

Kerala State Environment Policy 2009

**Department of Environment
Government of Kerala**



GOVERNMENT OF KERALA
(Abstract)

Kerala State Biodiversity Board – Environment Department – State Environment Policy, 2009 - Approved – Orders issued.

Environment Department

G.O (MS) No.04/09/Envt.

dated, Thiruvananthapuram 31.12.2009

- Ref:-
1. G.O (M/S) 22/07/Envt. dtd. 4.4.2007
 2. Letter No.200/A1/08/KSBB dtd.1.10.2009 from the Member Secretary, Kerala State Biodiversity Board.

ORDER

In order to evolve an Environment Policy for the State, Government formulated a draft Environment Policy and sought for the opinion and suggestions of the experts in the field of environment, scientists and environmentalists. As per the reference cited first, Government constituted a 16 member Working Group with the Member Secretary of the Biodiversity Board as Convener to examine the suggestions thus received and to finalize the Environment Policy.

The said Working Group discussed the remarks and suggestions received from various organizations, agencies and departments and on the basis of that, formulated a draft Environment Policy.

The Environment Policy was discussed at various workshops at different places in the state involving institutions concerned with Environment protection, environmentalists, NGOs and experts. Thereon Government obtained the remarks and suggestions of various Government Departments and those were made available to the Biodiversity Board to incorporate in the draft policy.

As per the letter read as second paper, the Member Secretary of the Kerala State Biodiversity Board submitted for approval of the Government, the modified final draft Environment Policy incorporating all the remarks and suggestions received from various Departments.

Government have examined the matter in detail and order that the State Environment Policy- 2009 enclosed herewith, is approved.

(By Order of the Governor)

**C.K.Viswanathan,
Secretary.**

Chairman, Kerala State Biodiversity Board, Thiruvananthapuram
Chairman, Kerala State Pollution Control Board, Thiruvananthapuram
Director, Environment Management Agency, Kerala, Thiruvananthapuram
All Principal Secretaries/ Secretaries/ Special Secretaries
All District Collectors/ All Head of Departments
All Departments of the Secretariat including Law & Finance
Accountant General (A&E/ Audit), Kerala

Copy to:

Private Secretary to Chief Minister
Joint Secretary to Chief Minister
General Administration (SC) Department
Stock file/ Office copy

By order

Sd/-

Section Officer

(Translated to English)

CONTENTS

Section	Title	Page No.
1.	Preamble	
2.	Environmental scenario of Kerala	
3.	Environmental initiatives undertaken	
4.	Broad objectives of the Environmental Policy	
5.	General Approach	
6.	Strategies and Action Plans Wetland Ecosystems	
6.1.	Rivers, lakes, reservoirs, ground water and rain water	
6.2.	Drinking water	
6.3.	Irrigation	
6.4.	Ponds, lakes and mangroves	
7	Forests and wildlife including fisheries	
8	Agricultural land systems	
8.1.	Crops in general	
8.2.	Paddy cultivation	
8.3.	Homestead farming	
8.4.	Caution against Genetically Modified Organisms	
9.	Costal and Marine resources	
10.	Animal Husbandry	
11.	Biodiversity Conservation	
12.	Industrial development	
13.	Mining and quarrying	
14.	Energy	
15.	Human settlement of built Environment	
16.	Tourism	
17.	Transportation	
18.	Air and Noise pollution	
19.	Promotion of Environmental Education and Awareness	
20.	R&D and promotion of technologies	
21.	Rehabilitation of people by projects	
22.	Environmental Audit statement	
23.	Report on the State of the Environment	
24.	Policy Implementation structures and linkages	
24.1.	Individual and household	
24.2.	Grama Panchayats	
24.3.	Block and District Panchayats	
24.4.	Departments and agencies of Government	
24.5.	State Environment Department	
24.6.	State District Advisory Councils	
24.7.	Non-Governmental Organisations	
24.8.	Strengthening Legislation	
25.	State Environment Fund	

Kerala State Environment Policy

Vision

To ensure clean air, water, soil and food to the people of Kerala and its sustainability for a healthy living condition

1. Preamble

- 1.1. The Indian constitution is one of the first in the world to recognize the importance of environmental conservation. The Constitution directs the “State to take measures to protect and improve the environment and to safeguard the environmental quality”. It also makes it a fundamental duty of every citizen to protect and improve the natural environment including forests, lakes, rivers and wildlife.
- 1.2. As the Constitution provides the framework for creating a welfare state, it is necessary that the finite natural resources of the country be optimally utilized without adversely affecting either the health of the people or the environment. This is the essence of the term sustainable development. We must make conservation – oriented development choices to avert pressure on natural resources and life-support systems.
- 1.3. Kerala provides a geographical and ecologically circumscribed but complex mosaic of land where the development-environment link is getting neglected and disrupted. The environmental systems here are very fragile because of the inherent nature of geography, climatic conditions and ecological characteristics. The biophysical system of the State could be considered among the richest in the whole world. It has all the three maximally productive and biodiversity rich ecosystems in the world, namely the tropical rainforest, the coastal, freshwater and brackish water wetlands; and the coastal marine coral reefs. All these three systems are compressed within a width of 50 km. The tropical humid climate of the State, high rainfall spread over more than six months, biogeographic position, long history of biological as well as human civilizational continuity without major upheavals are all our assets.
- 1.4. There has been progressive pressure on the environment and the natural resources of Kerala over the years. The exceptional nature of Kerala with a high literacy rate, its unique economic, social, political and cultural ethos and high density of population contribute to pressures on the environment. The alarming consequences of this pressure are becoming increasingly evident and utmost care has to be taken to see that the demand on the environment does not exceed its carrying capacity for the present as well as future generations. In this context, we need to recognize the physical limits imposed by economic activity and give a new thrust towards conservation along with sustainable development.
- 1.5. The Government of India has enunciated the National Conservation Strategy and Policy Statement on Environment and Development 1992, in response to the need for laying down the guidelines to highlight environmental considerations in the development process. This has necessitated a State Policy Statement with the objective of complementing and supplementing the National Strategy and Policy.
- 1.6. State government is in the process of framing policies related to forests, water and agriculture. Even though all these policies forward strategies and action plans for sustainable development in their respective fields, there is, so far, no comprehensive

policy dealing with environment. Hence, the present Environment Policy; intended, mainly, to mainstream environmental concerns in all development activities.

- 1.7. The policy has been designed to suit the specific local conditions of the State of Kerala and to help re-orient its development in conformity with environmental perspectives so as to make the development sustainable.
- 1.8. This Policy document provides a framework within which conservation and development can be achieved simultaneously with a view to maximize the quality of life for every one in the State, optimizing the ecological load on the natural systems as well as building up the State's economy while minimizing environmental degradation.

2. Environmental scenario of Kerala

Kerala State, with a total area 38,863 km², harbours a population of more than 30 million. The long coastline with an intricate system of backwaters along the coast, the tropical moist forests on the Western Ghats, the highly undulating terrain and the tropical monsoon climate make the State a unique geographical and environmental entity. The people have a high level of literacy and are generally conscious of health care practices, nutritional requirements and hygienic practices resulting in high life expectancy, low population growth and low infant mortality rate. The undesirable consequences of the development measures carried out without proper environmental considerations have left their indubitable impacts on the environment in Kerala, specifically in the following ways:

- 2.1. ***Loss and degradation of forests:*** On the Western Ghats, the forest are degrading alarmingly and the biodiversity base is shrinking, disrupting the ecology seriously; especially the pristine faunal and floral life. These lead to alarming fall in water availability in the rivers and other wetland systems and, also to land slides and heavy sedimentation of reservoirs.
- 2.2. ***Loss of mangrove ecosystems:*** In spite of being the most productive ecosystems of the world, mangrove in Kerala is confined mainly to a few areas in the northern districts. The remaining patches are also facing increasing threats, especially from new industrial and infrastructure development projects including tourism and housing. The impact of this on the fishing sector is recognized, but inadequately addressed and is a classical example of the need for integrating the sectoral planning process.
- 2.3. ***Threat to coastal ecosystems:*** Coastal erosion, pressure from various stakes, especially tourism, lack of basic infrastructure for fishermen families, such as toilets and sewage systems, pollution from urban areas and high density of population in the coast have made our coast a hotspot. A serious intervention to remediate, without affecting the habitats and livelihoods of fisher folk need to be developed. Also, vital is to improve the marine aquatic wealth with a focus on conservation needs.
- 2.4. ***Increased sand and clay mining:*** Mining from the rivers, river banks and paddy lands causes not only unaccounted ecological losses, but eventually will affect our food and water security. Attempts to regulate it through the district administration and police have not been able to curb this menace. It must be recognized that sand mining is directly related to the construction industry. Kerala's construction boom may have its economic spin-offs, but could destroy its water and food resources irreversibly.

Hence, this also needs to be effectively regulated. Kerala is losing its hills and rocks also at a fast pace and this also needs to be immediately curtailed.

- 2.5. ***Fresh water and marine fauna:*** These valuable resources of the State are fast getting depleted because of the habitat loss as well as over exploitation. The growing export industry is also a cause for the depletion. The need to conserve and replenish the habitats, as well as a focused activity to render their habitats viable and free from human influence such as pollution, reclamation, and construction also needs to be undertaken. As a source of livelihood and as an export commodity, a serious conservation and management strategy is needed, in association with the fisheries department and other impacting sectors.
- 2.6. ***Conversion of paddy lands:*** Conversion of paddy fields for cash crops, construction and other development activities has made serious erosion in food production in the State. As much as 5 lakh ha have been reclaimed in 30 years since 1971. This, indeed, is alarming. Worse still is that it affects water availability, as paddy fields essentially are water-conserving tanks, replenishing the ground water. Highest priority must, therefore, be given to the protection of paddy fields and revival of paddy cultivation.
- 2.7. ***Deterioration of the rivers:*** The rivers and the river ecosystems in Kerala are deteriorated, because of sand mining, encroachment, over-exploitation by industries, pollution from chemicals used in the plantations and, effluent and sewage/solid waste from industries, Municipalities and Corporations. A revival and remediation programme for the rivers on a river basin basis involving the local self governments, self help groups, schools and colleges has to be taken on a high priority. Appropriate acts and laws may also be needed to protect the river systems and maintain its good health.
- 2.8. ***Increasing scarcity of water:*** Water has become one of the most abused resources in Kerala, and there are growing– inter-state and intra-state conflicts in sharing water. It is ironical that contrary to the expectations that the State would have surplus water because of the good rainfall, most of the rivers in the state have become almost seasonal. Over-exploitation of the remaining water for domestic and industrial uses and the increasing level of industrial contamination pose a real threat to clean water availability.
- 2.9. ***Loss of farmland productivity:*** One of the reasons for the agrarian crisis is the loss of productivity of farmlands. This is attributed to intensive modern agriculture practices using chemical fertilizers and pesticides leading to loss of soil health, lack of adequate water when needed, non-availability of good quality seeds and also organic inputs.
- 2.10. ***Alarming rate of air, water and soil contamination:*** It is a matter of serious concern that tonnes of chemical fertilizers are being pumped into the agricultural land in the name of increasing productivity and, chemical pesticides, even those banned, are sprayed indiscriminately, again, in the name of protecting the crop from pests. As a result, today, analyses of pesticide residues in the State show that most of our food and water are contaminated at various levels. The latest incidence of contamination of soft drinks and bottled water is a clear indication of the seriousness of the situation.
- 2.11. ***Menace solid waste:*** Solid waste continues to be a seemingly unsolvable issue all across the State, in spite of the various initiatives taken to contain them. Most of the

Panchayaths, Municipalities and Corporations face the issue of not being able to manage the solid waste that is being dumped out of homes and establishments. Plastics, especially the disposable ones such as bags, cups, plates used and dumped into public places pose health disasters, such as Chikunguniya and Dengue. Special and intensive focus must be given to phase out the use of disposable plastics from our society.

- 2.12. ***Increasing threats from Industrial Pollution:*** Industrial Pollution, especially in the industrial estates in Ernakulam (Eloor-Edayar) and Palakkad (Plachimada, Kanjikode), has made life miserable. Some of these pollutants found in the environment – soil, river and air have entered the food chain and some of the worst toxins have been found in food and human blood. Increasing incidence of cancer and several health diseases caused by such contamination have been reported from Eloor-Edayar Industrial belt. While remediation is needed in such areas, the State must also formulate policies for the remediation of the distressed people.
- 2.13. ***Menace from electronic waste:*** Electronic-waste, produced from IT and electronic industries is becoming a serious issue to be reckoned with. Even with the intervention of the Supreme Court, Kerala has not yet been able to stop the problem of hazardous waste. This shows that a concerted effort along with community groups and local participation is needed to eliminate-waste.
- 2.14. ***Growth of urbanization:*** The fast growing urbanization impacts the urban landscapes and living environment, making it more and more un-inhabitable, especially when urban waste disposal remains as a daunting job as yet. This is now spreading into rural landscapes as well. Apart from numerous ecological problems, rapid urbanization is also causing loss of sand from rivers and paddy lands. Increasing demand for sand has forced the industry to turn to rock sand destroying the already mauled hills and rocks that are also water sources.
- 2.15. The net result of the deteriorating environmental conditions is amply reflected in the fast deteriorating health conditions of the people. The statistics showing recurring contagious diseases, alarmingly increasing life-style diseases, increasing rates of diseases affecting the growing child, especially related to mental growth and learning disabilities, increasing rate of cancers of almost all types, are manifestations of the sublimely poor environment where we live.

The Environmental Policy reflects all these serious issues affecting us and our life – support systems.

3. Environmental initiatives undertaken

- 3.1. The State Government have been pursuing to implement several regulatory and promotional measures for environmental protection and conservation through their various departments such as Department of Environment, Science and Technology, Health and Family Welfare, Forests and Wildlife, Factories and Boilers, Industries, Mining and Geology and Groundwater.

Some such regulatory measures introduced on the basis of Acts/Rules/Notifications are listed below:

- i. The Wildlife (Protection) Act, 1972 as amended in 1983, 1986 and 1991, 1992, 1993, 1995, 1998, 2002, 2003.
 - ii. The Water (prevention and Control of Pollution) Act, 1984 as amended in 1998.
 - iii. The Water (Prevention and Control of Pollution) Cess Act, 1977 amended in 1991, 2003.
 - iv. The Forest (Conservation) Act, 1980 as amended in 1988, 1992 and 2003.
 - v. The air (prevention and Control Pollution) Act, 1981 as amended in 1987.
 - vi. The Environment (Protection) Act, 1986.
 - vii. The Environment (Protection) Rules 1986 as amended in 1991, 1998, 1999, 2001, 2003 and 2004.
 - viii. The Hazardous Waste (Management and Handling) Rules, 1989, 1996, 1997, 1999, 2000, 2001, 2003.
 - ix. The Manufacture, Storage and Import of Hazardous Chemicals Rules 1989.
 - x. The Coastal Regulation Zone Notification 1991, amended in 1998, 1999, 2001, 2002, 2003.
 - xi. The Manufacture, Use, Import, Export and Storage of Hazardous Microorganisms and Genetically Engineered Organisms or Cells Rules 1989.
 - xii. The Environmental Impact Assessment, 1994, Amendments 1997, 2000, 2001, 2002, 2004.
 - xiii. The Chemical Accidents (Emergency Planning, Preparedness & Response) Rules 1996.
 - xiv. The Environmental Public Hearing Notification, 1997.
 - xv. The Biomedical Waste (Management & Handling) Rules 1998, 2000, 2003.
 - xvi. The Recycled Plastics (Manufacture & Usage) Rules 1999, amended in 2003.
 - xvii. The Environment (Setting for Industrial Projects) Rules 1999.
 - xviii. The Noise Pollution (Regulation & Control) Rules 2000, amended in 2002.
 - xix. The Municipal Solid Wastes (Management & Handling) Rules 2000.
 - xx. The Biological Diversity Act 2002 and the Biological Diversity Rules 2004.
 - xxi. Kerala River Bank Protection and Sand Mining Regulation Act (2001).
 - xxii. The Motor Vehicles Act, 1938, as amended in 1988.
 - xxiii. The Public Liability Insurance Act 1991; and
 - xxiv. The Public Liability Insurance Rules, 1991, amended in 1992 and 1993.
- 3.2. Kerala is one of the first States in India to constitute a State Pollution Control Board for monitoring and regulating measures for the abatement of pollution. The Government have also taken initiatives for the conservation and management of its forest and wildlife resources through the Department of Forests and Wildlife.
 - 3.3. In order to strengthen the R&D efforts required in the field of environment, the Government have established Kerala State Council for Science, Technology and Environment and a number of autonomous R&D centres such as the Centre for Earth

Science Studies (CESS), the Tropical Botanic Garden & Research Institute (TBGRI), the Kerala Forest Research Institute (KFRI), the Centre for Water Resources Development and Management (CWRDM), the Rajiv Gandhi Centre for Biotechnology (RGCB), National Transportation Planning and Research Centre (NATPAC) and Agency for Non-conventional Energy and Rural Technology (ANERT). The State's Science and Technology Policy was revised in 2002 to ensure that science and technology inputs become an essential part of its decision making process with regard to environmental issues. Further, University departments, colleges, research centers and a few NGOs also pursue R&D on environment-related issues in the State.

- 3.4. The Government constituted Environmental Protection Programme Planning Committee (EPPPC) and an Environment Protection, Task Force (EPTF) for facilitating the implementation of environmental protection, regulation and management measures. The EPTF has provisions for facilitating expert consultations on critical environmental issues.
- 3.5. Considerable effort is being taken through various public as well as non-governmental institutions for creating environmental awareness among the public. As a result, the State has already achieved the distinction of being a highly environmentally conscious State.
- 3.6. The Government of Kerala has brought out a State Water Policy addressing the water-related issues and to sustainably manage water resources with the primary objective of ensuring availability of safe drinking water.
- 3.7. The State Government has established the Kerala State Biodiversity Board (KSBB) during 2005, as per the provisions under the Biological Diversity Act, 2002 & Biological Diversity Rules 2004, in order to take measures for documentation, conservation and sustainable utilization of the State's rich biodiversity. The KSBB facilitate the formation of Biodiversity Management Committee (BMC) in all the Panchayats. The BMCs are expected to lead preparation of People's Biodiversity Registers, and biodiversity management plans and regulate collection of biological resources for commercial purposes.
- 3.8. The decentralized development system established through the three-tier Panchayat institutions is the most effective vehicle to address the issue of conservation of environment at the grass-root level, as it ensures active participation of the citizens. This has raised environmental consciousness in local development planning. A few Panchayats have attempted to set up biodiversity gardens and bird sanctuaries. A major effort is underway to prepare watershed-based master plans at the block level, which will lead to a long-term perspective plan towards sustainable and equity oriented development. There, however, is a need for environmental empowerment of Panchayats.
- 3.9. The achievements of these environmental management initiatives, although modest, are by no means insignificant. However, there is a greater need now than ever before for a comprehensive Environmental Policy considering the ever increasing thrust for 'development', unmindful of the deteriorating health of the environment and the life-support systems. Such a policy should be built on the premises of the following broad objectives:

4. Broad objectives of the environment policy

4.1. Ensure conservation of resources

Ensure conservation of natural resources, including species, ecosystems and genetic wealth of the State.

4.2. Ensure equitable access and sustainable use of resources

Ensure equitable access to natural resources to all sections of the society, particularly the poor, whose survival depends on the availability of natural resources, and to ensure sustainable and equitable use of environmental resources for meeting their basic needs of present as well as future generations.

4.3. Optimise the efficiency in environmental resource use

Ensure efficient use of environmental resources by reducing their consumption per unit of economic output, to minimize adverse environmental impacts.

4.4. Mitigation and restoration activities

Mitigate the damage already caused to the environment and the ecosystems by suitable restoration/ameliorative measures and, to prevent and control further deterioration of land, biomass, water and air which constitute our basic life-support systems.

4.5. Promulgate guidelines and policies for waste disposal

Promulgate guidelines and policies for the waste disposal especially for those emanating from industrial and municipal sources.

4.6. Integration of environmental concerns in economic and social development

Ensure that development vision, plans and projects are evolved with full respect to the environment and social concerns and, are correctly translated and implemented minimizing their adverse environmental consequences while maximizing economic and social benefits.

4.7. Environmental governance

Apply the principles of good governance (transparency, rationality, accountability, reduction in time and costs, participation, and regulatory independence) to the management and regulation of use of environmental resources.

4.8. Enhancement of resources for environmental conservation

Ensure higher resource flows, comprising finance, technology, management skills, traditional knowledge, and social capital for environmental conservation through mutually beneficial multi-stakeholder partnerships among local communities, public agencies, investors, academic and research community and, multilateral and bilateral development partners.

4.9. **Create environmental awareness for all sections of the society**

Sensitise all sections of the society the critical need for sustainability of the ecosystems and environment to meet the growing human development needs and, to promote public involvement in all environmental activities.

5. General Approach

- i. Carry out environmental impact assessment of all development projects right from the planning stage and integrate them with their cost-benefit considerations. Appropriate costs for environmental safeguards and eco- regeneration would continue to form an integral part of the projects. Data/information should be made available in the public domain.
- ii. Ensure that all projects/ activities, especially in ecologically sensitive/ fragile areas require compulsory prior environmental clearance.
- iii. Formulate appropriate legally binding environmental safeguards and protection measures in policies, planning, site selection, choice of technology and implementation of schemes in areas such as agriculture, water resource development, animal husbandry, fisheries, industries, mining and quarrying, mineral extraction and processing, energy, forestry, tourism, transportation and human settlements.
- iv. Encourage research, development and adoption of environmentally compatible technologies, and promote the application of modern tools of science and technology for conservation and restoration and in supply of natural resources;
- v. Identify and notify environmentally sensitive areas.
- vi. Elicit participation of people in programmes for integrating environmental concerns in planning and implementation of development projects; such participation should be done after informed consent.
- vii. Implement eco-mark and eco-labelling schemes for popularization and encouragement of eco-friendly products and projects.
- viii. Create environmental awareness in the society in tune with the goals of sustainability of the eco-systems for human survival and development needs.
- ix. Moderate the demand on resources by reducing wasteful consumption, recycling waste material and natural resources, conserving energy, reducing the use of natural resources in industries through measures like substitution of material. For example encourage substitute for river sand and wood.
- x. Frame policies and provide incentives to people to adopt life-styles consistent with ecological sustainability.
- xi. Develop appropriate organizational structures and a pool of professional manpower for environmental management.
- xii. Create and strengthen the requisite enforcement machinery and effectively implement all laws and regulations for environmental protection.
- xiii. Vigilance for municipal waste disposal and special strategy for disposal of hospital waste.

Strategies and Action plans

6. Wetland Ecosystems

Strategy

Conservation and sustainable use of wetlands, the most productive ecosystem of the world, for ensuring water and food security and economic benefit of the people.

Actions

6.1. Rivers, lakes, reservoirs, ground water and rain water

- 6.1.1 Basin-wise assessment of total quantity of fresh water available in the State and budgeting it for the demand for industry, agriculture, fisheries, household utilization, hospitals, hotels, recreation centres, and ecosystem functioning.
- 6.1.2 Continuous monitoring of demand and supply of fresh water and regulation of water utilization for completion of hydrological cycles.
- 6.1.3 Remedial measures to be undertaken, if there is a shortfall of water in completing the hydrological cycle.
- 6.1.4 Protection of all fresh water resources from pollution of any kind, and diversions.
- 6.1.5 Regulate monitoring of soil erosion in all the major wetlands.
- 6.1.6 Formulating simple methods to monitor soil erosion and involving schools/ colleges in the programme.
- 6.1.7 Prohibition of heavy utilization without proper impact assessment study.
- 6.1.8 Regular collection of rain data based on sub-basins.
- 6.1.9 Enacting necessary rules to make rain water harvesting mandatory.
- 6.1.10 Assessment of effluent loading capacity of each receiving water body before sanctioning new projects.
- 6.1.11 Fixation of maximum quantity of fresh water which an industry, institution, establishment or individual can utilize without prior sanction from the government.
- 6.1.12 Conservation, recycling and optimal use of surface and ground water, and rainwater harvesting will be brought under the local administration with clear guidelines.
- 6.1.13 New standards will be fixed for discharge of treated effluents based on ecotoxicological studies, especially the treated effluents to fresh water resources taking into consideration of the long-term effects.
- 6.1.14 A state level water literacy mission to educate the public on appropriate utilization and conservation of water.

6.2. Drinking water

- 6.2.1 Assessment of per capita drinking water requirement of the State at regional level and demarcation of their supply for other domestic purposes and irrigation.

- 6.2.2. Provide clean drinking water to all the people.
- 6.2.3. Promotion of community/village based drinking water supply projects.
- 6.2.4. Community based monitoring and water testing facilities in every local body.

6.3. Irrigation

- 6.3.1. Encouragement to small-scale irrigation projects which have only a minimum impact on the environment.
- 6.3.2. Encourage traditional systems of water management like pond irrigation and the promotion of alternate irrigation systems such as the harvesting of run off rain water.
- 6.3.3. Adoption of measures for increasing water use efficiency, conservation and recycling.
- 6.3.4. Designing and implementing of irrigation projects which are environmentally sustainable based on the experience from and the evaluation of earlier projects.
- 6.3.5. Provision of drainage as an integral component of irrigation projects so as to prevent water logging.
- 6.3.6. Formulation of guidelines for water management.
- 6.3.7. Adoption of command area development approach for irrigation projects to ensure optimal utilization.
- 6.3.8. Development of irrigation systems incorporating local water resources utilization, water conservation, recycling and optimum methods of irrigation and crop management.
- 6.3.9. Ensuring farmers 'participation in irrigation management' by the formation of farmers association and the development of group farming systems that are conducive to the preservation of the environment.
- 6.3.10. Continued evaluation and monitoring of all irrigation projects for their societal benefit and environmental impacts, if any.

6.4. Ponds, lakes and mangroves

- 6.4.1. No reclamation of wetlands shall be permitted.
- 6.4.2. Enact stringent legislation against conversion of all types of wetlands. As a prelude to this, notify banning conversion of wetlands into any other land use.
- 6.4.3. Conservation of existing mangroves and restoration wherever possible, through enacting appropriate legislative measures.
- 6.4.4. Encourage and support mangrove afforestation wherever possible.
- 6.4.5. While developing water bodies as a medium for transportation (National Waterway), the greatest caution shall be exercised to prevent pollution of the waters by discharge of oils and wastes from the vessels that operate on them.
- 6.4.6. Sensitize the public and local bodies on the environmental hazards of wetland reclamation.
- 6.4.7. Regulate unsustainable tourism in wetland areas.

- 6.4.8. Promote sustainable utilization of wetlands without compromising their biodiversity values.

7. Forests and wildlife including fisheries

Strategy:

Conservation of the forests and wildlife and, sustainable use of the fishery resources

Actions:

- 7.1. Survey, mapping and demarcation of all natural forest land as defined in 202/95 Supreme Court judgment.
- 7.2. Conservation of forests with special thrust to conservation of biodiversity.
- 7.3. Preservation of sacred groves with the biodiversity therein, without tampering with cultural integrity.
- 7.4. Restoration of degraded forests with people's participation, wherever possible.
- 7.5. Increase the tree cover in the State through afforestation and social forestry programmes, especially on denuded and degraded lands with participation of communities under the leadership of Local Self Governments.
- 7.6. Increase the productivity of production forestry / agroforestry by adopting modern technologies, and encourage efficient utilization of forest produce.
- 7.7. Encourage and enable local production, outside the forest areas, to meet the requirements of medicinal plants, timber, fire-wood, fodder and green manure.
- 7.8. Assist forest tribes to collect Non-Wood Timber Produce (NWFP) in a sustainable manner and to carry on a life-style that does not harm the environment; exclusive right of forest tribes to access and sustainably harvest NWFP will continue.
- 7.9. Alternative source for wood-based industries should be found out from outside forest areas.
- 7.10. Participatory Forest Management policy will be strengthened/implemented in the forest fringe areas.
- 7.11. Establish habitat corridors by restoring lost patches through appropriate measures.
- 7.12. Promote direct relationship between forest-based industry and farmers to raise the required raw material without diverting prime agricultural lands and without displacing small and marginal farmers.
- 7.13. Tourism activities within the forest areas should be under the strict control and supervision of forest department and, necessary administrative/legislative measures shall be taken to keep the natural ecosystems undisturbed.
- 7.14. Prevent and control the entry of Invasive Alien Species into natural ecosystems.
- 7.15. Augment the population of riverine endemic species through appropriate ranching programmes and research.
- 7.16. Prevent over exploitation of indigenous ornamental fishes and collection of fish species listed in the RET (Rare, Endangered, Threatened) category.

- 7.17. Establish fish sanctuaries in water bodies rich in RET species.
- 7.18. Prevent fishing using explosions and poisons in all water bodies.
- 7.19. Discourage indiscriminate and injudicious exploitation of fishery wealth from all type of open waters.
- 7.20. Encourage and support R&D programmes on conservation, restoration and sustainable utilization of forest resources. Priorities may be given to:
 - a. causes of degradation of natural forests and depletion of wildlife population, and corrective measures to restore them,
 - b. extensive research and development in forestry for better regeneration and improved productivity,
 - c. development of scientific methods for the efficient, sustainable and eco-friendly utilization of forest produce and dissemination of the knowledge generated through extension activities,
 - d. reproductive strategies and regeneration pattern of flora and fauna and causes of extinction and endangerment of flora and fauna,
 - e. management of natural forests to provide material and enable services without environmental degradation,
 - f. restoration of degraded forests in a phased manner,
 - g. improvement of the productivity of man-made forests while reducing large-scale planting of exotics and,
 - h. ensure eco-system integrity while promoting eco-tourism.

8. Agriculture land systems

Strategy

Develop Kerala's agriculture through the judicious utilization of the scarce resources of land, water, rural manpower and technology, focusing on increased production and productivity in a planned manner to ensure the food requirement of the State with least damage to the environment.

8.1. Crops in general

- 8.1.1. Strengthen soil conservation and soil enrichment programmes for preventing soil degradation.
- 8.1.2. Periodic monitoring of soil fertility to maintain and improve its productivity.
- 8.1.3. Encourage crops based on land capability classification and cropping patterns suitable for productivity conservation.
- 8.1.4. Promote organic farming along the Organic Farming Policy of the State and achieve complete organic farming within 5-10 years.
- 8.1.5. Revive traditional varieties of crops and establish gene/seed banks for their conservation.

- 8.1.6. Adopt integrated nutrient and pest management systems with the use of bio-fertilizers, organic compost and bio-pesticides.
- 8.1.7. Conserve paddy land and prevent its use for other crops.
- 8.1.8. Ensure the use of agrochemicals in a judicious manner and phase out chemical pesticides over time as stipulated in the State Organic Farming Policy.
- 8.1.9. Evolve efficient and cost-effective methods of water conservation and use.
- 8.1.10. Promote traditional practices of mixed cultivation in homesteads.
- 8.1.11. Provide support for storage, incentives for marketing and price stability by promoting local markets and discouraging involvement of middlemen.
- 8.1.12. Sustainable agricultural practices shall be encouraged and research projects pertaining to them shall be given priority.
- 8.1.13. Encourage cultivation of crops with least demands on water and energy inputs.

8.2. **Paddy cultivation**

Paddy farmers face a multiplicity of problems, many of which may be ameliorated by ecological measures, namely:

- 8.2.1. Regulation of water regimes, restoration of traditional irrigation structures such as contour tanks, drainage channels at suitable contours, conservation of water in tanks with combined irrigation and social use (e.g., ‘temple tanks’).
- 8.2.2. Cultivation of legume crops along field bunds so that the bunds are strengthened and the farmer gets an additional income yielding crop.
- 8.2.3. Combine fodder cultivation in rice fallows and other available lands, so that animal husbandry can be successfully integrated.
- 8.2.4. Conserve straw, as was the traditional practice.
- 8.2.5. Wherever possible, combine pisciculture with paddy, integrating duck or poultry farming.

8.3. **Homestead farming**

- 8.3.1. The holders of Homestead Farms require special empowerment in order to protect their holdings from economic threats like fragmentation and alienation, as well as ecological degradation by wrong usage by the owners themselves, and consequential uncontrolled actions by neighbours and public agencies.
- 8.3.2. Government and the Panchayats will accord high priority to organize neighborhood associations of homestead farmers, and enable them to undertake work for the ecological protection of their properties. Following examples illustrate this point:
 - a. plan together measures for conservation of soil and moisture for maximum benefit,
 - b. moderate alternative land use (e.g., construction, expansion of houses), so that it does not interfere with beneficial enjoyment of neighbours’ properties, or with natural water flows, soil regimes, or crop sequences,

- c. undertake work of common benefit such as retention walls, bunds and moisture conservation pits; combined land use such as fodder cultivation and animal husbandry, production of high value vegetation such as orchids and vanilla and, processing, marketing and maximizing value addition by local collectivists and,
- d. organize collective consideration of proposals for alternative land use including urban and housing development, so that informed consent may be accorded or denied.

8.4. **Caution against genetically modified organisms**

- 8.4.1. Widespread and indiscriminate adoption of untested exotic planting material, however mightily advertised, is fraught with irreversible damage. Government, Panchayats and Farmers will be constantly educated against the use of GMOs.
- 8.4.2. The Government would continue on its declared stand that GMOs will not be permitted within the State even for trials, until the controversy that is going world over on their negative impacts on economy, health and environment are settled beyond dispute.

9. **Coastal and marine resources**

Strategy

Conservation and sustainable use of the coastal and marine eco-system and, fisheries - both fresh water and marine, in the State.

Actions

- 9.1. Preparation of a database on inland and marine fishery resources, including maximum sustainable yield available for harvest in the water bodies.
- 9.2. Prevention of coastal and riverbank erosion by means of, as far as possible, biological methods.
- 9.3. Eco-friendly aquaculture activities to meet the gap between demand, production and supply.
- 9.4. Regulate total fishing efforts for avoiding over fishing and, encourage sustainable fishing.
- 9.5. Protect aquatic habitats from pollution, reclamation, dredging, infestation from weeds, over-exploitation and, unscientific methods of fishing.
- 9.6. Control trawling in the territorial waters of Kerala during the monsoon and frequent analysis of resources to record the availability of stock.
- 9.7. Regulation of mesh size in trawl net and fixed engine for conserving the juvenile fish and shellfish; adopt measures to reduce by-catch.
- 9.8. Regulation of fishing at the entrance of river mouths.
- 9.9. Establish a Fishery Resource Management Cell for monitoring optimum fishery utilization and to function as a clearing house for development programmes

with special reference to conservation and sustainable utilization of the precious fishery resources of the State.

- 9.10. Maintain a register of all fishing vessels with essential details under State jurisdiction.
- 9.11. Effective use of Geographical Information System for fisheries management; monitoring and control of fishing effort and energy use.
- 9.12. Evolve a mandatory programme for training and certification for non-motorised, motorised and mechanized fisherman in safe navigation, responsible fishing, log keeping and reporting.

10. Animal husbandry

Strategy

Maintain healthy and productive animal population to help enhance the economy while causing least damage to the environment. The environment related activities would be:

Actions

- 10.1. Improve the genetic variability of the indigenous breeds.
- 10.2. Control cattle population in the forest fringes so as to conserve the fodder resources and to avoid spread of diseases.
- 10.3. Restoration and protection of the existing grazing lands along with the promotion of stall feeding and rotational grazing.
- 10.4. Taking measures to increase the production of fodder and grass to bridge the gap between supply and demand.
- 10.5. Scientific siting and waste management should be mandatory for all the animal farms.
- 10.6. Integration of animal husbandry with farming systems to sustainably maximize farmers' benefits.
- 10.7. Encourage community action by neighbourhood groups so that cattle trespass, over-grazing of common lands and such like activities are prevented, and economies of scale achieved by means such as processing gobar gas, compost manures, vermi-compost and fodder production.
- 10.8. Enable existing Milk Producers' Co-operative Societies to maximize value addition at site, and to ensure that the maximum advantage is derived by the members.
- 10.9. Recycle household waste food and agricultural residues to be used as manure for fodder cultivation.
- 10.10. Integrate non-conventional animal husbandry such as rabbit-rearing, and farming of bird species (example: turkey and guinea fowl) for maximum benefit to the farmers.
- 10.11. Constant research and extension to ensure improvement of genetic variability.
- 10.12. Monitor migratory birds for pathogens and taking appropriate measures to check entry of exotic pathogens.

- 10.13. Enforcement of quality control by community action by Panchayats.
- 10.14. Monitoring and take up mass vaccination programmes in animals and birds to prevent diseases.
- 10.15. Launching training programmes for farmers in Scientific Animal Husbandry practices, reducing pressure on environment.
- 10.16. Promotion of backyard poultry for effective utilisation of household/ kitchen waste thereby reducing environment damage.
- 10.17. Hygiene management of slaughter houses, abbaters and proper waste management.
- 10.18. Proper treatment of dairy waste in dairy plants of the state by compulsors setting up of effluent treatment plants and ensuring constant monitoring.
- 10.19. Enforcement of licensing for all those engaged in processing and marketing of milk and milk products in the state so as to prevent environment pollution.

11. Biodiversity conservation

Strategy

Conservation and sustainable utilisation of the biodiversity of the State for the benefit of all sections of the society.

Actions

- 11.1. Intensification of surveys inside and outside the Protected Areas for complete documentation of biodiversity, including microbes.
- 11.2. Inventory of biological resources in different parts of the State through People's Biodiversity Register at Panchayat, Municipality and Corporation levels.
- 11.3. Conservation of biodiversity through a network of protected areas including biosphere reserves, national parks, sanctuaries, gene conservation centres, wetlands, mangroves, sacred groves, heritage sites and, such other natural habitats of biodiversity.
- 11.4. Protection and sustainable use of plant and animal genetic resources through appropriate laws and practices.
- 11.5. Protection and conservation of domesticated species/varieties of plants and animals in order to conserve indigenous genetic diversity.
- 11.6. Maintenance of corridors between national parks, sanctuaries, other protected areas, forests and, animal habitats for ensuring the natural movement of animals.
- 11.7. Documentation and conservation of traditional skills and knowledge related to biodiversity.
- 11.8. Conservation of threatened and endangered plants and animal species by especial or insitu programmes and also through application of modern techniques of tissue culture, biotechnology and cloning.

- 11.9. Discourage monoculture.
- 11.10. Introduction of any exotic species, if found critically needed to control noxious exotic species of flora and fauna, shall be done only after adequate experimentation.
- 11.11. Control of invasive species already affecting the land and water ecosystem.
- 11.12. Promote community biodiversity centres in local bodies.
- 11.13. Strengthen the State Biodiversity Board to function as a watch-dog of the State Biodiversity resources.
- 11.14. Control over-exploitation of biodiversity for commercial purposes.
- 11.15. Set up a Biodiversity Museum of international standards.
- 11.16. Popularise the need for biodiversity conservation.
- 11.17. Include biodiversity as a subject in curriculum at school and college levels.

12. Industrial development

Strategy

Prioritise and promote projects which would help the poor sections of the society and implement them through least possible damage to the environment.

Actions

- 12.1. Provision of incentives to environment friendly technologies involving recycling and reuse of wastes and the conservation of natural resources.
- 12.2. Insist on the installation of effluent and emission treatment plants in the industrial units and mining.
- 12.3. Operation of the 'polluter pays' principle shall be strictly adhered to and punitive measures be taken against those industries who exceed permitted standards by charging them with effluent tax and resource tax.
- 12.4. Demarcation of industrial areas in each locality/region and designation of specific areas for certain industries in the State.
- 12.5. Ensure setting up and running of industries adhering strictly to the environmental guidelines.
- 12.6. Establish industrial sites/zones for compatible industries so that, effluent treatment could be common, reducing costs and enhancing effectiveness; Wastes from one could be used as raw material for another and thus the net pollution load could be minimized.
- 12.7. Strict enforcement of pollution control norms by Pollution Control Board in various types of industrial units, depending upon their process/technologies and pollution potential; particular attention being paid to highly polluting industries.
- 12.8. Strict implementation of the treatment required for industrial effluents and solid waste disposal/management.
- 12.9. Common effluent storing/treatment facilities in industrial estates.

- 12.10. Regular monitoring of the quality of the industrial effluents, solid and gaseous emissions, and prompt action on complaints by the local people.
- 12.11. Incentives and recognition to industries for effective pollution control and reduction of wastes.
- 12.12. Establish green belts in the vicinity of/around industrial establishments.
- 12.13. Formulate regulations and enforcement of norms in respect of auto emission. Encourage the use of environmentally benign automobiles/motor vehicles and up-gradation of emission standards for automobiles in urban areas initially and in phases over the whole State.
- 12.14. Prepare 'on-site emergency' plans for hazardous industries and off-site emergency plans for districts in which hazardous units are located.
- 12.15. Setting up of Environmental Cells in industries for implementing Environmental Management Plans and for compliance with the requisite environmental laws.
- 12.16. Incorporation of the costs for environmental safeguards as an integral component of the total project cost.
- 12.17. Dissemination of information to the local public and workers on hazardous substances and measures to ensure safety of workers and people.
- 12.18. Promote zero industrial waste generation technology.
- 12.19. Formulate effective methods of treatment facility deal with e-waste in IT industry and households.

13. Mining and quarrying

Strategy

Mining and quarrying should be restricted to meet the bare minimum requirement and that too following well defined measures, leaving least environmental damages.

Actions

- 13.1. Environmental Impact Assessment (EIA) by competent agencies prior to the allocation of sites for mining and quarrying activities.
- 13.2. Strict implementation of regulations for mining and quarrying in compliance with pollution control mechanism ensuring minimal disturbance to the environment.
- 13.3. Restoration of the mined and abandoned areas by those responsible for their damage.
- 13.4. Ensure compulsory land filling and tree planting in the mined areas.
- 13.5. Implement Environment Management Plans approved by the appropriate authorities like the Pollution Control Board concurrently with the ongoing mining operations to ensure adequate ecological restoration of the affected areas.

- 13.6. Discourage selective mining of high-grade ores leading to local accumulation of low-grade ores, causing environmental degradation.
- 13.7. Upgradation and utilization of minerals at source to the extent possible in order to ensure the utilization of low grade minerals and to reduce the cost of transportation/processing and utilization.
- 13.8. Prevent mining and quarrying of hills.
- 13.9. Regulation and restriction of sand mining from all rivers, rivulets and, clay mining from paddy fields based on scientific studies.
- 13.10. Identification and promotion of alternative construction material and eco-friendly construction models and methods to avoid pressure on natural resources, mainly river sand.
- 13.11. Popularization of the ill effects of river sand mining.
- 13.12. Environmentally safe disposal of the bye-products and wastes of all mining operations.

14. Energy

Strategy

Popularize non-conventional energy systems and promote efficient and moderate energy use without waste.

Actions

- 14.1. Environment Impact Assessment should be mandatory as a prior condition for investment decisions and site selection for power generation projects.
- 14.2. Adoption of clean technologies for energy production including utilization of wastes for power generation.
- 14.3. Energy conservation in all sectors including households, agriculture, industry and transportation.
- 14.4. Energy conservation education and awareness activities.
- 14.5. Incentives to encourage energy conservation and, punitive measures for improper energy use.
- 14.6. Popularisation of the relevance and use of non-conventional and renewable energy sources and incentives for their use.
- 14.7. Promote researches on non-renewable energy sources.
- 14.8. Incentives for raising of bio-fuel plants in wastelands/degraded areas.
- 14.9. Promotion of efficient wood-burning chulahs.
- 14.10. Regular monitoring of the environmental impact of energy generation projects through well defined parameters and adoption of measures for the mitigation of environmental degradation.

- 14.11. Promotion of small scale hydroelectric projects (micro, mini and small).
- 14.12. Increase biomass availability to meet essential requirements of biomass based energy generation.
- 14.13. Regulation of trade and unscientific disposal of hazardous wastes.
- 14.14. Development of technologies for enhancing the productivity and efficiency in the use of all biomass resources (both terrestrial and marine) for energy generation.

15. Human settlements of built environment

Strategy

Provide reasonably comfortable housing to all people in the State in clean, hygienic and healthy surroundings, and to encourage green building technology by using energy efficient design, lay out and construction material.

Actions

- 15.1. Adoption of environment-friendly techniques and material in housing in the State.
- 15.2. Promotion of low cost building systems using indigenous and energy-efficient building material in construction and the improvement of existing building stock.
- 15.3. Promotion of strategies for the decentralization of urbanization through the establishment of satellite cities and townships with the necessary infrastructure facilities and job opportunities.
- 15.4. Documentation of the details of buildings, places and monuments of cultural heritage value and the adoption of measures including strict regulation on tourists/pilgrims for the protection and preservation of such places of historical/heritage values.
- 15.5. Adoption of deterrent measures to discourage unsustainable growth of human settlements and polluting industries in ecologically vulnerable areas such as hilly regions and coastal stretches.
- 15.6. Ensure the quality of water supply and provision for adequate sanitary facilities in all cities and towns, commercial centres, industrial establishments and rural residential areas.
- 15.7. Programmes for scientific and cost-effective management and disposal of sewage, garbage and domestic wastes.
- 15.8. Encourage planting of shade, fruit-bearing and ornamental trees on the roadside, in market places and commercial centres, school compounds, hospitals, offices, places of worship and other public places and provide incentives and recognition for the same.
- 15.9. Establish parks and gardens in urban and rural public places for public use and for the promotion of environmental awareness.
- 15.10. Promote cultivation of medicinal plants in home gardens and private farmlands.
- 15.11. Promote homestead farming.
- 15.12. Restriction of pavement to facilitate infiltration of water.

- 15.13. Prevent environmental degradation and resulting health problems, related to communicable and non-communicable diseases, by educating the people on personal hygiene, sanitation and the use of pure drinking water.
- 15.14. Prevent spreading of communicable diseases by creating awareness on individual community hygiene.
- 15.15. Strict vigilance and action by concerned local authorities in villages, towns and cities for the speedy removal and disposal of all accumulating rubbish, waste and garbage, and for keeping the surroundings of human dwellings and places of activities, as clean and neat as possible.
- 15.16. Promotion of the use of local products such as khadi and handlooms and encourage products using local resources.
- 15.17. Preparation of Environmental Impact Assessment and Environmental Management Plan for activities such as development of new townships, industrial units/clusters, settlement colonies, major highway projects, commercial complexes, hotel complexes, hospitals, and office complexes.

16. Tourism

Strategy

Promote sustainable eco-tourism in the State ensuring economic benefits to the local communities without causing damage to the natural environment.

Actions

- 16.1. Promotion of tourism on the basis of a careful assessment of the target areas with regard to their carrying capacity, and availability of support facilities such as transport, fuel, water and sanitation.
- 16.2. Regulate tourism in Protected Areas mainly forests and ecologically sensitive areas such as grass lands and wetlands.
- 16.3. Development of sustainable eco-tourism in harmony with the environmental conditions and without affecting the life style or the cultural heritage of the local people.
- 16.4. Encourage responsible tourism in all the tourist destinations.
- 16.5. Ensure that eco-tourism help enhance the livelihood of the local communities.

17. Transportation

Strategy

Develop an environmentally compatible but efficient transportation system in the State.

Actions

- 17.1. Improve the existing transport system based on scientific studies so as to provide efficient and safe transportation and to reduce consumption of fuel, traffic congestion and environmental pollution.

- 17.2. Development of inland water transport infrastructure which is more energy saving and cost effective on commercial basis.
- 17.3. Incentive for transportation using the backwaters, canals and river systems.
- 17.4. Promote the use of vehicles using LPG.
- 17.5. Encourage transportation of material through suitable means such as water, rail and pipeline in place of road.
- 17.6. Enforcement of smoke emission standards for containing pollution from vehicular exhausts at the manufacturer and user levels and, impose stringent punishment to violators.
- 17.7. Introduction of renewable energy and non-polluting transport systems, especially Compressed Natural Gas (CNG) for vehicles in a phased manner.
- 17.8. Promote the use of bicycles and enforce user friendly pedestrian and cycle tracks.
- 17.9. Strict enforcement of updated traffic laws/rules for the safety of users and the passengers.
- 17.10. Develop transportation infrastructure including roads which does not adversely affect the environment during construction or operation.
- 17.11. Enforce strict rules and regulations for environmental safety while transporting dangerous and hazardous materials.
- 17.12. Enforcement of regulations on cases such as overhead wires, construction of arches and, fixing of advertisement hoardings across and in the proximity of roads.
- 17.13. Avoid construction of roads through ecologically sensitive areas.

18. Air and noise pollution

Strategy

Ensure clean air in the State by preventing and controlling air and noise pollution.

Actions

- 18.1. Encourage use of clean fuels and clean technologies, energy efficient devices and air and noise pollution control systems.
- 18.2. Adoption of source specific and zone-wise air quality standards and set time bound plans to achieve the quality standards.
- 18.3. Locate development projects appropriately to minimize the adverse impact of noise on people and environment during construction and operation.
- 18.4. Strictly enforce emission control measures in industrial and transport sectors.
- 18.5. Incentives for environmentally benign substitutes, technologies and energy conservation.
- 18.6. Establishment of green belts with appropriate plant species for mitigating pollution.

- 18.7. Promote appropriate technologies to reduce emission of carbon dioxide and greenhouse gases.
- 18.8. Set up digital display boards showing atmospheric pollution at crucial areas in the State.
- 18.9. Reduce /avoid use of ozone depleting substances.
- 18.10. Strict control over the use of incinerators for solid waste treatment other than biomedical waste.
- 18.11. Promote recycling of plastics adopting modern technologies and ensuring least damage to environment.
- 18.12. Ensure safe disposal of electronic waste.

19. Promotion of environmental education, training and awareness

Strategy

Create environmental awareness among all sections of the society including students judiciary legislatures, bureaucrats, police, defense, NGOs and general public.

Actions

- 19.1. Revision of the existing syllabi and the contents of the text books from primary School to University level in a phased manner to include subjects relating to environment.
- 19.2. Organise special training programmes for the benefit of teachers imparting instruction in various aspects of Environmental Sciences.
- 19.3. Engage village level NGOs and literacy centres to promote public awareness and involve them in environmental activities.
- 19.4. Encourage non-governmental organizations involved in environmental activities, science popularization and social welfare to conduct environmental awareness campaigns.
- 19.5. Conduct through women's organisations and local bodies, special environmental awareness programme for women, since they have a pivotal role in environmental conservation programmes at the grassroots level.
- 19.6. Promote women to take up conservation programmes which are income generating, self-financing and sustainable on a long-term basis.
- 19.7. Develop required educational resource material by encouraging various institutions, NGOs, writers and publishers involved in the field of environment to publish literature on different aspects of environmental conservation, protection, preservation and, pollution control.
- 19.8. Conduct, regular compulsory inservice courses to update knowledge on environmental appraisal, impact assessment, environmental management planning and mitigatory measures for professionals, bureaucrats and other officials and local bodies involved in project planning and implementations especially those using and regulating the use of natural resources.

- 19.9. Launch State-level ecological literacy programme in each Panchayat.
- 19.10. Design and implement awareness creation and capacity building programmes for the elected people's representatives, bureaucrats and judiciary.

20. R&D and promotion of technologies

Strategy

Encourage Research and Development activities to promote development of appropriate technologies suitable for the local socio economic and environmental conditions with least disturbance to environment.

Actions

- 20.1. Initiate special efforts to promote R&D on cleaner technologies.
- 20.2. Encourage new projects making use of both conventional and modern high-tech methodologies such as remote sensing and biotechnology.
- 20.3. Create centralized Environmental Data Bank under the State's Environment Management Agency with the help of R & D centres in the field of environment studies, for the use of activities such as, initiation of new projects, environmental assessment, natural resource accounting and pollution abatement.
- 20.4. Assist the local bodies in the State with science and technology inputs in the preparation of projects which have environmental bearings, especially watershed development master plans.

21. Rehabilitation of affected people projects

Strategy

Ensure proper planning and adequate budget in the project document itself for rehabilitating the people compelled to be displaced for the project and, implement the same, honourably before the commencement of project activities.

Actions

- 21.1. Take conscious efforts to avoid displacement of local people.
- 21.2. Ensure comprehensive measures on priority basis, if rehabilitation is unavoidable, by providing suitable facilities, which shall be done before launching the project activities.
- 21.3. The rehabilitation package should contain not only the cost of the land, but also that of construction of the house and means of better livelihood.

22. Environmental audit statement

Strategy

Ensure strict adherence to the relevant rules and regulations pertaining to pollution and resource use by concerned industries.

Actions

- 22.1. Insist submission of Annual Environment Audit (AEAR) Report by each company within three months of the financial year end.
- 22.2. Ensure that the AEAR contains, the type and quantum of the material used, the type and quantum of effluents discharged, and, those of gaseous emissions; report of the monitoring of the levels pollution; periodical certificate by the Pollution Control Board; details of waste disposal; the modifications made, if any, on the advice of the PCB from time to time and, such other details that may be prescribed by the Pollution Control Board.
- 22.3. Ensure submission of the AEAR of all industries by the Pollution Control Board to the Government within 30th September of every year.

23. Report on the state of the environment

Strategy

Document the natural resources such as land, water, forests, wetlands and minerals of the State periodically for effective planning and conservation.

Actions

- 23.1. Entrust the various R & D Centres of the State to periodically assess the availability of natural resources such as land, water, forests, wetlands and minerals, each centre to take up the responsibilities of the components of its interest.
- 23.2. One of the R&D Centres will coordinate the activities and compile the status of natural resource availability and utilization every five years.
- 23.3. Evaluation of regional carrying capacity based on these information by the State Environment Department with the support of R&D Centres of the State.
- 23.4. The Government will prepare a five year natural resources budget based on the regional carrying capacity assessment, considering the availability of resources such as land, forests, water and minerals and, prepare an estimate of the extent of utilization of such resources every year.
- 23.5. This can be used while preparing the Five Year Plan of the State, thus ensuring conservation with sustainable development, allocating natural resources from the available sources for various development purposes.

24. Policy implementation structures and linkages

Ensure full involvement of individuals, individual households, Grama Panchayats, Block Panchayats, District Panchayats, various Departments of the Government and the committed NGOs and civil societies for the effective implementation of the objectives of the environmental policy.

24.1. Individual and household

Strategy

The primary agency for action to protect and enrich the environment is the very citizen and the very household of Kerala. The following activities could be the responsibility of individuals and households.

- 24.1.1. Increase own households and neighbours' awareness of the goals of sustainability of eco-systems for human survival and development.
- 24.1.2. Moderate demands on resources by reducing wasteful consumption, recycling waste material and natural resources, using substitutes for natural resources which are scarce and difficult to replace, conserving energy as well as resorting to non-conventional energy and, maximizing production of bio-mass for recycling.
- 24.1.3. Safeguard water, both in quantity and quality, by reducing run-off, harvesting rain water at the site, recycling, and gradation of quality of supply according to end use.
- 24.1.4. Act collaboratively with neighbours and other agencies for establishment of biogas plants, vermi-compost units, kitchen gardens, integrating animal husbandry into agricultural pursuits, such that cost is reduced, benefit maximized, and the environment protected and enriched.

24.2. Grama panchayats

The Grama panchayats should take up the following responsibilities.

Compared to all-India level, Kerala's grama panchayats are large, with about 20,000 people in each, and spreading over arbitrarily delineated territory. Therefore, it is necessary to organize at ward level and at even more primary collectivists, people's organisations under the Panchayat umbrella. Such groupings shall be based on micro-watersheds, so that they are clearly defined from an ecologically meaningful viewpoint. All programs for soil conservation and for preventing soil degradation, monitoring of soil fertility, encouragement of cropping systems in accordance with land capability classification, and other works in relation to agricultural lands will devolve on Village Panchayats. They shall arrange these works according to the identified micro-watersheds, and entrust the works to the multi-tiered people's organisations, to be formed as mentioned above.

24.3. Block and district panchayats

The Block and District Panchayat would undertake the responsibility for the following:

- 24.3.1. Conduct training classes, bringing about attitudinal, and competence change to enable the people to be conscious of ecological imperatives, while seeking economic maximization goals.
- 24.3.2. Co-ordinate and encourage programmes such as bio-gas plants, mini- and micro-hydel projects, wind energy farms, solar energy plants, and plantation of fuel wood species.
- 24.3.3. Pioneer and encourage the production and spread of fodder planting material and the cultivation of these species by farmers so that self-sufficiency in fodder needs is approached / reached.
- 24.3.4. Supplement, complete, and extend efforts undertaken by village panchayats and grass roots organisations to maximize benefits.
- 24.3.5. Ensure that public demand and profit-driven business in scarce material are harmonized with eco-specific requirements.
- 24.3.6. Link and form 'associations of associations' at the village panchayat and smaller levels, engaged in ecological conservation and enrichment activities, and businesses based on non-invasive land use, so that better economies and stronger bargaining for advantage are secured.

24.4. Departments and agencies of government

- 24.4.1. Government hope to end the pernicious colonial view on the relationship between Departments of Government and public property and prepare to usher in a more realistic, rational approach that the Departments, and their echelons at various levels, shall only be instrumentalities, whose services shall always be available to the Panchayati Raj institutions and people's organizations.
- 24.4.2. Environmental policy foregrounds people, and their participatory involvement. Departments of Government at all levels shall revise the rules and procedures so that the people's organizations receive the full cooperation of the Departments. Departmental officers and experts shall serve as consultants and technical experts in advising Panchayati Raj institutions on how best to achieve the ecological objectives together with economic growth.
- 24.4.3. Government will re-define and reform the working of various Departments vested with responsibilities in these areas, making them owning responsibility to the people, and ensuring complete transparency in their transactions.
- 24.4.4. Government will also constantly review the laws and regulations, relating to or having impact on ecological concerns, and revise them accordingly so that they become more effective dynamic tools to implement desirable ecological practices and to penalize eco-violative actions.

24.5. State environment department

- 24.5.1. Bring all the major activities related to environment under the Department of Environment.
- 24.5.2. The Environment Department shall be responsible for coordination of the activities of different departments, authorities and local bodies in the State relating to environment, and implementation of the Environment Policy of the

State.

- 24.5.3. The department will focus on promotional aspects for the protection and conservation of the environment with the help of the concerned government departments, research institutes, regulatory bodies, local bodies and reputed non-governmental organizations, researchers and academicians.
- 24.5.4. Strengthen the enforcement mechanism by enacting a comprehensive legislation.

24.6. State and district advisory councils

Advisory Councils comprising experts will be set up at the state and District levels to strengthen the administration with technical and scientific inputs while implementing the policy.

- 24.6.1. Formulate the State Level Environment Advisory Council, chaired by the Minister for Environment and comprising officials of various departments and governmental bodies, as well as experts and representatives of reputed non-governmental organisations working in the field of environment to advise Government on the issues of policy and implementation.
- 24.6.2. Constitute, District Level Environmental Advisory Councils to be headed by the respective District Panchayat Presidents and comprising official and non-official members focusing on district and local level problems relating to the environment.
- 24.6.3. The State Level Advisory Councils will be assisted by the District Level Advisory Councils.

24.7. Non-Governmental organizations

Strategy

Involve local non-governmental organizations from the planning stage itself of any project which will have environmental implications.

Actions

- 24.7.1. Ensure participation of residential associations and non-governmental organizations at the District, Block and Panchayat levels.
- 24.7.2. Local bodies shall ensure such participation for the successful implementation of the project with least disturbance to the environment.
- 24.7.3. Set up Environmental Information Centres at the district level, with the cooperation of NGOs and local District Panchayat, containing information on the local resources and environmental conditions and also different systems of environmental management practices.
- 24.7.4. The environmental information shall be disseminated through different NGOs, media and, through various other methods.

24.8. Strengthening legislation

A comprehensive legislation to successfully implement the Environmental Policy of the State is to be enacted.

25. State environment fund

There is a felt need for creating a separate corpus fund for tackling issues related to environmental hazards.

Primary source of this fund shall be the industries and shall be collected by introducing "Polluter Pays Principal/lines". The fund shall be used exclusively for environmental protection and tackling environmental hazards.