

പതിമൂന്നാം കേരള നിയമസഭ

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ചോദ്യം നമ്പർ : 1559

18.06.2012-ലെ മറുപടിയ്ക്ക്

'സ്റ്റേറ്റ് ഓഫ് ദി എൺവയോൺമെന്റ്' റിപ്പോർട്ട്

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(എ) സംസ്ഥാന ശാസ്ത്ര-സാങ്കേതിക പരിസ്ഥിതി കൗൺസിലിന് ഈ സർക്കാർ അധികാരമേറ്റശേഷം കേന്ദ്ര സർക്കാരിൽ നിന്ന് സഹായം ലഭിച്ചിട്ടുണ്ടോ ; വിശദാംശം വെളിപ്പെടുത്താമോ ;

(എ) ഉണ്ട്. കേന്ദ്ര വനം പരിസ്ഥിതി മന്ത്രാലയത്തിന്റെ കീഴിൽ പ്രവർത്തിച്ചു വരുന്ന പരിസ്ഥിതി സാങ്കേതിക വിവര കേന്ദ്രത്തിന് 8,15,253 രൂപയും, ദേശീയ ഹരിത സേനയ്ക്ക് 95,55,000 രൂപയും അനുവദിച്ചിട്ടുണ്ട്.

(ബി) ഔഷധങ്ങൾക്കും ആഹാരത്തിനും വേണ്ടി ഉപയോഗിക്കുന്ന സസ്യജാലങ്ങളെ സംബന്ധിച്ച് 'സ്റ്റേറ്റ് ഓഫ് ദി എൺവയോൺമെന്റ്' റിപ്പോർട്ടിലെ വിശദാംശങ്ങൾ വെളിപ്പെടുത്താമോ ;

(ബി) ശാസ്ത്ര സാങ്കേതിക പരിസ്ഥിതി കൗൺസിൽ തയ്യാറാക്കിയ സ്റ്റേറ്റ് ഓഫ് എൺവയോൺമെന്റ് റിപ്പോർട്ട്-കളിൽ കേരളത്തിലെ ഔഷധ സസ്യങ്ങളെക്കുറിച്ച് രേഖപ്പെടുത്തിയിട്ടുള്ള വിവരങ്ങൾ അനുബന്ധമായി ചേർക്കുന്നു.

(സി) പ്രസ്തുത റിപ്പോർട്ടിന്റെ അടിസ്ഥാനത്തിൽ സ്വീകരിച്ച നടപടികൾ വിശദമാക്കാമോ ?

(സി) ഈ റിപ്പോർട്ടിലെ ശുപാർശകളുടെ അടിസ്ഥാനത്തിൽ വകുപ്പുതലത്തിൽ പ്രത്യേകമായി നടപടികൾ സ്വീകരിച്ചിട്ടില്ലെങ്കിലും മാലിന്യ നിർമ്മാർജ്ജനം, തീരദേശ സംരക്ഷണം തുടങ്ങിയ വിഷയങ്ങളിൽ അതാത് വകുപ്പുകൾ നടപടികൾ സ്വീകരിച്ചുവരുന്നുണ്ട്. പല സ്ഥാപനങ്ങളിൽ നിന്നും ലഭ്യമായ വാറ്റയുടെ അടിസ്ഥാനത്തിൽ തയ്യാറാക്കപ്പെട്ടിട്ടുള്ള പ്രസ്തുത റിപ്പോർട്ട് സംസ്ഥാനത്തിന്റെ പദ്ധതി രൂപീകരിക്കുന്നവർക്കും, നിർവ്വഹണം നടത്തുന്നവർക്കും തീരുമാനമെടുക്കുന്നതിനും സഹായകരമായിട്ടുള്ളതാണ്.

സെക്ഷൻ ഓഫീസർ

#### 4.1.1 Biodiversity

An account of bio-diversity of Kerala's marine and coastal zone is given in Chattopadhyay *et al.* (2003) based on a technical note prepared by M.P. Nayar (2002). Compared to terrestrial biodiversity, the marine biodiversity and their ecological interactions are poorly studied. Tropical marine ecosystem of Kerala coast includes lagoons, mangrove swamps, sandy and rocky shores and open sea front. Studies on microorganisms, phytoplankton's, zooplanktons and micro algae are done in individual groups. The CMFRI (Central Marine Fisheries Research Institute), Kochi conducts studies on marine biodiversity.

A close relationship between the abundance of Oil Sardines (*Sardinella longiceps*) and abundance of *Fragilaria oceanica* in the west coast was reported. About 291 species of phytoplankton were listed in the Kozhikode coast. *Fragilaria oceanica*, *Coscinodiscus gigas*, species of *Chaetoceros*, *Rhizosolenia*, *Bacteriastrum*, *Skeletonema*, *Eucampia* and *Asterionella* were the dominant diatoms. Copepods formed the largest zooplankton community in the Kozhikode area. The other economically important groups in Protozoa are foraminifers and radiolarians. Flagellates form major groups with high productivity and high turnover. Macro algae belong to the families of Chlorophyceae, Phaeophyceae, Rhodophyceae and Cyanophyceae. Out of the total 64 families and 215 genera found in India, Kerala and Lakshadweep area have 25 families and 75 genera.

Sea grasses in the West coast are found in small shallow beds. *Halophila ovalis* is associated with mangroves. Other species are *Halophila beccari*, *Halodule pinifolia*, *Enhalus acoroides* and *Cymodocea rotundata*.

Mangrove vegetation is an important coastal ecosystem associated with tidal / mud flats and back water systems. According to one estimate in the recent past Kerala had 70,000 ha. of mangrove, which had diminished to less than 4200 ha (Mohanam, 1997). Some other estimate indicates the extend of mangrove vegetation to be 1671 ha at present within a distance of 500m from the coastline. Mangroves are found in small isolated patches along the coast and back waters. The major concentrations are found in the Vallapattanam river mouth, Kannur district, Puthuypene at Ernakulam district and Kumarakom (Vembanad lake east

bank) at Kottayam district. Certain patches are also found in Kozhikode districts, Alappuzha, Kollam and Thiruvananthapuram. Table 4.7 provides the district wise distribution of area under mangrove vegetation in the State.

Table 4.7: District - wise distribution of mangroves in Kerala

(Source: Mohanan, (1997))

District	Area in hectares	Area in % to total area	Number of major species
Kasaragod	50	1.20	15
Kannur	3500	83.35	14
Kozhikode	200	4.75	17
Malappuram	100	2.40	11
Thrissur	25	0.60	11
Ernakulam	250	5.95	17
Kottayam	20	0.45	21
Alappuzha	25	0.60	13
Kollam	15	0.35	22
Thiruvananthapuram	15	0.35	14
State total	4200	100.00	32

Important mangrove species are *Rhizophora apiculata*, *micronata*, *Bruguiera gymnorhiza*, *Avicennia officinalis*, *Sonneratia caseolaris*, *Sand apetala*, *Kandelia candal*. Mangrove associates are *Cerbera manghas*, *Hibiscus tiliaceus*, *Derris trifoliata* and *Pandanus tectorius*. These species grow behind the tidal mangrove zone. The fern *Acrostichum aureum* grows in degraded habitats and *Acanthus ilicifolius* colonizes saline marshes.

The strand vegetation (sand dune vegetation) comprises mainly sand binding *Ipomoea pes-caprae*, *Spinifex littoralis*, *Indigofera spicata*, and *Portulacca oleracea*. The common shrubs of the region are *Calotropis gigantea*, *Dodonaea viscosa*, *Scaveola taccada*, and *Hugonia mystax*. Estuarine vegetation is classified into tidal mangroves, prohaline and euhaline types. Prohaline type of vegetation is composed of salt tolerant fresh water plants such as *Ceratopteris siliquosa*, *Conchorus aestuans*, *Hydrophilu quadrivalves*, *Salvinia molesta* and *Sphenoclea zeylanica*. Eury haline type consists of highly salt tolerant plants like *Acanthus ilicifolius*, *Acrostichum* and *Pandanus ficiularis*.

Kerala is endowed with a rich diversity of marine fishes with a numerical strength of more than 300. They represent mainly under clupeids, perches, elasmobranchs, leiognathids, coakers, threadfin breams, flat fishes, carangids, red mullets, etc. There are about 54 species of prawns and shrimps commercially exploited in India. The number of marine mollusks exceeds 300 species with more than 10 commercially important species. The marine echinoderm fauna comprised of around 80 species while the ancillary resources such as sea fans, gorgonids, etc. constitute another 110 species. The state is also endowed with more than 25 species of sea weeds among them 12 species are commercially very important. *Macrobrachium rosenbergii*, the giant freshwater prawn is the largest prawn seen in Kerala backwaters. Apart from this there are more than 12 species of prawn inhabit in the estuaries and backwaters of Kerala among them *M. idella* is commercially very important. Commercially important lobsters occurring in the Kerala coast are *Panulirus homarus* and *P. polyphagus*. Other species are *Scyllarus sordidus* and *P. ornatus*. Important crab species used in food are *Matuta lunaris*, *M. planipes*, *Scylla serrata*, *Neptunus sanguinolentus*, *N. pelagicus*, *Charybdis cruciata*, *C. annulata*, *C. edwardsi*, *C. natator* and *Varuna litterata*.

Five species of marine turtles are found in Indian waters. The Hawksbill (*Eretmochelys imbricata*) variety is common in tropical water. Olive Ridley (*Lepidochelys olivacea*) turtle are found to nest in Kozhikode coast near Payyoli.

Mangrove forests in India are habitats of around 177 resident and migratory birds, of which 45 species are reported in the mangrove forests of Kerala alone. The common species are heron, kingfisher, sea eagle, kites and storks.

India has good pelagic fishery resources comprised of mainly of oilsardine and lesser sardines, mackerel, tuna, carangids, seer fishes, and demersal fishes such as cat fishes, elasmobranchs, sciaenids, silver bellies, besides shrimps and other crustaceans. About 60% of marine fish yield of the country comes from the west coast, of which Kerala contributed as high as 30%. The coastal waters in Kerala are highly productive, the mud bank formations in the Kerala coast add to the high fish turnover.

The common hydrophytes found in the wetlands of Kerala are classified as submerged and emerged types and they are further classified as free-swimming (phytoplanktons) and floating types. Some of the common wetland flowering plants are *Eichhornia crassipes*, *Pistia stratiotes*, *Monochoria vaginalis*, *M. hastata*, *Limnocharis flava*, *Lagenandra meeboldii*, *L. toxicaria*, *Colocasia esculenta*, *Nelumbo nucifera*, *Nymphaea nouchali*, *Blyxa aubertii*, *B. octandra*, *Hydrilla verticillata*, *Hygrophila auriculata*, *Xyris indica*, *Limnophylla chinensis*, *L. indica*, *Pandanus furcatus*, *P. fascicularis* and *P. thwaitesii*.

Important medicinal plants available in the coastal belt which help in local traditional medical practices are Vayambu (*Acorus calamus*), Adalodakam (*Adhatoda vasica*), *Aloe vera*, Perumaram (*Ailanthus triphysa*), Koovalam (*Aegle marmelos*) Kirath (*Andrographis paniculata*), *Aristolochia tagala*, Sathavaari (*Asparagus racemosus*), Bramhi (*Bacopa monnieri*), Thazhuthama (*Baerhavia diffusa*), Mukkutti (*Biophytum sensitivum*), Kanikonna (*Cassia fistula*), Uzhinja (*Cardiospermum halicacabum*), Kodangal (*Centella asiatica*), Vayana (*Cinnamomum verum*), Cheruthekkku (*Clerodendron serratum*), Veluthashangupuspam (*Clitoria ternatea*), Nilapana (*Curculigo orchicoides*), Karuka (*Cyperus dactylon*), Mulapalkodi (*Euphorbia hirta*), Kaiyonni (*Eclipta prostrata*), Chakkarkolli (*Gymnema sylvestre*) Adumbuvalli (*Ipomoea pes-caprae*), Neerkanthalam (*Lagenandra ovata*), Kizhanelli (*Phyllanthus amarus*), Kalluruki (*Scoparia dulcis*), Krumhotti (*Sida cordifolia*), Amrutu (*Tinospora cordifolia*), Nerinjil (*Tribulus terrestris*), Vallipala (*Tylophora indica*) and Murikkotti (*Zernia diphylla*).

## 4.2 DRIVING FORCES

The major driving forces of Kerala's marine and coastal environment are population, urbanization, industry, infrastructure, water transport, fisheries, agriculture, tourism and policy initiatives and legislative interventions of the Government.

### 4.2.1 Population

Census data of 2001 for the Grama Panchayats are not yet published, therefore, demographic characteristics of the coastal belt discussed in this report are based on 1991 Census data. In 1991, the total population of Kerala was 29.6 million. Out of 14 districts in Kerala, 10 are coastal. 227 panchayats, 3 corporations and 19 municipalities falling in the

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