15 -ാം കേരള നിയമസഭ

11 -ാം സമ്മേളനം

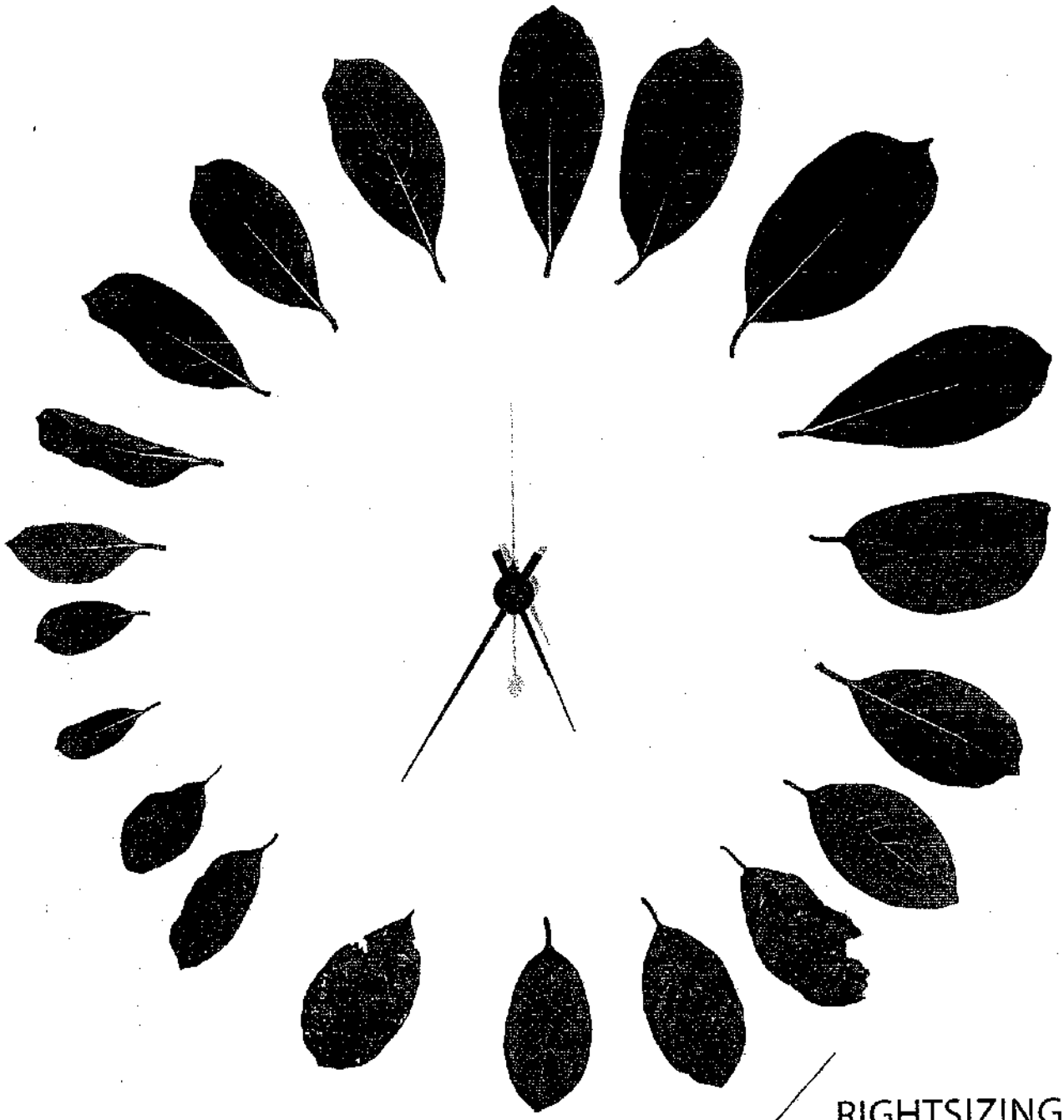
നക്ഷത്ര ചിഹ്നം ഇല്ലാത്ത ചോദ്യം നം. 41 **10-06-2024 - ൽ മറുപടിയ്ക്ക്**

മലിനീകരണ നിയന്ത്രണ ബോർഡിന്റെ പ്രവർത്തനം

ചോദ്യം		ഉത്തരം	
ശ്രീ. റോജി എം. ജോൺ		**ശ്രീ. പിണറായി വിജയൻ (മുഖ്യമന്ത്രി)**	
(എ)	സംസ്ഥാന മലിനീകരണ നിയന്ത്രണ ബോർഡിന്റെ പ്രവർത്തനം സംബന്ധിച്ച് ഐ.എം.ജി വർക്ക് സ്റ്റഡി നടത്തിയിട്ടുണ്ടോ; എങ്കിൽ പ്രസ്തുത വർക്ക് സ്റ്റഡി എന്ന് നടത്തിയെന്ന് അറിയിക്കുമോ; പ്രസ്തുത പഠന റിപ്പോർട്ടിന്റെ പകർപ്പ് ലഭ്യമാക്കുമോ;	(എ)	**ഉണ്ട്. 2021 ൽ ഐ.എം.ജി നടത്തിയ പഠന റിപ്പോർട്ടിന്റെ പകർപ്പ് ഉള്ളടക്കം ചെയ്യുന്നു.**
(ബി)	ഐ.എം.ജി നൽകിയ റിപ്പോർട്ട് പരിശോധിച്ച് തുടർനടപടി സ്വീകരിക്കുന്നതിനായി മലിനീകരണ നിയന്ത്രണ ബോർഡ് ഉപസമിതിയെ നിയോഗിച്ചിരുന്നോ; ഏത് സാഹചര്യത്തിലാണ് ഇപ്രകാരം ഉപസമിതിയെ നിർദ്ദേശിച്ചത്; പ്രസ്തുത ഉപസമിതി സമർപ്പിച്ച റിപ്പോർട്ടിന്റെ പകർപ്പ് ലഭ്യമാക്കുമോ;	(ബി)	**മലിനീകരണ നിയന്ത്രണ ബോർഡ് ഉപസമിതിയെ നിയോഗിച്ചിട്ടില്ല.**
(സി)	മലിനീകരണ നിയന്ത്രണ ബോർഡിൽ നിലവിൽ എത്ര ജൂനിയർ സയന്റിഫിക് അസിസ്റ്റന്റ് തസ്തികകൾ ഉണ്ട്; ഐ.എം.ജി. നൽകിയ പഠന റിപ്പോർട്ടിൽ മലിനീകരണ നിയന്ത്രണ ബോർഡിലെ ജൂനിയർ സയന്റിഫിക് അസിസ്റ്റന്റ് തസ്തിക എത്ര എണ്ണമായി ഉയർത്തണം എന്നായിരുന്നു നിർദ്ദേശിച്ചിരുന്നതെന്ന് വ്യക്തമാക്കുമോ;	(സി)	**കേരള സംസ്ഥാന മലിനീകരണ നിയന്ത്രണ ബോർഡിലെ 15 സീനിയർ സയന്റിഫിക് അസിസ്റ്റന്റ് തസ്തികകൾ 19.12.2022ലെ സ.ഉ.(സാധാ) നം. 98/2022/പരി നം. ഉത്തരവ് പ്രകാരം ജൂനിയർ സയന്റിഫിക് അസിസ്റ്റന്റ് തസ്തികകളായി തരംതാഴ്ത്തുകയും അതേ തുടർന്ന് 45 (30+15=45) ജൂനിയർ സയന്റിഫിക് അസിസ്റ്റന്റ് തസ്തികകളാണ് നിലവിലുള്ളത്.** **2021 ൽ ഐ.എം.ജി. നൽകിയ പഠന റിപ്പോർട്ടിൽ മലിനീകരണ നിയന്ത്രണ ബോർഡിലെ ജൂനിയർ സയന്റിഫിക് അസിസ്റ്റന്റ് തസ്തികയിലെ എണ്ണം വർദ്ധിപ്പിക്കുന്നത് സംബന്ധിച്ച് ശിപാർശകൾ ഒന്നും തന്നെയില്ല.**
(ഡി)	പ്രധാനപ്പെട്ട ലബോറട്ടറി പരിശോധനകൾ നടത്തേണ്ട എൻടി കേഡർ തസ്തികയായ ജൂനിയർ സയന്റിഫിക് അസിസ്റ്റന്റിന്റെ 72 തസ്തികകൾ കൂടി അടിയന്തരമായി സൃഷ്ടിക്കണം എന്ന പഠന റിപ്പോർട്ടിലെ നിർദേശം നിരാകരിച്ച് ഉപസമിതി റിപ്പോർട്ടിൽ ജൂനിയർ സയന്റിഫിക് അസിസ്റ്റന്റിന്റെ 8	(ഡി)	**2013 ലെ ഐ.എം.ജി പഠന റിപ്പോർട്ടിൽ ജൂനിയർ സയന്റിഫിക് അസിസ്റ്റന്റിന്റെയും പോസ്റ്റ് ഗ്രാജുവേറ്റ് സയന്റിഫിക് അപ്രന്റീസ് തസ്തികയും ചേർത്ത് 72 അഡീഷണൽ റിക്രൂയർമെന്റ് ശിപാർശ ചെയ്യുകയും തുടർന്ന് രൂപീകരിച്ച ഉപസമിതി ബോർഡിന്റെ മെച്ചപ്പെട്ട പ്രവർത്തനത്തിന് ജില്ലാ ബോർഡിന്റെ**

	തസ്തികകൾ മാത്രം സൃഷ്ടിച്ചാൽ മതി എന്ന് നിർദ്ദേശിക്കാനുള്ള കാരണം എന്താണെന്ന് വ്യക്തമാക്കുമോ?		**എല്ലാ ഓഫീസുകളിലെയും ജോലിഭാരം വിലയിരുത്തി മറ്റ് തസ്തികകളുടെ വർദ്ധനവിനോടൊപ്പം നിലവിലുണ്ടായിരുന്ന 37 സീനിയർ സയന്റിഫിക് അസിസ്റ്റന്റ് / ജൂനിയർ സയന്റിഫിക് അസിസ്റ്റന്റ് തസ്തികകളുടെ എണ്ണം 45 ആയി ഉയർത്തുന്നതിന് ശിപാർശ ചെയ്യുകയും ആയതിന്റെ വെളിച്ചത്തിൽ ജൂനിയർ സയന്റിഫിക് അസിസ്റ്റന്റിന്റെ 8 അധിക തസ്തികകൾ സൃഷ്ടിക്കുകയുണ്ടായി.**

സെക്ഷൻ ഓഫീസർ



RIGHTSIZING THE MANPOWER OF KERALA STATE POLLUTION CONTROL BOARD (KSPCB)

KERALA

IMG

INSTITUTE OF
MANAGEMENT IN GOVERNMENT

Right sizing the manpower of

Kerala State Pollution Control Board

INSTITUTE OF MANAGEMENT IN GOVERNMENT
THIRUVANANTHAPURAM 695033

October 2021

PREFACE

As the apex body in the State to control and abate pollution, the Kerala State Pollution Control Board plays a vital role for preserving healthy life in the State. Irrespective of the reasons, pollution is on increase, much to the heightened concern of society. The robustness of the machinery, the attitude and the skill set of the personnel to deal with the task is of paramount importance and it is in this context that the present study assumes significance.

The study was an attempt to assess the right quantity and quality of manpower required to meet the challenges in pollution control and environment protection. This study report has recommended an integrated approach to vitalize the existing and the emerging human resource of the organization. The study has also suggested the steps required and the activation required from the leadership to have the right attitude and skills along with motivational indicators.

The Board may use the study as a useful tool to initiate remedial measures and implement the recommendations regarding the value system, attitude and skills for all its employees. Such a holistic intervention will no doubt empower the State Pollution Control Board, to address the critical challenges before it in the larger interest of the society.

K. Jayakumar

Director, IMG

ACKNOWLEDGEMENTS

During the preparation of this document, we have sought and received valuable inputs and support from several persons. Director, Institute of Management in Government (IMG) and the members of the Consultancy Team gratefully acknowledge their valuable guidance.

We acknowledge with thanks the services of Shri Pradeep Kumar AB, Chairman KSPCB who recognized the need for this Study, laid out its contours and reposed faith in IMG. He had stepped in at every stage to make our task smoother. But for his perspicacity, this Study would not have been possible in such a short time. We also acknowledge the support and suggestions provided by all the Officers of KSPCB.

We thank Smt. Sreekala S, Member Secretary and Dr. Sheela AM, Chief Environmental Engineer who had enriched the Study by their domain knowledge and suggestions.

We are grateful to our two research associates Shri. J. Raveendran and Miss. Alif Dinar for all the meticulous work done during the data collection, analysis and report writing stages.

R. PRAKASAM & DR. MINI B. NAIR

Consultants

Table of Contents

LIST OF TABLES

LIST OF FIGURES

Abbreviations

ACO	Accounts officer
AE	Assistant Engineer
AEE	Assistant Environmental Engineer
AES	Assistant Environmental Scientist
AG	Accountant General
ALPA	Alappuzha
AMC	Annual Maintenance Contract
AO	Administrative Officer
APIO	Assistant Principal Information Officer
AQI	Air Quality Index
AS	Assistant Scientist
BCP	BlueSens Gas
BIMS	Bill Information Management system
C&AG	Comptroller and Auditor General
CAAQMS	Continuous Ambient Air Quality Monitoring Stations
CBMWTDF	Common Bio-medical Waste Treatment and Disposal Facility
CEMS	Continuous Emission Monitoring System
CET	College of Engineering, Trivandrum
CETP	Common Effluent Treatment Plant
CMPGRC	Chief Minister's Grievance Redressal & Distress Relief Fund
CPCB	Central Pollution Control Board
CSER	Corporate Social and Environmental Responsibility
CSIR	Council of Social and Industrial research
CTE	Consent To Establish
CTO	Consent To Operate

DA	Dearness Allowance
Db	Decibels
DCRG	Death cum Retirement Gratuity
DDT	Dichloro- Diphenyl-Trichloroethane
DO	District Office
DPC	Departmental Promotion Committee
EEE	Electrical and Electronic Engineering
EKM	Ernakulum
ENVIS	Environmental Information System
EP Act.	Environment Protection Act
EPA	Environment Protection Act
ES	Environmental Scientist
EV	Electric Vehicle
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GIS	Geographical Information System
GoI	Government of India
GST	Goods and Services Tax
HBA	House Building advance
HO	Head Office
ICPOES	Inductively coupled plasma - optical emission spectrometry
IDK	Idukki
IMG	Institute of Management in Government
ISO	Indian Standards Organisation
IT	Information Technology
JSA	Junior Scientific Assistant

K-CIS	Kerala - Centralised Inspection System
KEIL	Kerala Enviro Infrastructure Limited
KFRI	Kerala Forest Research Institute
KKD	Kozhikode
KLM	Kollam
KNR	Kannur
KPI	Key Performance Indicator
KPSC	Kerala Public Service Commission
KSGD	Kasargode
KSIDC	Kerala State Industrial Development Corporation
KSLMA	Kerala State Literacy Mission Authority
KSPCB	Kerala State Pollution Control Board
KSR	Kerala service Rules
KSRTC	Kerala State Road Transport Corporation
KSWIFT	Kerala Single Window Clearance Mechanism
KTM	Kottayam
LAN	Local Area network
LCMS	Liquid Chromatography with tandem mass spectrometry
LIC	Life Insurance Corporation
LIMS	Library Information Management System
LPC	Last Pay Certificate
LSG	Local Self Government
LWA	Leave without allowance
MCF	Material collection facility
MIS	Management Information System
MLPM	Malappuram
NABL	National Accreditation Board for Testing and Calibration Laboratories

NAMP	National Air Monitoring Progrmme
NGO	Non Governmental Organisation
NGT	National Green Tribunal
NIC	National Informatics Centre
NIIST	National Institute for Interdisciplinary Science and Technology
NOC	No Objection Certificate
NPS	National Pension Scheme
NRA	Non Refundable advance
NWMP	National Water Monitoring Programme
OCMMS	Online Consent Management and Monitoring System
ODEPC	Overseas Development and Employment Promotion Council
OSHAS	Occupational Health and Safety Assessment Series
PCB	Pollution Control Board
PIO	Principal Information Officer
PLKD	Palakkad
PTA	Pathanamthitta
RfP	Request for Proposal
RO	Regional Office
RRF	Resource Recovery Facilities
RSPM	Respirable suspended particulate matter
RTI	Right to Information
RTWQMS	Real Time Water Quality Monitoring System
RWSS	Rural Water Supply scheme
SAMP	State Air Monitoring Programme
SEE	Senior Environmental Engineer
SKALAR	Automated Wet Chemistry Analyzers
SLI	State Life Insurance

SOP	Standard Operating Procedure
SPCB	State Pollution Control Board
SPL	Sound Pressure Level
SWMP	State Water Monitoring Programme
TA	Travelling Allowance
TCLP	Toxicity Characteristic Leaching Procedure
TPA	Tones per Annum
TPD	Tones per Day
TSR	Thrissur
TVM	Trivandrum
TVPM	Thiruvananthapuram
UNDP	United Nations Development Programme
UNEP	United Nations Environment programme
UPS	Uninterrupted Power Supply
USA	United States of America
VOC	Volatile Organic Compound
WHO	World Health Organisation
WND	Waynad

Executive Summary

Environmental pollution is becoming a very vital challenge for humanity as well as to all living beings. The Kerala State Pollution Control Board (KSPCB) is the empowered authority for abating Pollution in the State. The study "Right sizing the manpower of the Kerala State Pollution Board" is entrusted with the Institute of Management in Government as part of strengthening the infrastructure required for controlling pollution in the State. The deliverables of the study were an organisation structure with appropriate manpower matching with the goals and objectives of the organisation and a performance appraisal system for the technical officers to monitor the performance of the organisation to reduce pollution.

The study had an all round approach in assessing the work of the technical staff in relation to the demand for pollution abating activities by KSPCB. This has been related to manpower requirement. The study has also given due importance in preparing a job description for the technical personnel and to measure performance through a performance appraisal system.

The Study recommends the following:

1. In the absence of an explicitly stated vision, mission and functions of KSPCB, we have proposed a Vision, Mission and consolidated functions. The Board may accept it as such or with modification.

2. It is recommended to have one more post of Assistant Engineer in all District offices (14 Nos.) except the Environmental Surveillance Office at Elloor and Additional District Office at Perumbavoor. The Board may redistribute the activities in such a way that each technical officer will get more time to undertake preventive projects and inspection. This recommendation is not in isolation, but linked to the performance appraisal system recommended in chapter 5.

3. For the Central Laboratory, equipments were purchased and installed for Residue Monitoring Lab., Microbiology Lab. and Genomic Lab. Proper and quality man power is required for its satisfactory performance. It is recommended to have one additional post of Environmental Scientist for each of these labs (3 Nos.). The mode of appointment shall be on deputation or on contract from personnel with Ph.D in concerned subject and experience. The specific qualifications may be fixed by the Board.

4. It is recommended to create a post of Law Officer in the rank of Deputy Secretary and the post may be filled by deputation from the Law Department of Government Secretariat. The present set up for legal activities will function under the Law Officer who will be reporting to the Member Secretary.

5. It is recommended to continue with the same organisation structure. The District Office II at Ernakulum is a misnomer. It creates confusion to any unfamiliar person. The district office II was started at Perumbavoor considering the intensity of industrial activities in the area and the resulting pollution concerns. The second district office in Ernakulum may be renamed Sub District Office, Perumbavoor. The same staff pattern shall continue with same functions and powers. The Environmental Surveillance Centre at Eloor will continue as Environmental Surveillance Centre and not as District Office III Ernakulum.

6. When the intensity of activities in an area increases, there is a requirement to have more officers and with infrastructure to handle it. Intensity of activities is a function of increasing number of establishments which are prone to create pollution. Hence it is recommended that when the number of consent authorisation increases over 2000 per year and the number of planned (as programmed in OCMMS) inspections required crosses 1500, a new Sub District Office with a geographical demarcation shall be created.

7. Performance appraisal is an integral part of any organisation to ensure that the human resource works in line with the organisational objectives. We have developed a performance appraisal system for the technical staff of the Board. It is recommended to implement the performance appraisal system proposed in chapter 5 of this report. The additional manpower recommended is coupled with this appraisal system and hence either of this should not be implemented in isolation.

8. Awards may be instituted for functionaries of the Board on the basis of performance appraisal. Similar awards may be given to the best district and the best regional office on the basis of aggregate score of all the employees.

9. We have felt a severe shortage of skills and right attitude among personnel in the organisation. A systematic training system is recommended for improving the skills and attitude of personnel in the Board. A compulsory induction training of 2 weeks duration within one week of posting them, after KPSC recruitment is proposed. We have suggested the topics to be included also. Similar training programmes with topics of relevance to the work situation may be arranged for other categories of recruited personnel. As large number of personnel are going to be recruited on regular appointment, these programmes will go a long way in moulding them with the right knowledge, skills and

attitude. Refresher training also may be arranged thereafter, at least once in 2 years for better administration along with subjects of topical importance. This should be apart from the usual training programmes conducted by other organisations on which Board's Officers are deputed.

10. Lot of efforts were put in by the IT and Data Management Centre. Many are adhoc, some are not integrated and some are left unutilised and underutilized by officers. The last effort was in creating cloud based Unified Digitization Platform with many features to make office work easier. Definitely this is a good move, but the Centre has to be made more professional. It is recommended that the proposal may reframed with a new RfP by an expert which will cover a process re-engineering, integration of all prevailing modules and an e-office avoiding all duplications, redundancy and online updating in all shareable stakeholder sites. Whether it is cloud based or any other data centre, this has to be based on expert opinion avoiding all dependencies and ego. The RfP shall be prepared to attract national level players in software development with programming and maintenance support. This is very vital as it affects the health of a community no financial constraints to be considered. This shall be coupled with providing national or international level training to personnel in IT and Data Management Centre for a broader picture of the state of affairs. This recommendation, if implemented properly will reduce the work load by 30 to 35 %. The ease and comfort of working will improve considerably. There will be increase in efficiency and better public image for the organisation.

11. Social changes are also required to bring in the right attitude from the society for a safer environment. A planned approach is to be initiated with the objective of 'safe habits and attitudes for a healthy environment'. Many activities like seminars, workshops, publications, advertisement etc. can accomplish this. But a focused approach on changing the prevailing habits and attitudes to the desired level is what is required. It calls for promotional media campaigns which translate the motivation of the society into action. In this context, we recommend that at least 5% of the proposed budget for the ensuing year may be set apart for media campaigns to bring in changes in the attitude and behaviour of people to abate pollution. For implementing the same Board may hire agency/ people on contract who may develop the campaign and implement it along with monitoring. The funds earmarked for this purpose have not been utilised fully. In case, more funds are required, , it may be sourced from own funds collected through penalties or by mobilising it from CSR funds of bigger and higher polluting organisations like BPCL, FACT etc.

Right sizing the manpower of Kerala State Pollution Control Board

CHAPTER 1

INTRODUCTION

1.1 Introduction

The Kerala State pollution Control Board (KSPCB) has entrusted Institute of Management in Government, Kerala with an assignment of studying and rightsizing the organisation based on Board's proceedings No. PCB/EI/39/15/2020 dated 17.06.2021. Environmental pollution is a global problem that is inextricably linked with rapid industrialisation and urbanisation. 'Humanity is waging a war on nature', warned United nations' Secretary General in 2020, referring to how our consumption and production systems are destroying the environment. According to a new report by the United Nations Environment Programme (UNEP), World needs to transform its relationship with nature and tackle the climate, biodiversity and pollution crises together to secure a sustainable future and prevent further pandemics.

Rapid economic development of India has undoubtedly changed the life of millions of Indians, but there is no element of doubt that it has also polluted the environment in which more than a billion Indians live. While pushing for growth, planners and administrators must also ensure that growth is sustainable and doesn't have negative impact on the air we inhale, food we eat and the water we drink. According to the latest World Air Quarterly Report published in 2021 by the Swiss organisation IQ Air, out of 30 most populated cities in the world 22 are in India. The cost of Indian business due to air pollution is $95 Billion (about Rs.7 lakhs crore) every fiscal year which is around 3% of India's GDP, according to a major research report (Business Line 21st April 2021).

The study has immense potential, if properly implemented in providing a healthy and safe environment for human life in the state. Kerala State Pollution Control Board

should take a positive and proactive approach to see that technology is used appropriately and human efforts are optimised for bringing pollution under control. To beat pollution, governments, businesses and civil society must have access to the latest updated geospatial information, assessments and tools for evidence based policy and action.

1.2 Need for the study

Indian Constitution guarantees to everyone in India the right to life under Article 21 as a fundamental right. The right to clean environment and the right to have access to safe drinking water are included as fundamental rights under the above as upheld by the Hon'ble Supreme Court of India (1991) 1SSC 598 in Subash Kumar Vs State of Bihar Article 51 A of the Constitution lays down that it shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wild life and to have compassion for living creatures. Neither the administrative machinery and strategy nor the citizen's responsibility to discharge the fundamental duty to protect and improve the environment is forthcoming to meet this challenge to the desired level.

The Environment (Protection) Act of India was enacted in 1986 under Article 253 of the Indian constitution with the objective of providing protection and improvement of the environment. The State Legislature has also made a few Acts and framed rules there under with the above purpose. The National Green Tribunal, established in 2010, as per National Green Tribunal Act is a specialised judicial body equipped with the expertise solely for the purpose of adjudicating environmental cases in the country. Kerala State Pollution Control Board was also created as a regulatory Authority for enforcing various pollution control laws and for controlling or abating pollution. Despite efforts made by the Pollution Control Board, the Government also needs to empower the existing administrative machinery to be more proactive in combating pollution in the State.

The rapid urbanisation, increase in vehicles, industrialisation, constructions, mining and quarrying activities, creation of municipal solid waste, e-waste, bio-medical waste etc. are increasingly accelerating the speed of pollution in the State. However, the machinery to abate it is scattered, poorly coordinated and unfocused. There is a need for better of coordination, unified authority and focussed proactive approach.

The Hon'able Supreme Court has stepped in time and again for improving implementation of pollution laws. The Auditor and Comptroller General of India in its report on municipal solid waste squarely blames the implementing agencies for the failure in addressing the waste management issues. The head of the Delhi based Centre for Science and Clean Air programme said, "Environmental laws are pretty strong, but it does not necessarily lead to enforcement and implementation". The growing number of industries and polluting activities and the increasing functions of the Pollution Control Board dictate an urgent need for capacity building in terms of technical expertise and strength of technical manpower, as has been expressed by environmental experts and recommended by Parliamentary Committee on Environment.

KSPCB in their letter dated 30.01.2020 has stated that the staff sanctioned now is on the basis of the work load which was necessary for the implementation of the Water and Air Acts. After the enactment of the above legislations, a number of legislations have come under the purview of the KSPCB. The Board has also been entrusted with the implementation of the Hon'ble National Green Tribunal orders within the time limit.

The Hon'ble Supreme Court in Techi Tagi Tara Vs Rajendra Singh Bhandari & Ors., (2018)11 SCC 734 with regard to performance audit, recruitment and functioning of the State Pollution Control Boards, has directed all State Governments to strengthen their Pollution Control Boards in terms of its management, infrastructure and manpower.

Based on Order dated 05.02.2021 of the Hon'ble National Green Tribunal , Principal Bench, New Delhi, in O.A. no. 837of 2018, The Chief Secretary, Government of Kerala in his Note No.12/EM Cell/CSO/2021(2) dt.05.02.2021 directed the Environment Department to review the present activities of the KSPCB and study and address the issues emerging from CPCB Report, prepare and execute the respective action plans which will include filling all vacant posts with competent persons and procuring the requisite equipment, including commissioning and up-gradation of all laboratories and recognition under the EP Act, 1986.

1.3 Objectives of the study

The study will:

1. do an assessment of the quantum of activities involved in controlling pollution due to increasing complexity of life;

2. assess the present activities and the gaps in man power in fulfilling the responsibilities of Kerala State Pollution Control Board;
3. develop an organisation structure to accomplish the goals and objectives of Kerala State Pollution Control Board and
4. propose a performance appraisal system for technical officers with a view to monitor and control pollution in the state.

1.4 Deliverables

- An organisation structure with appropriate manpower matching with the goals and objectives of the organisation.
- A performance appraisal system for the technical officers to monitor their performance and organisational performance to reduce pollution.

1.5 Approach

KSPCB in 2012 entrusted IMG with a work study of the organisation to ascertain the man power requirement. The study recommended increase in manpower to manage the work load at that time and some arrangements for transferring the non-technical work of technical staff to non-technical staff. But actual work load to abate pollution is a step by step process especially on a proactive level and the manpower requirement for the same was not attempted as this was not within the scope of that study.

The present study was instituted after several rounds of discussions considering the scope of the study on a larger framework of controlling pollution in the state. There is a requirement to be proactive and reactive in controlling pollution. Equally important is the coverage of all the sources of pollution based on the extent and impact.

Attitude and habituations of the society play a very crucial role in self containing pollution and its impact. It is also the responsibility of Governments at various levels to support it with creation of infrastructure, machinery and appropriate legislation to complement and support the efforts to abate pollution.

The study has done an all round / 360 degree approach in assessing the work of the technical staff in relation to the demand for pollution abating activities by KSPCB. The has been converted to period specific plans and a manpower requirement for the same is assessed. The study has also given due importance to preparing a job description f

the technical personnel, infrastructure like laboratory, data centre etc. and a measure of the resulting performance through a performance appraisal system.

1.6 Methodology

1.6.1 Primary Data

Interviews were conducted with Officers of Head Office, Regional Offices at Trivandrum and Ernakulum, District Offices at Trivandrum and Ernakulum and the Central Laboratory at Ernakulum. Data were also collected from all the offices using structured questionnaires attached as Annexure 1. Focus Group Discussions were held with sample group of Officers from different levels and categories. Structured questionnaires, guided questions and open discussions were done to collect primary data. Wherever required, activity sampling and observations were also used. Important stakeholders outside the organisation were interviewed for expert opinions.

1.6.2 Focus Group Discussions

On line Focus group discussions (FGD) with all the Officers of head quarters, regional offices and district officers were arranged by the KSPCB for eliciting information on a facilitative mode.

1.6.3 Expert Opinion

Interviews with experts were held to elicit expert opinion and clarify issues raised out of primary data, secondary data and data from focus group discussion.

1.6.4 Secondary Data

Secondary data required to assess the causes, extent and impact of pollution were collected and used for the study from various published sources. Data available with the organisation were collected to assess the performance of officers and organisation. The work Study conducted by IMG in 2013 was also used as secondary data source for the study.

1.6.5 Analysis

Simple statistics, logical derivations, expert opinions and our expertise in manpower studies along with the primary and secondary data collected were used for assessment of the manpower requirement.

1.7 Benefits of the Study

While assessing and appreciating the role played by the KSPCB in preventing and mitigating the pollution in the State, in the given situation and constraints it is confronted with, the study could give a new dimension with a comprehensive approach of preventive, collaborative, social and extensive reach required for controlling and abating pollution in the State.

Abating pollution is very vital for the very existence of life on earth. A small State like Kerala with protective boundaries of mountains and sea has higher potential in controlling and reducing pollution in the State. The study recommends preventive initiatives independently by KSPCB, jointly by LSGs and KSPCB, facilitating social and voluntary organisations and social marketing for attitudinal change apart from the curative measures already existing now. This will definitely help to reduce pollution in the State.

The recommendations of the study envisage change in the manpower requirement, organisation structure and approach to pollution control. But this may not necessarily result in a performance improvement in pollution control. To ensure organisational performance the study recommends a performance appraisal system for the professionals which will be linked to their career advancement.

Capacity building of personnel is very important in performance. The recommendations of the study on capacity building will not only help individual development but also result in mitigating the pollution and protecting the environment to a great extent while providing sustainable economic growth through more efficient productivity in different sectors.

1.8 Limitations of the Study

The Covid - 19 pandemic and the mobility restrictions imposed by the Government was the major constraint in meeting more people and collecting information. This has also

restricted the extensiveness in covering various activities by observing and assessing. The partial attendance restrictions also added to reaching the Officers due to their non availability and very often caused delay in getting both primary and secondary data.

The study was undertaken with an understanding that KSPCB will share all the information required for the study, but there were restrictions.

CHAPTER 2

ENVIRONMENTAL POLLUTION – CAUSES, EXTENT AND IMPACT

2.1 Introduction

Environment Pollution is the unfavourable alteration of our surroundings, largely as a by-product of man's action which is evidenced by loss of vegetation, biological diversity, excessive amount of harmful chemicals in the ambient atmosphere and land and in food grains causing threat to life support system. Pollution is pervasive and persistent.

2.2 Air Pollution in India

Air pollution in India is a serious health issue. Of the most polluted cities in the world, 22 are in India in 2020 as per the Air Quality Report 2021 prepared by the Swiss Organisation IQ Air. As per a study based on 2016 data, at least one million people in India breathe air that is 10 times or more over the WHO safe limit and 13 among the world cities with the highest annual levels of air pollution are in India. Fig. 2.1 shows the major causes of air pollution in India.

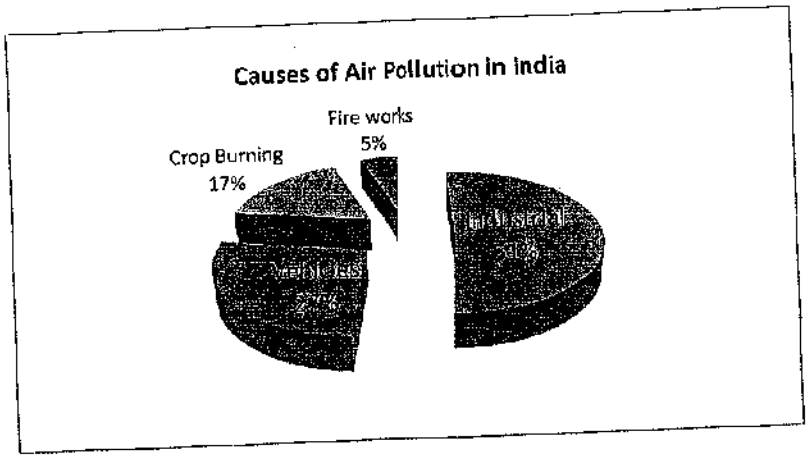


Fig.2.1. Causes of air pollution in India.

The major cause of air pollution is industrial pollution (51%) followed by vehicles (27%), crop burning (17%) and fire works (5%). Emission comes from vehicles and industry due to burning of fossil fuels such as coal and petroleum where as in rural areas, much of pollution comes from biomass burning for cooking and keeping warm. In autumn and

spring months, large scale crop residue burning in agricultural fields – a cheaper alternative to mechanical tilling is a major source of smoke, smog and particulate pollution. Though India has a low per capita emission of green house gases, the country as a whole is the third largest green house gas producer after China and the USA. A 2013 study report says that Indians have 30% weaker lung function than Europeans.

In Kerala ever increasing use of fossil fuels in the transportation and industrial sector is the major source of air pollution adversely affecting the air quality of Kerala. The number of registered motor vehicles across Kerala in the last 3 decades, has shown a tremendous increase of motor vehicles from 5.81 lakhs in 1990, 19.1 lakh in 2000, 53.98 in 2010 to 141.84 lakhs at the end of the fiscal year 2020. The decadal increase of vehicles in Kerala is given in Fig. 2.2.

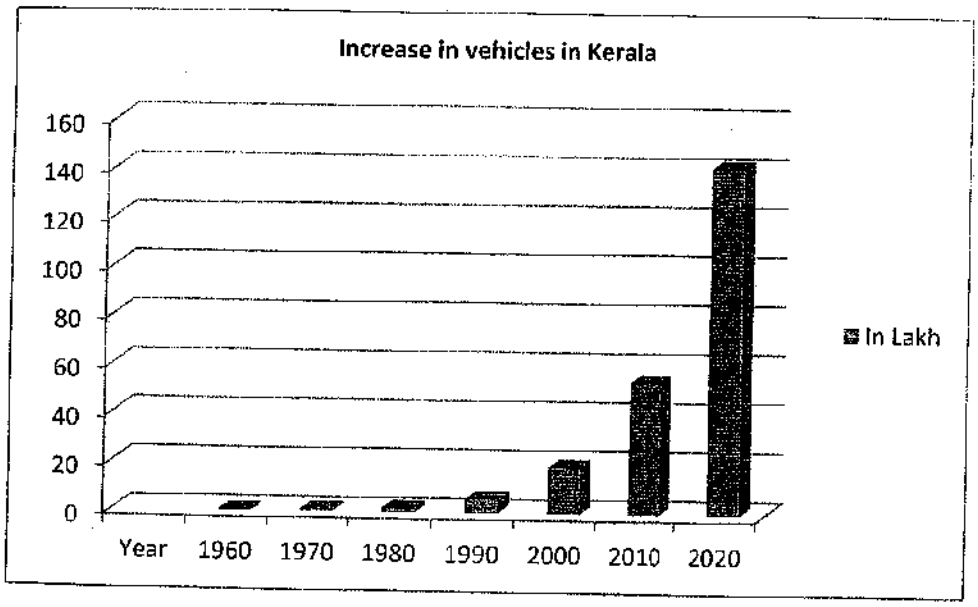


Fig.2.2. Figure showing decadal increase in vehicles in Kerala.

Traffic has been growing at a 10 to 11% every year resulting in excessive pressure on roads that have not improved proportionate to the number of motor vehicles. The total road length of the State during 2017-18 is 2,73,113.30 Kms, according to ENVIS Centre. The road density of the State is 528.8 Km per 100 Sq. Km and it is far ahead of national average of 387. The spurt especially in personal vehicles, in a State that has an estimated population of over 3.47 crore as on 2021 is due to over dependence on personal vehicles and inefficiency of public transport – both KSRTC and private stage carriers, lack of mass rapid transit system in the major cities and new life style goals.

Though the number of vehicles increased many fold at an unprecedented level, the increase in road length has not increased to the required level to ensure easy and smooth running of vehicles resulting in further deterioration in air quality, apart from causing more and more road accidents.

Rapid urbanisation process causes increased levels of mining and quarrying, improper collection and disposal of municipal solid waste, burning of plastics, biomedical waste etc.

2.3 Municipal Solid Waste

The consumption of resources results in generation of waste. Solid waste generation is mainly due to domestic and industrial activities. The industrial waste is hazardous as well as non-hazardous in nature.

It is projected that Asian countries will experience largest increase in food waste production by 44% ie. from 278 million tonnes to 416 million tonnes between 2005 to 2025, there by the methane emission will enhance from 34 million to 48 million tones.

The CPCB 2016 statistics says 1,41,064 TPD of municipal solid waste is produced due to various household activities and other commercial and institutional activities waste collected is 1,27,531 TPD (90%) and treated 34,752 TPD (27%) and landfilled is 4,515 TPD. An increase in one percent national income increases solid waste by 0.7 percentage. Studies indicate that 51% of the waste generated is compostable, 18% recyclable and 31% inert. Among the recyclable, 6% is paper, 3% is textiles, 1% is leather, 4% is plastics, 2% is metals, and 2% is glass materials.

The solid waste generation due to domestic activities is very high in Kerala due to a developed modern society compared to other states. As per 2020 report of KSPCB, the quantity of solid waste generated in Kerala is estimated to be 3452 TPD which works out to 400gm per person per day. The responsibility of collection, treatment and safe disposal of all types of solid waste rests with the generator and local bodies. The nature of municipal solid waste is same in all areas but its quantity varies. No segregation of municipal solid waste is done in general. However in certain urban areas like Kozhikode Municipal Corporation an attempt is made to segregate the waste.

landscape. Extraction and processing of ores and minerals affects local hydrology, causing changes in the water flow as well as quality. An emission contaminates air and water, putting wild life and local population at risk.

A survey initiated by two Scientists of Kerala Forest Research Institute (KFRI), Trissur identified 33 stone quarries with in 10 km radius of Kavalppara in Malappuram District, a highly sensitive area of ecologically fragile Western Ghats where 59 people were buried under a massive landslide that occurred during the early morning on 8th August 2019. The remnants of the destroyed houses portends dangers of an unregulated and unscientific quarrying of granite in a State with unique ecosystems involving high rocky hills, 44 rivers, and a unique backwater system linked to the sea. The quarries have changed the landscape of the region and made the hill unstable.

As per another study by KFRI, Kerala has a total of 5924 functioning stone quarries, while the number of those which obtained mandatory permission from the Department of Mining and Geology stands at 750. Kerala Assembly Panel on Environment has rightly urged the State Government to formulate a comprehensive policy, strictly adhering to the directions of National Green Tribunal and Hon'ble Supreme Court of India and bring all quarries under Government control. The Committee also urged the Government, Central and State Pollution Control Boards to issue more stringent conditions for quarrying operations, mainly about the distance from human settlements and environmentally fragile forest areas. It also emphasised the need to prohibit non electrical technology for blasting.

2.6 Plastic

Plastic pollution is a pervasive and global issue. According to an article, titled 'Earth challenge 2020' by Metis Meloche & Anne Browser published in June 2020 (wilsoncentre.com), 8.3 billion tonnes of plastic are estimated to have been produced since 1950s.

Kerala Suchitwa Mission has estimated that Kerala produces 480 tonnes of plastic waste per day as the administration fails to enforce a ban on plastic material below 50 microns. On an average, a family in the state is estimated to produce 60 grams of plastic waste per day. The Thiruvananthapuram municipal corporation produces 26 tonnes of

plastic waste per day, while Kochi and Kozhikode produce 16 tonnes each followed by Kollam with 8 tonnes, Thrissur with 7 tonnes and Kannur 4 tonnes.

Plastic is a petroleum based material and when burned it is like any other fossil fuel. The burning of plastics releases toxic gases like dioxins, furans, mercury and polychlorinated biophenyls (known as BCPs) in to the atmosphere and poses threat to vegetation and human and animal health. Burning plastic also releases black carbon (soot) which contributes to climate change and air pollution. Unburned portion of plastic litter on the ground, in lakes and rivers disintegrates. Animals may eat this plastic affecting their health and life. Large pieces of plastic can become a breeding ground for diseases, by trapping water that provides habitat for mosquitoes. According to the article mentioned above, ocean plastics directly impact more than 800 species worldwide.

2.7 Marine plastics in Kerala

Kerala has a long coastline and 41 of the 44 rivers ultimately flow into the sea along its western coast. Some empty first in to Vembanad and Ashtamudi Wetland (Ramsar sites) before entering the sea with loads of plastics and other waste.

A study conducted by 'Thanal' a Kerala based environmental organisation, says that 17,00,32,429 pieces of plastic are littering nine districts of Kerala coast weighing 1,057 tonnes. Through the calculation of litter index (the number of plastic litter in a plot divided by the area of the respective plot), they observed that Malappuram exceeds the state litter index average of 1.66 pieces per sq. meter by reaching 2.86 pieces per sq. meter.

Scientists have detected tiny plastics (smaller than 5mm) in salt, beer and human stool. These micro plastic items break off bigger plastic items, or come from products like car tyres and cosmetics. Once they enter our rivers, Oceans and soil, they can get in to food chains. Sea creatures can get tangled in plastic or mistake it for food, and the effects are fatal.

2.8 Water Pollution

Water pollution is the contamination of the water bodies usually as a result of human activities. Water bodies include rivers, lakes, canals, oceans, ground water, surface water etc. Water bodies are polluted due to industries, untreated effluences and

sewage and solid waste including plastic waste. The specific contaminants leading to pollution in water include a wide spectrum of chemicals, pathogens and physical changes such as elevated temperature and discolouration. Hence this can lead to degradation of aquatic ecosystems and create public health problems for people living downstream or in proximity.

In Kerala a study compiled by the Kerala State Literacy Mission Authority (KSLMA) has come up with a startling finding that 26.90 % of water sources in Kerala are completely polluted and as many as 46.10% of over 3000 water sources including ponds, canal, river and backwater stretches and public wells, surveyed in 2003 wards across the State are partially polluted. The study says, solid waste accounts for 53% of pollution of water sources, liquid waste 16.97 %, house hold waste 23.24% and encroachment 7%. Among solid waste, hotel waste accounted for 40% of the pollution while plastic waste 20% and other waste 30.55%. The sources of water pollution are depicted in fig. 2.3 and contributions of solid wastes in polluted water in fig.2.4. It says cleaning of vehicles and bathing of animals also cause water pollution.

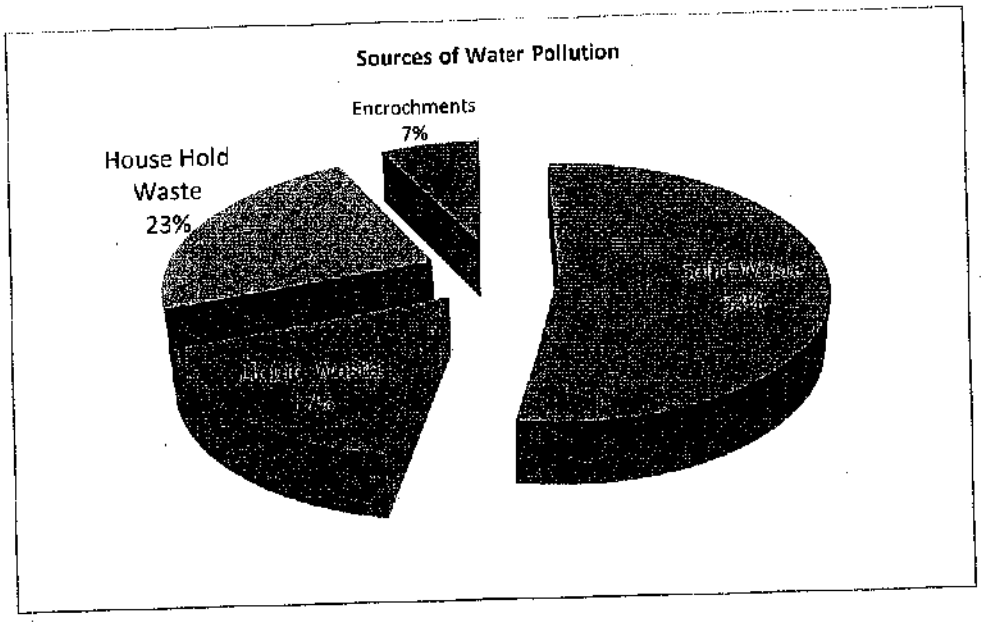


Fig.2.3. Sources of Water pollution

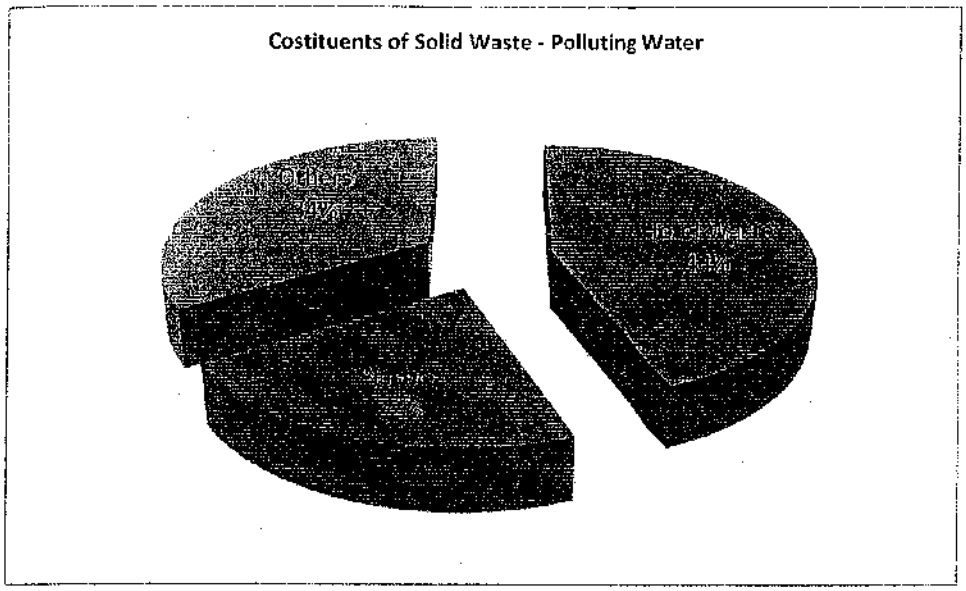


Fig.2.4. Constituents of Solid Waste Polluting Water

Impact of water pollution

Polluted water can lead to diseases such as cholera, tuberculosis, dysentery, jaundice, diarrhoea, etc. In fact around 8% of stomach ailments happen because of consuming polluted water. Apart from harmful effect on human life, at a certain level polluted water can be detrimental to crops and can reduce the fertility of soil affecting the overall agricultural sector. When sea water is polluted, it can impact oceanic life in a bad way.

2.9 e- Waste

The UNDP report 2019has estimated that World produces 50 million tonnes of electronic and electric waste a year, but only 20% of this is formally cycled with 80% either ending up in land filling or being informally recycled, much of it by hand in developing countries exposing workers to hazardous and carcinogenic substances such as mercury, lead and cadmium. E-Waste in land fill contaminates soil and water resources at risk. According to the report, in addition to health and pollution impact, improper management of e-waste is resulting in significant loss of scarce and valuable raw materials such as gold, platinum, cobalt and rare earth elements. The e-waste produced annually is worth over $62.5 billion, more than the GDP of most countries. There is 100 times more gold in a tonne of e-waste than in a tonne of gold ore.

India has over 504 million active users of internet as on November 2019, according to the 'Digital in India' report of the Internet and Mobile Association of India. After Delhi (68%), Kerala (56%) registered the highest internet penetration among the States.

2.10 Pollution due to Festivals

In Kerala, as in other states numerous festivals are celebrated with great spirit and fervour. Due to bursting of crackers during Diwali, the air get highly polluted, it gets choked and filled with smog. The loud noise can impair hearing ability and can also cause psychological stress. During Durga Puja and Ganesh Chaturthi, hundreds of idols of God are immersed in rivers and ocean that get contaminated because of mixing of chemicals in it. This adversely affects the aquatic system. The frequencies at which music is played, loud speaker activation in high volume and crowd noises cause noise pollution during festivals and can do serious harm to human beings, other animals and the environment. During festivals thousands of people take holy dips which also causes water pollution. The brightly coloured powders thrown during Holi celebrations are made from highly structured polymers which never biodegrade, causing toxic pollution to soil and waterways. The powders are dangerous as it contains harsh chemicals, which cause asthma, skin rashes, problems with the eyes and respiratory tract. Disposal of garbage due to festivals is another serious problem. During Christmas and other festivals, artificial trees and other decorations are often made of petroleum based plastics that eventually end up in land fill where they will never break down.

2.11 Oil Spill

Oceans are polluted by oil on a daily basis from oil spills, routine shipping, run offs and dumping. Oil spills cause a localised problem, but can be catastrophic to local marine wild life such as fish, birds and sea otters. Oil cannot dissolve in water and forms a thick sludge in water affecting visibility. Oil spills also makes sea food unsafe to eat.

2.12 Battery Waste

Disposal of battery waste is already an existing problem. At present lead acid batteries are the most widely used rechargeable batteries in the automotive and industrial sector because of its cheap cost. The main treatment method of batteries are incineration and land fill, solidification treatment, manual sorting, wet recovery technology, dry recovery

technology and bio metallurgical technology. Cadmium, mercury, zinc, lead and chromium are hazardous waste and these heavy metals will enter the soil, change the soil acidity and alkalinity, affect the growth of crops and accumulate in the crops and affect human health.

Jaguar, Mercedes, Tata, Morris Garage, Hyundai and Mahindra have so far launched electric vehicles (EV) in India and many more would come up as the country laps up the environment friendly mobility movement going on across the world. The question however is, whether we are ready to tackle the potential waste problem caused by the batteries that will be thrown in landfills in the years to come.

There is no doubt a transition from fossil fuels to electric energy was over due for the automobile industry. The concern is how to dispose off the EV batteries once they approach the end of their life. The EV batteries contain lithium, nickel, cobalt and copper among other things. The only way to address the problem is to move towards a eco-friendly recycling method for batteries.

The EV battery recycling methods employed today are rudimentary, reports National Geographic. The discarded battery's tough outer casing is removed and modules are throne in a furnace. Lithium and manganese are burned, leaving behind alloy slurry that contains higher value metals like copper, nickel and cobalt. Individual metals are then extracted from the alloy using strong acids. All these processes need a lot of energy and emanate toxic gases and waste products.

Cobalt and nickel command high market price and so they are recovered; but lithium is not considered valuable enough to recycle because the quality of the metal recovered is not good enough to make new batteries. Gavin Harper, a research fellow at the Faraday Institution in the USA, says 'in the future there might be a cleaner and more efficient option of direct recycling instead of extracting individual metals from the mix'.

2.13 Construction and Demolition

Waste is generated whenever construction/ demolition activity takes place such as building roads, bridges, flyover, subway, remodelling etc. It consists mostly of inert and non biodegradable material such as cement concrete, cement plaster, bricks, rubble, stone (marble, granite etc.), metal, wood, plastics, pipes, electrical fixtures, glazed tiles, glass panels etc. A part of this waste comes to the municipal stream, while retrievable

items such as bricks, wood and metals are recycled, the concrete and masonry waste, accounting for more than 50% of the waste from construction and demolition activities are not being currently recycled in India. Construction and demolition waste does not create chemical or biochemical pollution. Hence maximum effort can be made to reuse and recycle them.

2.14 Chemicals

Chemical pollution occurs when people use, produce, or dispose of chemicals that causes harm to human and other living organisms. A chemical may cause harm immediately (acute poison), after a longer period of exposure (chronic poison), or even in the next generation (a trans-generational poison). Cleaners, beauty products, food packaging etc are a significant source of daily personal chemical exposure that accumulates over time. Human made substances of extreme toxicity such as pesticides, synthetic chemicals products, and radioactive wastes dumps, preservatives, food additives like monosodium glutamate are sources of chemical poisoning. Indiscriminate use of cosmetics such as skin bleaching/ medicated creams, mosquito repellents etc are also sources of chemical pollution.

Chemical pollutants undermine the integrity and health of animals, human and the ecosystem. Different chemicals harm different systems of the body in different ways. Exposure to combination of chemicals may cause more harm than single toxicants. Chemical waste buried over many years led to birth of deformed and premature babies. Endosulphan spraying in the cashew plantations in Kasargod district in Kerala, severely affected hundreds of individuals and animals. In Muthalamada village alone, it affectec over 180 people of which at least 77 had a chronic illness.

Women are in the front line of indoor exposure to toxins in the environment. DD (Dichloro- Diphenyl-Trichloroethane), dioxins, and other chlorinated, heavy metals etc are causing breast cancer and endometriosis. High metabolic rate of some toxicants lik benzene result in women metabolizing 23–26% more benzene than men. Also, Wome in low income group occupation are often exposed to toxic chemicals for examp working in agricultural fields, garbage collection & locations where pesticid /herbicides & solvents are used.

During pregnancy the foetus receive certain amount of chemicals from the mother via placenta and umbilical cord. Some toxic chemicals are passed to the infants through breast feeding. Foetus can be highly sensitive to particular periods during their development, and the harm may not be discovered until adulthood.

2.15 Hazardous Chemicals

Hazardous chemicals, because of their chemical or physical characteristics, have an inherent property to cause adverse effects when an organism, system, or population is exposed to them. Chemicals are widely used in manufacturing. They can significantly contribute to the improvement of the quality of life, health, and well-being of people. Yet, many chemicals are highly hazardous and can negatively affect people's health and the environment when improperly managed.

Examples include benzene, which is found in gasoline; perchloroethylene, which is emitted from some dry cleaning facilities; and methylene chloride, which is used as a solvent and paint stripper by a number of industries. Examples of other listed air toxins include dioxin, asbestos, toluene, and metals such as cadmium, mercury, chromium, and lead compounds.

Hazardous chemicals in air, water, food, consumer products, and occupational environment can potentially cause a range of diseases including cancer, foetal malformations, diseases of the respiratory, endocrine, cardiovascular and urinary systems, and neurodevelopmental and immune disorders.

2.16 Chemical Accidents and Spills

By their nature, the manufacture, storage, and transport of chemicals are accidents waiting to happen. Of the more than forty thousand chemicals in commercial use, most are subject to accidental spills or releases. Chemical spills and accidents range from small to large and can occur anywhere chemicals are found, from oil drilling rigs to factories, tanker trucks to drums.

Chemical accidents seem most threatening because they often kill people outright; it is the smaller, more routine accidents and spills that affect most people. Some of the most common spills involve tanker trucks and railroad tankers containing gasoline,

chlorine, acid, or other industrial chemicals. Many spills occur during the transportation of hazardous materials.

2.17 Industrial Waste

Waste generated from industrial sources can have non-hazardous and hazardous components, with non-hazardous waste usually representing the greater part of the volume. The types of industrial waste generated include cafeteria garbage, dirt and gravel, masonry and concrete, scrap metals, trash, oil, solvents, chemicals, weed grass and trees, wood and scrap lumber, and similar wastes. Industrial solid waste may be solid, liquid or gases held in containers.

Non-hazardous industrial wastes are those that do not meet the EPA's definition of hazardous waste - and are not municipal waste. This waste is generated at every stage in the production process, use and disposal of manufactured products. Out of this a large portion can be traced to the processing of industrial chemicals and to the food products industry.

Most major industries have treatment facilities for industrial effluents but this is not the case with small-scale industries, which cannot afford enormous investments in pollution control equipment as their profit margin is very slender. The effects of water pollution are not only devastating to people but also to animals, fish, and birds. Polluted water is unsuitable for drinking, recreation, agriculture, and industry. It diminishes the aesthetic quality of lakes and rivers. More seriously, contaminated water destroys aquatic life and reduces its reproductive ability. Eventually, it is a hazard to human health. Nobody can escape the effects of water pollution.

2.18 Hazardous Waste

Wastes are classified as hazardous if they exhibit one or more of ignitability, corrosiveness, reactivity, or toxicity. Hazardous wastes are waste or combination of wastes which pose a substantial present or potential hazard to human health or living organisms because such wastes are non-degradable or persistent in nature or because they can be biologically magnified, or because they can be lethal, or because they may otherwise cause or tend to cause detrimental cumulative effects .

There are some of hazardous medical and dental wastes that, when dispose improperly, could cause harm to the environment. It also presents an occupation health hazards to the healthcare personnel who handle these wastes at the point

generation and those involved with their management, that is, segregation, storage, transport, treatment, and disposal.

Waste with high content of heavy metals: Mercury (thermometers, blood pressure gauges, amalgam), cadmium (discarded batteries), and lead (reinforced wood panels for radiation proofing in radiology department) generated from hospitals could be represented as a subcategory of hazardous chemical waste.

Nuclear applications have been rapidly developed recently, and several nuclear power plants started to work throughout the world. The potential impact of released radioactive contaminants into the environment has received growing attention due to nuclear accidents. Radioactive waste, arising from civilian nuclear activities as well as from weapon activities, poses a potential problem for handling and saving the environment for coming generations.

2.19 Noise Pollution

Sound waves are vibrations of air molecules carried from a noise source to the ear. Sound is typically described in terms of the loudness (amplitude) and the pitch (frequency) of the wave. Loudness (also called sound pressure level, or SPL) is measured in logarithmic units called decibels (dB). The normal human ear can detect sounds that range between 0 dB (hearing threshold) and about 140 dB, with sounds between 120dB and 140 dB causing pain (pain threshold). The ambient SPL in a library is about 35 dB, while that inside a moving bus or subway train is roughly 85 dB; building construction activities can generate SPLs as high as 105 dB at the source. SPLs decrease with distance from the source.

A recent study conducted in Kerala in the commercial zones of Thiruvananthapuram, Ernakulam and Kozhikode indicates that the noise levels are higher than that prescribed by the Ministry of Environment and Forests, Government of India by 15 dB. The silence zones in the cities also showed higher levels. The measured sound level at residential building at night times during festival zones and during election campaigns exceeds the prescribed limit by 30 to 40 dB. The vehicles fitted with public address system showed levels above 100 dB at a distance of 10 to 15 metres.

2.20 Conclusion

The classifications based on the sources mentioned above are not exclusive and water tight compartments. There are duplications also. The intention of the discussion, however, was to give a list of pollutants with its causes, extent and impact. None of the information is new especially to the functionaries of KSPCB. But the point of significance is the requirement to have a mechanism or activity to address all the pollutants in a proactive and reactive manner.

CHAPTER 3

KSPCB – A REVIEW

3.1 Introduction

The fore runner of KSPCB, the Kerala State Board for Prevention and Control of Water Pollution was constituted by Government of Kerala on 12.09.1974 as per G.O(M. S). No. 205/74/HD dated 12.09.1974 exercising powers vested under Section 4 of the Water (Prevention and control of Pollution) Act 1974. This was before the 42nd constitutional amendment in 1976 which made provision for protection of environment in the constitution as a fundamental duty. The Board was renamed later in 1984 as Kerala State Pollution control Board on being entrusted with the implementation of the Air (Prevention and Control of Pollution) Act,1981. The major purpose of KSPCB is to abate environmental pollution in the state.

3.2 Constitution of the Board

The Board has been constituted by the Government of Kerala as per Section 4 (2) of the Water (Prevention and Control of pollution) Act 1974 and the enactments which came after that also deemed the same section with respect to the constitution of the Board. It consists of up to 17 members. The term of office of all members, except that of the Member Secretary, is three years. The present Board consists of the following members:

1) Chairman

2) Members representing Government: Additional Secretary to Government, Health & Family Welfare Department, Chief Conservator of Forests (Eco Development), Additional Secretary to Government, Environment Department, Additional Secretary to Government, Finance Department, Director of Factories and Boilers department.

3) Members representing Local Authorities: Corporation, District Panchayath, Municipality, Block Panchayath, Grama Panchayat.

3.3 Functions of KSPCB

The Board has not developed any Vision /Mission statements which will have powerful communication among all stakeholders in terms of clarity in path towards abating or reducing pollution in the State. Functions of the Board are now defined by various provisions of enactments from time to time. Accordingly the important functions defined as per Water (Prevention and Control of pollution) Act 1974 are:

- to plan a comprehensive program for the prevention, control or abatement of pollution of streams and wells in the State and to secure the execution thereof;
- to advise the State Government on any matter concerning the prevention, control or abatement of water pollution;
- to collect and disseminate information relating to water pollution and the prevention, control or abatement thereof;
- to encourage, conduct and participate in investigations and research relating t problems of water pollution and prevention, control or abatement of wate pollution;
- to collaborate with the Central Board in organising the training of persons engage or to be engaged in programs relating to prevention, control or abatement of wat pollution and to organise mass education programs;
- to inspect sewage or trade effluents, works and plants for the treatment of sewa and trade effluents and to review plans, specifications or other data relating plants set up for the treatment of water, works for the purification thereof and t system for the disposal of sewage or trade effluents or in connection with the gra of any consent as required by this Act lay down, modify or annul effluent standa for the sewage and trade effluents and for the quality of receiving waters (not be water in an interstate stream) resulting from the discharge of effluents and classify waters of the State.

When the Water (Prevention and Control of pollution) Cess Act came in to existe the following important functions were also added:

- to receive water consumption returns from persons liable to pay cess;
- to assess the cess payable by the concerned person carrying on any special indu or local authority;

- to allow rebate on the cess payable by any person carrying on any industry or local authority who install requisite plant for treatment of sewage or trade effluent;
- to collect cess from the assesses;
- to take or cause to take action against defaulters.

When the Air (Prevention and Control of pollution) Act was enacted, another set of important functions were added:

- to plan a comprehensive programme for prevention, control and abatement of air pollution and to secure the execution thereof;
- to advise the State Government on any matter concerning prevention, control or abatement of air pollution.;
- to collect and disseminate information relating to air pollution;
- to collaborate with the Central Board in organising the training of persons engaged or to be engaged in programmes relating to prevention, control or abatement of air pollution and to organise mass education programmes relating thereto;
- to inspect, at all reasonable times, any control equipment, industrial plant or manufacturing process and to give, by order, such directions to such persons as may be considered necessary to take steps for prevention, control or abatement of air pollution;
- to inspect air pollution control areas at such intervals as it may think necessary, assess the quality of air therein and take steps for the prevention, control or abatement of air pollution in such areas;
- to lay down, in consultation with the Central Board and having regard to the standards for the quality of air laid down by the Central Board, standards for emission of air pollutants into the atmosphere from industrial plants and automobiles or for the discharge of any air pollutant into atmosphere from any other source whatsoever not being a ship or an aircraft, provided that different standards for emission may be laid down under this clause for different industrial plants having regard to the quantity and composition of emission of air pollutant into the atmosphere from such industrial plants.

The Environment (Protection)Act further added the following functions:

- to implement measures for the protection and improvement of environment and the prevention of hazards to human beings, other living creatures, plants and property;
- to cause remedial measures to prevent or mitigate environmental pollution in case of accidents;
- to conduct inspections to check compliance and to collect or seize evidence thereof;
- to collect samples of air, water, soil or other substances;
- to provide service as Environmental Laboratory;
- to evolve standardised methods for sampling and analysis of various types of environmental pollutants;
- to analyse samples sent by empowered officers;
- to carry out investigations to lay down standards, to monitor and to enforce standards;
- to carry out any other entrusted function;
- to take cognisance of offences.
- To implement the Hazardous Wastes (Management, Handling and Transboundar Movement) Rules, particularly
- to process applications for and to issue/refuse/renew authorisation for collectior reception, treatment, storage and disposal of hazardous wastes;
- to monitor compliance with the provisions and conditions of authorisation;
- to process and forward to the Ministry of Environment & Forests applications fc imports;
- to review matters pertaining to identification and notification of disposal sites.
- to implement the Manufacture, Storage and Import of Hazardous Chemical Rule particularly
- to enforce directions and procedures in respect of isolated storage of hazardoı chemicals, regarding;
- to co-operate in preparation of on-site emergency plans;

- to enforce directions and procedures on import of hazardous chemicals on information regarding import;
- to issue direction to importer to take appropriate safety measures, including stoppage of import, if necessary;
- to informing concerned port authority on safety measures;
- to serve improvement notice on persons contravening the Rules.
- to implement rules for the manufacture, use, import, export and storage of Hazardous Micro-organisms, Genetically Engineered Organisms or Cells, particularly
- to inspect, investigate and take punitive action on behalf of the State Biotechnology Co-ordination Committee in case of violations;
- to supervise, on behalf of the Genetic Engineering Approval Committee, implementation of the terms and conditions of approvals granted by the Committee.
- to implement the Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, particularly
- to serve in the State Crisis Group;
- to serve in the District Crisis Groups which are the apex bodies in the respective areas to deal with major chemical accidents and to provide expert guidance for handling chemical accidents.
- to implement the Biomedical Waste (Management and Handling) Rules, particularly
- to receive from institutions generating, collecting, receiving, storing, transporting, treating, disposing and/or handling biomedical wastes applications for authorisation, to process the same and issue/ refuse/ renew/ cancel/ suspend authorisation;
- to compile and furnish to the Central Pollution Control Board annual reports from occupiers /operators;
- to inspect and verify facilities and records;
- to receive and act upon reports of accidents.
- to implement the Plastics Manufacture, Sale and Usage Rules, particularly

- to receive and process applications for registration for manufacture of virgin/recycled or both plastic carry bags and containers and to issue/refuse/ renew/cancel registration.
- to implement the Municipal Solid Wastes (Management and Handling) Rules, particularly
- to monitor compliance with standards on ground water, ambient air, leachate quality, compost quality and incineration;
- to receive and process application for authorisation for setting up waste processing and disposal facility and to issue/refuse/renew/cancel authorisation;
- to furnish annual reports to the Central Pollution Control Board.
- to implement the Noise Pollution (Regulation and Control) Rules, particularly
- to regulate and control noise of industrial origin;
- to monitor ambient sound levels;
- to advise the State Government on pollution control.
- to implement the Batteries (Management and Handling) Rules, particularly
- to receive and verify half yearly returns on sale of new batteries and collection old batteries;
- to receive and verify half yearly returns on sale and collection of batteries dealers;
- to receive and verify annual returns from recyclers of used batteries;
- to receive and verify half yearly returns form bulk consumers of batteries;
- to receive and verify half yearly returns by auctioneers of used batteries;
- to ensure compliance with the Rules.
- to file annual compliance status report to the Central Pollution Control Board.
- to implement the EIA notification, particularly
- to receive request for environment public hearing;
- to notify the details of public hearing;
- to assist District Collector for public hearing and to furnish report thereof to Ministry of Environmental and Forests.

- to implement the Public Liability Insurance Act, 1991.
- to make application to court to restrain owner under section 13(1) from handling hazardous substances, to implement the order of the Court under section 13(3)(b) and to recover cost thereof under section 13(4).
- to file complaint in Court and to receive and act upon notice under section 18(b) of intention to make complaint to Court.

The above functions are as stated in the published annual report. The way the functions of the Board evolved resulted in a negative feeling in the functionaries as they were overloaded with work on enactment of new Acts without addition to the functionaries. This to a greater extent reflected in the attitude towards their work also. The work is seen as parts and not as a whole. We felt a need for redrafting the functions on a common platform with a focus on pollution control along with a vision and mission statement. The Board may accept it with or without modification.

3.4 Organizational Structure

The general organizational structure of the KSPCB is given in fig 3.1. The board has three Regional Offices, one at Thiruvananthapuram and the other two at Ernakulam and Kozhikode. There is a Central Lab at Ernakulam which has the same status as the Regional Office in terms of the hierarchy. The District Offices comes under Regional Offices. At present there are 14 District Offices. The Ernakulam District has got one additional District Office and one Environmental Surveillance Centre which has the same status making the number 16.

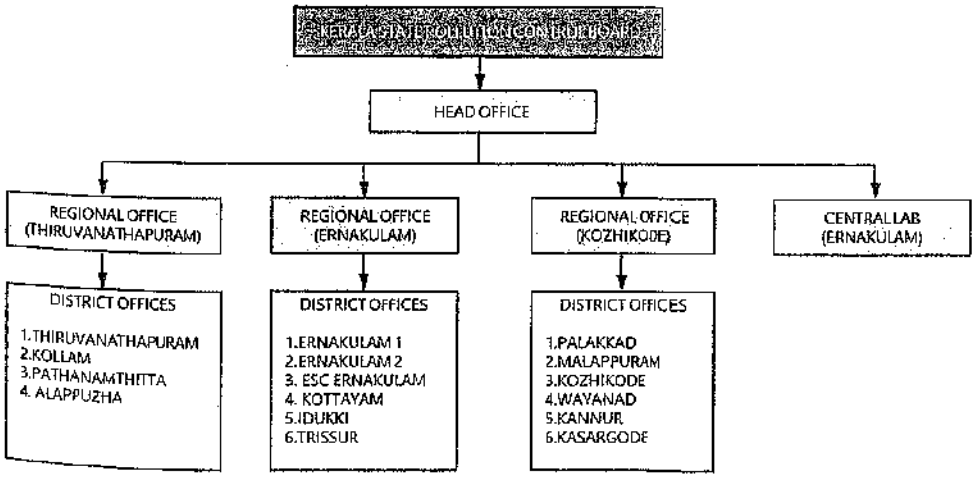


Fig. 3.1: The organisation structure of KSPCB.

3.5 Sources of Funds

The major source of income for the Board is fees collected for various purposes Kerala Government also gives Plan and Non-plan fund as grant. The income expenditure for the year 2018-19 to 2020-21 are given in figure 3.2. The sourc income for the year 2020-21 is given in fig. 3.3. Actual figures of income, expenc and sources of funds are detailed in table 3.1.Expenditure remaining the sam income is coming down. This may be due to the lower level of activities due t pandemic. As of now the board is not experiencing any financial difficulties.

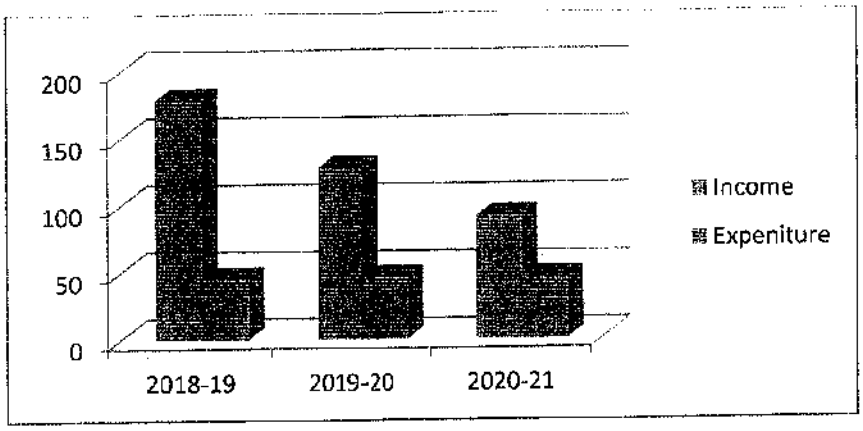


Fig. 3.2: Income and expenditure for the years2018-19, 2019-20, 2020-21.

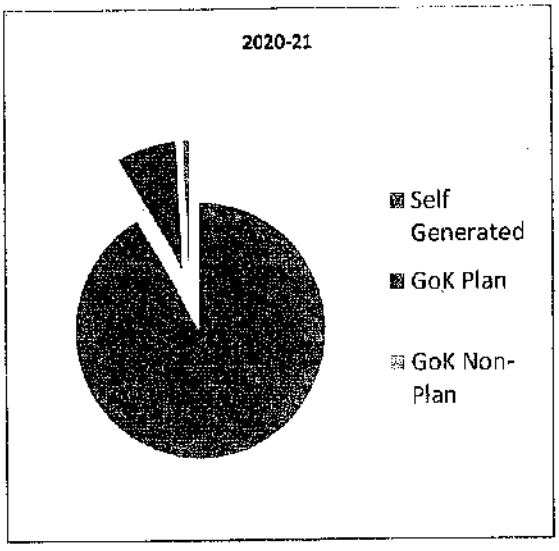


Fig. 3.3: Sources of income of KSPCB.

	2018-19	2019-20	2020-21
Income			
Self-Generated	164	120.5	83.82
Penalty Fund Account			
Kerala Government Non plan	0.88	0.66	0.84
Kerala Government Plan	14.15	6.75	7
Expenditure			
Non Plan Expenditure	38.45	43.1	39.86
Plan Scheme Expenditure	7	3	6

Table 3.1. Details of Income, expenditure and sources of funds for 2018-19,2019-20, 2020-21.

3.6 Activities of the Board

1. Acts and Rules administration

The Board is responsible for administration of the following Acts and Rules:

ACTS

- The Water (Prevention and Control of Pollution) Act, 1974
- The Air (Prevention and Control of Pollution) Act, 1981
- The Environment (Protection) Act, 1986
- The Public Liability Insurance Act, 1991
- The Biological Diversity Act, 2002
- The National Green Tribunal Act, 2010

RULES

- The Water (Prevention and Control of Pollution) Rules, 1975
- The Air (Prevention and Control of Pollution) Rules, 1982
- The Public Liability Insurance Rules, 1991
- Noise Pollution (Regulation and Control) Rules, 2000

- The Ozone Depleting Substance (Regulation and Control) Rules, 2000
- Batteries (Management and Handling) Rules, 2001
- Environment Impact Assessment Notification, 2006
- The Hazardous and Other Wastes (Management and Trans boundary Movement) Rules, 2016.
- Bio Medical Waste Management Rules, 2016
- Solid Waste Management Rules, 2016
- The E-Waste (Management) Rules, 2016
- Plastic Waste Management Rules, 2016
- Construction and Demolition Waste Management Rules, 2016
- The Wetlands (Conservation and Management) Rules, 2017
- The Regulation of Persistent Organic Pollutants Rules, 2018

An account of the activities of Board for the administration of the above Acts and Rules as evident from the various reports are discussed.

Evaluation of Water Quality

The state is implementing National water Quality Monitoring Programme (NWMP) and State Water Quality Monitoring Programme(SWMP) under NWMP there are 128 monitoring stations which include 65 stations in 42 rivers, 7 in rivulets/tributaries, 6 in reservoirs, 3 in fresh water lakes, 8 in estuarine lakes, 3 in canals, 2 in ponds and 34 stations in ground water. Under the SWMP there are 129 stations in 23 rivers and 23 stations in 4 lakes. The Board is also monitoring water quality of rural water supply schemes.

Among the water bodies monitored, Pookode lake in Wayanad district is the only one satisfying within 'class A' criteria. The major problem associated with river water is the bacterial contamination and 80% of the water bodies monitored fall into the 'B' or 'C' category, only because of increased bacterial population. Coliform counts at Moonattumukku in Karamana river, Kallayi bridge in Kallayi river, Pampa river Purakatteri in Korapuzha river, Thodupuzha river and Munnar river are reported very high.

Evaluation of Air Quality

The board is monitoring the ambient air quality of the state. There are two programs, the National Air Quality Monitoring Programme (NAMP) and State Air Quality Monitoring Programme. Under these programmes, air quality is measured at 34 stations in the state. Apart from these two programs there are four Continuous Ambient Air Quality Monitoring Stations (CAAQMS) one each at Thiruvananthapuram and Kozhikode and two stations at Ernakulam, one in commercial area and one in industrial area. The parameters monitored are sulphur dioxide (SO2), oxides of nitrogren (NOx) and respirable suspended particulate matter (PM10). Measurement of PM2.5 at 13 stations in the state commenced from August 2000.

The annual average concentrations of sulphur dioxides and oxides of nitrogen are within the limit whereas the RSPM values (PM10) exceeded the limit of 60μg/m^3 many times at monitoring stations located at Kalamassery, Eloor 1, Eloor 2 and Kozhikode city during the year 2018. The data collection and compilation for Air and Water Quality Directory are coordinated at the Central Lab, Ernakulam (Environmental Scientist 1) and monitored by project department of Head Office (Assistant Scientist).

Noise Pollution (Regulation and Control) Rules, 2000

The Noise Pollution (Regulation and Control) Rules, 2000 (as amended till 10/08/2017), regulate and control noise producing and generating sources with the objective of maintaining the ambient air quality standards in respect of noise. The National Green Tribunal has directed KSPCB to have ambient noise monitoring stations in industrial zone, commercial zones, residential zones, silent zones along with identification of hotspots. It also envisages setting up of sound level meter and trained officers in Police Stations as per noise pollution rules. The target for action is specified in the compliance report is 2020. Not much progress has happened in this direction.

The present practice of giving permission by Police Stations for use of loud speaker etc. is based on declarations by the applicant. In cases of complaints from public verification require equipment and skills for doing it as the calculations are more technical and very often require the help of skilled persons from KSPCB. This is because the authorised agency is not trained in doing it. It is the responsibility of KSPCB to train police personnel in detecting levels of sound pollution. There should be at least one trained person in every police station. There are about 500 police stations in the state. To meet

the target at least 750 personnel in police department have to be trained at the beginning and there after one or two batches every year.

A schematic representation of the Board's monitoring programme for water air and noise are shown in Fig 3.4.

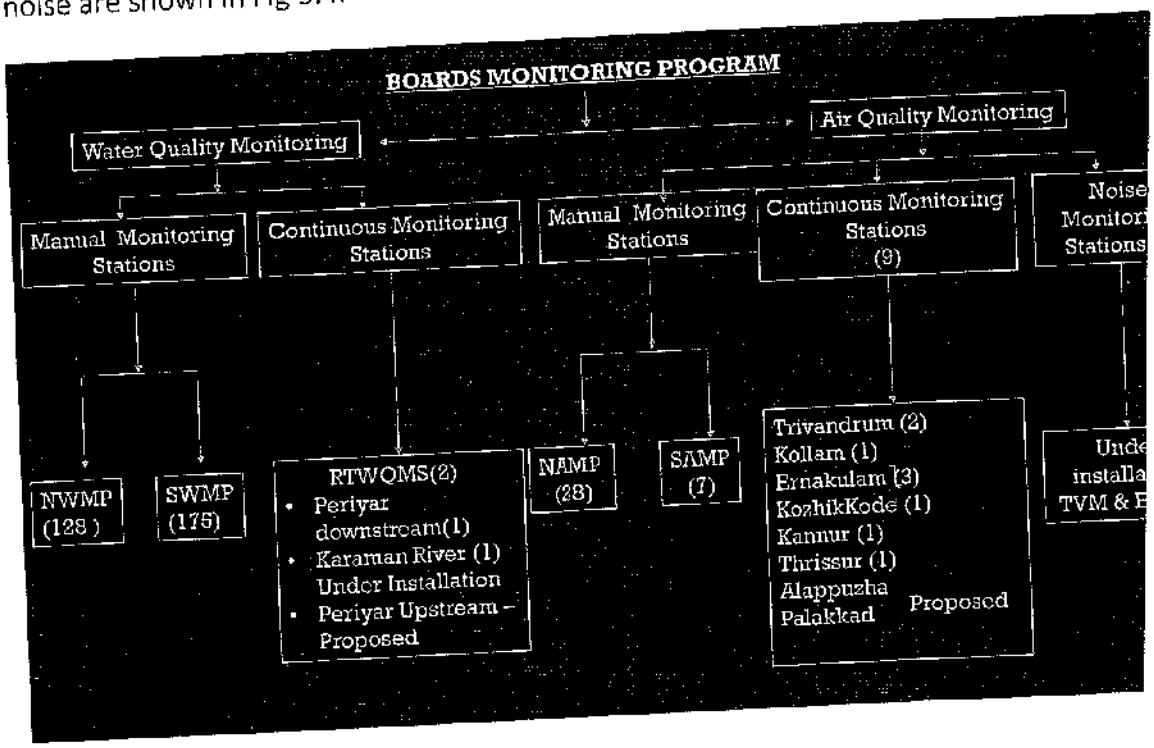


Fig. 3.4: Schematic representation of the Board's monitoring programme for water, air and noise.

Batteries (Management and Handling) Rules, 2001

As per the Batteries (Management and Handling) Rules, 2001, the prescribed author for ensuring compliance of the provisions of these rules shall be the State Polluti Control Board and it shall file an annual compliance status report to the Cent Pollution Control Board by 30th April of every year.

The rule prescribes the responsibility of a manufacturer, importer, assembler a reconditioner to ensure that the used batteries are collected back as per the Schec against new batteries sold excluding those sold to original equipment manufacturer bulk consumer(s); ensure that used batteries collected back are of similar type specifications as that of the new batteries sold and file a half-yearly return of their s and buy-back to the State Pollution Control Board. They shall set up collection cer either individually or jointly at various places for collection of used batteries f

consumers or dealers; ensure that used batteries collected are sent only to the registered recyclers; ensure that necessary arrangements are made with dealers for safe transportation from collection centres to the premises of registered recyclers and ensure that no damage to the environment occurs during transportation. They shall also create public awareness though advertisements, publications, posters or by other means with regard to hazards of lead and responsibility of consumers to return their used batteries only to the dealers or deliver at designated collection centres.

The Central Pollution Control Board shall compile and publish the date received every year from the State Boards. It shall review the compliance of the rules periodically to improve the collection and recycling of used lead batteries and apprise the Ministry of Environment & Forests, Government of India. As per the rule, after second year of implementation of the rule, ie. from 2003 onwards 90% of new batteries sold have to be collected back. As per the return filed by KSPCB to Central Pollution Control Board in 2018 the number of stake holder who have filed returns are shown in fig. 3.5 and table 3.2. The percentage of batteries collected back and recycled are given in fig. 3.6.

Major distribution of batteries happen through dealers and bulk consumers. Majority of the dealers are not even filing returns.

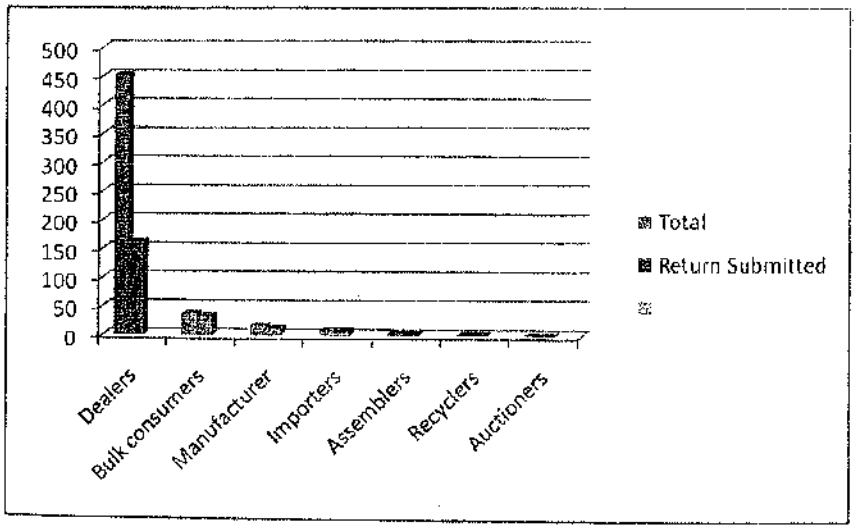


Fig. 3.5. The number of stake holder who have filed returns on Battery Management Rules.

Stake holders	Total	Return Submitted
Dealers	452	163
Bulk consumers	38	35
Manufacturer	17	12
Importers	8	8
Assemblers	4	3
Recyclers	2	2
Auctioners	1	1

Table.3.2 Stakeholders in battery dealing and their response in terms of submitting returns.

The batteries collected back and re-cycled are only 35.67%. There are only 2 re-cycl in the state. Their total capacity is only 25.45 MT per year. Much needs to be don preventing pollution due to batteries especially in the context of higher thrust give electric vehicles, the increasing fuel cost and its impact on reducing air pollution.

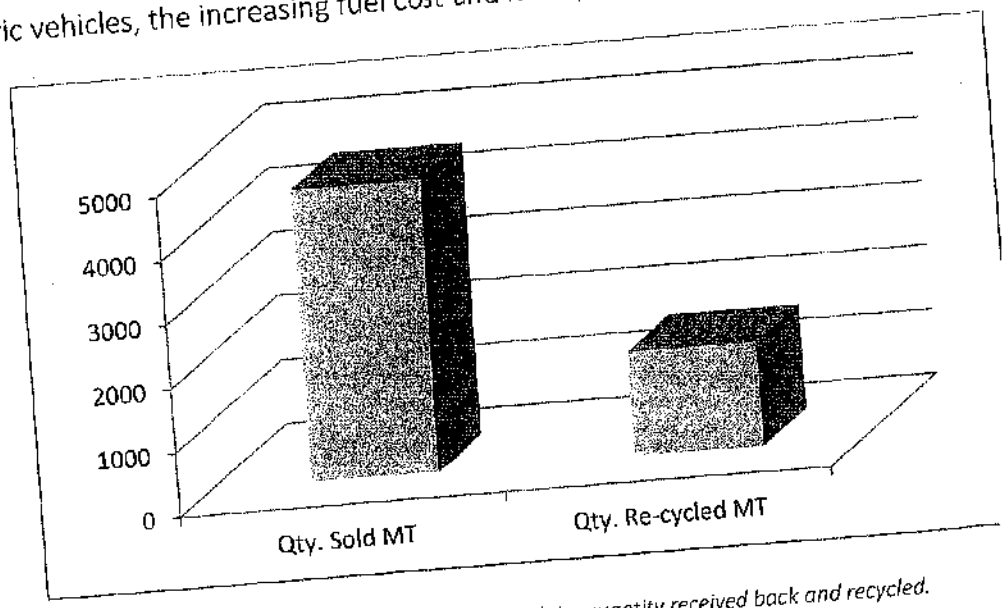


Fig. 3.6 The quantity of batteries sold and the quantity received back and recycled.

The waste due to batteries are going to increase many fold in the near future. for more proactive action from Board's side.

Solid Waste Management Rules 2016

As per the Solid Waste Management Rules 2016, it is the responsibility of the State Pollution Control Board or the Pollution Control Committee to enforce these rules through local bodies and review implementation of these rules at least twice in a year. The Board may give directions to local bodies for safe handling and disposal of domestic hazardous waste deposited by the waste generators. The Board shall also monitor environmental standards and adherence to conditions as specified under the schedule 1 and 2 of the rules.

The total solid waste collected and treated in the state for the year 2018-19 and 2019-20 may be seen from fig.3.7. Over a period of one year there is reduction in waste generated and increase in treated waste. Probably some treatment at generation level is happening. Fig 3.8. shows the average daily waste production and treated quantity and the gap, in different districts of the state.

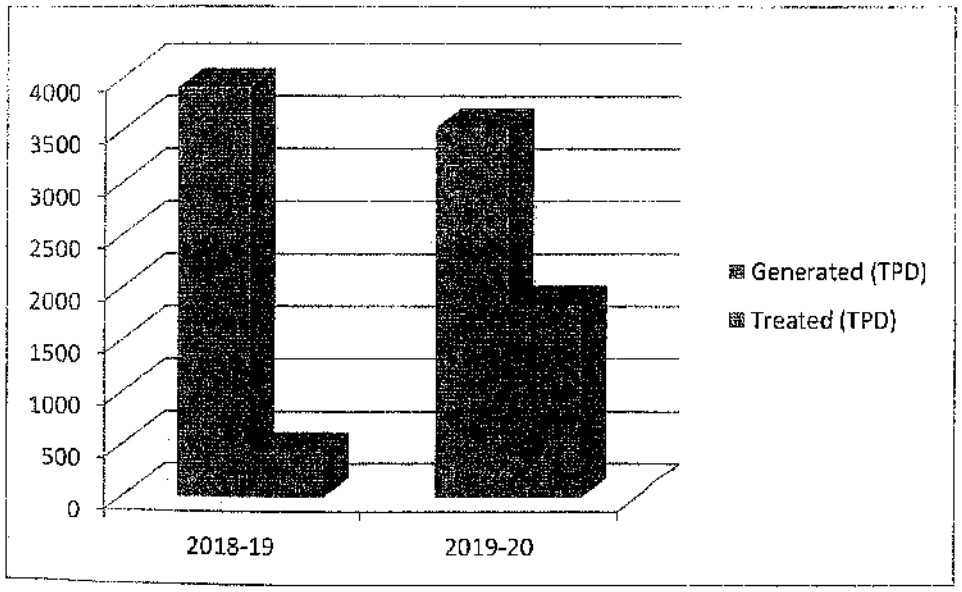


Fig. 3.7. The total waste generated and treated in the State for the year 2018-19 & 2019-20.

More of waste is generated in Malappuram district followed by Thiruvananthapuram, Ernakulam and Kozhikode. Generated to treated gap is more in Thiruvananthapuram than Malappuram, Ernakulum and Kozhikode. In many reports it is stated that 100% door to door solid waste collection is happening in many LSGs. But the solid waste throne in open places, streets and road ways are on the increase. A quick response from the public reveals that the waste collection facilities are limited and some of the

facilities like recycling bin, tube compost were abandoned by many because of its inherent problems.

As per the National green Tribunal directions, on 31st May 2019 the State has selected 3 model cities (Thiruvananthapuram, Thrissur and Kozhikode), 3 model towns (Attingal, Punalur and Kunnamkulam) and 42 model villages (3 in each district) to ensure compliance of solid waste management Rules 2016. Workshops were conducted to make them fully comply with environmental norms. Many meetings were conducted, many proposals were received, but as of now it may take years to materialise, except in the case of Kozhikode, the work order was given for a waste to energy plant.

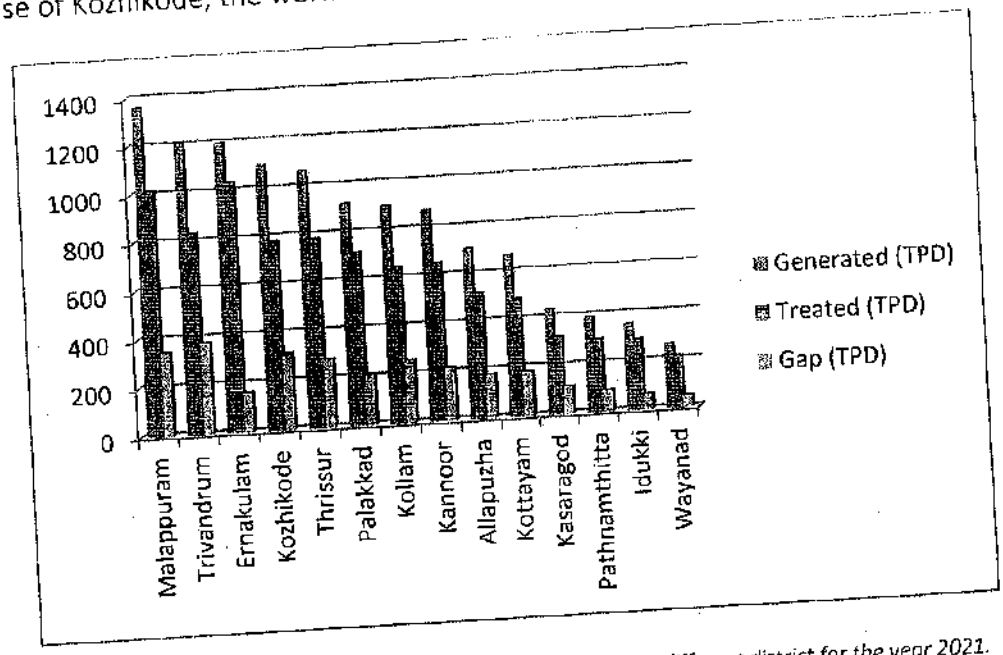


Fig.3.8. The average daily waste generated, treated and gap at different district for the year 2021.

It is the responsibility of the Board to examine the proposal for authorisation received from the local bodies or other agency authorised by the local body to permit appropriate mechanisms for solid waste management. As per annual report 2018-19 authorisation granted were only 5 against 23 applications received, holding 18 under scrutiny. In 2019-20 out of 35 applications received for authorisation, only 8 authorisations were sanctioned and 26 are under scrutiny. If there are objections clarifications or modifications required, it is also the implied responsibility of the Boar to help local bodies in this regard.

The Hon'ble Minister for Environment, Government of Kerala while inaugurating sewerage treatment plant in one of the Medical Colleges in the State announced th implementation of plants of 5 MT/10 MT/ 100 MT for solid waste treatment plants in

LSGs based on local requirements. This is through a 2500 Cr. financing from World Bank and the launching shall be in October 2021. This calls for lot of authorisations to be issued in time.

Plastic Waste (Management& Handling) Rules 2016

Plastic Waste (Management & Handling) Rules, 2016 provides a regulatory framework for management of plastic waste generated in the country. The State Pollution Control Board is the authority for the enforcement of these rules relating to registration, manufacture of plastic products and multi layered packaging, processing and disposal of plastic waste. Every local body shall be responsible for development and setting up of infrastructure for segregation, collection, storage, transportation, processing and disposal of the plastic waste either on its own or by engaging agencies or producers. Every person engaged in the manufacture, recycling or processing waste shall make an application to the State Pollution Board for registration or renewal of registration. For obtaining the registration, the unit should possess valid consent under Water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981 along with a certificate of registration issued by the District Industries Centre. The State Pollution Control Board has to prepare and submit an annual report to the CPCB on the implementation of the Plastic Waste Rules, by the 31st of July every year.

Poor management of plastic waste in the state are making it ending up in streams, rivers and road sides making even recycling impossible and has reached an alarming state of environmental and health hazards. Complete ban on single use plastic is imposed in the State with effect from 01.01.2020. This has not reduced the mismanaged plastic waste. The Board has come up with an explanation that proper accounting of plastic waste has become impossible as companies who have obtained registration from the Central Pollution Control Board are not furnishing progress reports regarding collection of plastic waste from the state as part of the producer responsibility.

As per the 2019-20 report 1,31,400 TPA of plastic waste is produced in the state. Of the total plastic waste produced only 1730 MT is accounted. The accounting was through Clean Kerala Company and plastic used for tarring of roads. The report says that there are 837 Material Collection Facility (MCF) and 151 Resource Recovery Facilities (RRF). The State has 214 plastic manufacturing units, and 147 recycling units and 5

compostable plastic manufacturing units. The details of the quantity of plastic h by these organisations are not available.

Hazardous and other Wastes (Management & Transboundry) Rules, 2016

The management of Hazardous waste is regulated by Hazardous and Other V (Management and Transboundary Movement) Rules, 2016. The State Pollution C Board (SPCB) is the authority for the grant of authorisation on the application submitted by any person engaged in handling, generation, collection, st packaging, transportation, use, treatment, processing, recycling, recovery et transfer or disposal of the hazardous and other waste. The State Pollution Control has the power to suspend or cancel an authorisation for failure to comply with the provisions of the Act or rules. Based on the annual returns to be filed operator of common facility or occupier of captive facility for the treatm hazardous waste, the SPCB should prepare an annual inventory of the waste gen recycled, disposed etc. and submit annual returns to CPCB every year on 30th of Ju

As per the annual report for the year 2019-20, the total hazardous waste genera 3,14,488.2 TPA. In the state 1617 industrial units are generating hazardous waste is a common hazardous waste disposal facility at Ambalamugal by Kerala Infrastructure Limited (KEIL)which was established on the directive of the Su Court monitoring committee on hazardous waste for treatment and disp hazardous waste generated from industries. Kerala Government has appointed K the nodal agency for setting up such facilities in Kerala. The capacity of the KEIL 50,000TPA. During the year 2019-20 KEIL received 62,610 T of hazardous was disposed 55,810 T. There is a need to increase the capacity for treatment of haz waste. For the year 2018-19, 626 units have not submitted annual returns. T increased to 707 in 2019-20.

Biomedical Waste (Management & Handling) Rules, 2016

The management of Bio-medical waste generated in the country is regula Biomedical Waste (Management & Handling) Rules, 2016. The prescribed autho implementation of the provisions of these rules shall be the State Pollution C Board in respect of states. Every occupier or operator handling biomedical wast make an application to the state PCB for grant of authorisation which shall be d to have been given if not objected by the Board within a period of 90 days fr

date of receipt of duly completed application along with necessary documents. Every occupier or operator shall submit an Annual Report to the SPCB on or before 30th June every year and the same shall be available on the website of the occupier and the SPCB. The occupier or the operator of common biomedical waste treatment shall be liable for all damages caused to the environment or the public due to improper handling of biomedical waste. As per the rules, urban local bodies shall have tie up with the common biomedical waste treatment and disposal facility to pick up the waste from Material Recovery Facility (MRF) or from the households directly for final disposal as per the standards specified.

The duties of State PCB inter alia are:

- Inventorisation of occupiers and data on biomedical waste generation, treatment and disposal.
- Compilation of data and submission of the same in annual report to CPCB within the stipulated time period.
- Grant and renewal, suspension or refusal, cancellation of authorisation under these rules.
- Monitoring of compliance with various provisions and conditions of authorisation.
- Action against health care facilities or common biomedical waste treatment facilities for violation of these rules.
- Organizing training programmes to staff of health care facilities and common biomedical waste treatment facilities and State PCBs or Pollution Control Committees, Staff on segregation, collection, storage, transportation, treatment and disposal of biomedical wastes.

There are 17354 Health care facilities in the state as per 2019-20 report. This includes 817 Ayush and 533 veterinary units. There is a common bio-medical waste treatment facility for the entire state located at Palakkad district with a capacity of 55.8 TPD. This facility is initiated by the Kerala chapter of the Indian Medical Association. It has incinerators and autoclave. Erecting of another incinerator within the vicinity is expected to be completed soon. The inventory on the total bio-medical waste generated is not available. But it is expected that the entire waste in the State can be treated through the above facilities. 17 Health care facilities have not yet complied with the provisions like segregation, pre-treatment, on-site storage, bar coding etc.

Collection and disposal of unused medicines from houses were initiated by Chemists and Druggist association and Drugs controller. About 200 bins were provided in front of the medical shops in Thiruvananthapuram Corporation. The first load of 5 T has been flagged off from Thiruvananthapuram to bio-medical waste treatment facility on 01.10.2018. The attempt was to spread it across the state. But the status on whether it is continuing or anybody is doing it now, is not available.

E-Waste Management Rules, 2016

As per E-Waste Management Rules, 2016 that regulates management of e-waste, State Pollution Control Board is the authority for granting authorisation and renewal of authorisation to manufacturers generating e-waste. The authorisation shall be granted within 120 days to carry out safe operations in the authorised place and shall be valic for a period of 5 years. The Board can refuse to give authorisation after giving ar opportunity of being heard. The manufacturers shall submit annual returns containin specified details on or before 30th June every year. The State PCB shall maintain a online register of authorisation granted with conditions imposed under the rules. Th CPCB is the authority to grant Extended Producer Responsibility (EPR) – authorisation producers. The EPR plan is forwarded to State PCB for monitoring.

It is estimated by the Board that about 250 TPA of e-waste is produced from inform sector. As per 2019-20 report 19 TPA is given to registered re-cycler at Erattupett Kottayam (Eco friendly Solutions) and the information that action being done to have dismantling unit at Kuttipuram by Clean Kerala Company only is available. Other deta in terms of stakeholders, quantity, action plan, monitoring of action plan are available with the Board's Offices.

e-Waste re-cycling needs a reorientation

An E-waste policy that focuses on extracting minerals from e-waste can turn recyc into a significant opportunity. Next to Delhi (68%), Kerala (56%) is the largest produ of e-waste in India. The broad focus of the e-waste policy in India is EEE (Electrical Electronics Equipment) waste. Some international agencies have highlighted the n to expand the scope of waste to include items such as spent Lithium ion batteries waste is known to be potential source of several precious and strategic metals, suc Lithium, Cobalt, Nickel and find overlap with the metals that are part of EEE wa

Many of these metals are now imported. The Board shall take a proactive approach in identifying suitable agencies with appropriate technology to recycle this waste.

Construction and Demolition waste Management Rules, 2016

Construction and Demolition Waste Management Rules, 2016 is applicable to every waste resulting from construction, remodelling, repair and demolition of any civil structure of individuals or organization or authority who generates construction and demolition waste such as building materials, debris, rubble etc.

Every waste generator shall prima facie be responsible for collection, segregation of concrete, soil and others and storage of construction and demolition waste generated as directed or notified by the concerned local authority in accordance with the rules. It is the duty of local authority to issue detailed directions with regard to proper management of construction and demolition waste within its jurisdiction and seek assistance from concerned authorities for safe disposal of such waste contaminated with industrial, hazardous or toxic material or nuclear waste if any. The local authority shall also make arrangements and place appropriate containers for collection of waste and shall remove at regular intervals either through own resources or by appointing private operators. It is the duty of State PCB to monitor the implementation of these rules by the concerned local bodies and the competent authorities. The annual report shall be sent to the CPCB and State Government for generating state level comprehensive data. Such reports also contain the comments and suggestions of State PCBs. The Sate PCB shall grant authorisation to construction and demolition waste processing facility after examining the application received. The State PCB shall also prepare annual report with special emphasis on the implementation status of compliance of the rules and forward report to CPCB before 31st July for each financial year.

The Board has addressed all Corporations/ Municipalities on 03.08.2019 for identifying, suitable sites for setting up of the storage, processing and recycling facilities for construction and demolition waste. No information on any follow up in this regard is available with the Board. One major demolition happened in the state was the demolition of 5 high rise buildings in Maradu Municipality in Ernakulum district on orders of the Hon'ble Supreme Court of India. M/s Prompt Enterprises was entrusted by Maradu Municipality and they identified 56 acres of land at Kumbalam and set up a 500

TPD construction and demolition waste processing facility there with the authorisation of KSPCB.

Industrially Polluted Clusters

The Hon'able NGT has placed Greater Kochi Area as critically polluted Area as per order O.A. No. 1038 of 2018. The moratorium imposed was lifted as the score has come down based on a monitoring done by an accredited agency. However the initative to prepare an action plan is going on.

2.Issuing Consent

Any person or organization starting or establishing or expanding new industrial units, hospitals and other establishments where effluent air, water or waste or storage of any material is injurious to health require a consent to establish from the pollution contro board. Establishments handling such materials are classified under four categories namely red, orange, green and white. A list of the items which comes under these categories are given in Annexure 2. The list on white Category was not readily available.

Online Consent Management and Monitoring System (OCMMS)

The Board had introduced Online Consent Management and Monitoring System with effect from June 2014. This system allows the industries for online submission o application for integrated consent to establish/ operate, renewal of consents. The number of industries for which consent has been issued under Red, Orange and Green categories from different districts is given in figure 3.9. The number of industries tha comes under white category are not included as statistics about it is not readil available.

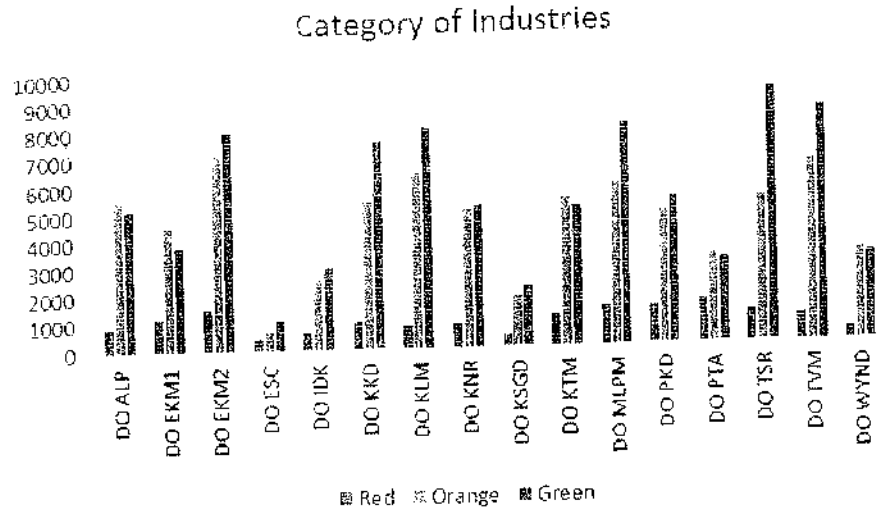


Fig. 3.9. The number of industries for which consent has been issued under Red, Orange and Green categories from different districts.

The applicants for issuing consent can know the status of their application and there is also opportunity to submit clarification sought, documents, fees, periodical returns etc. through the OCMMS website.

a) **Consent to Establish**

Consent to Establish is to be obtained prior to carrying out any work at the site proposed for the project. Before commissioning such a unit, the applicant should obtain Consent to Operate under the Water Act and/or the Air Act. The application is to be submitted through the website krocmms.nic.in. The consent fee is payable as DD drawn in favour of Kerala State Pollution Control Board payable at the respective District Office.

However Consent to Establish is issued even if construction work of the unit has been started provided:

- the site is suitable;
- the application for consent to establish is accompanied by consent fee including penalty of 50% for late submission of application;
- the required pollution control measures are provided.

The validity of Consent to Establish is three years. Consent to Establish should be renewed if the unit is not commissioned by then. If renewal is not sought within the validity period, fresh application has to be made to the Board.

The number of consent to establish issued by different districts during the period from 2018-19 to 2020-21 is given in fig 3.10.

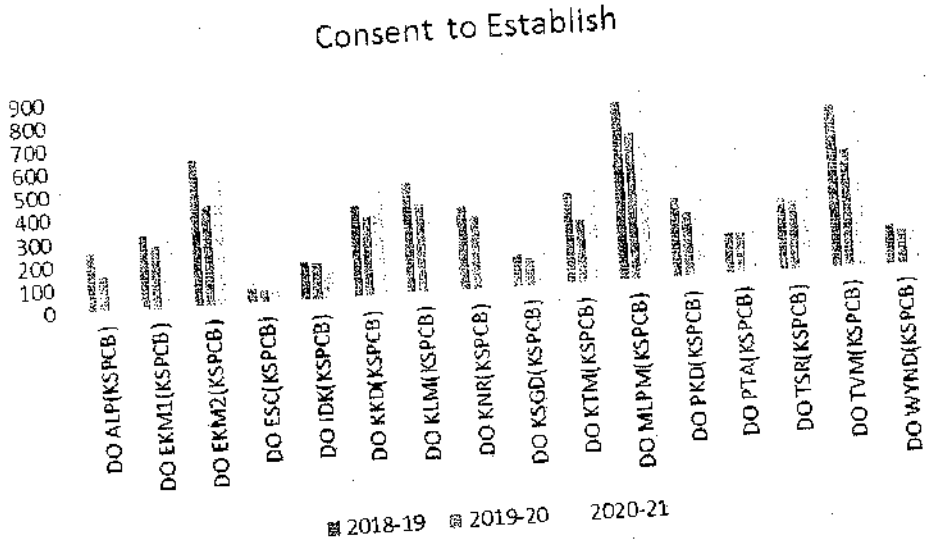


Fig. 3.10. The number of consent issued by different districts for 2018-19,2019-20 &2020-21.

b) Consent to Operate

The applicant should obtain Consent to Operate under the Water Act. The application i to be submitted through the website krocmms.nic.in. The consent fee is payable as D drawn in favour of Kerala State Pollution Control Board payable at the respectiv District. Consent shall normally be for a period of three years. However, in case Orange category, consent up to maximum period of six years and in case of Gree category; consent up to maximum period of nine years shall be given if fees for tho many years are remitted. The number of consent to operate given from differe districts for the years 2018-19, 2019-20, 2020-21 are given in fig. 3.11.

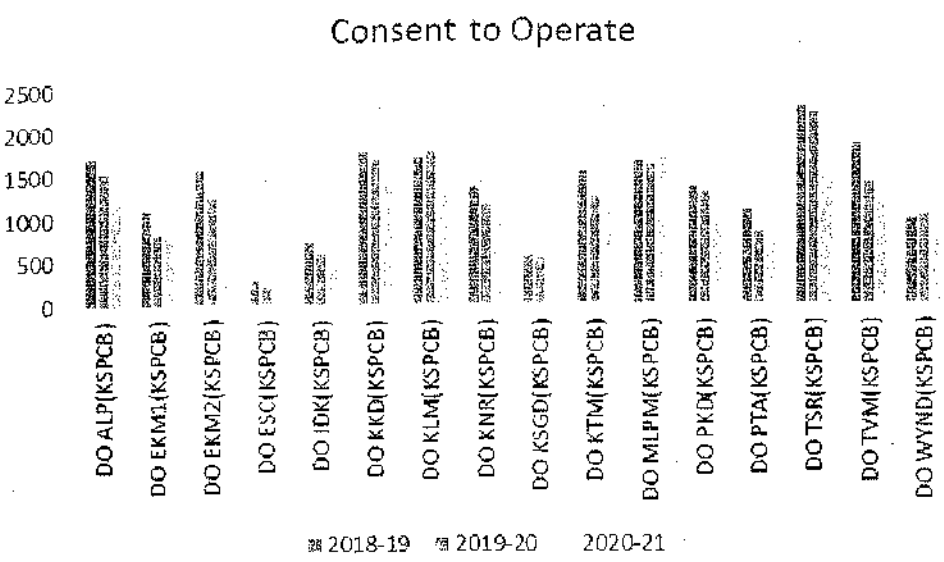


Fig. 3.11: The number of consent to operate given from different districts for the years 2018-19, 2019-20, 2020-21.

c) Integrated Consent to Establish/Operate

As all environmental segments are interrelated, environmental pollution control has to be done in an integrated and comprehensive manner. Conversion of one form of pollution into another form does not yield a holistic solution. The different consents/authorisation for effluent, emission and solid wastes need therefore be integrated to achieve overall compliance in all segments of environmental pollution control.

The Board decided to have integrated clearance procedure and proposed to the State Government necessary amendments to the Water (Prevention & Control of Pollution) Rules and the Air (Prevention & Control of Pollution) Rules.

The Integrated Application is for the following clearances

- Consent under Water Act
- Consent under Air Act
- Authorisation under Hazardous Wastes Rules
- Authorisation under Bio Medical Wastes Rules and
- Registration under Plastics MS&U Rules

The new procedure provides for combined application form for obtaining consents, registration and authorisation and include aspects of water pollution, air pollution, bio

medical waste management, manufacture of plastic carry bags and hazardous waste handling and management. The data on number of applications processed under integrated application processing are not readily available. The complaints received against consent management at head quarters from different districts are given in fig. 3.12. Complaints from Trivandrum district is on the increase where as it is reducing on other districts.

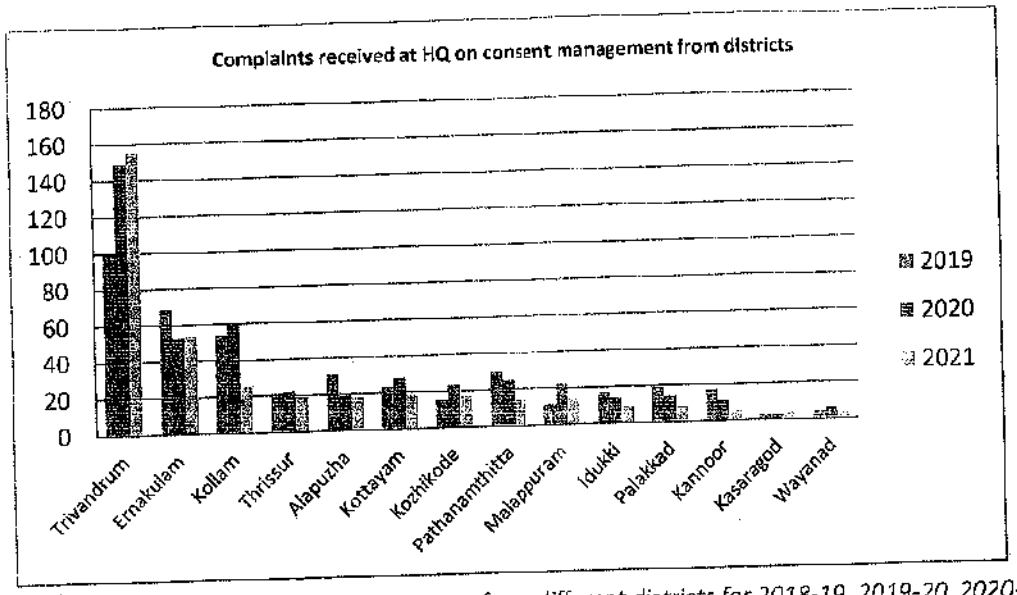


Fig. 3.12. Complaints on consent management from different districts for 2018-19, 2019-20, 2020-21.

3. Laboratory Services

Central Laboratory

The board has a Central Laboratory complex located at Gandhi Nagar, Kadavanthra, Ernakulum. It has NABL accreditation as per ISO/IEC 17025:2005 for 61 parameters in the discipline of chemical and biological testing. It has also got accreditation under EPA and OSHAS. It had 6 important sections namely Effluent Lab, Surface/Groundwater lab, Project Lab, Air Lab, Biology Lab and Microbiology Lab. In addition to these labs, a new lab is coming up for testing AMR (Anti Microbial Residue) Analysis which is ready for commissioning. It has three fully air conditioned instruments room with modern sophisticated instruments like Atomic Absorption Spectrometer with flame and graphite furnace and Hydride generation unit, Gas Chromatograph with ECD and NPD, Gas Chromatograph with FID and ATD, high performance liquid chromatograph with UV and fluoresce detectors, Gas Chromatograph Mass Spectroscopy (GCMS), ICP-OES, UV-

Visible Scanning Spectrometer, Specific Iron Analyser, Milli Q Water System, TCLP Apparatus etc.

The laboratory also coordinates the water and air quality monitoring and compiles the results generated. The different sophisticated instruments and their application in environmental sample analysis are given in table 3.3. We were looking for the records of the number of tests done under different categories. This was not disclosed.

	INSTRUMENT	APPLICATION
1	LCMSMS (Liquid Chromatography Mass Spectrometry)	Provides mass to charge ratio data which can help provide structural identity of the compound
2	Atomic Absorption Spectrometer (with flame, graphite furnace &Hydride generation unit)	Analysis of heavy metals in water, waste water, air particulates, soil, sediment, sludge, hazardous waste etc.
3	Gas Chromatograph (with ECD and NPD)	Analysis of individual organic compounds present in water, waste water, air and air particulates environmental pollutants like organo Phosphorous, pesticides, residues, organo chloro pesticides, chloro phenols, polychlorinated bi phenyls, dioxins etc.
4	Gas Chromatograph (with FID and ATD)	Analysis of individual organic compounds present in water, waste water, air and air particulates environmental pollutants as VOCs, phenols, poly nuclear aromatic hydrocarbons etc.

5	High performance liquid chromatograph (HPCL)	Determination of Carbamate, pesticides, poly aromatic hydrocarbons, phenolic compounds etc.
6	CHNS Analyser	Determination of carbon, nitrogen, hydrogen and sulphur content in any sample.
7	GCMS Analyser (Gas Chromatograph-Mass Spectroscopy)	Estimation of poly chlorinated bi-phenyls, poly aromatic hydrocarbons, semi volatile organic compounds and volatile organic compounds of solid and water samples.
8	IPC-OES (Inductively Coupled Plasma- Optical Emission Spectrometer)	Analysis of heavy metals in water, waste water, air particulates, soil, sediments, sludge and hazardous wastes etc.

Table 3.3. Different sophisticated instruments and their application in environmental sample analysis.

Regional Laboratory, Kozhikode

The Board has one Regional Laboratory at Kozhikode. The organisation structure is given in chapter 4 along with the organisation structure of other units

District Laboratories

The board has laboratories in all 14 districts. Laboratories are also attached to Environmental Surveillance Centre at Eloor and the District Office-2 at Perumbavoor The number of tests done by each district under different categories is also not disclosed.

Approval of other Laboratories

Industries have to monitor the quality of effluent discharged and emission made. Th result of such monitoring is to be submitted to the Board at stipulated intervals. Th monitoring and analysis is done through laboratories approved by the Board. Approv of such laboratories is granted by the Board after being satisfied with the facilities ar

manpower available at the laboratory. Laboratories are classified in to three Grades A, B and C based on the analytical capability of the laboratory. Laboratories are further categorised into three on the basis of whether they are attached to institutions (academic), to industries (industrial) or independent establishments (commercial) for fixing norms for granting of approval by the Board.

4.Other projects (state & central) plan & non-plan

The Project section of Kerala State Pollution Control Board head office manages the project related activities of the board. The primary functions are purchase, surveillance monitoring, updating database, maintenance of Central Laboratory and District Laboratory and its accreditations along with various other initiatives.

The Project Section is headed by a Senior Environmental Engineer (SEE-1), responsible for monitoring of all project activities in the department including review of expenditure under plan fund, sanction of all purchase under both plan and non-plan schemes, awareness activities and uploading data in the Board's website and web portals. The Assistant Environmental Engineer (AEE-3) coordinates all work assigned to the Assistant Engineers. AEE-3 ensures proper monitoring and performance on operations of surveillance vans in all the districts and oversees the updating of Planspace (Kerala Government integrated information for monitoring and evaluating all plan schemes) and processing of monthly progress report to the Environment Department. The SEE is also the Public Information Officer (PIO) of this department assisted by AEE, the APIO.

The primary responsibilities of Assistant engineers, AE5 and AE6 are plan scheme projects and non plan scheme projects respectively along with various other tasks like preparing annual reports, periodic progress reports, updating Planspace, RTI's, bill payments, stock register maintenance, maintenance of water quality (RTWQMS) and air quality (CAAQMS) monitoring stations and coordination of other government initiatives, schemes & projects.

The two Assistant Scientists (AS-1 & AS-2) assisted by one Junior Assistant Scientist (JSA-1) coordinates all activities and evaluates performance of Central Laboratory and District Laboratories. This includes: (1) Documentation, sanction & purchase of all Lab equipment required in the district, (2) Coordination & preparation of air & water quality directory, (3) Maintaining laboratory accreditations, (4) Daily evaluation of air quality index and uploading all surveillance data at regular intervals. A list of the major

stakeholders are given in table 3.4. The project activities undertaken are given in table 3.5.

Coordination with other Departments/Bodies

Sl. No.	Work/Activity	Department
1	Annual Plan Reports	Planning Board
2	Annual Plan	Environment Department
3	Budget Speech notes	Government
4	Data Upload	Planspace (Govt. Portal)
5	Progress Reports	State & Central Govt.& NGT
6	Accreditation	
	Central Laboratory	NABL
	Central Laboratory	OSHAS
	Central Laboratory	EPA

Table 3.4 Major stakeholders of KSPCB.

Year	Project Type	EP Rule	Amount (in lakh)	Impleme nting Office	Im
Air (Prevention & Control of Pollution) Act, 1981					
2019-20	Plan	Study of Anti-Microbial residue in the Environment (AMR Lab & Equipment)	295	Central Lab	
		Compact low cost sensor based Air Quality Monitoring Networks	54	HO, RO	
	Non Plan	Process for development for control of volatile emission and odour from spray painting units and flour mills-CSIR, NIIST			

		Trend Analysis of GHG emissions in Kerala	13		
		Source apportionment of surface level trace gases and particulate matter at coastal sites of Trivandrum- IIST	-		
	Central	VOC emission from spray painting and control technologies	4.5		
		Odour Measurement Lab	70		
Water (Prevention & Control of Pollution) Act, 1981					
	Plan	Sanitation survey of Ashtamudi Lake	9	DO KLM	
	Non Plan	Proposal for environmental modelling including environmental flow requirement of Periyar and Kuttanad/Alappuzha- CSER			
		Change detection studies on coastline of Neendakara Kayamkulam belt	0.75	CSIR NIIST	
		Surveillance of antimicrobial resistance in selected surface water bodies of Trivandrum district	10.53	University of Kerala, TVM	
		Study of antimicrobial resistance in waste water	13	CET	
	Central	Assessment of pollution load of 21 river stretches in Kerala (NGT Order)	6702		
Solid Waste Management Rules, 2016					
	Plan	Study of dioxine emission from country type solid waste burners in Kerala	18.96	HO, RO (CSIR, NIIST)	
	Non	CEMP for Vengola Gramapanchayat-	35.14	CSIR	

	Plan	Implementation of Model Pollution Control Facility		NIIST	
Hazardous Waste Management Rules, 2016					
	Plan	Study of dioxine emission from country type solid waste burners in Kerala- CSIR, NIIST	18.96	HO, RO	
		Preparation of Oil Spill Contingency Plan	60		
Bio-medical Waste Management Rules, 2016					
	Plan	Financial Assistance to CBMWTDF (Common Bio-medical Waste Treatment and Disposal Facility)	200	RO EKM RO KKD	
Noise Pollution Regulation & Control Rules, 2000					
	Plan	Continuous Ambient Noise Monitoring Station	15	HO, RO	
	Non Plan	Noise Modelling Software	-	CSIR SRRI	

Table 3.5. List project activities undertaken under plan & non plan funds.

5.Inspections

The KSPCB being a statutory body for enforcement of pollution abating activities inspections are a must to administer the various Acts and Rules relating to pollution. Inspections are required for consent management, control, surprise inspections to detect malpractices, planed inspections based on the nature of the industry and inspections to prepare reports based on directions from higher authorities and courts. The OCMMS software has a module which can randomly draw industries for inspection and post monitoring according to the category and duration with respect to protocol and this is not made use of. Details on the number of inspections conducted by various officers are not readily available.

6. Cess Collection

As per the Water (Prevention and Control of Pollution) Cess Act, 1977, the Board was collecting water cess which was discontinued on introduction of GST.

7.Legal Actions

While administering the Acts and Rules, violations have to be fined or non compliance have to be dealt with legal proceedings. The legal section is handled by Environmental Engineer – 4. Since many cases are in the Hon'ble High Court, in the Regional Office at Kochi also there is a section to deal with the legal cases headed by an Environmental Engineer assisted by Assistant Engineer. The organisational structure at head quarters is given in Chapter 4 as part of other organization structure. The number of writ petitions pending with Hon'ble High Court of Kerala is given in fig.3.13. The number of cases have come down in many districts especially in the districts with more number of cases namely Ernakulam, Allappuzha and Thiruvananthapuram. Apart from these cases, there are 61 cases pending with the NGT and another 51 cases with Appetalte Tribunal.

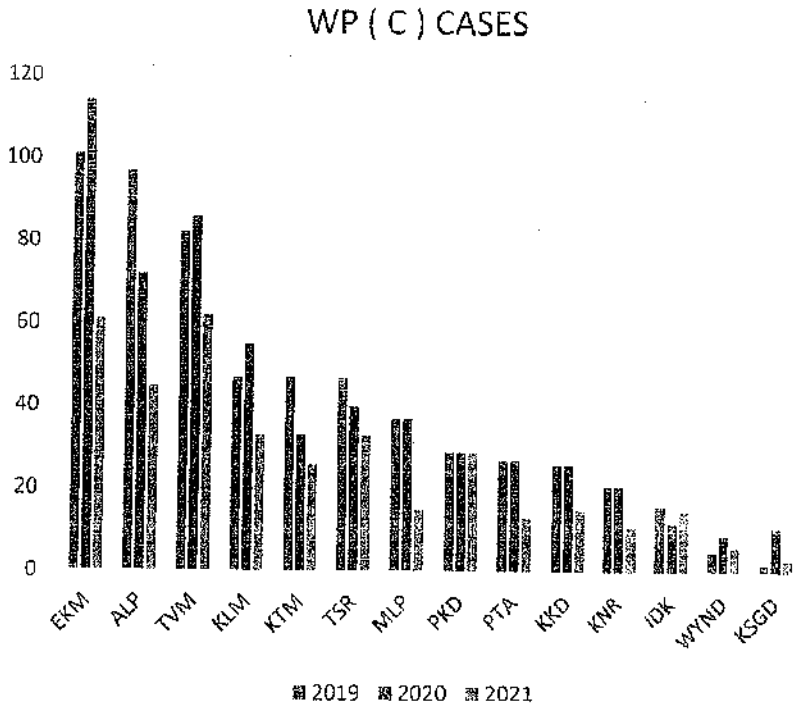


Fig.3.13. The number of writ petitions pending with the Hon'ble High Court from different districts.

8. IT & Data Management Centre

Primary Functions:

- Proposals and follow up new modules
- Proposals and follow up new modules of software of various activities of the Board
- Proper updation and maintenance of Boards website, Nodal officers of CMPGRC & OCMMS complaints (General), E-Samiksha
- Admin of OCMMS
- Co-ordination with NIC, IT Mission etc.
- Purchase of computers/laptop, printer, accessories, UPS
- Press release and publicity of all activities in connection with the sections concerned
- Establishment of odour measurement lab in consultation with Central Laboratory
- APIO

IT cell is managed by Senior Environmental Engineer in the KSPCB Head Office, assisted by an Assistant Environmental Engineer, an Assistant Engineer and a System Analyst. There were many efforts and attempts for digitization of the entire system. An e-office was developed by National Informatics Centre along with a handbook and conducted training for the employees. The attempt was stopped citing it as not user friendly.

The Online Consent Management & Monitoring System is a system which allows the industries for online submission of application for integrated consent to establish / operate and renewal of consents. The Assistant Environmental Engineer of the IT cell is the administrator of this platform. The OCMMS can also randomly draw industries for inspection and post monitoring according to the category and duration with respect to protocol. Currently the mechanism is not used on the plea of work load and hectic routine works in district offices.

The IT section is in charge of uploading all data on river action plan, minutes, progress report etc. in the River Rejuvenation Committee website.

This section is responsible for managing complaints received online from the Kerala - Centralised Inspection System (K-CIS) and intimate the concerned departments and officers in charge. K-CIS is a central inspection framework to carry out all inspections in a single platform with computerised synchronized inspections to improve implementation practices and increase compliance from agencies including KSPCB, Labour Department, Factories and Boilers, Legal Metrology and LSGD. The public can also use this platform to lodge a complaint against any agency or unit to ensure timely action.

The section also manages the requests from the regulatory compliance portal of GoI Ministry of Commerce and Industry Department for Promotion of Industrial Trade to provide industry friendly compliance.

The section is responsible for all matters regarding management of the state's website. This includes uploading Air Quality index in KSPCB website which is provided by the Assistant Scientist in the Project section of head office. The Central Laboratory at Ernakulum enters air and water quality parameters in centralised software called LIMS (Laboratory Information Management System) in which air and water quality monitoring data are entered at regular intervals.

A private Consultancy firm at Trivandrum has developed software for integrated platform for all inventories, authorisations, consent monitoring etc., but the launch is on hold due to certain security concerns and delay in availability of data from NIC.

National Informatics Centre E-samiksha is a digital governance platform for easy, instant and secure exchange of information. IT wing is in charge of collecting inventory of waste from all concerned departments of the head office and the regular data updating in the NIC government portals of e-samiksha.

The India e-track industries website provides an updated information and quick access of data on 17 categories of grossly polluting industries. This is an MIS developed by CPCB for enabling the furnishing of data by SPCBs. Industries discharging effluents into a water course and handling hazardous substances or effluent having BOD load of 100kg per day or more is considered as GPI. CPCB has issued directions to SPCBs for inventorisation of GPIs and initiating action against the defaulting industries. There are about 30 highly polluting industries in the state which has effluent treatment plants and based on the quality parameters for the treated discharge automatic notifications are

received by the Board. An alert is sent, if the parameters exceed the limit. Of these plants only about 50% of them are now working satisfactorily.

Currently, based on a proposal for a development of cloud based Unified Digitization Platform with many features to make office work easier, competitive bids were received and processed. But the work was not awarded on suspicions about the qualified bidder.

The data to be fed in to the central web site remains not updated for years which has created a very poor image about KSPCB as may be seen in the Transparency Index Report, 2021.

9. Public Awareness Programme (Social Marketing)

Public Awareness and Assistance

It is the responsibility of the Board to educate the people on the importance of environmental protection and for redressing complaints of the public on pollution problems. The Board could do only very little compared to the magnitude of the efforts required in bringing a social change, especially in the mind set of the public along with what they should do and how facilities are arranged for the same. The redressal of complaints is also the responsibility of the Board and this is being co-ordinated from head office.

Mass Education

The Board is bringing out quarterly newsletter "PARISTHITHI VAARTHA". This is made available free to all public libraries and to those interested in environmental protection. In addition, dissemination of information on environment related issues is being attempted through lectures, seminars, symposia, radio and T.V. programmes, hoarding, stickers, leaflets etc.

Administration wing

Administration Division is headed by an Administrative officer of the rank of Additional Secretary (on deputation) from the Government of Kerala Secretariat. The responsibility of the administration division is to see that all communication to and from the Board are processed for decision making at appropriate levels, timely attention and action on all establishment matters are taken along with preparation and publishing of annual

reports. Organisational structure of the administration division is given in Chapter 4 along with the organization chart of other divisions.

The delay in publication of annual reports and audited statement of accounts of the Board which is separately discussed towards the end of this chapter has a direct implication in terms of the responsibility of the Administrative Officer who is an Additional Secretary on deputation from Government of Kerala.

Right to Information related Activities

The KSPCB has been sharing all important information to the CPCB annually and National Green Tribunal quarterly but KSPCB's website shares only partial information of its activities. In the absence of a published annual report after 2014-15 providing the entire activities of the board during each year, the stakeholders and public are kept in the dark with regard to the compliance with the statutory provisions and rules, efforts of the Board and gaps in achieving a pollution free environment.

The number of RTI applications received from different districts and head office is given in Fig.3.14. It is on the increase at head quarters compared to district offices. Number of appeals on RTI request is given in fig. 3.15. The appeals are also very high at head quarters. The implication is that the websites are poorly managed. Proactive disclosures will limit the need for formal applications under the RTI.

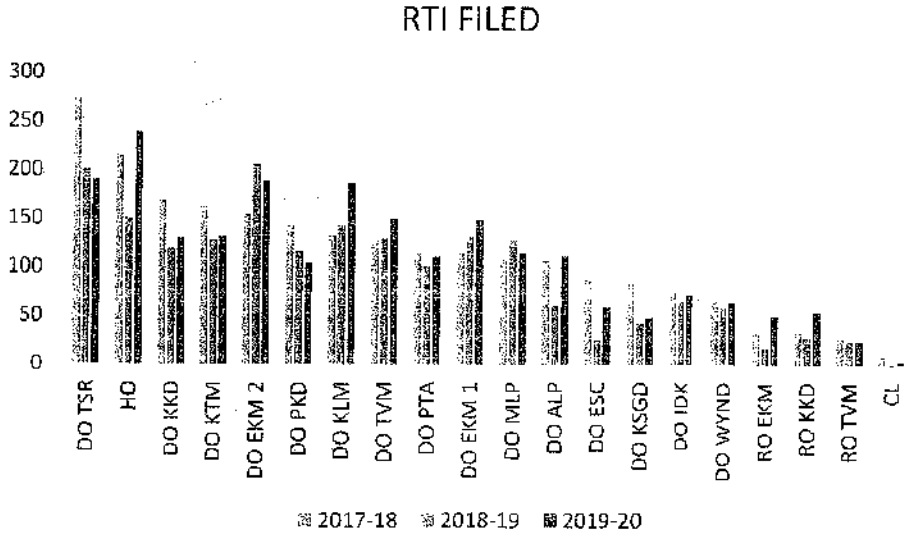


Fig. 3.14. RTI applications received from different districts and head office.

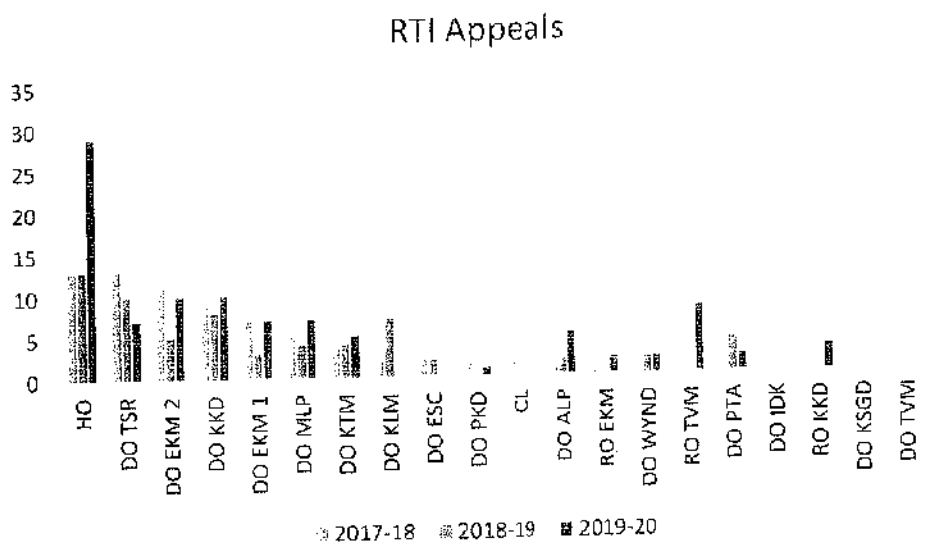


Fig. 3.15. RTI appeal applications received from different districts and head office.

Accounts Wing

Accounts Division is headed by an Accounts Officer in the rank of Deputy Secretary (on deputation) from the Secretariat of the Government of Kerala. The responsibility of the accounts division is to see that all receipts and payments are made as per the existing rules and authorisations, receivables are followed up, and annual statements of accounts are prepared for inclusion in the annual reports. Organisational structure of the accounts division is given in Chapter 4 along with the organization chart of other divisions.

Usually, paucity of funds is a constraint that impedes the implementation of policies, plans and projects by the state government departments and statutory organizations in implementing the developmental programmes of the state. Taking into cognizance of the paramount importance of sustainable development and environmental protection, the State Government has been providing budgetary support to KSPCB for setting up infrastructure and execution of schemes and programmes for abating pollution. However, it has to raise to the occasion to see that execution / fund utilization abilities are improved. The budget provision, allotment and surrender of funds may be seen from the table 3.6.

Year	Plan Funds (Rs. in Lakh)			Non Plan Funds (Rs. In Lakh)		
	Budgetary Allotment	Utilized	Surrendered	Budgetary Allotment	Utilized	Surrendered
2018-19	1415.25	987.96	427.29	88.66	86.66	-
2019-20	675.00	101.62	573.38	66.00	46.00	20.00
2020-21	700.00	605.39	94.61	84.24	20.00	64.24

Table 3.6. Budget provision, allotment and surrender of funds for 2018-19, 2019-20, 2020-21.

The above data shows that initiatives and enthusiasm have to come from within the organization by designing innovative plans, projects, schemes or programmes and execution of the same.

Annual Report & Audited Accounts of the Board

The latest published annual report containing audited annual accounts of the Board relates to the year 2014-15. Section 20 (2) of the Water (prevention and control of pollution) Amendment Act, 1988 (For section 39 (2) of the principal Act), says,

"Every State Board shall, during each financial year, prepare in such form as may be prescribed an annual report giving full account of its activities under this Act during the previous financial year and copies thereof shall be forwarded to the State Government within four months from the last date of the previous financial year and that Government shall cause every such report to be laid before the State Legislature within a period of nine months from the last date of the previous financial year."

The compilation and finalization of accounts from the year 2015-16 onwards has been inordinately delayed, said to be due to the delay in appointing an audit firm by the State Government. The C & AG advised the name of the audit firm for auditing the accounts of KSPCB for the year 2015-16 vide their letter dated 31-07-15. As per letter dated 22-03-16, of the Member Secretary, the Board informed the Senior Administrative Officer, O/o C & AG that the annexure showing the name of the audit firm was not seen attached with their letter. From there upon a series of protracted correspondence in

black and white emerged from the Member Secretary, KSPCB to the Additional Chief Secretary (Environment) Government of Kerala. Even the Chairman sent D.O letters to the Additional Chief Secretary requesting the appointment of auditor for the year 2015-16.

At last, after a period of 32 months, KSPCB could know the name of the audit firm vide G.O dated 27-03-18. As per the above G.O, the auditors for auditing the accounts 2015-16, 2016-17 and 2017-18 have been appointed. After four months, wisdom prevailed upon the KSPCB to appoint another Charted Accountant firm, Renjith KK and Company vide letter dated 26-06-18, probably for the preparation, compiling of accounts or for conducting internal audit for the year 2015-16 before transmission to the audit firm. The appointment orders of auditors for 2018-19, 2019-20 were issued on 19.10.2019 and 03.12.2019 respectively by the Government of Kerala as advised by the C&AG. The C & AG has also advised the name of a Chartered Accountant firm for audit of accounts for the year 2020-21, well in advance as in the past vide their letter dated 09-09-2020. The letter of the C&AG also says "where audit is due for more than one year auditors would formally certify the accounts of a particular year or after the previous years' audited accounts are adopted by the AGM which hopefully would be held in quick succession to overtake arrears in compilation of accounts."

The present status of the accounts finalization, internal audit or the audit conducted by the auditor appointed by Government and the reason for the delay is not known. The Member Secretary seems to have relied upon absolute faith in the power of the pen; but proved to the futile in this case. The officers of the Government Secretariat did not even respond to his/her letters even though it is their responsibility to appoint auditor based on the advice of the C & AG. He/she could have directed the Accounts Officer or Administrative Officer or any other suitable person from KSPCB just to go to Government Secretariat and the AG's Office in Trivandrum to impress upon the section officer/senior officers concerned about the problem being confronted by the Board in discharging its statutory obligation of publishing the accounts within the prescribed time limit and seek their help and cooperation. This is a classic but strange example that reveals the attitude of the government employees to keep his/her side safe, to create evidence to show that he/she has done everything possible rather than getting things done.

The officers of the Government Secretariat and pollution control board cannot be expected to be in a mutually exclusive empire of their own; they need to be liberated from the self-proclaimed ego and play a complementary role. It is high time that KSPCB made an introspection about their efficiency and their own position among the boards of the country with respect to the publication of annual report containing the audited accounts. It is the problem solving skills that can bring results. Where correspondence fails, the former wins.

The purpose of incorporating the above remarks here is with a twofold intention. First, the organization and the people created by an Act of the parliament are becoming the violators of the Act. Second, the same apathy is seen at all levels in the organization. We have proposed training and a performance appraisal system along with the recommendations. But that is not all, unless there is a general positivity and a commitment to the cause of pollution, the situation may not improve. This has to be inculcated by the leadership.

3.7 A Comparison with other State Pollution Control Boards

The annual Report is a statutory requirement and serves the purposes of disseminating information on its activities to the stake holders and the public and also provides transparency revealing the Board's efforts and key gaps in combating the environmental issues. According to Transparency Index Report published in 2021 by the Centre for Science and Environment, New Delhi, out of 34 PCBs, 12 PCBs have shared their latest annual reports on the web site (as on June 25 ,2021), 5PCBs shared reports for 2019-20, 7 PCBs shared reports for 2018-19 and other 5 PCBs shared their reports for 2017-18. Kerala PCB with Meghalaya is at the lowest position. They could publish the annual report only for the year 2014-15. Such a report is redundant and is of no use.

The Transparency index report, 2021 has identified 10 State PCBs in the country which have made serious efforts to share meaningful information in public domain. The criteria they have based upon for identifying the good performing states are availability of latest annual report, detailed information on public hearing, CEMS data display, detailed consent information along with CTO/CTE certificate, detailed information on waste, detailed information on laboratory infrastructure and accreditation, detailed information on manpower, detailed information on accounts and finance, information on number of closure notices, direction and show cause notices issued, availability of

action plan for non-attainment cities and polluted river stretches. Kerala is not included among the top 10 boards identified by them.

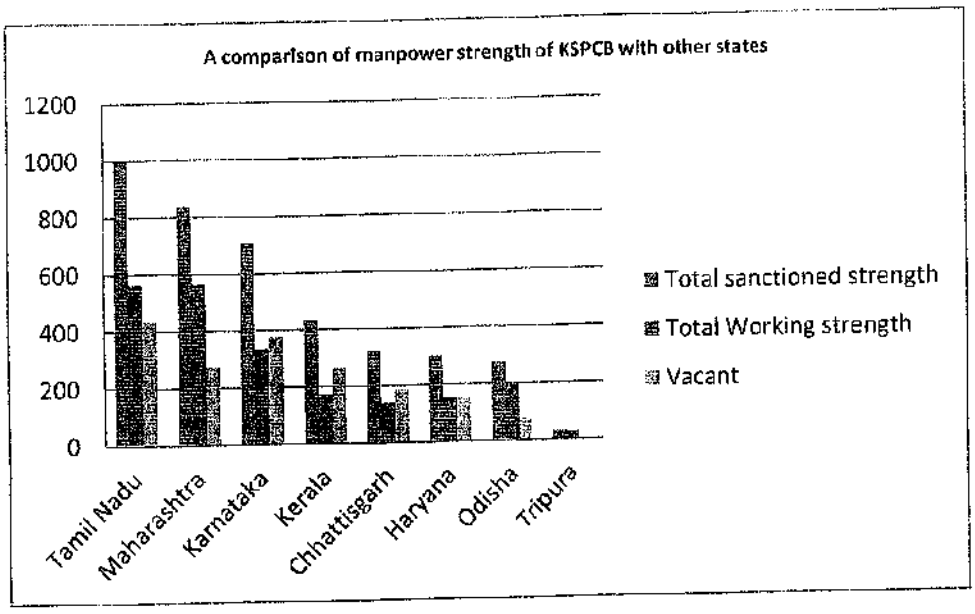


Fig. 3.16: The manpower sanctioned strength, working strength and vacant of various states as reported in the Transparency Index Report, 2021.

The Transparency Index Report, 2021 gives the manpower sanctioned strength, working strength and vacant positions of seven states viz. Tamil Nadu, Maharashtra, Karnataka, Chhattisgarh, Haryana, Odisha and Tripura. Kerala is not there in the list, as it has not provided the information in the web site. We have included Kerala's figure and a comparison is given in fig. 3.16. Kerala's present manpower position is not bad if one considers the geographical area of states. But then filling up of the vacant positions are very important.

CHAPTER 4

WORK DISTRIBUTION, WORK LOAD AND JOB DESCRIPTION

4.1 Introduction

In organisations, work / activities for accomplishment of the objectives of the organisation have to be distributed evenly. The works distributed have to be based on the time required to complete it and the total work time available for the particular employee to do it. This is applicable to the lowest level of employee, who will not be able to delegate it further down to any employee. When there is an employee down the lane for delegating, the principle applicable is different. They can completely delegate work / partially delegate or only delegate works other people may do. Alternatively smart managers either prefer to help subordinates who require it or a much higher job of value addition to the activity done by the subordinate. They also have priorities, good managers prefer to work on important activities in the organisation rather than completing urgent works assigned to subordinates.

4.2 Work Distribution

The work distribution in different offices viz. Head Office, Regional Office and District are done periodically based on the manpower strength. The present organisation structure and the work distribution among different individuals are discussed.

4.2.1 Technical Wing

The Chief Environmental Engineer is responsible for the performance of the Technical Wing of the Board. There are 3 Senior Environmental Engineers under the Chief Environmental Engineer. The organisation structure of Senior Environmental Engineer 1 in charge of Projects is given in figure 4.1 and the activities entrusted with each officer under him/her are listed below.

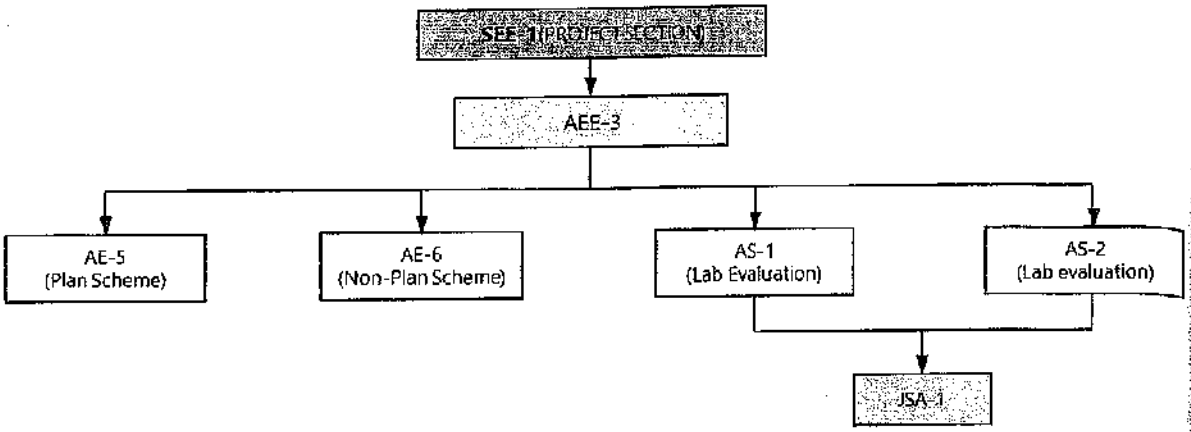


Fig. 4.1. The organisation structure of the office of SEE-1.

Senior Environmental Engineer (SEE 1)

- Head of Project section
- Co-ordination and monitoring of all activities assigned to AEE-3
- Review of all projects and related activities
- Review the expenditure under Plan Fund
- Establishment of odour measurement lab in consultation with Central Laboratory
- Sanction for all purchase under plan & non-plan scheme
- Ensure all activities concerned to the section (reports, photographs etc.) of awareness are uploaded in the Board's website and web portal of CPCB.
- PIO

Assistant Environmental Engineer (AEE 3)

- Co-ordination & follow up of all works assigned to AE- 5, AE- 6, AE-16, AS-1, AS-2
- Monitoring and performance on operations of surveillance van in various Districts
- Follow-up and updation of Planspace & Monthly Progress report to Environment Department.
- Press release and publicity of all activities in connection with the concerned sections

APIO Assistant Engineer (AE-5)

- Plan scheme projects
- Formulation of Annual plans and regular follow up regarding Annual Plan with Environment Department.
- Updation of Plan space & Monthly Progress report to Environment Department.
- Preparation of Annual Plan reports in coordination with Planning Board
- Preparation of notes for Budget Speech, Governor's Address
- Payment of Bills for Plan Scheme Projects
- Concerned RTI's

Assistant Engineer (AE-6)

- Non-Plan projects
- Maintenance of Real Time Water Quality Monitoring Stations [RTWQMS]
- Maintenance of Continuous Ambient Air Quality Monitoring Station-O&M
- AMR Action Plan & related projects
- Resilient Kerala Initiative (RKI) Plan
- Payment of Bills for Non-Plan Projects
- Concerned RTI's

Assistant Engineer (AE-16)

- CETP at Aroor Chandiroor at Alappuzha by ACCEPT Society
- Green Grass Project
- Maintenance of stock register concerning to project section
- Project under various schemes -Evaluation, Coordination and timely follow up
- Remediation of Eloor KuzhikandomThodu–NCEF project in coordination with DO Eloor & RO EKM

- Odour measurement lab
- Concerned RTI's

Assistant Scientist (AS-1)

- Maintain Central Laboratory to NABL accreditation
- Follow up of OSHAS accreditation & EP approval of Central laboratory
- Maintenance of Ambient Air Quality Monitoring Station – O & M follow up
- Weekly uploading of analysis data of Ambient Air Quality Monitoring in the State (manual station)
- Daily evaluation of AQI based PM2.5, PM10 and average for CAAQMS and uploaded to Board's site as well as to press and monthly uploading of River & Lake data analysis
- Online effluent/emission/ambient air & water quality data – management
- Evaluation and interpretation of the above data with consolidation annually

Assistant Scientist (AS-2)

- Performance evaluation of District/Central Lab
- Co-ordination of all activities with Central Laboratory.
- Responsibility on co-ordination and preparation of Air & Water Quality directory based on the data collected from Data Management Centre and Central Laboratory
- AMC documentation and necessary follow up of lab equipments.
- Approval of laboratories & related matters
- Maintenance and performance of District Lab in consultation with Central Laboratory
- Documentation of all equipment/instruments available in the District
- Sanction for purchase of lab items in consultation with Central Laboratory.

Junior Scientific Assistant -1 (JSA -1)

- Assisting all works assigned to AS1& AS2

The organisation structure of Senior Environmental Engineer 2 in charge of Solid & Plastic Rules, Haritha Keralam & Audit Section is given in figure 4.2 and the activities entrusted with each officer under him/her are listed below.

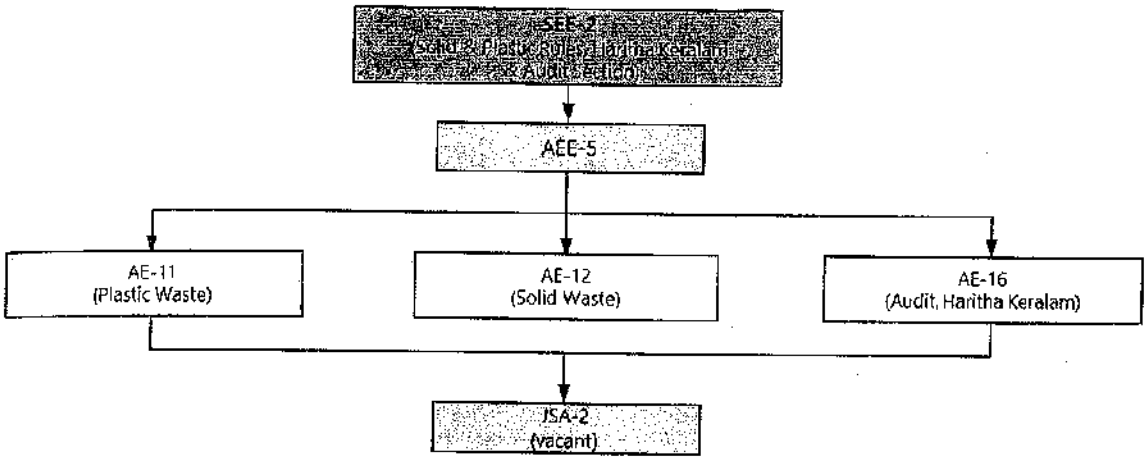


Fig. 4.2. The organisation structure of the office of the SEE-2.

Senior Environmental Engineer (SEE-2)

- Proper follow up and implementation of Solid Waste Management Rules & Plastic Waste Management Rules
- Review of all activities under the section
- Haritha Keralam Mission
- Supervision of all activities concerned with the section
- Library
- Ensure all activities concerned to the section (reports, photographs etc.) of awareness are uploaded in the Board's website and web portal of CPCB.
- PIO

Assistant Environmental Engineer (AEE-5)

- Co-ordination & follow up of all works assigned to AE- 11 & AE-12
- Press release and publicity of all activities in connection with the concerned sections

- APIO

Assistant Engineer (AE-11)

- Empanelment of consultants
- Co-ordination of Committee meetings formulated for specific purpose
- Plastic Waste Management Rules, its Amendments- Implementation, annual reports and Inventory under the Rules

Assistant Engineer (AE-12)

- Audit – General (In consultation with AE-11)
- Solid Waste Management Rules its Amendments- Implementation, annual reports and Inventory under the Rules.

The organisation structure of Senior Environmental Engineer 3 in charge of Building Construction, Technical & IT Section is given in figure 4.3 and the activities entrusted with each officer under him/her are listed below.

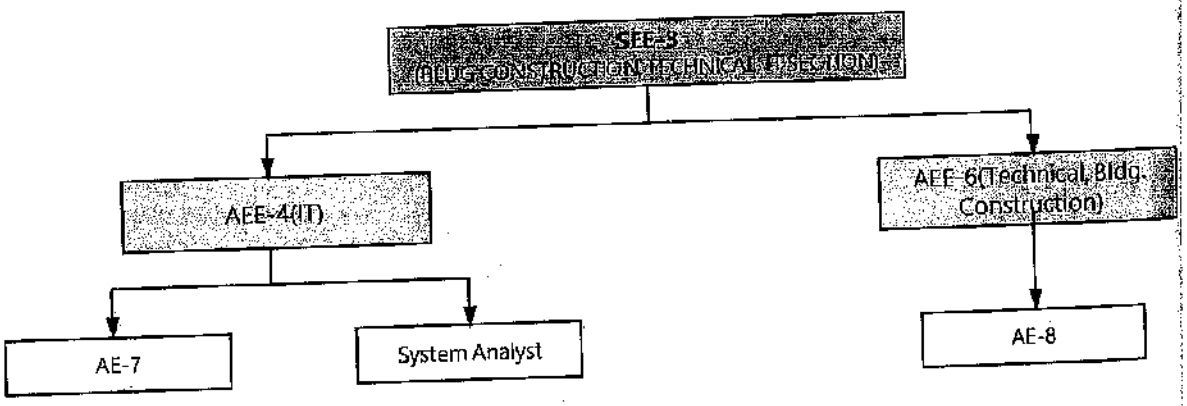


Fig. 4.3. The organisation structure of the office of the SEE-3.

Senior Environmental Engineer (SEE-3)

- Head of Technical Section & IT cell
- Evolve technical guidelines
- Evaluation of new technologies
- Evaluation and follow up of works assigned to AEE-4, AE-7, AE-14
- Review and supervision of construction of head office building
- Co-ordination and monitoring of all activities assigned to Civil Engineer

- Ensure all activities concerned to the section (reports, photographs etc.) of awareness are uploaded in the Board's website and web portal of CPCB.
- PIO

Assistant Environmental Engineer (AEE-4)

- IT & Data Management Centre
- Co-ordination & follow up of all works assigned to AE- 7, AE- 14
- Proposals and follow up of new modules of software of various activities of the Board
- Proper updation and maintenance of Boards website Nodal officers of CMPGRC & OCMMS complaints (General), E-Samiksha
- Admin of OCMMS
- Co-ordination with NIC, IT Mission etc.
- Purchase of computers/laptop, printer, accessories, UPS
- Press release and publicity of all activities in connection with the concerned sections
- APIO (including building construction)

Assistant Engineer (AE-7)

- Purchase & maintenance of computer, printer, UPS, photostat machine in all Board offices
- Network connectivity (LAN & dongle) enabling maintenance and regular bill payment
- E-office implementation, computerisation of administrative/accounts/technical section in all Board offices
- Tally software development & maintenance in all Board offices
- Purchase of digital signature certificates and identity cards to Board officers
- Maintenance of stock register of computers and equipments
- Video conferencing

- Evaluation of online monitoring data and programmes on implementation of online monitoring facilities under 17 category industries, hospitals, other establishments.
- OCMMS matters related to all districts
- Consent data management under KSWIFT-portal maintenance & monitoring
- Verification of receipt of online payment in consultation with accounts section
- Matters related to OCEMS
- E-Samiksha portal-regular updation
- Submission of quarterly reports in India e-track portal
- Payment gateway implementation in OCMMS
- Ensure all activities (reports, photographs etc.) are uploaded in the Board's website and web portal of CPCB
- Concerned RTI's

Assistant Engineer (AE-14)

- To evolve technical guidelines sector wise on all technical matters handled by the Board
- Evaluation of various new technology which are acceptable
- Rating and evaluation of performances of various project proposed by the consultants implemented by the units
- Modification and uniformity in consent conditions.
- Circular-Compilation, updation and Periodic review of circulars of the Board
- Categorization and norms evolving
- To study the SOPs from CPCB & office memorandum of MOEF & CC on various technologies with respect to Environmental (Protection) Act and Rules
- Identification of issues requiring R&D and transferring them as a main project for M.Tech students of Pollution Control Board, deputed officers or to outside Govt. agencies.

- Concerned RTI's

Civil Engineer

- All works connected to construction of Head Office building
- All works connected to maintenance of other office buildings including existing Head Office building
- New building construction other than HO Building
- Concerned RTI's

The organisation structure of Environmental Engineer 1 in charge of Consent Section is given in figure 4.4 and the activities entrusted with each officer under him/her are listed below.

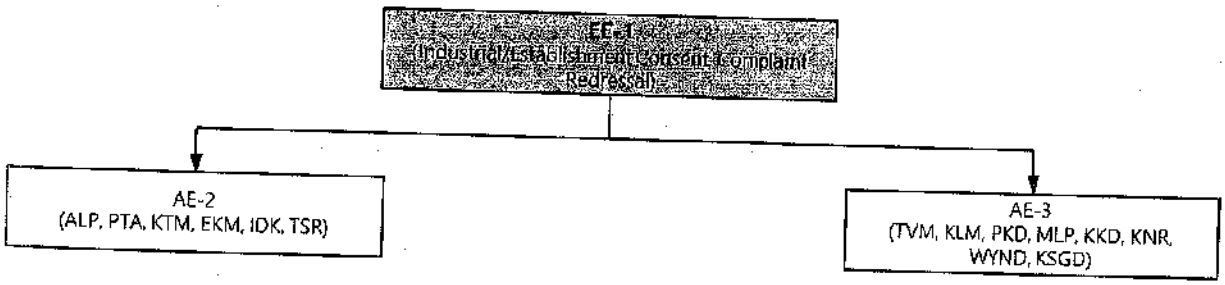


Fig. 4.4. The organisation structure of the office of the EE-1.

Environmental Engineer (EE-1)

- Co-ordination and monitoring of all activities under consent administration
- All assignments and follow up of activities of AEE- 1
- Ensure all reports/affidavits filed in time in various Courts and Government
- PIO
- Compilation & uploading of matters related to ETP/STP/CETP/CSTP as per Supreme Court Order.
- Files pertaining to NGT case on 593/2017 shall be routed through SEE-3
- Ensure all activities concerned to the section (reports, photographs etc.) of awareness are uploaded in the Board's website and web portal of CPCB.

Assistant Environmental Engineer (AEE-1)

- Further action and follow up of all assignments of AE- 2 and AE- 3
- Evaluation of monitoring reports submitted by consent holders
- Forwarding monitoring reports to IT cell
- Further follow up of complaints and court cases
- Evaluation of inspections and sample collection as per the circular No. PCB/HO/CIRCULAR-01/03/2017dated: 10/10/2017
- Matters related to India e-Track
- Press release and publicity of all activities in connection with the concerned sections
- APIO

Assistant Engineer (AE-2)

(Area of jurisdiction – TVPM, KLM, ALPA, PTA, KTM, IDK, TSR)

- Consent/Authorization/Registration under Water Act, Air Act and EP Rules
- Post monitoring of consent conditions with coordination of Regional Offices and District Offices under the area of jurisdiction
- Proper follow up of complaints and court cases
- Legislative Committees - All reports and correspondence under the area of jurisdiction
- CMPGRC – Proper follow up actions on reports
- RTI
- General co-ordination of the Head Office, Regional Office & DOs under the area of jurisdiction
- Maintenance of file register, case register, complaint register, govt. correspondence register
- Sabarimala – Environmental up keep of Sabarimala, Coordination of all activities with Regional Office, Thiruvananthapuram and District Office, Pathanamthitta.

Assistant Engineer (AE-3)

(Area of jurisdiction – EKM, PLKD, MLPM, KKD, KNR, WND, KSGD)

- Consent/Authorisation/Registration under Water Act, Air Act and EP Rules
- Post monitoring of consent conditions with coordination of Regional Offices and District Offices under the area of Jurisdiction
- Proper follow up of complaints and court cases
- Legislative Committees - All reports and correspondence under the area of jurisdiction
- CMPGRC - Proper follow up actions on reports
- RTI
- General co-ordination of the Head Office, Regional Offices & DOs under the area of jurisdiction
- Maintenance of file register, case register, complaint register, govt. correspondence register

The organisation structure of Environmental Engineer 2 in charge of Board & Review Meeting, BMW & E-Waste Rules, Public Hearing & RTI General Section is given in figure 4.5 and the activities entrusted with each officer under him/her are listed below.

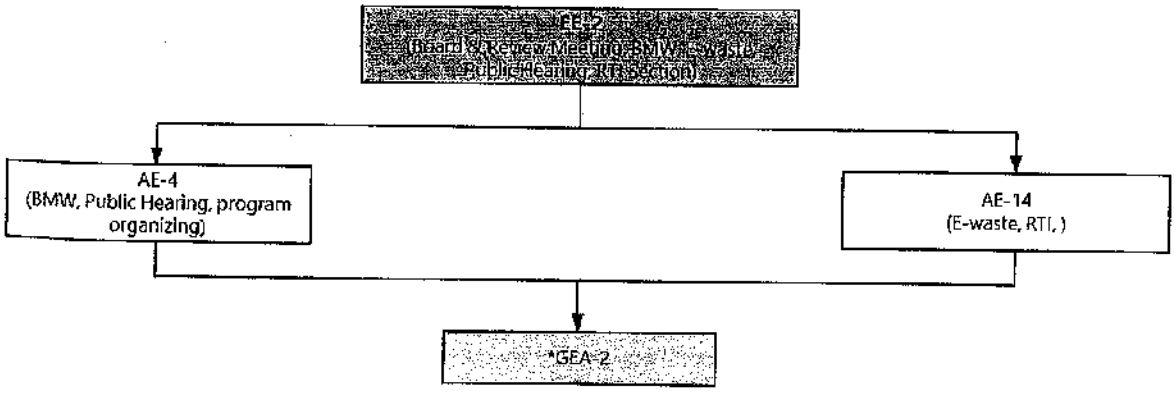


Fig. 4.5. The organisation structure of the office of the EE-2.

Environmental Engineer (EE-2)

- Co-ordination and monitoring of all activities in connection with the implementation of BMW & E-waste Rules.

- All assignments and its follow up of activities of AE-4, AE-8, JSA-2
- Files pertaining to NGT cases 710-713/2017, 43/2017, 512/2018, 585/2018, 72/2020 shall be routed through SEE-2
- Ensure all activities concerned to the section (reports, photographs etc.) of awareness are uploaded in the Board's website and web portal of CPCB.
- PIO (General)

Assistant Engineer-4 (AE-4)

- Best Environmental Practices Awards under various activities – timely action and follow up.
- Organizing various programmes in connection with Award distribution
- Public Hearing
- Board & Board Committee Meetings
- BMW Rule-Implementation & related awareness and training programmes
- Preparation of Action Plan on execution of concerned Rules
- Preparation of reports based on the various awareness activities organized by the Board in connection with BMW Rule.

Assistant Engineer-8 (AE-8)

- Work Order
- RTI General
- Review Meeting
- E-Waste Rule-Implementation & related awareness and training programmes
- Preparation of Action Plan on execution of concerned Rules
- Press release and publicity of all activities in connection with the concerned sections
- Preparation of reports based on the various awareness activities organized by the Board in connection with E wastes Rule.
- APIO

Junior Scientific Assistant (JSA-2)

- Follow up and preparation of Annual Reports under the Rules and inventory under the above rules
- All other Festivals – Formulation of activities under Water Act, Air Act and EP Rules
- Daily data updation in COVID BMW tracking app

The organisation structure of Environmental Engineer 3 in charge of Hazardous Waste, C&D Waste, Batteries & Noise Rule Section is given in figure 4.6 and the activities entrusted with each officer under him/her are listed below.

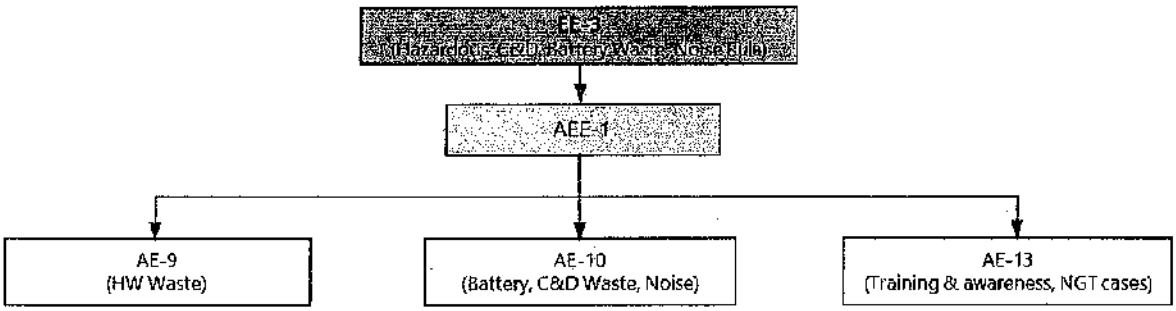


Fig. 4.6. The organisation structure of the office of the EE-3.

Environmental Engineer - 3 (EE-3)

- Co-ordination of all activities connected with implementation of Hazardous Waste OA 804/2017, C&D Waste, Batteries & Noise Rules
- Review of all assignments of AEE-6, AE-9, AE-10, AE-13 & GIS Specialist
- RRC (River Rejuvenation Committee) OA 673/2018 & OA 581/2018
- Oil Contingency Plan
- Parliament & Assembly matters
- General matters related to Water Act, Air Act, Public Liability Insurance Act, Noise Pollution (Regulation & Control) Rules, Chemical accidents (Emergency Planning, Preparedness & Response Rule, Manufacture, Storage & Import of Hazardous Chemical Rules, Ozone Depleting Substances Regulation and Control Rule.
- Identification and Restoration of water bodies (OA No.325/15)
- Rejuvenation of Tirur-Ponnani River (OA No.582/2018)

- Files pertaining to NGT cases on 804/2017, 134/2020, 22/2020, 12/2020), 681/2018 (action regarding noise only), 67/2020 shall be routed through SEE-1
- Files pertaining to NGT cases 673/2018, 581/2018, 582/2018, 325/2015, 829/2019, 496/16 shall be routed through SEE-2
- Ensure all activities concerned to the section (reports, photographs etc.) of awareness are uploaded in the Board's website and web portal of CPCB.
- PIO

Assistant Environmental Engineer (AEE-6)

- Co-ordination and follow up of all works assigned to AE – 9, AE-10 & AE-13
- Press release and publicity of all activities in connection with the concerned sections
- APIO

Assistant Engineer (AE-9)

- HW Rules, Implementation & Programmes, OA 804/2017
- Preparation of Action Plan on execution of concerned Rules
- Details of Industries/Institution under the above rule shall be maintained
- HW Rules, its Amendments, Follow up & preparation of Annual Reports under the Rules, Inventory under the Rules
- Public Liability Insurance Act
- Chemical accidents (Emergency Planning, Preparedness & Response Rule, Manufacture, storage & Import of Hazardous Chemical Rules
- RTI

Assistant Engineer (AE-10)

- Batteries, C&D Waste Rules– Implementation & Programmes
- Preparation of Action Plan on execution of concerned Rules
- Details of Industries/Institution under the above rule shall be maintained
- Follow up and preparation of Annual Reports under the Rules and inventory under the above rules

- Parliament & Assembly matters
- Noise Pollution (Regulation & Control) Rules
- Ozone Depleting Substances Regulation and Control Rule
- General Matters related to Water Act, Air Act
- RTI

Assistant Engineer (AE-13)

- RRC (OA No.673/2018)
- Oil Contingency Plan
- Training and awareness programs under HW Rules, Batteries, C&D Waste Rules
- Identification and Restoration of water bodies (OA No.325/15)
- Restoration of River Stretch of Karamana-Malekkdu to Thiruvallam (OA No.581/2018)
- Rejuvenation of Tirur-Ponnani River (OA No.582/2018)
- RTI

GIS Specialist

- shall attend works in all sections as per requirement

The organisation structure of Environmental Engineer 4 in charge of Legal Section is given in figure 4.7 and the activities entrusted with each officer under him/her are listed below.

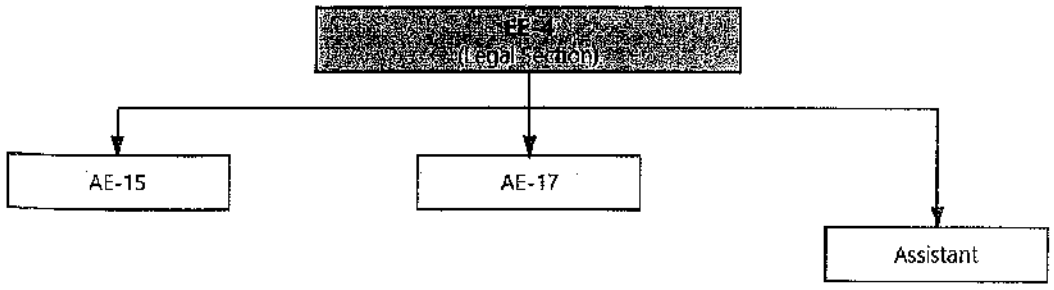


Fig. 4.7. The organisation structure of the office of the EE-4.

Environmental Engineer (EE-4)

- Co-ordination & timely review of all assignments of AE-15, AE-17 & Legal Assistant

- SLMC
- Matters related to CPCB – Performance Audit and CPCB – Monthly Review Meeting
- Co-ordination & communication of all matters with CPCB, SPCB, MoEF & CC, State Government
- Vetting of legal Affidavit/ Reports
- Ensure all activities concerned to the section (reports, photographs etc.) of awareness are uploaded in the Board's website and web portal of CPCB.
- PIO

Assistant Engineer (AE-15)

- Settlement of Bills of Standing Counsels / Advocates/ Legal advisor
- Press release and publicity of all activities in connection with the concerned sections
- RTI
- APIO

Assistant Engineer (AE-17)

- Co-ordination of all activities related to Legal General, Tribunal, Commission, Appellate Authority & National Green Tribunal, Legal Action
- Co-ordination of Legal Cell activities at RO, EKM
- SLMC

Legal Assistant

- Co-ordination of legal activities pertaining to EE-4
- Contact all section heads daily and update legal action if any pending and need urgent attention
- Digitalization of order of Hon'ble High Court/ NGT

The work distribution order covers all the activities and the division of work is on the basis of geographical area.

4.2.2 Administration Wing

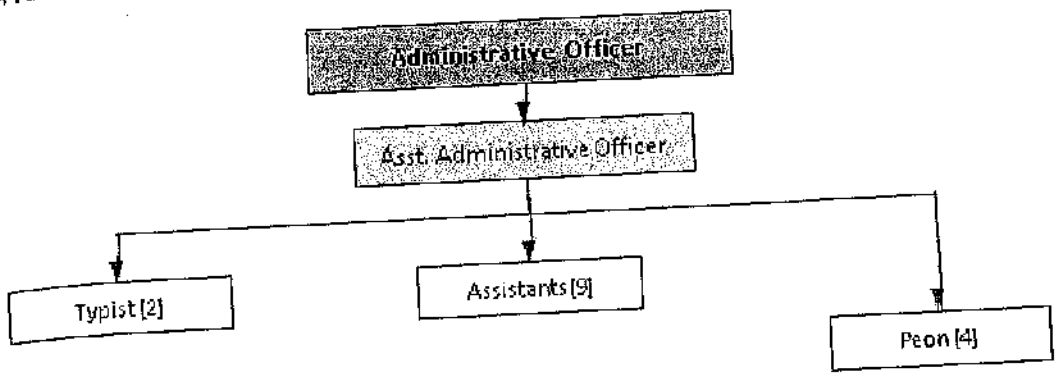


Fig. 4.8. The organisation structure of the office of the Administrative Wing.

E-1 Section

- KPSC Appointments
- Posting through Employment Exchange in the Board
- Promotion/Grade promotion of the staff in the Board
- Transfer and postings in the Board
- Creation of posts in the Board
- Amendment of Service Regulation in the Board
- Work Study report
- Deputation to and from the Board
- Compassionate employment
- Papers relating to the appointment of Chairman and Member Secretary of the Board
- Maintenance of staff details register
- Supernumerary Appointment

E-2 Section

- All papers relating to confidential issues including vigilance cases, complaints and allegation against Board staff and furnishing action taken report to the government.
- All papers relating to DPC

- Sanctioning of pensionary benefits of all the staff and maintenance of their Service Books and Pension Books.
- Confidential Reports
- Pension revision of the staff
- All papers related to property statements of the staff
- Correspondence relating to constitution of the Board.
- Papers relating to filing of property statements to Lok Ayukta
- NLC
- Paper relating to delegation of powers
- Preparation of pension payment order
- ICC Tribunal complaints Committee, Women Cell, Constitution of Vigilance Cell, Complaint Registration Cell

E-3 Section

- Purchase and distribution of stationary items and maintenance of stock register
- Purchase of furniture and maintenance of stock register
- Sanction of advertisements, orders and payments
- Purchase and distribution of computers and photocopiers stationery and its payments
- Reimbursement of newspaper charge to AO/ACO
- Sanction of payment towards the subscription of newspapers and magazines in the Head Office
- Printing of registers, diary and other items and hologram
- Purchase of Government calendars and diaries
- Stamp sale
- Auction and disposal of furniture
- Public awareness
- All papers related to the purchase and maintenance of Photocopiers of all the offices of the Board
- Other miscellaneous papers in the Establishment Section

E-4 Section

- Commercial Apprentices, GEA, PGSA
- Processing of biometric punching statement
- Official language Malayalam
- Deputation of Board staff for M.Tech courses
- Papers relating to the annual report of the Board and correspondence with Government regarding this
- Payments of wages of daily waged staff of the Board
- Casual leave register
- Maintenance of attendance and abstract registers
- Appointment of Standing Counsel and Additional Standing Counsels and Legal Adviser of the Board and payment of their retainer fee.
- Papers relating to office discipline
- Appointment official advertisement agency
- Miscellaneous papers

E-5 Section

Inward Section

E-6 Section

- Payment of land phone bills of Head Office and Annexe, mobile phone bills and reimbursement of mobile bills of AO/ACO
- Group Insurance Scheme SLI, GPAIS & GSLI of Board employees
- Papers related to all rented buildings of PCB and execution of agreements
- Sanctioning of non-refundable advance and temporary advance of board employees
- Payment of water charge & electricity charge of Head Office
- Medical reimbursement of Board employees and maintenance of its register
- Purchase of official mobile phones and sims and maintenance of its register
- Test on Pollution Control Act & Rules
- Papers relating to Election Commission duties

- Completion of stock verification reports of all offices of the Board
- Experience certificate/NOCs

E-7 Section

- TA
- Sanctioning of increments to staff of Head Office and all the offices in the rank of Senior Environmental Engineers/Senior Environmental Scientist and above of the Board and maintenance of increment register
- Declaration of probation of staff and maintenance of its register
- Sanctioning of all kinds of leaves and ELS of the staff of Head Office and that of Senior Environmental Engineers/Senior Environmental Scientists and above of the sub offices of the Board and maintenance of their Service Books.
- LWA under Appendix XII B & C and of LPR to the Board staff
- Gradation list/Seniority list
- Pay fixation & Pay revision of the staff
- Maintenance of service books of the staff appointed through employment exchange and sanctioning of leaves and ELS to them
- LPC
- NPS
- HBA
- RTI
- Granting permission for foreign country

E-8 Section

- LA Interpellation/WP (c)
- CMPGRC
- Papers relating to acquisition of land for offices of the Board
- Vehicle purchase and hiring
- Evaluation of utilization of vehicles on monthly basis
- Vehicle maintenance and fuel charges
- Vehicle imprest

- Papers relating to the appointment leave and LPC of Administrative Officer and Accounts Officer
- Paper related to training of the Board staff
- Arrangement of conveyance and accommodation of Board Officers and officers from other Government Offices
- ODEPC payments
- Allotments to fund to Welfare Society & Reimbursement of Refreshment charges

E-9 Section

The distribution to this section was not disclosed.

4.2.3 Accounts Wing

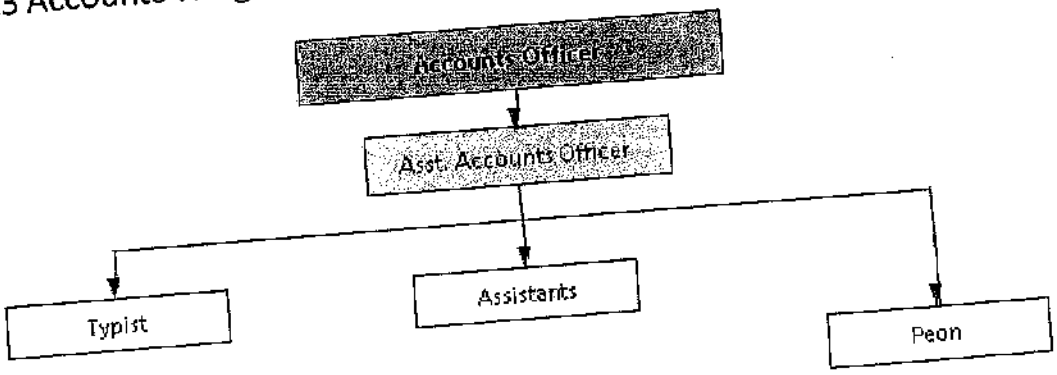


Fig. 4.9. The organisation structure of the office of the Accounts Wing.

Assistant (A1)

- Computerisation of accounts including entry of fixed deposits, PF subscription and loan repayment
- Crediting of interest of all employees through Tally software
- Preparing and accounting of income and expenditure statement, interest of bank accounts
- Reconciliation of all accounts
- Preparing of vouchers for payment

Assistant (A2)

- PF Account no. allotment
- Maintenance of PF registers of all employees (remittance & ledger)
- Credit slip preparation
- Calculation and verification of TA
- NRA & maintenance of registers of TA & NRA
- Sanctioning of PF closure of all employees
- HBA register
- Verification of statement of DA arrear, PF related to DOs including HO

Assistant (A3)

- Imprest maintenance
- Issuance of cheque for all payments
- Preparation of pension bill and DR arrear bill
- Pensioner's DR calculation
- DCRG
- Commutation
- Pension contribution calculation in respect of deputed staff and Board staff
- Service book verification of all employees
- Internal audit of all offices of KSPCB
- Pension IT remittance
- Audit reply regarding pension
- Filing of NPS details of employees internal audit

Assistant (A4)

- Monthly remittance in respect of deputation staff and maintenance of its register
- Monthly and annual reconciliation of receipts and payments
- Pass book maintenance of SLI, LIC, GIS
- Maintenance of cash books

Assistant (A5)

- Salary Bill, increment, promotion pay
- IT calculation, IT e-filing
- Arrears, DA arrears and Pay revision arrear
- Terminal surrender & surrender
- Maintenance of pay bill register
- Monitoring of remittance of PF, HBA, GIS, LIC, SLI, IT and other recovery schedules
- Issue of salary certificate
- Reply to RTI
- Appointments of auditors, AG's audit reply etc.
- Budget preparation and release of Non Plan grant received from government and online uploading in BMS & consolidation
- Submission of plan bills through BIMS
- Miscellaneous communications to other sections

Assistant (A6)

- FD Register (Bank & Treasury) maintenance including reconciliation, interest rate, monitoring of deposit, renewal & closure
- DD register maintenance, bank guarantee register maintenance and RTI Register
- Settlement of temporary advance- register verification and maintenance
- Maintenance of cheque issue register

Assistant (A7)

- Monthly Plan and Non Plan expenditure and receipt consolidation
- Fund allotment to sub offices
- Payment of advocate fee
- Maintenance of audit documents received from sub offices
- Maintenance of ledger

4.2.4 Regional Office

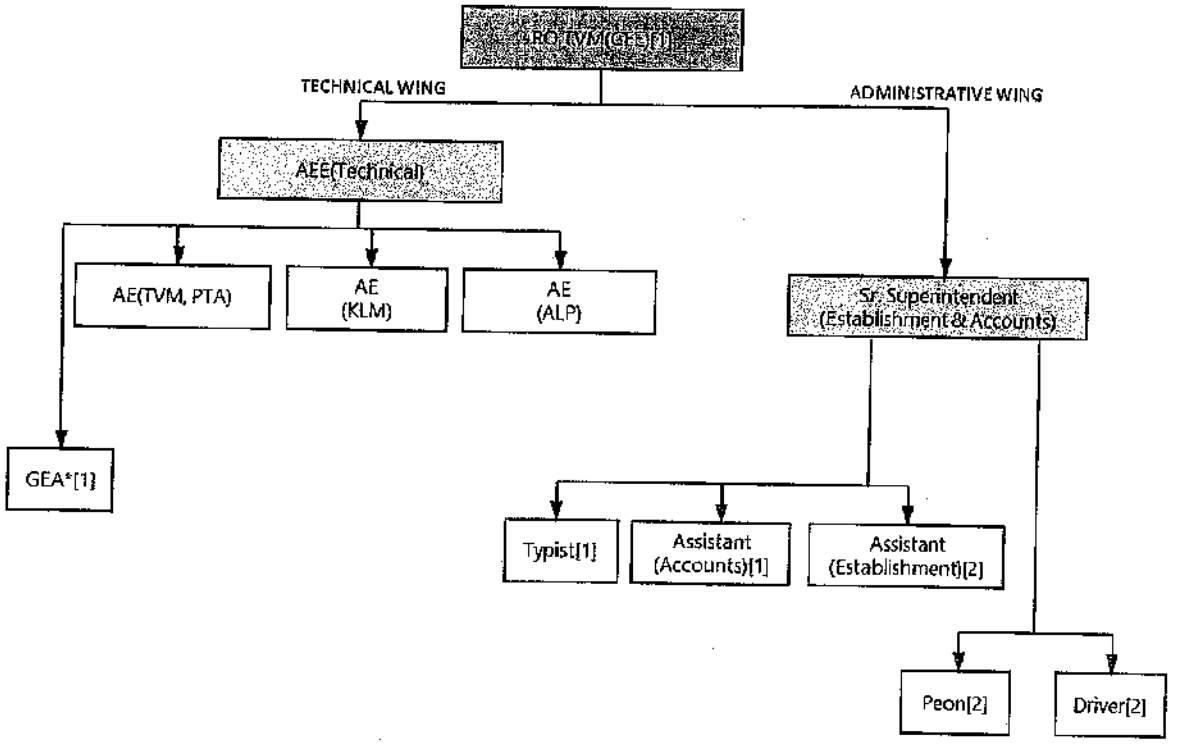


Fig. 4.10. The organisation structure of the office of the Regional Office, Thiruvananthapuram.

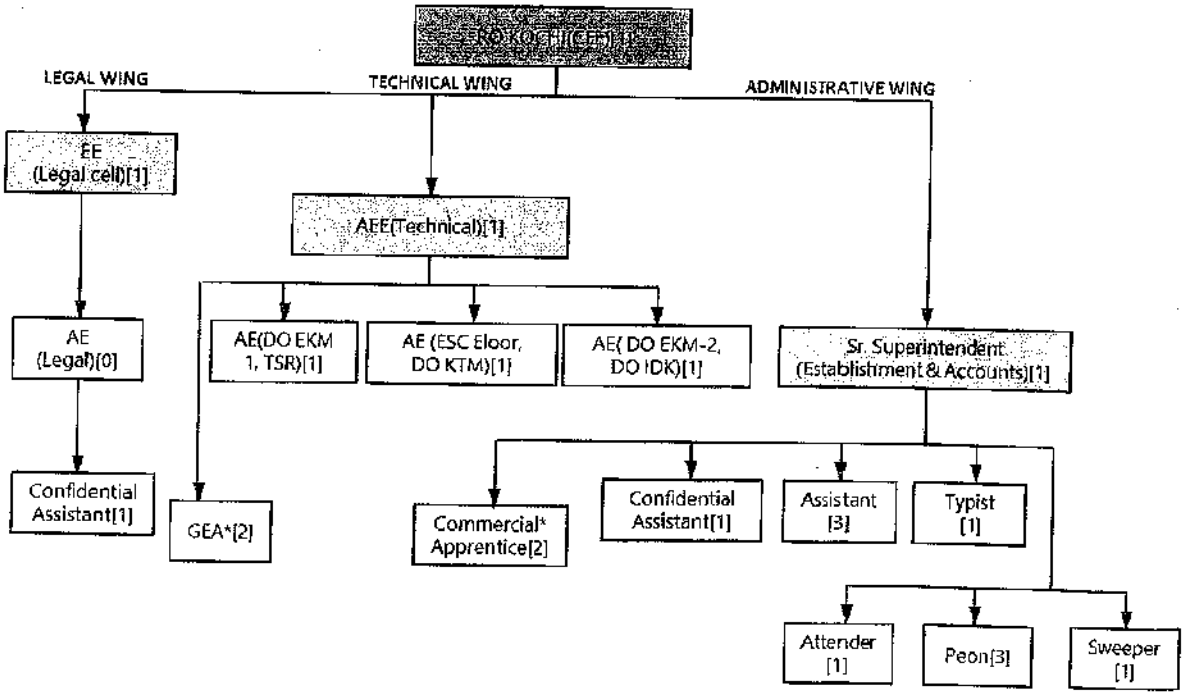


Fig. 4.11a The organisation structure of the office of the Regional Office, Kochi.

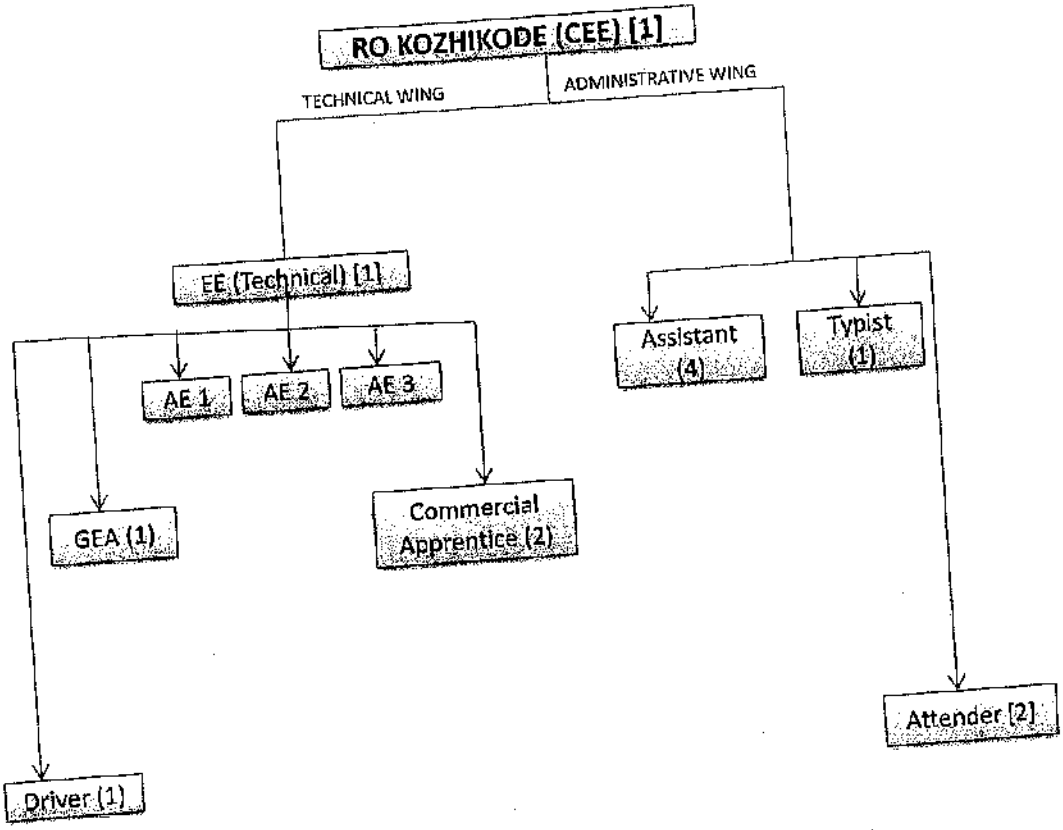


Fig. 4.11b The organisation chart of the regional office, Kozhikode.

Chief Environmental Engineer (CEE).

- In charge of administrative section and technical section of Regional Office and general co-ordination of the Regional Office and Central Laboratory.
- All administration, Technical matters and accounts files of Regional Office shall be routed through the Chief Environmental Engineer.
- Evaluation and follow up of all works assigned to all officers.

Environmental Engineer (EE) – Legal Cell

- Co-ordination of all activities related to Legal actions from the Board, Tribunals, Commissions, Appellate Authority, National Green Tribunal, High Court & Supreme Court.
- Supervision of Vehicles allotted to Regional Office.
- Liaison works with Advocate Standing Counsel.
- Super vision of construction related works of Building especially Training center and auditorium.

- Member, Purchase Committee.
- Coordination with District Offices/Central Laboratory in connection with transfer of equipments/Instruments/CAAQMS/NAMP etc.
- Any other official duties assigned by the Chief Environmental Engineer

Assistant Engineer (AE) – Legal cell

- Works related to Legal Cell, (Assisting AEs in the preparation of affidavits, liaison with advocate standing counsel).
- Any other official duties assigned by supervising officers

Assistant Environmental Engineer (AEE)

- Supervision of works done of AEs and GEAs
- OCMMS verification and evaluation of consent and authorization application processing and its disposal at Regional and District Officers with the help of GEAs.
- Post monitoring of consent conditions
- Complaints, Court Cases, NGT and all legal matters
- Legislative Committees
- Reports to government, Chief Minister's Portal- Nodal Officer
- Arrangements regarding Regional Review Meetings
- CMPGRC
- RTI(PIO)
- Technical and general matters under the Regional Office.
- Arrangement and monitoring of tour programme.
- Audit related works
- Supervision and verification of file registers, complaint register, govt. correspondence register.
- Co – ordination of all AE s and DOs under the jurisdiction of RO.
- General Co-ordination of Head Office matters, Regional Office & all DOs under RO
- Any other official duties assigned by the Chief Environmental Engineer
- Member, Purchase Committee

Assistant Engineer (AE)

Work is divided to Assistant Engineers based on jurisdiction under the respective region.

- Administration of Consent/Authorization/Registration under Water Act, Air Act and EP Rules of the allocated area
- All matters related to the implementation of Waste Management Rules and Noise Rules
- Plan projects for the districts
- Preparation of inspection schedule
- Post monitoring of consent conditions
- Complaints and Court Cases
- Timely preparation/ follow ups of draft affidavits/status reports of all Courts/Tribunal/Commission/Appellate Authority matters under the allocated areas.
- Legislative Committees
- CMPGRC
- Preparation of RTI replies, annual report and maintenance of registers (APIO)
- General Co-ordination of the Regional Office & all allocated DOs
- Maintenance of file register, complaint register, govt. correspondence register and RTI register.
- Monitoring of CAAQMS data and daily checking of emails.
- Maintenance Vehicles / log books
- Supervision of DG Set and HT installation works
- Maintenance of equipments allotted to Regional Office
- Maintenance of file register, complaint register, govt. correspondence register and RTI register
- Preparations of RTS, maintenance of complaint register.
- Any other official duties assigned by supervising officers

Graduate Engineering Apprentice

- Assisting in the duties of all AEs/AEE/EE/CEE
- OCEMS & CAAQMS daily monitoring and follow up
- Compilation of Inspection details & preparation of schedule
- Maintenance of SOP, guidelines, orders and circulars soft copies
- Administration Section

Instrumentation Engineer [appointed on daily wages basis]

- Performance evaluation, maintenance, preparation of estimates of all works related to equipments, instruments of all office of the Board.
- Coordination of activities of the Central Laboratory.

Senior Superintendent

- Supervision and verification of all the matters related to Administration and Accounts Section
- Supervision of the works in the Administration section of Regional Office and all District Offices coming under the jurisdiction of the Regional Office.
- Supervision of purchase by Regional Office.
- Maintenance of Cash Book and custody of Cash, Cheque Books etc.
- Preparation of all bills except TA Bills.
- Maintenance of all registers related to Accounts except Pay Bill Register and Registers related to Pension and Accounts.
- Works related to Income Tax.
- Maintenance of pay bill register and registers related to pension and accounts.

Selection Grade Confidential Assistant

- Confidential Assistant to Chief Environmental Engineer
- Receiving all E- mails to Chief Environmental Engineer as well as technical and administration section.
- Data entry and typing of all letters in English and Malayalam.

A1 Section: Assistant GR-II [appointed on daily wages basis]

- Clerical works in Technical section and Administrative section.
- Inward, despatch and maintenance of allied registers
- Maintenance of stamp account and allied registers

A2 Section: Assistant GR-II: [appointed on daily wages basis]

- Maintenance of Service Books.
- Increment of staff members of Regional Office and other District offices under the jurisdiction of this office.
- Assist Senior Superintendent in the posting through Employment Exchange/ daily wage.
- Preparation of TA Bills.
- Works related to dispatch section of RO.
- Works related to inward section of RO
- Stationery and Medical Re–imbursement
- All kinds of leave and maintenance of leave registers.
- Attendance register and punching machine related works.
- Assisting Senior Superintendent in all allocated administrative matters.
- Any other works assigned from time to time by the superior officers.

A3 Section: Assistant GR-II [appointed on daily wages basis]

- To Assist the Assistant Engineers in the preparation of affidavits/reports etc. of all Courts/Tribunal Matters.
- Any other works assigned from time to time by the superior officers.

Commercial Apprentice

- All works related to accounts, cash book, ledger, petty cash book, cheque register, imprest a/c, preparation of vouchers and tally.
- Assisting Senior Superintendent in all allocated accounts matters.

- Any other works assigned from time to time by the superior officers.
- Inward and despatch, stamp account, bill of fuel charges

4.2.5 Environmental Surveillance Centre, Ernakulam

The Environmental Surveillance Centre, commonly called District Office-3 of Ernakulam is located at Eloor, Ernakulam. The functioning is same as that of a district office with a similar staff pattern except that one Assistant Engineer, 1 NAMP operator and a Driver will be present during the night shift also for a 24 hour surveillance. This is to take care of the emergency situations if any in the district, as Ernakulam is a highly industrialised area. The office is headed by a Senior Environmental Engineer unlike the other DOs. An Assistant Environmental Engineer supervises the three Assistant Engineers comprising the Technical wing of the office. The scientific wing consisting one Assistant Scientist and 2 JSAs are in charge of the laboratory.

4.2.6 Central Laboratory, Ernakulum

The Central Laboratory is headed by the Chief Environmental scientist. The organisational structure of the Central Laboratory is given in fig 4.10. It has a scientific wing and a administrative wing. The activities of different functionaries are listed below.

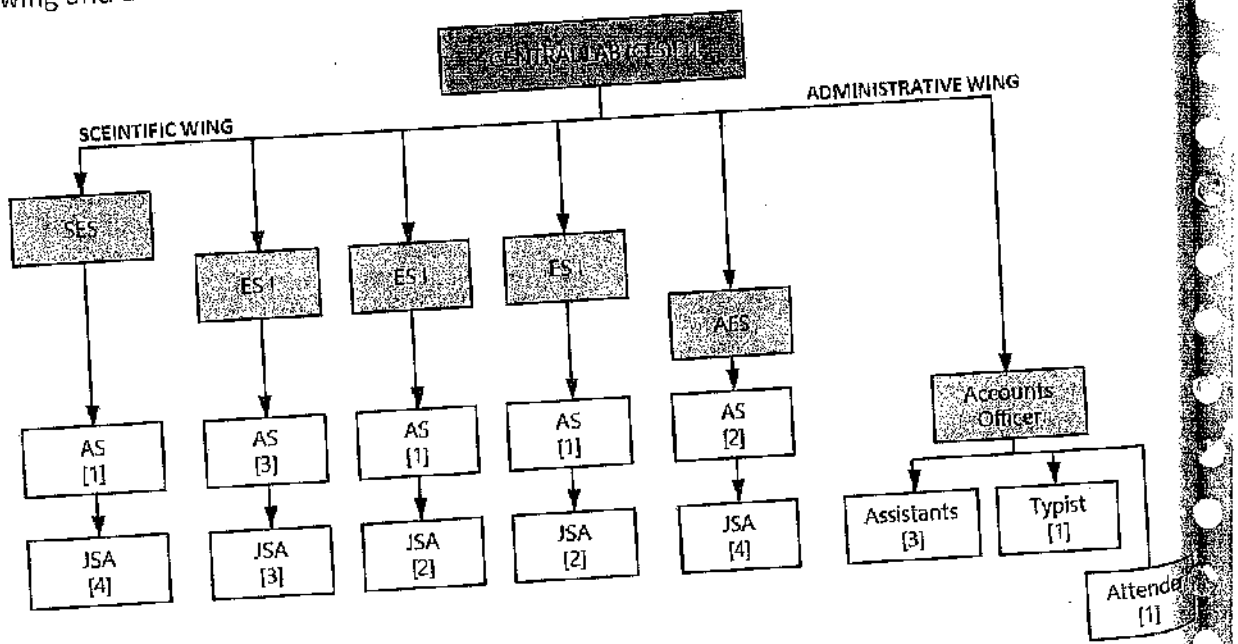


Fig. 4.12: The organisation structure of the office of the Central Laboratory, Ernakulum.

Chief Environmental Scientist (Technical Manager NABL)

Senior Environmental Scientist (SES)

- Quality manager- General Environment & Pollution
- In charge of Microbiology Lab, AMR Lab Calibration Lab, LIMS
- Operation and maintenance of AMR instruments including LCMS
- NABL accreditation & E(P)A accreditation
- Calibration of glass wares
- Vehicle
- e-tender
- Approval of other laboratories
- Progress report
- Lab Renovation

Environmental Scientist (ES I)

- In charge of National Water Monitoring Program (NWMP)
- Purchase and distribution of chemicals and glass wares.
- Maintenance of poison license
- Operation of HPCL, GC I & GC II classification of water bodies.
- Air and water quality directory
- Lab renovation
- Authorised Signatory Chemical (residues in water- Pesticides)

Environmental Scientist (ES II)

- Air Lab
- Quality Manager of Atmospheric Pollution
- NAMP
- PIO
- Calibration & Maintenance of FTIR, TOC, CHNS, IC.
- Online water quality monitoring
- Vehicle
- Lab Renovation

Environmental Scientist (ES III)

- OHSMS accreditation
- APIO
- Purchase and distribution of equipments to all district offices
- Maintenance of air conditioner and cold room
- Authorised Signatory of Chemical (Water and Industrial Water, Residues in water, heavy metals)
- Lab renovation

Assistant Environmental Scientist

- In charge of Effluent Lab
- Quality Manager of Water & Industrial water
- Analysis including TCLP
- Reporting of samples received from DO, RO, and other District offices
- Operation and Maintenance of ICPOES and AAS
- Packaged drinking water
- Maintenance of Computers, Printers, Telephones, CFA, SKALAR
- Lab Renovation

Assistant Scientists and Junior Scientific Assistants

Assists the SES, ES and AES. The work distribution of AS and JSAs in the Central Laboratory has not been made available.

The Central laboratory has installed Residue Monitoring, Microbiology and Genome laboratories for which expert manpower is required.

Administration & Accounts Wing of Central Laboratory

One Accounts Officer is in charge of the all matters related to administration and accounts. The AO is assisted by 3 Assistants, 1 Typist and an Attender.

All officers are bound to carry out any other work assigned by the higher officers. Breach of directions from the higher officers shall be viewed seriously under various clauses of KSR & Kerala State Subordinate Service Rules.

4.2.7 Regional Laboratory, Kozhikode

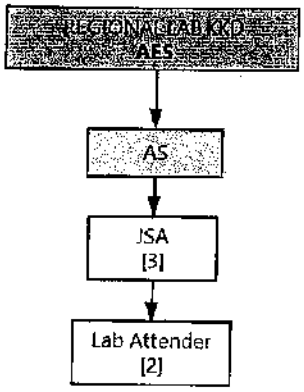


Fig. 4.13: The organisation structure of the office of the Regional Laboratory, Kozhikode.

Laboratories are functioning in the District offices also. This is covered along with district offices.

4.2.8 District Offices

The organisation chart of District Offices in Trivandrum, Kollam, Alappuzha, Kottayam, Ernakulam-1 &2, Trissur, Palakkad and Kannur is given in fig 4.14. The staff pattern in districts like Kasargode, Wayanad, Idukki, Pathanamthitta, Malappuram, Kozhikode and Ernakulam DO-3 which varies from the other districts with 3 Assistant Engineers, 2 Assistants and scientific wing headed by Assistant Scientist unlike in the other districts where it is headed by an Assistant Environmental Scientist.

Graduate Apprentices and Commercial Apprentices assist the AEs in the primary functions of the unit.

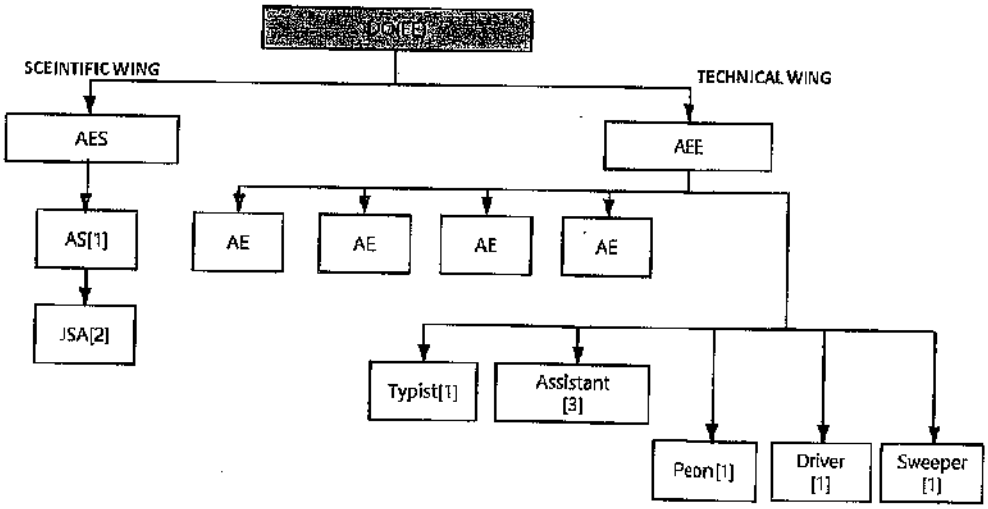


Fig. 4.14: The organisation structure of the office of the District Offices.

Assistant Engineer

- All technical works related to concerned Taluks
- Consent management and post monitoring
- Preparation of reports/reply under RTI
- Surveillance and sound level monitoring with the assistance of NAMP operators
- Preparation of monthly reports as per Right to Service Act
- Preparation of authorisation under all Waste Management and Handling Rules
- Compilation of annual report as per all Waste Management and Handling Rules
- Coordination of all general matters, meetings and preparation of surveillance reports
- Maintenance of all technical registers with the help of Assistants
- Any other work entrusted by superior officers from time to time

Assistant Grade II(A1)

- Establishment
- Maintenance and updation of registers related to establishment
- Preparation of bills/salary/wages
- Vigilance
- Right to Service Act
- Purchase and maintenance of office equipments, computers and other accessories
- Rent (vehicle & building)
- Store and stock register

Assistant Grade II (A2)

- Accounts
- Maintenance and updation of Ledgers and Registers related to Accounts (Vouchers, Imprest, Receipt Books/Register, Cash Book, DD Register, Cheque issue Register, Advance Register, Monthly Pay Bill Register etc.)

- Bank Guarantee
- Income Tax
- Any other work entrusted by superior officers from time to time

Assistant Grade II (A3)

- Maintenance of Inward Register and Despatch Register
- Maintenance and updation of Stamp Register
- Assisting Assistant Engineers (AEI, AE2, AE3 & AE4) in all technical matters including inward processing, preparation of letters, reports & counter affidavits.
- Maintenance of file register, consent register, complaint register, legal register, Human rights etc.
- Updation of Database, Transparency reports
- All AEs shall submit reports under RSA on or before 3rd working day of next month to AI section in the required format without fail
- Any other work entrusted by superior officers from time to time

Assistant Scientist

- Lab Administration, Supervision or lab activity & Co-ordinating the works of JSA-1 and JSA -2
- SWMP and effluent analysis
- Analysis, cross checking/quality control and preparation of reports
- Plan Scheme projects
- Supervising the repair and maintenance of surveillance instruments as reported and arranged by NAMP operators
- Purchase, maintenance and repair of all scientific equipments.
- Special projects assigned from time to time
- Any other work entrusted by superior officers from time to time

Junior Scientific Assistants

- Lab works related to NAMP with the assistance of NAMP operators
- Effluent analysis
- Assisting Assistant Scientist in all lab related works including file works and special projects assigned from time to time

- Maintenance of all registers in the lab report/bill preparation
- Any other work entrusted by superior officer from time to time
- Selection Grade Typist
- All typing works
- Maintenance of RTI Register and preparation of Annual Report as per Right to Information Act
- Any other work entrusted by superior officers from time to time

Higher Grade Driver

- Driver to Board's vehicle

Commercial Apprentice

- Attending Kiosk
- Extending necessary support to the Assistant Engineers in inward processing and online application processing as and when required
- Uploading of the complaints received in the grievance module
- Any other work entrusted by superior officer from time to time
- CAs shall take print out of e-mail & correspondence received via e-mail in the same day& hand over to A3 section and Assistants.

Graduate Engineering Apprentice

- All works assigned by superior of assisting AEs in preparation of Annual Reports & other reports under various Rules.

Peon

- Arranging files and retrieving them as and when required
- Providing assistance to all office staff
- Any other work entrusted by superior officers from time to time.

4.2.9 Work Load assessed by KSPCB

The Chief Environmental Engineer has made an assessment of the man power requirement of the district offices based on the prevailing activities and its time bound

completion. The calculation made is given in table 4.1 Though the time estimates are slightly on the higher side, this gives an account of the activities they have completed on a time bound frame work.

Sl. No	Activity	Time (days)
1	Man-days required for processing 200 applications at the rate of 200 applications @ 1-2 hrs per application including scrutiny and consent preparation -330hrs / 7 days	43 days
2.	Considering that 30% of Sl.No.1 require inspection, man days required for inspection - 60 Nos / 5	12 days
3.	Considering that 20 complaints are required /month. No of days required for inspection (2to 3/day)	10 days
4.	Report preparation @ 2 hrs/complaint 20*2 / 7	6 days
5.	No. of inspections with respect to court cases (HC, MC, NGT) 3to 5 per day complaint and monitoring.	4 days
6.	Report preparation on Sl. No. 5	4 days
7.	Public hearing and arrangements for the same @ 2days / hearing	6 days
8.	Report preparation on Sl. No. 7	4 days
9.	RTI replies 20-30 / month @ 1-2hrs / RTI hrs – 60/7	8 days
10.	Answering complaits and queries of public 2-3 hrs / day 2*25 / 7	7 days
	Total man days required	104 days
	Total man days available in a district office with 3 Asst. Engineers (25*3) and with 4 Asst. Engineers – 100 days	75 days

Table 4.1. The man days of work in district offices as calculated by the Chief Environmental Engineer.

The work load varies with districts. This is primarily due to the type of developments happening in the districts. This has resulted in Ernakulum District with 3 district offices. The districts of Thiruvananthapuram, Kollam, Alappuzha, Kottayam, Ernakulam 1 & 2, Thrissur, Palakkad and Kannur have 4 Assistant Engineers each where as Kasargode,

Wayanad, Iddukky, Pathanamthitta, Malappuram, Kozhikode and Ernakulam 3 has only 3 Assistant Engineers. The calculation in table 4.1 is applicable only to districts with 3 Assistant Engineers. The other districts have extra work and hence 4 Assistant Engineers were posted.

4.2.10 Job Description

A job description is a written narrative that describes the general tasks, or other related duties, and responsibilities of a position. The analysis considers the areas of knowledge, skills and abilities needed to perform the job. During the course of our study we met with comments like "that is not my work", it is not covered in my work distribution order", "without subordinates, I will not be able to do it", "my role is only advisory" etc. Many people especially technical people and senior officers view their work with a limited scope of covering only what is urgent in the work distribution order. This was the reason behind preparing the following job description for technical officers. It is not only important to technical officers but also to everyone working in the organisation from top to bottom including the cleaning staff. This has to be inculcated by the core personnel who are the technical officers.

Chief Environmental Engineer

- Responsible for development of the activities / projects / schemes for the Board, to contribute to the functions, mission and vision.
- Responsible for development of policies and procedures for Regions, Districts and other institutions like Central Laboratory, District Laboratories, Surveillance units, and other stakeholder institutions.
- Help other Officers liaise with LSGs, NGOs and other stakeholder institutions.
- Provide leadership to all subordinate officers and staff members.
- Ensure that transparency is maintained in all decisions and actions and is for the benefit of the organisation.
- Responsible for development of all personnel under his/her control.
- Responsible for mentoring and redressel of grievances of all personnel under the control.
- Ensure that responsibilities of the Board are effectively carried out through the subordinates.

- Enforcement of establishment matter.
- Liaison with external and statutory agencies.
- Responsible for developing public relation function of the Board.
- Participate in all discussions internal and external to the Board to present facts about the department to exploit opportunities for pollution Control.
- Should evince interest in taking additional responsibilities.

Senior Environmental Engineer

- Responsible for monitoring and control of all activities of the department under his/her responsibilities.
- Responsible for preparing project of relevance to the geographical/ functional area of responsibility.
- Laise with LSGs, NGOs and other stakeholders for better implementation of pollution reducing projects and programmes.
- Provides guidance to subordinate officers regarding their jobs.
- Get data on progress of activates for proactive decisions and reporting to higher ups.
- Responsible for review of reports on work done, consumption of resources and issue suitable instructions.
- Arranges for deployment of additional resources (manpower, money, material etc.) as and when required.
- Reviews and recommends proposals/ projects for pollution control at local level, contract works, related payments and also procurement of resources.
- Prepare annual budget proposals for the department.
- Participate in training programmes as and when required.
- Co-ordinates with other divisions for necessary data / information.
- Discharges administrative responsibilities.
- Any other official work that may be assigned by reporting officers.

Environmental Engineer

- Managing of all functions entrusted as per work order.
- Responsible for control over people, resources and out puts prescribed contributing to the performance of the Board.
- Responsible for preparing project of relevance to the geographical/ functional area of responsibility.
- Preparation and monitoring of plan of action on various responsibilities.
- Responsible for efficiency and efficacy of various operations for which he/she is responsible for.
- Responsible for solving problems and giving proper guidance to subordinates.
- Evaluation of personnel, their attendance, leave and performance and assigning the right job to the right person.
- To smoothen the administrative works and control of the office.
- Ensure proper housekeeping.
- Any other responsibility assigned by the reporting officer as required for smooth functioning.

Assistant Engineer

- Overall supervision of all activities.
- Attending to day to day problems and issues.
- Preparing proactive plan of action to meet contingencies and repetitive problems.
- Responsible for issuing various documents as required.
- Responsible for record maintenance of various activities and reporting its significance to various stakeholders.
- Responsible for preparing project of relevance to the geographical/ functional area of responsibility.
- Any other responsibility assigned by the reporting officer as required for smooth and uninterrupted work flow of the office.

Chief Environmental Scientist

- Responsible for development of the activities / projects / schemes for quality and quantity improvement, accreditation and control of all laboratories and analysis related activities of the Board, to contribute to the functions, mission and vision.
- Responsible for development of testing policies and procedures for Central Laboratory, District Laboratories, Surveillance units, and other stakeholder institutions.
- Help other Officers liaise with LSGs, NGOs and other stakeholder institutions.
- Provide leadership to all subordinate officers and staff members.
- Ensure that transparency is maintained in all decisions and actions and are for the benefit of the organisation.
- Responsible for development of all personnel under his/her control.
- Responsible mentoring and redressel of grievances of all personnel under the control.
- Ensure that responsibilities of the Board are effectively carried out through the subordinates.
- Enforcement of establishment matter.
- Liaison with external and statutory agencies.
- Responsible for developing and conducting public awareness programmes.
- Participate in all discussions internal and external to the Board to present facts about the department to exploit opportunities for pollution Control.
- Should evince interest in taking additional responsibilities.

Senior Environmental Scientist

- Responsible for monitoring and control of all activities related to NWMP, NAAMP, SWMP, SAAMP of the department under his/her responsibilities.
- Supervision of all activities of the Central Laboratory, accreditation works, Internal ACQ work, inter laboratory proficiency work etc..
- Responsible for preparing project of relevance to the area of responsibility.

- Provides guidance to subordinate officers regarding their jobs.
- Get data on progress of activates for proactive decisions and reporting to higher ups.
- Responsible for review of reports on work done, consumption of resources and issue suitable instructions.
- Arranges for deployment of additional resources (manpower, money, material etc.) as and when required.
- Responsible for purchase, maintenance of all instruments and equipments in laboratories.
- Inspection of Laboratories for recognition.
- Reviews and recommends proposals/ projects for improvement of Laboratories, contract works, related payments and also procurement of resources.
- Prepare annual budget proposals, Water and Air quality directory, annual report and monthly progress report.
- Participate in training programmes as and when required.
- Co-ordinates with other divisions for necessary data / information.
- Discharges administrative responsibilities.
- Any other official work that may be assigned by reporting officers.

Environmental Scientist

- Managing of all functions entrusted as per work order.
- Responsible for control over people, resources and out puts prescribed, contributing to the performance of the Laboratory.
- Responsible for preparing project of relevance to the functional area of responsibility.
- Preparation and monitoring of plan of action on various responsibilities.
- Responsible for efficiency and efficacy of various operations for which he/she is responsible for.

- Responsible for solving problems and giving proper guidance to subordinates.
- Evaluation of personnel, their attendance, leave and performance and assigning the right job to the right person.
- To smoothen the administrative works and control of the office.
- Ensure proper house keeping.
- Any other responsibility assigned by the reporting officer as required for smooth functioning.

Assistant Environmental Scientist

- Overall supervision of all activities.
- Attending to day to day problems and issues.
- Preparing proactive plan of action to meet contingencies and repetitive problems.
- Responsible for issuing various documents as required.
- Responsible for record maintenance of various activities and reporting its significance to various stakeholders.
- Responsible for preparing project of relevance to the functional area of responsibility.
- Any other responsibility assigned by the reporting officer as required for smooth and uninterrupted work flow of the office.

Assistant Scientist / Senior Scientific Assistant / Junior Scientific Assistant

- Responsible for routine activities as per work order.
- Timely reporting of issues and problems on routine activities to supervisors.
- Up-to-date data entry and maintenance of all records.
- Proper up keep of all equipments under their control.
- Sample collection wherever required.

- Responsible for quick actions warranting time limit actions.
- Checking the smooth flow of all inputs to the functions and out puts / reports from the operation.
- Proper house keeping.
- Keeping good interpersonal relations and public relations.
- Any other responsibility assigned by the superior officers as required for smooth and uninterrupted functioning.

CHAPTER 5

KEY RESULT AREAS AND PERFORMANCE APPRAISAL

5.1 Introduction

The study has envisaged preparation of a performance appraisal system for the technical staff of KSPCB. The traditional appraisal system in Government is more based on traits required in organisations and it has very little component in terms of a quantification of the performance of an individual/section/ division /organisation. The present system of KSPCB will continue along with this new performance appraisal and will have equal weightage while considering performance appraisal/confidential report for various organisational requirements especially career advancement.

5.2 Key Performance Indicators

In organisations when it comes to measurement of performance, indicators are used which are commonly called Key Performance Indicators (KPIs). Key Performance Indicator is a quantifiable measurement that shows how well an organisation, team, or individual is performing against a predetermined goal or objective. In its simplest form KPI is a type of performance measurement that helps you understand how your organisation, department or individual employee is performing. A good KPI should act as a compass that shows whether you are taking the right path towards your strategic goals.

A selection has been made to arrive at the KPIs from the job description and responsibilities attached to each job which have a bearing on the level of the functionary/division/organisation. Of those KPIs identified, weightage has been assigned depending on its significance in performance of the organisation. The purpose is to assess functionary /division /organisation in its performance for a specified period of time. Based on the KPIs and weightage given, it is proposed to have performance appraisal system along with the confidential report system. Given equal performance the one with seniority will be placed first. After short listing, the order in the final list shall be based on seniority.

In preparing the KPI's we have considered the organisational performance under three broad categories, preventive, curative and administrative. A sample range of activities for different types of pollution and the weightage to each is presented in table 5.1.

Type of pollution	Preventive measures	Curative measures	Administrative efficiency
Water pollution	Protection of river bank from waste, Providing Cameras, Converting it as tourist spots etc.	Inspection, Fines, River cleaning etc.	Monitoring Activities, Timely completion, Using river monitoring data for preparing projects etc.
Air Pollution	Projects for reducing exhaust emission,	Inspection , fines etc.	Controlling authorised agencies, Vigil on timely progress reporting etc.
Industrial	Projects for installing on line monitoring, Community education on hazards etc.	Increasing Inspections,	Planned periodic and regular inspections,
Non industrial operations	Evolving projects through NGOs, Community awareness programmes etc.	Inspections, fines etc	Regular data collection and analysis for timely action

Festivals	Legislations on Crackers, Projects for manufacturing idols etc. using degradable materials etc.,	Issuing warnings in festivals.	Prior identification of festivals and issuing instructions to authorised enforcers.
Chemical accidents	Strict enforcing of safety regulations, Arranging seminars for Enforcing Officers,	Regular checking by authorised authorities.	Proper data collection and analysis.
Hazardous waste	Awareness creation of stakeholders, training to personnel handling etc.	Regular testing.	Analysis based on regular and periodic testing.
Hazardous chemical	Strict enforcement of Rules, Training to people handling etc.	Periodic testing.	Regular vigilance
Oil spill	Regular planned checking of tanker trucks and railroad tankers containing gasoline, chlorine, acid, or other industrial chemicals.	Preparedness for plan A and Plan B in cases of accidents.	Keep informed on past data.
Biomedical waste	Promoting more players for collection and processing, Awareness programme for stakeholders etc.	Inspections	Proper data base management
Solid waste	Projects promoting disposal at source, Affordable & smaller Bio Gas projects etc.	Help arrange LSGs in arranging facilities for waste collection.	Inspection and imposing fines.

Plastic waste	Strict enforcement of ban on plastic, Promoting plastic recycling project, Plastic segregation projects etc.	Inspection of producers, stockists and intermediaries.	Managing a proper data base.
Construction and demolition waste	Developing more units for reuse and recycling of waste.	Insist LSGs to inspect and support the cause.	Proper liaison with LSGs.
E-waste	Identifying more waste recyclers, Preparing projects reports for KSIDC to implement recycling plants, Promotion of non incineration treatment technologies etc.	Monitoring and timely action on progress reports.	Detection of timely action on violations.
Batteries	Timely identification new entrants to the field.	Monitoring and timely action on progress reports.	Inspection of existing agencies on compliance.
Noise	Encouraging and Training Police personnel.	Helping police personnel punish offenders	Marinating noise date base and taking appropriate action
	40% weightage	40% weightage	20% weightage

Table 5.1. Some of the preventive, curative and administrative activities for different types of pollution.

We propose the following KPIs:

KPI - Preventive Activities (Sample)

Prioritisation of pollution causes requiring immediate action on controlling / preventing /abating pollution in the area of jurisdiction:

- Preparation of projects to be implemented by KSPCB / LSG / NGOs
- Approval of projects prepared

- Implementation of projects approved

- Implementation of innovative techniques / technology which reduces pollution

- Awareness programmes like seminar / workshops / public lectures

KPI – Curative Activities

General co-ordination of all pollution related activities

Attendance on various meetings (with Chairman, Member Secretary, RO, LSG, NGOs and timely compliance to the decisions taken.

Processing of verification reports consent /authorisation

Scrutiny of effluent / emission monitoring reports

Periodical inspection of industries, hospitals, hotels, municipal solid waste sites etc..

Joint inspection with other departments

Compliances to mile stones in plan schemes and projects

Timely providing of data related to pollution

KPI – Administrative Efficiency

Timely reply to all papers and quarries from Head Office / Regional office (maximum delay 5 days)

Timely processing, decision and action on various requests and permits from organisations / public (Maximum delay 5 days)

Proper upkeep of registers and files

The above KPIs and its components were selected considering the overall objectives of KSPCB and controlling and abating pollution in the State. The focus required was considered on the weightages given. Individuals may score more, but limit is fixed for preventive, curative and administrative to give importance to all the three without neglecting one. The score assigned to different items of work are given in table 5.2.

KPI	Component	Score
Preventive (Maximum score 40 out of 100)	Preparation of projects to be implemented by KSPCB / LSG / NGOs (per project)	5
	Approval of projects prepared (per project)	5
	Implementation of projects approved (per project)	
	Implementation of innovative techniques / technology which reduces pollution (per technique)	5
	Awareness programmes like seminar / workshops / public lectures (per each instance)	2
	Any other item as assessed by Controlling Officer (Maximum 10)	5
Curative (Maximum score 40 out of 100)	General co-ordination of all pollution related activities	10
	Attendance on various meetings (with Chairman, Member Secretary, RO, LSG, NGOs and timely compliance to the decisions taken.	5
	Processing of verification reports consent / authorisation	5
	Scrutiny of effluent / emission monitoring reports	5
	Scrutiny of effluent / emission monitoring reports, periodical inspection of industries, hospitals, hotels, municipal solid waste sites etc..	5
	Joint inspection with other departments	5
	Compliances to mile stones in plan schemes and projects	5

Administrative	

Table 5.3. Format for action plan

The KPIs developed and the weightages given and the action plan may be used for the performance appraisal system. The computer division may develop an application for performance appraisal which will capture the data on KPIs as and when it happens. In instances where this is not happening the immediate supervisor will enter such data as and when the event happens. Certain indicators are cumulative like consent management etc. and will be assessed from the system. Wherever none of these is there, and the employee or the district has an achievement related to KPI, this may be taken to the attention of the immediate supervisor for recording in the system. The form in table.5.4 may be used for performance appraisal.

To exemplify the scoring, if an Assistant Engineer proposes a project and if it is approved for forwarding to the funding agency he will get a score of 5 points. If it is approved by the funding agency he will get another 5 points during the year on which it gets approval. If it is successfully implemented he will get another 5 points during the year of successful implementation. If the project is proposed jointly 2 persons or more each will get 5 points at each stage based on their involvement if it is provided in the action plans proposed. Without providing in the action plan, last minute revelations will not count for sharing the score. Similar scoring will be given to any officer at any level based on the initiative. For curative activities like consent management, inspection etc., the average for the district per officer competent to issue will be considered. If the minimum number of inspection by an officer in the district is 300 and the maximum in the district by an officer is 700, the difference is 400. This difference divided by the

5.3 Performance Appraisal System

Action Plan

Every technical personnel both engineers and scientific have to submit an action plan at the beginning of the financial year before 15th April in terms of the work proposed under preventive, curative and administrative catogory. This has to be based on the previous year's backlogs commitments and priority areas of action required in reducing or abating pollution and other statutory requirements. It can also be items like innovative approaches and any research to be undertaken for the ensuing year. This may be done in consultation with the immediate supervisor and submitted to the Member Secretary before 15th April of the ensuing year. The immediate supervisor may suggest additions, alterations, deletions etc. based on its relation with the general performance of the district or region. Once finalised, this document will form the frame work in which he/she operates along with the routine operational activities. The immediate supervisor may do a mid-evaluation of the action plan to provide sufficient feedback. This shall help assess the work load of individuals and to have an equitable distribution of work for all. The form in table5.3 may be used for the same.

Action Plan for the year 20 -	
Name	Designation
Office	Date
KPI's	Associates if any
Preventive	
Curative	

	Timely providing of data related to pollution	5
	Timely reply to all papers and queries from Head Office / Regional office (maximum delay 7 days)	
	Timely providing of data related to pollution	5
	Others if any, entrusted (maximum 5)	5
Administration (Maximum score 20 out of 100)	Timely reply to all papers and queries from Head Office / Regional office (maximum delay 7 days)	15
	Timely processing, decision and action on various requests and permits from organisations / public (Maximum delay 7 days)	10
	Proper upkeep of registers and files	10
	Others if any, entrusted (maximum 5)	5

Table 5.2. The individual score for different activities.

The KPIs, its components and the weightage were fixed considering the importance of each item and its impact on controlling, reducing or abating pollution in the state. To be more practical unless there is a shift from doing urgent works to doing important works, any increase in the number of personnel will have only the same state of affair as far as pollution is concerned. Moreover when important works are done the number of urgent works will get reduced considerably. The previous study by IMG and the resulting increase in personnel by another 92 numbers and the present state of affairs vouch this. The situation has even deteriorated, if one looks at the reduction in the number of plan and non plan projects proposed, approved and implemented.

There is also a requirement to utilise the talents and potential of our young professionals joining the service to be more creative and worthy for the cause of pollution. The system has the advantage of making the work more challenging if properly managed. The chance of accomplishing this is high, if the appraisal is done in an objective and transparent mode.

score prescribed for the activity will decide the quantity to be done for each score above the minimum. That is, if the score for the activity is 5, then 400 divided by 5 units of the activity (400/5=80) is to be done for one score above the minimum. If one has done 380 inspections he will have a score of 1 (0 for 300 and 1 for 80) and thereafter 1 score for every 80 inspections. For administrative items the immediate supervisor may give a score based on the timeliness, quality of work and decision making ability involved in the administrative works. The total score for the individuals in the district divided by the number of individuals will be the score for the district and the average of the district score will be taken as the score for the region.

Performance Appraisal Form

Sl. No	KPI	Employee Score	Weightage (Max)	Av. Aggregate District score	Supervisor's score	Final score on appeal if any.
Preventive			40			
1						
2						
3						
4						
5						
Curative activities			40			
6						
7						
8						
9						
10						
Administrative						
11						

12			20			
13						
14						
15						

Name/Division	Designation	Signature
Mr. X		
Approval of the Immediate Supervisor		
Approval of the Appellate Authority, if appeal.		
Acceptance by Emp. / Div. (Not mandatory)		

Table 5.4. Format for performance appraisal

The following grade may be awarded based on the score in performance appraisal.

Above 80%	Outstanding
70% to 79%	Very Good
60% to 69%	Good
50% to 59%	Satisfactory
49% and below	Unsatisfactory

Individuals with outstanding grade may be recognised by the Management and all the grades may be published in the web site of the Board. For career advancement and promotions this performance appraisal for an individual may be considered along with the confidential report with 50% weightage for each.

Awards may be instituted for the best Engineer, best Scientist, best District, and best Region based on performance. For district and region the average aggregate of the performance of the individuals may considered.

CHAPTER 6

DISCUSSION AND RECOMMENDATIONS

6.1 Introduction

The biggest threat to the present generation and generations in the days to come is the increasing environmental pollution and its impact on the life of the society. One of the interesting findings in many research studies is the higher intelligence quotient (IQ) of the new generation compared to the old generation. But the paradox is the impact of environmental pollution on the reduced blood supply to the foetus during pregnancy and early child hood resulting in poor IQ.

The impact of climate change transcended both geographical and sectoral boundaries. The 2021 Climate Risk Index published by German Watch ranks India among the top 10 most vulnerable countries. The 'green swan risk' which affects the stability of the entire financial system, the chances of a low carbon economy where the current economic architecture will not be able to fully incorporate climate risks in asset prices were recognised by the Reserve Bank of India. The Reserve Bank of India became a member of the Network for Greening the Financial System (NGFS), an international coalition of central bankers formed in 2017 to adopt various ways of mitigating the impact of climate change, including the creation of a green taxonomy to differentiate between green and brown assets and encouraging climate-related disclosures by private firms.

The above citations were to point out the penetration of the deterring impact of pollution beyond boundaries. Proper awareness, infrastructure and a focused sustained effort are required to reduce and abate the impact of pollution and climate change. Realising the poor awareness of the public and the poor infrastructure prevailing in the State, a 360 degree approach for activating the Kerala State Pollution Control Board is recommended in this report.

6.2 Proposed Vision, Mission and Functions

The vision of an organisation is a cherished aspiration, a relentless passion or a shared mental image of an ideal future. It disseminates an emotional appeal that inspires the members and stakeholders to think big which motivates for action. Though the vision

does not specify the means to achieve it, it is a load star or guiding force that leads or guides all concerned in pursuit of realising that visionary gleam. The vision conceived in its grandeur will ignite the minds that are instrumental for its transformation to a real life scenario.

In the absence of an explicitly stated vision, mission and functions of KSPCB, we propose the following Vision, Mission and consolidated functions. The Board may accept it as such or with modification.

Vision:

KSPCB strives to perceive its cherished aspirations of sustainable development of the State and the protection of environment and the ecosystem from all types of pollution so that the inhabitants are assured of clean air to breath, safe water to drink, and healthy environment to live in.

Mission:

KSPCB's actions are focussed and directed towards sustainable development and facilitation of a healthy environment.

It endowers to proactively design and implement innovative, preventive and regulatory mechanisms effectively to attain its visionary goals and objectives through capacity building such as appropriate technology, adequate infrastructure and skilled human resources.

Functions:

- *Specified Authority to implement statutes to control and minimise pollution*
- *Control further damage to the environment and ecosystem,*
- *Conserve the environment,*
- *Restore the quality of the environment in areas damaged including such measures as reclamation of degraded land,*
- *Create authorities to administer the policy and contents of the legislation,*
- *Provide penalties and prosecution for violation of environmental laws.*

6.3 The Manpower Strength

The approved manpower strength of KSPCB is 434 personnel as categorised in table 6.1. This was 325 in 2013 when they approached the Institute of Management in Government to conduct a work study as they were phasing acute shortage of staff. The IMG conducted the study and proposed an additional manpower of 195 as categorised in table 6.1. The Board examined the proposal of IMG and recommended to the Government for sanctioning 109 additional posts as categorised in table 6.1. Government approved the recommendations of the Board and sanctioned the same on 03.10.2016. Another 5 supernumerary posts (3 Assistants and 2 peons) were added to this making the total strength 434. Since the work-study in 2013 was limited to assessing the then work done by different functionaries, not much of attention was given to the extent of pollution and a holistic approach to controlling and abating pollution as this was not within the scope of the study.

Sl. No.	Post	Before Work Study	Work study Recommendation In 2013	Recommendation of Board & approved by Govt. On 3.10.2016	No.
1	Chairman	1			1
2	Member Secretary	1			1
3	Chief Environmental Engineer	3		1	4
4	Senior Environmental Engineer	4			4
5	Environmental Engineer	19		1	20
6	Asst. Environmental Engineer	25			25
7	Assistant Engineer	32	68	51	83

8	Chief Environmental Scientist	1			1
9	Senior Environmental scientist	1			1
10	Environmental Scientist	3			3
11	Asst. Environmental Scientist	11			11
12	Assistant scientist	11	5	12	23
13	Senior Scientific Assistant	15			15
14	Junior Scientific Assistant	22	72	8	30
15	Administrative Officer	1			1
16	Accounts Officer	1			1
17	Asst. Administrative Officer	1			1
18	Assistant Accounts Officer	1			1
19	Senior Superintend	3			3
20	Assistant	41	26	26	65+5*

21	Confidential Assistant	4			4
22	Fair-copy Superintend	1			1
23	Computer Assistant (Typist)	21	19	10	31
24	Record Keeper	1			1
25	Attended	14			14
26	Peon	31			29+5*
27	Driver	27			27
28	Watcher	4			4
29	Part time Sweeper	19			19
Total			190	109	434

- Supernumerary posts

Table.6.1 The manpower strength prior to work study in 2013, recommended in the work study, approved and present manpower.

Even before the work study in 2013, the Government have handed over the appointments of the Board to Kerala Public Service Commission. For the commission to undertake this, the Government and KPSC have to approve the recruitment rules of the Board. This process took several years and the special rules were approved on 11.01. 2021. The KPSC is now on the process of recruitment. Meanwhile the following posts in table 6.2 were filled on contract or daily wage basis.

Sl. No.	Posts	Total	Number vacancy/ Contract
1	Assistant Environmental Engineer	25	2
2	Assistant Engineer	83	83
3	Assistant Environmental Scientist	11	11

4	Assistant Scientist	23	23
5	Senior Scientific Assistant	15	15
6	Junior Scientific Assistant	30	30
7	Assistant	65+5	14
8	Confidential Assistant	4	3
9	Computer Assistant (Typist)	31	28
10	Record Keeper	1	1
11	Attender	14	10
12	Peon	29+5	14
13	Driver	27	25
14	Watcher	4	4
Total			263

Table 6.2. The vacancy filled by contract or daily wage against total posts in the Category.

So there is always a problem of termination of the contract and new persons coming in, and the need to orient/induct them. This frequent change of personnel is affecting the smooth performance. The exact number of people filled by contract or on daily wage was not made available to us. This has to some extent made our work difficult. The immediate problem to be tackled is the appointment of the people against vacant positions. Extra persons suggested in this study are not going to solve this problem as they can also be appointed on contract or daily wage till the KPSC completes the process of selection to different positions.

6.4 Perception of the Officers on the time spent on different activities

Perception of the officers of the districts were collected through a questionnaire. Only very few attempted this. We have taken the more common appearing data (mode) and the same is given in table 6.3.

Sl. No.	Activity	% of time
1	Consent administration under Air Act and Water Act through online consent	30
2	Inspections based on consent applications, based on complaints, court cases, post monitoring and river monitoring	10
3	Preparation of reports /Affidavits in High Court/ NGT cases	10
4	Air monitoring in selected stations under the national ambient air monitoring program	2
5	Inspections to Local Self Government Institution as per Solid waste management Rules and issuing authorization.	2
6	Inspection to health care facilities as per Bio Medical Waste management Rules and issuing authorization.	3
7	Inspection to industries and establishments for the compliance monitoring as per hazardous and other waste management Rules and issuing authorization	3
8	Preparation of annual reports on all waste management rules	3
9	Preparation of specific reports after data collection	4
10	Preparation of reports to Human Rights Commission, Chief Ministers Public grievance redressal cell	3
11	Keeping accounts of the district office	5
12	Purchase of chemicals, consumables and equipments following the purchase protocol	2
13	Maintenance and upkeep of the office vehicle	2

14	Preparation of reply/ reports under Right to information Act	5
15	Analysis of effluents, river water and air pollutants	10
16	Preparation of lab reports	2
17	Kiosk service for public enquiry and online application	4
	Total	100

Table 6.3. The perception of district officers on the % of time spent in various activities.

6.5 Perception of the Officers on Coverage of Pollution Control

Through a questionnaire we have collected the perception of the technical personnel on their achievements in pollution control and pollution abating activities under various types of pollution. Only 18 officers participated in this exercise. Their perception consolidated and arranged in the descending order is given in fig 6.1. As is usual, one's own perception of own work will be slightly higher than reality. The finding has to be taken as an eye opener on the proactive activities to be taken up / initiated under different types of pollution. The general activities counted for assessing the work of technical personnel are primarily the ones they are compelled to do and important activities for preventing pollution are not forth coming as their priority.

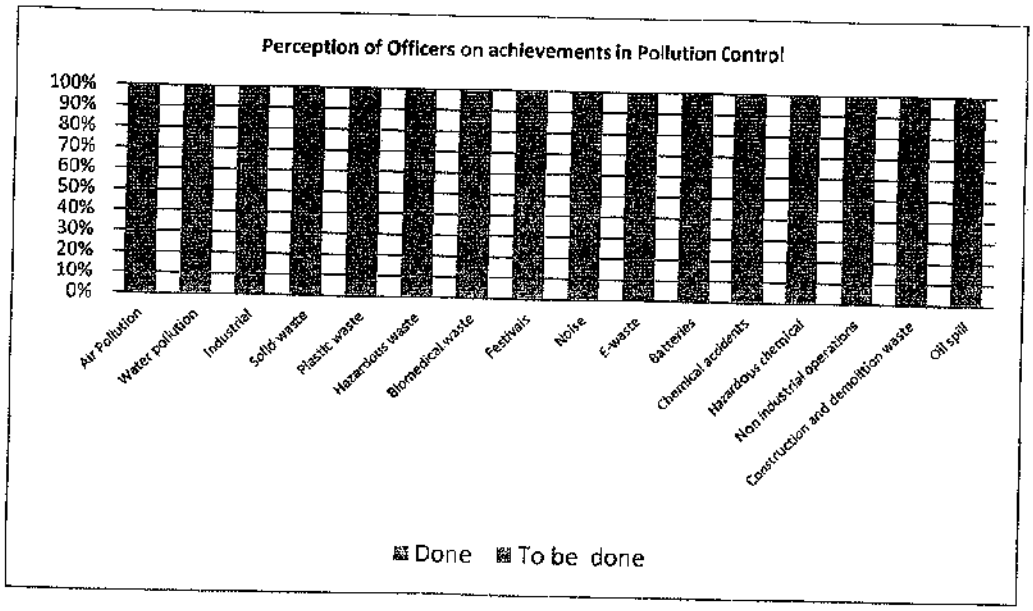


Figure 6.1 The perception of technical personnel on controlling various types of pollution.

6.6 Work Load - Gaps

There exists a gap of many activities not undertaken, which are part of the responsibilities. The National Green Tribunal has issued orders on many issues concerning pollution in the state which are proactive. Based on the directions of the NGT, State has selected 3 model cities (Thiruvananthapuram, Thrissur and Kozhikode), 3 model towns (Attingal, Punalur and Kunnamkulam) and 42 model villages (3 in each districts) to ensure compliance with solid waste management rules 2016. Workshops were conducted to make them fully comply with environmental norms. Many meetings were conducted, many proposals were received, but as of now it may take years to materialise, except in the case of Kozhikode, the work order was given for a waste to energy plant. The plan is to extend it to all LSGs.

Another direction of NGT Principal Bench was to work towards ensuring a healthy river ecosystem in the state, 21 polluted river stretchers in the state are set in motion for clean up. The action plan will include components like identification of polluting sources, status of sewage and effluent treatment plants, solid waste management & processing facilities and others. The water quality monitoring work is continuing, but many of the action plans are still waiting for implementation.

The perception of the officers on the activities for pollution control reveals air, water and industrial pollution rank high and this, to a greater extent is evident in the progress reports also. In other areas much need to be done, if this perception is read along the progress reports. In many instances the prescribed authority may be a different organisation and control has to happen based on progress reports received. This calls for higher level of liaison work with the prescribed authority for effective control.

The number of inspections required for proper monitoring is to increase. We have tried to collect the actual inspections done by functionaries in each district, but failed. An estimate is 200 inspections by each functionary at the level of Assistant Engineer. Inspections have to be conducted for consent management, inspections for control, surprise inspections to detect malpractices, planned inspections based on the nature of the industry and inspections to prepare reports based on directions from higher authorities and courts. Some of these inspections are not happening now and to that extent, pollution control measures also have weakened.

6.7 Adequacy of Activities and Manpower

The preset manpower of 434 is sufficient to do the activities given as per work distribution orders issued at different offices. Some of the vacancies which are not filled even by contracts or daily wage are creating work pressure on other personnel. But we have come across many activities which are to be undertaken on a war footing to see that pollution is brought under control at least in a decadal period. The number of projects undertaken by the Board has declined considerably. Various project proposed for reducing water pollution and air pollution are also not liaised and monitored properly. Though details of inspection were not provided to us, it is very clear that the inspections have come down. Even the OCMMS which can randomly draw industries for inspection and post monitoring according to the category and duration with respect to protocol is not made use of. There are also few additional facilities created in the Central Laboratory which are not used for want of qualified personnel. The additional man power suggested is to overcome the above issues and to see that performance is forth coming through implementation of the performance appraisal system.

KSPCB has to manage the provisions of half a dozen Acts and more than a dozen Rules. It is natural that there will be lot of court cases and litigations. Though there are out sourced Counsels, the Board doesn't have experienced expertise in law. The post of Legal Officer on deputation proposed is to solve this.

6.8 Required Manpower

In arriving at the right size of manpower the first criteria considered was the manpower required for preventive, curative and administrative effectiveness coupled with the geographical reach of the functionaries as the causes of pollution are hidden in the nook and corner of every household. The second concern was in identifying left out important activities for abating pollution due to the urgency of other activities and the shortage of time resulting in less number of people. As is usual important activities become urgent only occasionally. The preventive aspects which are important to a greater extent are left out limiting only to seminars, awards and orientation classes. The dictum' Prevention is better than cure', is very important in this context and prevention activities have to be undertaken with priority.

To make every work challenging and motivating was our next concern. As the great psychologist Herzberg pointed out in his theory on motivation, challenges in work, career advancement and recognition are three important factors that motivates people in work situation, unlike pay, colleagues, easiness of work etc. which are only hygienic factors. A key result area based performance assessment linked to career advancement and recognition by way of awards to meritorious services has to be seen in this context.

The attitudes of the people towards waste disposal have to change. Even when we encourage disposal at the source of origin, considerable education of the public is required for proper disposal. It is also the responsibility of the Local Self Governments to provide infrastructure for the people to dispose their waste by taking them to confidence. There is a requirement to address this issue by direct and indirect appropriate interventions by the KSPCB.

The statutory requirements of the Board call for officers with above average skill set of facilitation, co-ordination and control apart from the leadership qualities in producing the desired performance. The probability of the number of personnel recruited having these skill set is low. So there is a requirement to have a systematic training from the very inception of a person's career in the organisation. This has to be reinforced with periodic refresher programmes.

With the above issues and concerns, we recommended the following organisation structure and complementary actions which have an impact on performance.

6.9 Recommendations

Vision, Mission and Functions

The proposed Vision, Mission and Function of KSPCB at the beginning of this chapter may be approved with or without modification.

Additional man power

It is recommended to have one more post of Assistant Engineer in all District offices (14 Nos.) expect the Environmental Surveillance Office at Elloor and Additional District Office at Perumbavoor. The Board will redistribute the activities in such a way that each technical officer will get more time to undertake preventive projects and inspection.

This recommendation is not in isolation, but linked to the performance appraisal system recommended in chapter 5.

For the Central Laboratory, Equipments were purchased and installed for Residue Monitoring Lab., Microbiology Lab. and Genomic lab. Proper and quality man power is required for its satisfactory performance. It is recommended to have one additional post of Environmental Scientist for each of these labs (3 Nos.). The mode of appointment shall be on deputation or on contract from personnel with Ph.D in concerned subject and experience. The specific qualifications may be fixed by the Board. These are not proposed as promotion posts, as labs require competent. For such persons, the Board may find it difficult to provide better career advancement prospects. Appointments to these positions on deputation or contract shall be through a selection process. Similarly the present appointment of Instrumentation Engineer on daily wage basis may continue or may be made on contract basis after a due selection.

It is recommended to create a post of Law Officer in the rank of Deputy Secretary and the post may be filled on deputation from the Law Department, Government Secretariat. The legal activities will function under the Law Officer who will be reporting to the Member Secretary.

Organisational Structure

It is recommended to continue with the same organisation structure. The District Office II at Ernakulum is a misnomer. It creates confusion to any unfamiliar person. The district office II was started at Perumbavoor considering the intensity of industrial activities in the area and the resulting pollution concerns. The second district office in Ernakulum may be renamed Sub District Office, Perumbavoor. The same staff pattern shall continue with same functions and powers. The Environmental Surveillance Centre at Eloor will continue as Environmental Surveillance Centre and not as District Office III Ernakulum.

Creation of new Sub Districts

When the intensity of activities in an area increases, there is a requirement to have officers in the vicinity and additional man power with infrastructure to handle it. Intensity of activities is a function of increasing number of establishments which are prone to create pollution. Hence it is recommended that when the number of consent

authorisation increases over 2000 per year and the number of planned (as programmed in OCMMS) inspections required crosses 1500, a new Sub District Office with a geographical demarcation may be created.

Performance Appraisal

Performance appraisal is an integral part of any organisation to see that the working of the personnel are directed towards the objectives of the organisation. We have developed a performance appraisal system for the technical staff of the Board. It is recommended to implement the performance appraisal system proposed in chapter 5 of this report. The additional manpower recommended is coupled with this appraisal system and hence either of this should not be implemented in isolation.

Awards

Awards may be instituted for functionaries of the Board on the basis of performance appraisal. Similar awards may be given to the best district and the best regional office on the basis of aggregate score by all the employees.

Training

Personnel are selected to work in organisations based on their course of study and technical competence. Once they begin working, very often the working environment and work will be strange to them. Many learn it by trial and error, some may get the right mentor and very few organisations in the public domain arrange an induction training to the newly recruited employee to orient them with the work. We have observed shortage of skills and right attitude among personnel in the organisation. The difficulty in filling the vacancies, shortage of skill sets among existing personnel, appointment of people on contract arrangements for shorter duration, re-appointment of new persons on completion of shorter contracts etc. have aggravated the competence versus skill set gap. Being a statutory organisation, this has affected compliance to rules and promoting sustainable development.

A systematic approach to training is recommended for improving the skills and attitude of personnel in the Board. People who are appointed through KPSC should get a compulsory induction training of 2 weeks duration within one week of posting. When the numbers per batch are low, people who are already placed from the lowest in the seniority should be given preference as many such people have not undertaken any

similar training programme. We propose the following content for the induction training of Assistant Engineers:

- An Overview of KSPCB
- Pollution Causes, Extent and Impact
- Constitutional Provisions, Various Acts and Rules
- Sustainable Development
- National Green Tribunal (NGT)
- Consent Management
- Code of conduct
- Controlling and Abating Pollution in the State
- Preparation of Projects for Controlling Pollution
- Implementation and Monitoring of Pollution Control Projects
- Facilitation Skills, Writing Skills, Positive attitude
- Conducting Seminars, Workshops and Media Management
- Leadership skills, Team Building Skills, Time Management Skills.
- Legal Actions, Preparing affidavits, Handling Court Cases
- RTI and RTS
- A workshop - on preparing a sample project for controlling a specific area of pollution.
- Technical topics of topical importance
- LSGs & Decentralised Planning

Similar training programmes with topics of relevance to the work situation may be arranged for other categories of recruited personnel. As a large number of personnel are going to be recruited on regular appointment, these programmes will go a long way in moulding them with the right knowledge, skills and attitude.

For the programme suggested for Assistant Engineers, there should be an evaluation of the training programme at the end, on which the grade obtained on the sample project prepared also should be included. For technical people who are appointed on contract, a condensed version of the training (without workshop) for 3 days may be introduced. The Training programmes may be conducted by the Board or may be entrusted to a training institute or any competent personnel in the training field.

Refresher training also may be arranged thereafter, with technical subjects of topical importance at least once in 2 years for better administration. This should be apart from the usual training programmes conducted by other organisations on which Board's Officers are deputed.

IT and Data Management Centre

Lot of efforts were put in by the IT and Data Management Centre. Many are adhoc, some are not integrated and some are left unutilised and underutilized by people just for the sake of comfort. The last effort was in creating a cloud based unified digitization platform with many features to make office work easier. Definitely this is a good move, but the Centre has to be made more professional. It is recommended that the proposal may reframed with a new RfP by an expert outsourced which will cover a process reengineering, integration of all prevailing modules and an e-office avoiding all duplications, redundancy and online updating in all shareable stakeholder sites. Whether it is cloud based or any other data centre, this has to be based on expert opinion avoiding all dependencies and ego.

The RfP shall be prepared to attract national level players in software development with programming and maintenance support. Since it is very vital affecting the health of a community, money should not be a consideration. Infact, it is affordable to the KSPCB. This shall be coupled with providing national or international level training to personnel in the IT and Data Management Centre for a broader picture of the state of affairs.

This recommendation, if implemented properly will reduce the work load by 30 to 35 %. The ease and comfort of working will improve considerably. This improve organisational efficiency and better public image.

Social Marketing

Social changes are also required to bring in the right attitude from the society for a safer environment. A planned approach is to be initiated with the objective of 'safe habits and attitudes for a healthy environment'. Many activities like seminars, workshops, publications, advertisement etc. can accomplish this. But a focused approach on changing the prevailing habits and attitudes to the desired level is what is required. It calls for promotional media campaigns which translate the motivation of the society into action. To exemplify, suppose you have successfully organised a promotional

campaign to interest people in the pollution problem and the respiratory problems arising from it, then it should also be clear in the action they should pursue like where to put the waste, what type of mask one should wear etc. which will address the problem.

In this context, we recommend that at least 5% of the proposed budget for the ensuing years may be set apart for media campaigns. This will bring in positive change in the attitude and behaviour of people to abate pollution. For implementing the same the Board may hire agency/ people on contract who may develop the campaign and implement it, with monitoring the impact. Already the funds earmarked for this purpose have not been utilised fully. If more funds are required for this, it may be sourced from own funds collected through penalties or by mobilising it from CSR funds of bigger and higher polluting organisations.

ANNEXURES

Annexure 1

Questionnaires

Form 1

Pollution Control Board

The Institute of Management in Government (IMG) is conducting a study on 'Rightsizing the manpower of Pollution control Board' to meet the changing requirements of pollution control in the State. IMG rely on your expertise to understand your units' activities/ work/ existing manpower and related opinion as accurately as possible on various aspects. All information collected will be treated confidentially and will only be used for the study. Your response to ALL questions are mandatory. Please do not leave any column blank. In case of no response to a particular question, kindly mark your response as NIL or Not Applicable as the case may be.

The filled in questionnaire may be e-mailed to IMG addressed to facultyimgmbn@gmail.com with copy to r.prakasam@gmail.com .

The filled in questionnaire may be emailed **within five days of receipt of the same.** The hard copies of the same may be brought with you, if you are called for a Focus Group Discussion to facilitate a productive discussion.

Clarifications, on any aspect including that on questionnaire may be obtained through email or by contacting the nodal contact point of the study team Dr. Mini B. Nair (9447836600) or Dr. R. Prakasam (9847172429).

1. Name of the /Division/ District/ Head Quarters/unit where you work.

2. Primary functions of the Unit

3. List of present manpower in your District/ Office/ Unit.

Employee Name &ID	Designation/ Position	Permanent/ Temporary	Area/location/unit of Activity	Reporting to	Qualification

4. List of Activities you are responsible for, and its time consumption.

Activity/Process	% of time consumed	Remarks if any.

5. Works you find it difficult to accomplish due to time constraint.

Works you find it difficult to accomplish due to time constraint.	How much extra time is required? (hrs./day)	Can some body else do that?	Who is that person & Why is it necessary?

6. Do you feel that more is to be done for reducing pollution in the state (Please tick) Yes/No If "Yes"

7. Fill up the details.

Area/Activity	How to do it?	Who should do it?	Why is it so necessary?

8. On the following areas how much you will rate yourself as a pollution controller in your geographical area of activities? (Please tick appropriately)

Area	Very good	good	Average	Fair	Poor
Air Pollution					
Water Pollution					
Industrial					
Chemical					
Recycled Plastic					
Biomedical					
Hazardous micros					
Batteries					
Ozone depleting					

Noice					
Hazardous waste					
E- waste					
Any other (specify)					

9. According to you, why Pollution is not under control?

Thank You

Form 2

Pollution Control Board

The Institute of Management in Government (IMG) is conducting a study on 'Rightsizing the manpower of Kerala State Pollution control Board' to meet the changing requirements of pollution control in the State., IMG require the existing manpower strength and reporting relationship of all units in the KPCB. The information collected will be treated confidentially and will only be used for the study. Your quick response in this regard will speed up the completion of the study.

1. Name of the /Division/ District/ Wing

2. Primary functions of the wing.

3. List of present manpower in the Wing.

Designation	Number of Personnel	Permanent/ Temporary	Vacant number	Reporting to

Thank You

Form 3

Kerala State Pollution Control Board

The Institute of Management in Government (IMG) is conducting a study on 'Rightsizing the manpower of Kerala State Pollution control Board' to meet the changing requirements of pollution control in the State., IMG require the following details. The information collected will be treated confidentially and will only be used for the study. Your quick response in this regard will speed up the completion of the study.

1. Vision of KSPCB

2. Mission of KSPCB

3. Targets for Pollution control in the State.

Areas	Targets	Area wise	How to do it?

Thank You

Form 4

Pollution Control Board

The Institute of Management in Government (IMG) is conducting a study on 'Rightsizing the manpower of Pollution control Board' to meet the changing requirements of pollution control in the State. IMG rely on your expertise to understand your units' activities/ work/ existing manpower and related opinion as accurately as possible on various aspects. All information collected will be treated confidentially and will only be used for the study. Your response to ALL questions are mandatory. Please do not leave any column blank. In case of no response to a particular question, kindly mark your response as NIL or Not Applicable as the case may be.

The filled in questionnaire may be e-mailed to IMG addressed to facultyimgmbn@gmail.com with copy to r.prakasam@gmail.com .

The filled in questionnaire may be emailed **within five days of receipt of the same**. The hard copies of the same may be brought with you, if you are called for a Focus Group Discussion to facilitate a productive discussion.

Clarifications, on any aspect including that on questionnaire may be obtained through email or by contacting the nodal contact point of the study team Dr. Mini B. Nair (9447836600) or Dr. R. Prakasam (9847172429).

1. Name of the /Division/ District/ Head Quarters/unit where you work.

2. Primary functions of the Unit

3. List of Activities you are responsible for, and its time consumption.

Activity/Process	% of time consumed	Remarks if any.

4. Works you find it difficult to accomplish due to time constraint.

Works you find it difficult to accomplish due to time constraint.	How much extra time is required? (hrs./day)	Can some body else do that?	Who is that person & Why is it necessary?

5. Do you feel that more is to be done for reducing pollution in the state (Please tick) Yes/No If "Yes"

6. Fill up the details.

Area/Activity	How to do it?	Who should do it?	Why is it so necessary?

7. According to you, why Pollution is not under control?

Thank You

Annexure 2

LIST OF RED CATEGORY INDUSTRIES AND NON-INDUSTRIAL OPERATIONS AS ON 31-05-2021	
Sl.No.	Name of industries and non- industrial operations
1	Isolated storage of hazardous chemicals (as per schedule of Manufacturing, Storage of Hazardous Chemicals Rules,1989 as amended)
2	Automobile Manufacturing (integrated facilities) (*Remark: Heavy engineering including ship building*)
3	Industries engaged in recycling /reprocessing/recovery/reuse of Hazardous Waste under schedule of iv of HW (M, H & TBM) rules, 2008- Items namely - spent cleared metal catalyst containing copper, spent cleared metal catalyst containing zinc
4	Manufacturing of lubricating oils, grease and petroleum based product
5	DG set of capacity > 5 MVA
6	Industrial carbon including electrodes and graphite blocks, activated carbon, carbon black
7	Lead acid battery manufacturing (excluding assembling and charging of lead - acid battery in micro scale
8	Phosphate rock processing plant
9	Power generation plant [except Wind and solar renewable power plants of all capacities and Mini Hydel power plant of capacity <25 MW]
10	Industries engaged in recycling /reprocessing/recovery/reuse of Hazardous Waste under schedule of iv of HW (M, H & TBM) rules, 2008- Items namely - spent catalyst containing Nickel, Cadmium, Zinc, Copper, Arsenic, Vanedium and Cobalt
11	Process involving chlorinated hydrocarbons
12	Sugar (excluding Khandasari)
13	Fibre glass production and processing (excluding moulding)
14	Fire crackers manufacturing and bulk storage facilities
15	Recycling /reprocessing/recovery/reuse of Hazardous Waste under schedule of iv of HW (M, H & TBM) rules, 2008- Dismantlers Recycling plants etc
16	Milk process and dairy products (integrated project)
17	Phosphorous and its compounds

18	Pulp & Paper (waste paper based without bleaching process to manufacture craft paper)
19	Coke making, liquefaction, coal tar distillation or fuel gas making
20	Manufacturing of explosives, detonators, fuses including management and handling activities
21	Manufacturing of paints, Varnishes, Pigments and intermediate (excluding blending /mixing)
22	Organic chemicals manufacturing
23	Airports and Commercial Air Strips
24	Asbestos and asbestos based industries
25	Basic chemicals and electro chemicals and its derivatives including manufacturing of acids
26	Cement
27	Chlorates, per - chlorates & peroxide
28	Chlorine, Flurine, bromine, iodine and their compounds
29	Dyes and Dye - Intermediates
30	Health- care Establishment (as defined in BMW Rules) (Total waste water generation > 100 KLD)
31	Hotels having overall waste water generation @ 100 KLD and more.
32	Recycling/reprocessing/recovery/reuse of HW under schedule iv of HW Rules,2008-items namely-Lead acid battery plates and other lead scrap/ashes/residiue not covered under Batteries Rule,2001 etc.
33	Recycling /reprocessing/recovery/reuse of Hazardous Waste under schedule of iv of HW (M, H & TBM) rules, 2008- Integrated Recycling plants etc
34	Manufacturing of glue and gelatin
35	Mining and ore benefication
36	Nuclear power plant
37	Pesticides (technical) (excluding of formulation)
38	Photographic film and its chemicals
39	Railway locomotive workshop / Integrated road transport workshop/ Authorized service centres
40	Yarn/ Textile processing involving any effluent/ emission generating process including bleaching, dyeing, printing and colouring

41	Chlor Alkali
42	Ship Breaking Industries
43	Oil and gas extraction including CBM (offshore &on -shore extraction through drilling wells)
44	Industry or process involving metal surface treatment or process such pickling/ electroplating/paint stripping/heat treatment using cynade bath/phosphating or finishing and anodizing/ enamelling/galvanizing
45	Tannaries
46	Port and harbour, jetties and dredging operations
47	Synthetic fibers including rayon, tyre cord, polyester filament yarn
48	Thermal power plants
49	Slaughter house (as per notification S.O.270(E) dated 26.03.2001) and meat processing industries, bone mill, processing of animal horn, hoofs and other body parts
50	Aluminium smelter
51	Copper smelter
52	Fertlizer (basic) (excluding formulation)
53	Iron & steel (involving processing from ore/integrated steel plants) and or Sponge Iron units
54	Pulp& Paper (waste paper based with bleaching process to manufacture writing and printing paper)
55	Zinc Smelter
56	Oil Refinery (mineral oil or petro refineries)
57	Petrochemicals manufacturing (including processing of Emulsions of oil and water)
58	Pharmaceuticals
59	Pulp & Paper (Large - Agro + wood), Small Pulp & Paper (agro based wheat straw/ rice husk)
60	Distillery (molasses/ grain/yeast based)
61	Industrial estates/ parks/ complexs/ areas/export processing zones/ SEZs/ Biotech parks/ leather complex (*Remark: category depends on industries operating/ proposed to be permitted in the area. Follow guidelines prescribed in EIANotification,2006*)
62	Clay processing (including chemical processing)

63	Common Effluent treatment plant (CETP), Common Hazardous waste treatment, storage and disposal facility (CTSDF), Common Bio medical waste treatment facility (CBMWTF) (*Remark: categorisation will depend upon the category of member industries being served*) Effluent conveyance project, incinerator, MSW sanitary land fill site)
64	Fish oil extraction
65	Heavy engineering including ship building
66	Husk retting
67	Incineration plants - Muncipal solid waste
68	Instant tea/coffee processing (with boiler)
69	Latex centrifuging unit
70	Manufacture of rubber latex threads (with latex centrifuging)
71	Manufacturing of coir items from coconut husk (involving dyeing and bleaching)
72	Shipyard
73	Centralised solid waste processing plant
74	LPG bottling Plant
75	Clay mining
76	Common sewage treatment plant
77	Worship places including convention and pilgrimages(temporary)-Sewage and sullage generation ≥ 100 KLD
78	Zoological park-waste water generation ≥ 100KLD
79	Plate and spoon making using melamine powder
80	Chicken waste fertilizer
81	Aluminium powder coating (with pre-treatment involving metal surface treatment using acid alkaline degrease, etchinig, chrome coating etc)
82	Railway stations (waste water generation≥ 100 KLD)
83	Building and construction project more than 20000 sq.m built up area with discharge more than 100KLD
84	Secondary metallurgical process
85	Common Septage/sewage treatment plant (FSTP/CSTP)
86	Restaurants having waste water generation above 100 KLD

Sl. No	LIST OF GREEN CATEGORY OF INDUSTRY/ORGANIZATION/ACTIVITY
1	Aluminium utensils from aluminium circles by pressing only (dry mechanical operation)
2	Ayurvedic and homeopathic medicines (without boiler)
3	Bakery/confectionery/sweets products (with production capacity <1tpd (with gas or electrical oven)
4	Bi- axially oriented PP film along with metalizing operations
5	Biomass briquettes (Sun drying) without using toxic hazardous wastes
6	Blending of melamine resins & Different powder, additives by physical mixing
7	Brass and bell metal utensils manufacturing from circles (dry mechanical operation without re-rolling facilities)
8	Candy
9	Cardboard or corrugated box and paper products (excluding paper or pulp manufacturing and without using boilers)
10	Carpentry & wooden furniture manufacturing (excluding saw mill) with the help of electrical (motorized) machines such as electrical wood planner, steel saw cutting circular blade, etc.
11	Cement products (without using asbestos/boiler /steam curing) like pipe, pillar, jafri, well ring, block/tiles etc. (should be done in closed covered shed to control fugitive emissions)
12	Ceramic colour manufacturing by mixing & blending only (not using boiler and waste water recycling process)
13	Chilling plant, cold storage and ice making
14	Coke briquetting (sun drying)
15	Cotton spinning and weaving (small scale)
16	Dal mills
17	Decoration of ceramic cups and plates by electric furnace
18	Digital printing on PVC clothes
19	Facility of handling, storage and transportation of food grains in bulk
20	Flour mills (dry process)

21	Glass, ceramic, earthen potteries, tile and tile manufacturing using electrical kiln or not involving fossil fuel kiln
22	Glue from starch (physical mixing) with gas/ electrically operated oven /boiler.
23	Gold and silver smi thy (purification with acid smelting operation and sulphuric acid polishing operation) (using less or equal to 1 litre of sulphuric acid /nitric acid per month)
24	Heat treatment with any of the new technology like ultrasound probe, induction hardening, ionization beam, gas carburizing etc.
25	Insulation and other coated papers (excluding paper or pipe manufacturing)
26	Leather foot wear and leather products (excluding tanning and hide processing except cottage scale)
27	Lubricating oil, greases or petroleum based products (only blending at normal temperature)
28	Manufacturing of pasted veneers using gas fired boiler or thermic fluid heater and by sun drying
29	Oil mill Ghani and extraction (no hydrogenation /refining)
30	Packing materials manufacturing from non asbestos fibre, vegetable fibre yarn
31	Phenyl /toilet cleaner formulation and bottling
32	Polythene and plastic processed products manufacturing (virgin plastic)
33	Poultry, Hatchery, Piggery and Duck farm
34	Power looms (without dye and bleaching)
35	Puffed rice (muri) (using gas or electrical heating system)
36	Pulvarization of bamboo and scrap wood
37	Ready mix cement concrete
38	Reprocessing of waste cotton
39	Rice mill (Rice hullers only)
40	Rolling mill (gas fired) and cold rolling mill
41	Rubber goods industry (with gas operated baby boiler)
42	Saw mills
43	Soap manufacturing (hand made without steam boiling /boiler)
44	Spice grinding (upto-20 HP motor)
45	Spice grinding (>20 hp motor)

46	Steel furniture without spray painting
47	Steeping and processing of grains
48	Tyres and tube retreating (without boilers)
49	Chilling plant and ice making without using ammonia
50	Co2 recovery
51	Distilled water (without boiler) with electricity as source of heat
52	Hotels (upto 20 rooms and without boilers)
53	Manufacturing of optical lenses (using electrical furnace)
54	Mineralized water
55	Tamarind powder manufacturing
56	Cutting, sizing and polishing of marbile stone
57	Emery powder (Fine dust of sand) manufacturing
58	Flyash export, transport& disposal facilities
59	Mineral stack yard/railway sidings
60	Oil and gas transportation pipeline
61	Seasoning of wood in steam heated chamber
62	Synthetic detergent formulation
63	Tea processing (with boiler)
64	Aluminium roofing sheet making
65	Ayurvedic health club
66	Bakery/sweets products making with production capacity <1 tpd
67	Battery water preparation unit
68	Beauty clinics
69	Boat building (without spray painting)
70	Cardamom drying unit
71	Cashew kermel (only) processing unit with borma using fire wood as fuel (all fuel except cashew shells)
72	Catering unit
73	Cattle farm
74	Cement godown /chemical godown /medical godown /fish stall

75	Cinema theater with seating capacity ≤ 600 and waste water generation <10 KLD
76	Coir mat manufacturing (using PVC resin)
77	Compostable substitude including compostable plastic garbage bags
78	DG set attached to mobile towers
79	Dog farm
80	Dredging without using machine provided there are no sensitive locations such as water intake points in downstream
81	E waste collection centers
82	Fibre glass moulding (Biogas plant, chairs, boat body making)
83	Flour mills (wet process excluding roller flour mill)
84	Gate and grill (involving grinding, cutting, hammering, but no painting)
85	Glass cutting
86	Godown for storage of crusher parts
87	Hall marking and assay
88	Hand sanitizer unit (Formulation, blending, bottling and packing)
89	Home stay
90	Interlock making unit using concrete waste and broken bricks
91	M sand, Rock dust, Rock sand godown storage capacity >10 T
92	Material recovery facility (including shredder)
93	Non -woven carry bags
94	Organic manure (mechanic process)
95	Paper cup manufacturing unit
96	Perfume making (mixing only)
97	Petrol bunk
98	Polyethylene flex printing unit
99	Polyurethene footwear
100	Pressure testing unit
101	RO plant
102	Railway stations (waste water generation< 10 KLD)
103	Restaurants having seating capacity upto 100 seats

104	Restaurants having seating capacity upto 36 seats
105	Restaurants having seating capacity between 20 - 100 seats
106	Ribbed smoked rubber sheet excluding coagulation
107	Rubber backed coir mat
108	Rubberised coir sheets
109	Rubberised coir sheets without latex backing
110	Steel Godown having storage capacity >10T
111	Sanitary napkin other than cottage industry
112	Screw nut and tools manufacturing (using milling, drilling, cutting, grinding machines and lathe)
113	Sculpture making (wooden)
114	Steel godown storage capacity greater than 10 T
115	Tender coconut shake unit less than 100 Nos
116	Tile Adhesive/wall putty/joint filler making
117	Water treatment plant
118	Wood designing using CNC machine
119	Copra drying unit using dryer
120	Water theme park
121	Engine Decarbonization
122	Vehicle ceramic coating
123	Arecanut sizing unit
124	Argon and Co2 filling unit
125	Open cattle farm
126	Manufacturing of cement blocks in which steel slag is used as raw material
127	Meat stall (without slaughtering)
128	Storage & trading of used Lead Acid Batteries
129	Comfort station/ Toilet complex
130	(ii) Lodges (without restaurants) above 6 rooms
131	Biodiesel production (with vegetable oil & methanol without used engine oil)
132	Cardamom drying unit

133	Battery Water preparation unit
134	Cement godown having no.of bags ≤500
135	Laterite quarry

Sl. No	LIST OF ORANGE CATEGORY OF INDUSTRY/ORGANIZATION/ACTIVITY
1	Dismantling of rolling stocks (Wagons/Coaches)
2	Manufacturing of tooth powder, toothpaste, talcum powder and other cosmetic items
3	Printing or etching of glass sheet using hydrofluoric acid
4	Silk screen printing, sari printing by wooden blocks
5	Synthetic detergents and soaps (excluding formulation)
6	Thermometer manufacturing
7	E-waste dismantling unit
8	Cotton spinning and weaving (medium and large scale)
9	Coconut processing unit
10	Autoclaved fly ash bricks
11	Almirah, Grill manufacturing (Dry Mechanical Process)
12	Aluminium & copper extraction from scrap using oil fired furnace (dry process only)
13	Manufacturing of Interlock/ Tiles/sheets using waste plastic (with extrusion)
14	PVC Solvent cement (Fugitive emissions to be captured and treatment/control measures are essential)
15	Automobile servicing, repairing and painting (excluding only fuel dispensing)
16	Ayurvedic and homeopathic medicine
17	Li-ion Battery assembling & charging
18	Bakery and confectionery units with production capacity > 1 TPD. (With ovens /furnaces)
19	Brickfields (excluding fly ash brick manufacturing using lime process)
20	Building and construction project more than 20,000 sq.m built up area

21	Ceramics and Refractories
22	Coal washeries
23	Dairy and dairy products (small scale)
24	DG set of capacity > 1MVA but < 5 MVA
25	Dry coal processing, mineral processing, industries involving ore sintering, pelletisating, grinding & pulverization
26	Fermentation industry including manufacture of yeast, beer, distillation of alcohol (Extra Neutral Alcohol)
27	Ferrous and Non - ferrous metal extraction involving different furnaces through melting, refining, re-processing, casting and alloy making
28	Fertilizer (granulation /formulation /blending only)
29	Chanachur and ladoo from puffed and beaten rice (muri and shira) using husk fired oven
30	Fish feed, poultry feed and cattle feed
31	Fish processing and packing (excluding chilling of fishes), peeling shed
32	Forging of ferrous and non- ferrous metals (using oil and gas fired furnaces)
33	Formulation/pelletization of camphor tablets, naphthalene balls from camphor/ naphthalene powders
34	Glass ceramics, earthen potteries and tile manufacturing using oil and gas fired kilns, coating on glasses using cerium fluorides and magnesium fluoride etc.
35	Gravure printing, digital printing on flex, vinyl
36	Heat treatment using oil fired furnace (without cyaniding)
37	Hot mix plants
38	Hotels (< 3 star) or hotels having > 20 rooms and less than 100 rooms.
39	Ice cream
40	Coated electrode manufacturing
41	Industries engaged in recycling/reprocessing/recovery/reuse of Hazardous waste under schedule iv of HW (M, H & TBM) rules, 2008 -Items namely - paint and ink Sludge/residues

42	Industries engaged in recycling/reprocessing/recovery/reuse of Hazardous waste under schedule iv of HW (M, H & TBM) rules, 2008 -Items namely - Brass Dross, copper dross, copper oxide, mill scale, copper reverts, cake & residues, waster copper and copper alloys in dispersible, form, slags from copper processing for futher processing or refining, insulated copper wire, scrap/copper with PVC sheathing including ISRI-code material namely 'Druid' jelly filled copper cables zonc dross hot dip galvanizers SLAB, Zinc dross bottom dross, Zinc ash/skimming arising from galvarizing and die casting operations. Zinc ash/skimming/other zinc bearing wastes arising from smelting and refining, zinc ash and residues including zinc alloy residues in dispersible form
43	Industry or processes involving foundry operations
44	Lime manufacturing (using lime kiln)
45	Liquid floor cleaner, black phenyl, liquid soap, glycerol mono-stearate manufacturing
46	Manufacturing of glass
47	Manufacturing of iodized salt from crude/ raw salt
48	Manufacturing of mirror from sheet glass
49	Manufacturing of mosquito repellent coil
50	Manufacturing of starch/sago
51	Compact disc computer floppy and cassette manufacturing /Reel manufacturing
52	Mechanized laundry using oil fired boiler
53	Modular wooden furniture from particle board/MDF <swan timber etc, ceiling tiles /partition board from saw dust, wood chips etc., and other agricultural waste using synthetic
54	New highway construction project
55	Non- alcoholic beverages (soft drink) & bottling of alcohol / non alcoholic products
56	Paint blending and mixing (Ball mill)
57	Paints and varnishes (mixing and blending)
58	Ply-board manufacturing (including veneer and laminate) with oil fired boiler/ thermic fluid heater (without resin plant)
59	Potable alcohol (IMFL) by blending, bottling of alcohol products
60	Printing ink manufacturing

61	Printing press
62	Flakes from rejected PET bottle
63	Reprocessing of waste plastic including PVC
64	Rolling mill (oil or coal fired) & cold rooling mill
65	Spray painting, paint backing, paint shipping
66	Steel and steel products using various furnaces like blast furnace/open heartn furnace / induction furnace/arc furnace/submerged arc furnace/basic oxygen furnaces/hot rolling reheated furnace
67	Stone crushers
68	Surgical and medical products including prophylactics and latex
69	Tephlon based products
70	Thermocoal manufacturing (with boiler)
71	Tobacco products including cigarettes and tobacco/opium processes
72	Transformer repairing/Manufacturing (Dry process only)
73	Food and food processing including fruits and vegetable processing
74	Tyres and tubes vulcanization/hot retreating
75	Vegetable oil manufacturing including solvent extraction and refinary /hydrogenated oils
76	Wire drawing and wire netting
77	Dry cell battery (excluding manufacturing of electrodes) and assembling& charging of acid lead battery on micro scale
78	Pharmaceutical formulation and for R&D purpose (for sustained release / extended release of drugs only and not for commercial purpose)
79	Synthetic resines
80	Synthetic rubber excluding moulding
81	Cashew nut processing
82	Coffee seed processing
83	Parboiled Rice Mills
84	Jute processing without dyeing
85	Foam manufacturing
86	Industries engaged in recycling/reprocessing/recovery/reuse of Hazardous waste under schedule iv of HW (M, H & TBM) rules,2008 - Items namely - used oil

87	Industries engaged in recycling/reprocessing/recovery/reuse of Hazardous waste under schedule iv of HW (M, H & TBM) rules,2008 - Items namely - Waste oil
88	Producer gas plant using conventional up drift coal gasification (linked to rolling mills glass and ceramic industry refectories for dedicated fuel supply)
89	Manufacturing of Silica gel
90	Aluminium powder coating
91	Aluminium vessel making using Aluminium scrap
92	Animal skin salting unit
93	Automobile body building
94	Automobile body dismantling unit
95	Building and construction projects having built up area upto 20,000 m2, and waste water generation ≥ 50 KLD.
96	Burial ground
97	Cashew Kermel (only) processing unit with Borma using cashew shells as fuel
98	Chicken stall
99	Cinema theatre with seating capacity > 600
100	Coir defibering/ginning
101	Coir stenciling
102	Common biomedical treatment facility (with complete reuse of effluent, adequate pollution control measures in incinerator, dry process)
103	Compressed/Refined Bio-gas production from Bio-degradable wastes
104	Construction and demolition (C&D) waste processing plants.
105	Decentralised solid waste processing plant
106	Dredged sand processing unit
107	Educational institutions with hostel facility - waste water generation greater or equal 50 KLD
108	Electro cast scrap stone crushing unit
109	Fertilizer and pesticide godown (Area>25 m^2)
110	Fish market

111	Fishing harbours
112	Flasts/Apparments/Commercial building (Area 2000 Sqm-20000 Sqm)
113	Food additives, nutrients and flavours
114	Gas/Electric/Fire wood crematorium
115	Gold assaying and hallmarking centers
116	Health care Establishment
117	Industries generating domestic effluent only
118	Inland waterway projects
119	Kalyanamandapam /auditorium
120	Laundary without boiler
121	M Sand
122	Manufacture of crepe/crumb rubber
123	Manufacture of rubber latex threads (without latex centrifuging)
124	Matti Sand
125	PVC Pipe bending unit (using vegetable oil)
126	Pesticides /Insecticides/Fungicides/herbicides/Agro chemical formulation
127	Physiotherapy centers with area >2000m² inpatient facility
128	Pulping and fermanting of coffee/coco beans
129	Railway stations (waste water generation ≥ 10 KLD but < 100 KLD)
130	Resorts and house boat
131	Restaurants having seating capacity 100 seats and above
132	Ribbed smoked rubber sheets with latex coagulation
133	Rock dust separation having screening and / or washing
134	Rubber gloves/Rubber band making
135	Rubwood seasoning plant
136	Scrapping centers (for End of Life vehicles and other such plant and machineries, Structural material, Railway coatches and wagons etc)
137	Thinner manufacturing (mixing only)
138	Vault for burials
139	Workship places including convention and pilgrimages-temporary-generation of sewage & sullage greater or equal 50 KLD

140	Zoological parks- waste water generation < 100 KLD
141	Engineering fabrication units (dry process without any heat treatment/metal surface finishing operations / painting) - already in white category Others
142	Cement Godown having no.of bags >500