domestic sources, transport and traffic, construction activities, festivals and religious activities etc. WHO suggests that noise can affect human health in number of ways. The major causes of air and noise pollution in the state are due to automobiles and industries. Vehicular emission and noise from these vehicles are severe in the three major cities of Kerala, viz., Thiruvananthapuram, Kochi and Kozhikode. Indiscriminate and unrestrained use of loud speakers also causes for the sound pollution problem in the state.

Water pollution

Kerala is one among the most thickly populated regions in the world and the population is increasing at a rate of 14% per decade. The rivers of Kerala have been increasingly polluted from the industrial and domestic waste and from the pesticides and fertilizer in agriculture. Industries discharge hazardous pollutants like phosphates, sulphides, ammonia, fluorides, heavy metals and insecticides into the downstream reaches of the river. The major water quality problem associated with rivers of Kerala is bacteriological pollution. The assessment of river such as Chalakudy, Periyar, Muvattupuzha, Meenachil, Pamba and Achenkovil indicates that the major quality problem is due to bacteriological pollution and falls under B or C category of CPCB classification.

Soil pollution

Soil is the dumping ground of most of the waste products-domestic, human, animal, industrial and agricultural. Every year the solid wastes dumped into the soil are increasing at an alarming rate all over the world. These are leached by municipal and industrial wastes and are responsible for pollution of ground water in Kerala. The problem of soil pollution is compounded by the use of agrochemicals like pesticides, fungicides, bactericides, insecticides, biocides, fertilizers and manure. Besides these the soil is polluted by deadly pathogenic organisms. In fact, the soil has been heavily polluted as a result of industrial revolution and green revolution. Basically humans are responsible for the pollution of the land.

Pesticide pollution

Indiscriminate use of pesticides and fertilizers in Kerala to increase agricultural produce

has resulted in serious environmental impacts. Through our crop fields, the poison has seeped in to our food such as vegetables, fish, grains, meat and even in the breast milk. Studies show that less than 0.1 per cent of chemical pesticides in India reach the target pest. The remaining is absorbed by humans, livestock and the natural biota. One of the living evidences of fertilizer use in agricultural fields is the aerial spraying of the pesticide endosulfan on cashew plantations by Plantation Corporation of Kerala and its resultant impacts among the people of Kasargod, Kerala for the last few years. Government records show aerial spraying of endosulfan killed 486 people and affected the health of thousands of others until 2008 in Kasargod. About 4,000 have been affected over the past 25 years since the spraying began on government-owned cashew plantations in the district. Now the government of Kerala banned the use of endosulfan in the state.

Loss of bio diversity

Biodiversity is the variety of life on earth. It includes the variability of species in terrestrial, aerial and aquatic habitats, the diversity of ecosystems and the diversity of genes they harbor. It is an essential component of the nature and it ensures the survival of human species by providing food, fuel, shelter, medicines and other resources to mankind. Biodiversity serves the humans by providing the basic life supporting systems such as clean air, water and fertile soil. The current challenge on our bio diversity is the interference of human beings on environment. Over exploitation of nature and industrialization led by the human beings are threatening the existence of many lives. The major causes for the loss of bio diversity are the degradation of native agricultural-ecosystems, large conversion of agricultural land, introduction of exotic crops, mechanized farming, encroachments, cattle grazing, collection of fire wood, unscientific collection of non-timber forest produce, forest Fires, invasive species and mass tourism. The degrading of natural forests due to factors such as unregulated harvest, forest fire, weeds, diversion for non-forest purposes, soil erosion, harmful effects on management and poor regeneration leads to loss of biodiversity. Tree felling is another severe threat to biodiversity conservation in the state. The primary effect of tree felling on bio diversity is the removal of biomass and loss of habitat for many epiphytic and arboreal species. Tree felling leads to soil erosion and change of the soil properties.

Environmental problems created by tourism and Pilgrimage

Mass Tourism and Pilgrimage are considered to be one of the major and increasing threats to biodiversity conservation. Approximately 13 million people visit forest areas annually either as pilgrims or visitors. Among all the Protected Areas in India, Periyar Tiger Reserve receives a maximum number of tourists. The large influx of people into the forests in short duration makes severe changes to habitat. The expansion of tourism also creates problems to the environment due to the various reasons like the construction of buildings, encroachment of the beach, unscientific disposal system, destruction of ecology of hills for the construction of resorts and hotels.

Environmental problems created by stone crushers

The alarming rate of increase in construction leads to indiscriminate rate of quarrying. The main complaint of the affected people was that inhaling the air containing the dust formed as a result of blasting of rocks caused several diseases in the area such as silicosis, asthma, and allergy. Sound pollution produced during the operation of the stone crusher units created hearing problems and disturbed the learning capacity of school children in the area. The dust and fragments of rocks from the crushers fly in the air and fall into the nearby wells and water systems thereby polluting them.

Clay mining

Kerala's lush countryside is under threat due to unrestrained clay mining, posing a serious environmental problem in Kerala. In the eighties when the construction boom started, vast tracts of paddy fields in the in the districts of Thrissur, Malappuram, Kozhikode and Palakkad, Ernakulam and Kollam have been converted into clay mines to meet the increased demand for bricks and roof tiles.

Climate Change

Climate change is another issue that can be at least partially remedied through sustainable development. The climate of Kerala is tropical monsoon with seasonally excessive rainfall and hot summer. The entire state is classified as one meteorological sub division for climatologically purposes. The year may be divided into four seasons. The period March to the end of May is the hot season. This is followed by Southwest Monsoon season that

continues till the beginning of October. Then North East Monsoon season From October to December, two months January and February are winter season. One of the major consequences of the environmental degradation is climate change. Climatic changes happen due to the emission of green house gases and population pressure. The Pressure of population leads to the deforestation. Declining of forest area leads to higher concentration of carbon dioxide in the atmosphere. Besides, methane emissions from various sources results in climate change.

CONCLUSION

Sustainable development is the only one way which can be adopted for a growing world economy. Some of the practices that can be adopted for protecting our environment are 1) use alternative fuel for vehicles 2) apply green building principles to new construction and remodeling projects 3) avoid household carpets, rugs, furniture and other products contain chemicals, produce and buy organic vegetables, fruits, meats and poultry instead of the items contaminated with chemical fertilizers and pesticides 4) avoid harsh dish detergents and laundry detergents for green products and install low-volume flush toilets or compost toilets 5) concentrate on Investment in alternative renewable and sustainable energy 6) persuade people to practice waste management by composting wastes and replacing plastic bags, plates, cups and utensils with bio degradable plant based products 7) replace household chemicals with green cleaning products 8) replace light bulbs with more energy efficient and non-heat producing LED bulbs 9) use renewable resources like wind power, hydropower, geothermal Energy, solar Energy, biomass and biofuel 10) use LPG and Gobar gas in rural areas and CNG in urban areas 11) depend on mini-hydel plants for local demand for energy 12) bring traditional knowledge and practices like Ayurveda, Unani, Tibetan and folk treatment systems back into practice 13) use pesticide based on plant product like neem . People already uses a huge amount of the Earth's non-renewable resources to satisfy their everyday lives. As more people join them, more of these resources are needed and the faster these resources are depleted. By utilizing the limited non renewable resources carefully and balancing future and current demands, we can ensure that

natural resources will always be available to meet essential needs of present and future generation and sustainability of our environment. It is the duty of present generation to sustain what they enjoyed today for their future generation.

REFERENCES

1. *World Commission on Environment and Development, Our Common Future* (Oxford University Press, 1987)
2. *Bill McKibben, Eearth: Making a Life on a Tough New Planet* (New York: Times Books/Henry Holt, 2010)
3. *Amartya Sen Development is Freedom* (New York: Anchor Books, 1999)
4. *Herman E. Daly & John B. Cobb Jr., For the Common Good: Redirecting the economy toward community, the environment, and a sustainable future* (Boston: Beacon Press, 1994)
5. *David C. Korten The Great Turning: From Empire to Earth Community* (Bloomfield CT & San Francisco: Kumarian Press & Berrett-Koehler, 2006)
6. *Environmental Science by Ahluwalia V.K. And Sunita Malhotra* (2009) Ane Books Pvt. Ltd. New Delhi
7. *Agarwal, Anill and Sunita Narain. Global warming in an unequal world, Centre for science Environment, New Delhi 1996*
8. *Bharucha, E. Text Book of Environmental studies for Under graduate Courses, Universities Press (India) Pvt Ltd 2005*
9. *Rajagopalan, R. Environmental Studies: From crisis to Cure. Oxford University Press, New Delhi 2005*
10. *Karpagam, M. Environmental Economics. Sterling Publishers, New Delhi 2001*
11. *George K.K. Limits to Kerala Model of development an analysis of fiscal crisis and its implications 1993*
12. *Kerala State Planning Board Economic review 2013*
13. *Oommen M A Essays on Kerala Economy IBH Publishing 1993*
14. *Parayil, G The Kerala Model of Development and sustainability in the world 1996*
15. *Veron R Sustainability and the new Kerala Model 2000*