



UNIVERSITI PUTRA MALAYSIA

***WATER MANAGEMENT : WATER QUALITY OF RIVERS IN KUALA
PILAH (A CASE STUDY)***

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(A CASE STUDY)**

**By
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إِنَّمَا يَأْمُرُكُمْ بِالسُّوءِ وَالْفَحْشَاءِ
وَأَنْ تَقُولُوا عَلَى اللَّهِ مَا لَا تَعْلَمُونَ ﴿١٦٩﴾ وَإِذَا قِيلَ لَهُمْ اتَّبِعُوا مَا
أَنْزَلَ اللَّهُ قَالُوا بَلْ نَتَّبِعُ مَا أَلْفَيْنَا عَلَيْهِ آبَاءَنَا أَوَلَوْ كَانَ آبَاؤُهُمْ لَا
يَعْقِلُونَ شَيْئًا وَلَا يَهْتَدُونَ ﴿١٧٠﴾ وَمَثَلُ الَّذِينَ كَفَرُوا كَمَثَلِ الَّذِي
يَنْعِقُ بِمَا لَا يَسْمَعُ إِلَّا دُعَاءً وَنِدَاءً صُمُّ بَكُمْ عُمَى فَهُمْ لَا يَعْقِلُونَ ﴿١٧١﴾

Sesungguhnya pada kejadian langit dan bumi; dan (pada) pertukaran malam dan siang; dan (pada) kapal-kapal yang belayar di laut dengan membawa benda-benda yang bermanfaat kepada manusia; demikian juga (pada) air hujan yang Allah turunkan dari langit lalu Allah hidupkan dengannya tumbuh-tumbuhan di bumi sesudah matinya, serta Ia biakkan padanya dari berbagai-bagai jenis binatang; demikian juga (pada) peredaran angin dan awan yang tunduk (kepada kuasa Allah) terapung-apung di antara langit dengan bumi; sesungguhnya (pada semuanya itu) ada tanda-tanda (yang membuktikan keesaan Allah kekuasaanNya, kebijaksanaanNya, dan keluasan rahmatNya) bagi kaum yang (mahu) menggunakan akal fikiran.

ABSTRACT

Kuala Pilah is a district situated in the middle of Negeri Sembilan. It's hilly and highly dense forested area makes it suitable as catchment areas to provide a continual water supply. The upstream has a relatively good water quality compared to the downstream.

In this study, the water quality index for Muar River and Pilah River in Kuala Pilah district have been determined using five parameters namely BOD₅, COD, ammoniacal nitrogen, total suspended solids and pH values. Other determinants for water quality are the nutrients content such as nitrates and phosphates and metals content such as iron and manganese.

The water quality in the upper Muar River Basin that constitutes the rivers mentioned above has changed drastically when the rivers go through towns, industrial and housing or residential areas. Data collected from various sources and for several years show a continual deterioration of water quality in the basin since 1992 where the river water is polluted. The water quality is between Class IIA and Class III for those years.

The high pollution in the rivers was due to the wastewater being discharged directly into the river without any treatment. Other contributors to the pollution are active logging and earthworks for development purposes. Hence, new approaches to management of water are introduced to uplift the water quality.

ABSTRAK

Daerah Kuala Pilah terletak di bahagian tengah Negeri Sembilan. Kawasannya yang berbukit-bukau dan kebanyakannya dikelilingi hutan menjadikannya sesuai sebagai kawasan tadahan air untuk pembekalan air yang berterusan. Air di bahagian hulu sungai mempunyai kualiti air yang lebih baik berbanding air di hilir sungai.

Dalam kajian ini, indeks kualiti air bagi Sungai Muar dan Sungai Pilah di daerah Kuala Pilah telah ditentukan dengan menggunakan lima parameter iaitu nilai-nilai BOD₅, COD, ammonia-nitrogen, jumlah pepejal terampai dan pH. Parameter lain yang terlibat dalam penentuan kualiti air adalah kandungan nutrien seperti nitrat dan fosfat dan kandungan logam seperti besi dan manganum.

Kualiti air di hulu sungai di Lembangan Hulu Sungai Muar yang mengandungi sungai-sungai di atas berubah dengan mendadak apabila air sungai mengalir melalui bandar, kawasan perindustrian dan penempatan. Data yang dikutip daripada pelbagai sumber dan untuk beberapa tahun menunjukkan kualiti air yang berubah-ubah secara berterusan di lembangan ini sejak tahun 1992 dengan keadaan air sungai yang tercemar. Kualiti air adalah di antara Kelas IIA dan III bagi tahun-tahun berkenaan.

Pencemaran yang tinggi dalam sungai-sungai ini adalah disebabkan oleh air buangan dibuang secara terus ke dalam sungai tanpa sebarang rawatan. Penyumbang-penyumbang lain kepada pencemaran adalah pembalakan yang aktif dan kerja-kerja perataan tanah untuk tujuan pembangunan. Oleh itu, pendekatan baru kepada pengurusan air telah diperkenalkan untuk meningkatkan kualiti air sungai.

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TABLE OF CONTENTS

	Page
DEDICATION	ii
ABSTRACT	iii
ABSTRAK	iv
ACKNOWLEDGEMENTS	v
APPROVAL SHEET	vi
TABLE OF CONTENTS	vii
LIST OF TABLES	viii
LIST OF FIGURES	x
LIST OF GRAPHS	xi
CHAPTER	
1 INTRODUCTION	1
1.1 History of water pollution	2
1.2 Statement Of The Problem	3
1.3 Objectives	3
2 LITERATURE REVIEW	4
2.1 The water cycle	4
2.2 Physical characteristics of water	7
2.3 Chemical characteristics of water	10
2.4 Chemical oxygen demand (COD)	11
2.5 5-Day biochemical oxygen demand (BOD ₅)	12
2.6 pH	13
2.7 Water quality index (WQI)	14
2.8 Profile of Kuala Pilah	17
3 DATA ANALYSIS	29
3.1 Present situation Kuala Pilah schemes	29
3.2 Rainfall as water resource	33
3.3 Condition of catchments	36
3.4 Domestic and industrial water demand	40
3.5 Water Stress Areas	41
3.6 Water quality analysis	42
4 DISCUSSION	53
4.1 Rainfall	53
4.2 Water quality monitoring	53
4.3 Sources of pollution	66
4.4 Present status of river water quality	67
5 CONCLUSION	71
BIBLIOGRAPHY	72
APPENDICES	74

LIST OF TABLES

	Page
Table 2.1 Water Readily Used By Humans	5
Table 2.2 Common Analyses Used To Assess Physical Impurities Of Water And Wastewater	8
Table 2.3 Offensive Odours Commonly Encountered In Water	9
Table 2.4 Department Of Environment (DOE) Water Quality Index Classes	14
Table 2.5 Best-Fit Equations Used For Derivation Of Parameters	15
Table 2.6 Interim National Water Quality Standards For Malaysia	16
Table 2.7 Land Usage Sector	21
Table 3.1 The Schemes Name And Total Area For Each Scheme	31
Table 3.2 Activity For The Schemes In Kuala Pilah	32
Table 3.3 Rainfall Stations	33
Table 3.4 Average Rainfall At Each Station For 1998 To 1999	35
Table 3.5 Average Rainfall At Each Station For 1978 To 1992	36
Table 3.6 The Schemes And Catchment Area For Each Scheme	37
Table 3.7 Treatment Plants In Kuala Pilah	40
Table 3.8 Water Demand And Water Supply For Kuala Pilah	41
Table 3.9 Location Of Water Quality Station	42
Table 3.10 Water Quality Test In 1992	43
Table 3.11 Water Quality Analysis At Station PLH1	44
Table 3.12 Water Quality Analysis At Station PLH2	45
Table 3.13 Water Quality Analysis At Station MUR1	46
Table 3.14 Water Quality Analysis At Station MUR2	47

Table 3.15	Water Quality Analysis At Station MUR3	48
Table 3.16	pH Value For Muar River And Pilah River At Each Station	49
Table 3.17	Biochemical Oxygen Demand (BOD) At 20 °C (mg/L)	49
Table 3.18	Chemical Oxygen Demand (COD) (mg/L)	50
Table 3.19	Concentration Of Ammonia (mg/L)	50
Table 3.20	Concentration Of Nitrates (mg/L)	51
Table 3.21	Concentration Of Phosphates (mg/L)	51
Table 3.22	Concentration Of Iron (mg/L)	52
Table 3.23	Concentration Of Manganese (mg/L)	52
Table A.1	Water Quality Test For MUR1	74
Table A.2	Water Quality Test For MUR2	75
Table A.3	Water Quality Test For PLH1	76
Table A.4	Water Quality Test For PLH2	77
Table A.5	Water Quality Test For PLH3	78

LIST OF FIGURES

		Page
Figure 2.1	Map Showing Districts In Negeri Sembilan	19
Figure 3.1	Map Showing Location Of Rainfall Stations	34
Figure 3.2	Map Showing Rivers In Kuala Pilah	38



LIST OF GRAPHS

		Page
Graph 4.1	pH Value For Muar River And Pilah River	59
Graph 4.2	Biochemical Oxygen Demand For Muar River And Pilah River	60
Graph 4.3	Chemical Oxygen Demand For Muar River And Pilah River	61
Graph 4.4	Concentration Of Ammonia For Muar River And Pilah River .	62
Graph 4.5	Concentration Of Nitrates For Muar River And Pilah River	63
Graph 4.6	Concentration Of Phosphate For Muar River And Pilah River	64
Graph 4.7	Concentration Of Iron For Muar River And Pilah River	65
Graph 4.8	Concentration Of Manganese For Muar River And Pilah River	66

CHAPTER 1

INTRODUCTION

Malaysia has abundant water resources with an estimated of 560 billion cubic meters of surfaces water and 12 billion cubic meters of groundwater available per year. However, their occurrence is unevenly distributed due to the highly variable spatial and temporal rainfall patterns and the river catchment physiographical and geological formations.

Priority has been accorded to the development of the water resources sector to meet the requirements for domestic, industrial and agricultural demands as well as for hydropower development. The main thrust of development in the sector will be on the optimal utilization of existing water resources through developing new sources, upgrading, rehabilitating and improving the efficiency of existing facilities; preservation of the quality and quantity of existing sources by controlling pollution and implementing pollution abatement measures as well as conservation and protection of catchment areas through controlled land development and deforestation. The threat of pollution of water sources is increasing due to population growth, the rapid rate of urbanization and industrialization as well as the inadequate provision of sanitary facilities.

Demand for water is expected to increase from 15.2 billion cubic meters in the year 2000 to 20 billion cubic meters by the year 2020. It has become necessary to implement new storage schemes and to practice sound operation and management of

existing storage facilities. The immediate objective of water supply development will be to meet the industrial and domestic requirement, particularly in areas that have been identified as new growth centers.

In Malaysia, the management of water resources involves essentially a number of agencies. The agencies involved are Department of Veterinary Services, Department of Irrigation and Drainage District Councils, Local Authorities, Department of Mines, Department of Water Supply and Department of Chemistry. The three major functions are assessment, protection and development.

1.1 History of Water Pollution

The prosperity and relatively high standard of living of Malaysians draw heavily on Malaysia's rich resource base, both renewable and non-renewable, ranging from agricultural and forestry commodities, petroleum and minerals resources, to the most basic resource of all, water.

For many years, the major environmental problems in Malaysia stemmed predominantly from ad-hoc development and inadequate infrastructure facilities together contributed to the deterioration of the environment. With Independence in 1957 and its successive National Development Plans, accelerated development programs spanning mining, forestry, agriculture, land settlement, urban and industrial development were seen as the main culprits. The environmental deterioration is a consequence of the high rates of economic development experienced in the last two decades that have made substantial demands on the reserves of minerals, soil, forests,

land and water. The government, sensitive to the implications of reaching a condition of over exploitation of these resources by the turn of the century, took timely action to head off such a situation through a gradual transition from an exploitative resource-based economy to a more balanced resource utilization and development strategy incorporating environmental considerations.

1.2 Statement Of The Problem

The Upper Muar River Basin has been subjected to stress from agriculture, industry and urbanisation, allowing insights into the physical, chemical and biological dynamics in river ecosystems. The diverse agricultural and industrial activities would bring an increase in human population in the Kuala Pilah District that contributes to the high pollution in the rivers. This study is carried out to look at to what extent does pollution in the rivers in Upper Muar River Basin persists and is monitored. Kuala Pilah District was chosen as the study area as it is well known fact that the district is a dry area and has potential of requiring the best water management practices to satisfy all stakeholders.

1.3 Objectives

- i. To determine the water quality of the rivers in Kuala Pilah District.
- ii. To study the water management in domestic, agricultural and industry in Kuala Pilah District.

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