



UiTM LAW REVIEW

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Volume 1

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UNIVERSITI TEKNOLOGI MARA (UiTM)

An Introduction

Universiti Teknologi MARA (formerly known as MARA Institute of Technology) is Malaysia's largest institution of higher learning. It had its beginnings in 1956 as Dewan Latihan RIDA, a training centre under the supervision of the Rural Industrial Development Authority (RIDA).

Nine years later Majlis Amanah Rakyat (MARA) Act, 1965 provided for a change of name from Dewan Latihan RIDA to Maktab MARA (MARA College). The Act also defined a new role for the MARA College – to train Bumiputras (literally it means “the sons of the soil” - ie the indigenous people) to be professionals and semi-professionals in order to enable them to become equal partners with other ethnic groups (ie the former migrants, especially the Chinese and Indians) in the commercial and industrial enterprises of the nation.

In 1967 Maktab MARA was renamed Institut Teknologi MARA (ITM) (or MARA Institute of Technology). In August 1999, the Institute was upgraded to university status and named Universiti Teknologi MARA (UiTM).

As part of the government's affirmative action policies, UiTM provides education and training in a wide range of sciences, technology, business management and professional courses to 56,408 full-time students in 2000. Another 3,156 have enrolled for off-campus courses. In addition, there are 7,725 students in distance-learning and flexible-learning programmes.

The main campus stands on a 150-hectare piece of land on a picturesque hilly area of Shah Alam, the state capital of Selangor Darul Ehsan, about 24 kilometres from the city of Kuala Lumpur.

The Universiti has also established branch campuses in the various states of the Federation: Sabah (1973), Sarawak (1973), Perlis (1974), Terengganu (1975), Johor (1984), Melaka (1984), Pahang (1985), Perak (1985), Kelantan (1985), Penang (1996), Kedah (1997) and Negeri Sembilan (1999).

The Universiti currently offers 184 programmes conducted by 18 Faculties. These programmes range from post-graduate to pre-diploma or certificate levels. More than half of these are undergraduate and post-graduate programmes, while diploma programmes account for an additional 39%. Some of the post-graduate programmes are undertaken in the form of twinning programmes, through collaboration with universities based overseas.

The following 18 Faculties currently run programmes in the University:

Accountancy; Administration and Law; Applied Science; Architecture Planning & Surveying; Art & Design; Business & Management; Civil Engineering; Education; Electrical Engineering; Hotel & Tourism Management; Information Technology & Quantitative Science; Mass Communication; Mechanical Engineering; Office Management & Technology; Performing Arts; Science; Sport Science & Recreation.

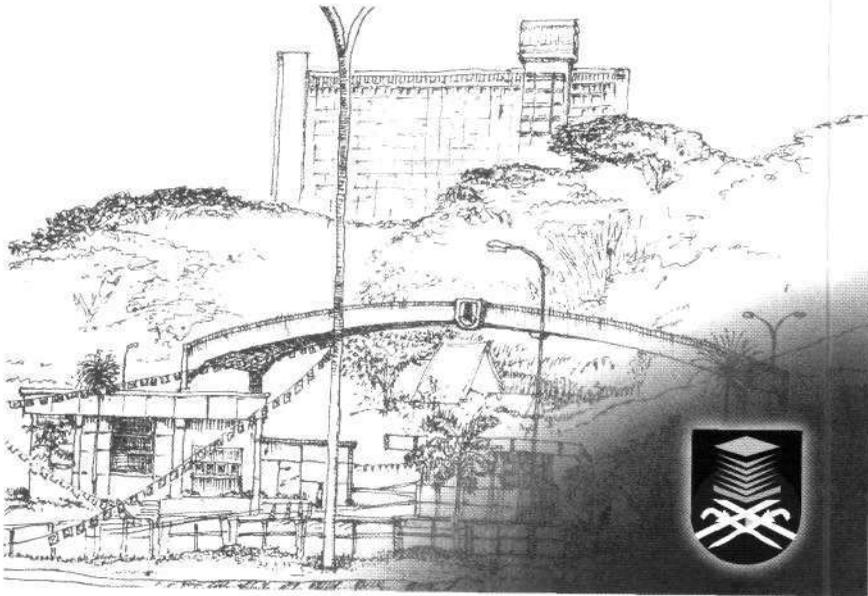
In addition to faculties there are 17 'academic centres' to cater various academic, business, technological and religious needs of the campus community. They are Extension Education Centre (PPL); Language Centre; Centre for Preparatory Education; Resource Centre for Teaching and Learning; Total Quality in UiTM (CTQE); Department of Academic Quality Assurance & Evaluation; Computer Aided Design Engineering Manufacturing (CADEM); Malaysian Centre for Transport Studies (MACTRANS); Text Preparation Bureau; Bureau of Research & Consultancy; Malaysian Entrepreneurship Development Centre (MEDEC); Islamic Education Centre; Centre for Integrated Islamic Services; Business & Technology Transfer Centre.

THE FACULTY OF ADMINISTRATION AND LAW, UiTM

The Faculty of Administration and Law (formerly known as the School of Administration and Law) was founded in 1968. It began as a centre offering British external programmes, the LLB (London - External) and the Chartered Institute of Secretaries (now Institute of Chartered Secretaries and Administrators). The only internal programme offered then was the Diploma in Public Administration and Local Government (DPALG). In 1978 the LLB (London - External) programme was terminated and replaced by the current internal LLB programme. The LLB is a three-year academic degree course based on the structure of the undergraduate law programmes normally offered in the British universities. Unlike most of the British LLB programmes, however, the LLB at the Faculty is conducted on a semester system. In 1982 the Faculty introduced a one-year LLB (Hons) programme towards which graduates of the LLB could advance their studies. The LLB (Hons) is a professional and practice-oriented programme that provides training to students for their career in the legal practice as Advocates and Solicitors. The delivery of the curriculum for this course adopts the method and strategy of simulated or experiential learning. Because of the unique experience it provides to students in their legal training this course has acquired wide recognition and acceptance among the Malaysian public.

The Faculty of Administration and Law enjoys strong connections with the legal profession, particularly the Malaysian Bar, and the industry. It takes pride in continually developing pioneering options in its degree programmes, both at the academic and professional levels. In 1995 the Faculty introduced the degree of Bachelor in Corporate Administration (Hons) to train young and bright Malaysians to hold office as Company Secretaries. In the pipe-line are some new courses - Bachelor of Law and Management (Hons), Bachelor of Administrative Science (Hons), Masters of Law and Executive Masters in Administrative Science.

The Faculty currently comprises some 70 academic staff from both the disciplines of law and administration. It has about 600 students reading for the LLB and LLB (Hons) and 500 students reading for the Diploma in Public Administration and Bachelor in Corporate Administration (Hons). The Faculty admits about 200 students each year.



Main Entrance to Shah Alam Campus

EDITORIAL NOTES

This law journal had a long period of gestation in the Faculty. There were several attempts in the past, by individuals or the faculty collectively, to bring about its parturition. It is no easy task to initiate an academic journal, regardless of the discipline it represents. It demands a high degree of commitment in time, energy and attention. It calls for an intense love of labour for scholarship among a critical mass of the faculty members, either in the editorial board or as article contributors. But, at long last, this journal has arrived.

Many factors led to this successful launch. The recent elevation of this institution to university status created its own impetus. Our strong law programme and its capable teachers demanded, and will benefit from, this specialist forum for academic debate and analysis. There is support within the legal profession and among our many distinguished alumni for such a journal, too. We are delighted by the synergy and collaborative goodwill the notion of a journal has evoked. So, we were able to marshal much expertise and experience to bring out this inaugural issue of the Journal.

Academic faculty at UiTM are part of the worldwide network of academia. We must participate in discussions and debates over issues that are not only of direct academic and professional concern but also of importance to the general public. A journal such as this facilitates reflective and disciplined participation. In doing so, it helps the Faculty, and the University, to undertake its noble role in serving the general community.

A learned journal is one of the major measures by which the weight and prestige of an institution are judged. It reflects the institution's maturity and ability to manage and conduct its specialist discipline. It reflects a confidence among its faculty to offer themselves to be evaluated in the open market place of ideas, and it serves notice of the faculty's readiness to serve the community at large. This Journal, in no small measure, marks the coming of age of the Faculty.

The Journal functions also as a meeting point for law teachers and practitioners who share a common interest in various areas of law. It provides them a source of information on the current and topical issues in their specialised areas. It creates a forum for the exchange of ideas and for engaging in discourse over sometimes intricate and often vexed legal issues. Much is gained by the legal fraternity, as well as the legal system, through such engagements and encounters.

Law teachers, as members of the broader academic community, are aware that it is no longer tenable for them to function solely within their traditional ivory towers, isolated from the reality of the world outside. For career and professional advancement, and for taking their rightful role in the community, no academic can confine

herself to her classroom or departmental audience. She must reach for a wider audience. The recognition (or lack of it) that she gains from her peers, both within and without the discipline, will speak for her standing and credibility in the community, both scholarly and otherwise. This Journal will serve as one channel for the Faculty members to reach that wider audience.

There are relatively few academic legal journals in this country. Most existing legal publications cater for the professional needs of legal practitioners. One ramification of this is that there are few discourses on theoretical and abstract legal issues. Yet these issues are important for the fuller appreciation and development of the law and the legal system, by the legislature, the reform bodies and the courts. This Journal will try to answer this need and stimulate discussions on issues that are of interest and relevance to the academic and broader communities.

The labour and skill required for this Journal to thrive will challenge the staff of the institution and the supporters of this initiative among the profession and the wider community. We hope the Journal sails well in fair winds.

Our wish is that Malaysia's legal profession, its legal academic circle and the many students and practitioners of law in this country and elsewhere will benefit from this forum for analysis and reform. We hope this Journal makes an important contribution to debate on vital legal matters in our society. We hope, too, that our quest for self-expression and critical reflection among the members of the legal academia will be assisted by this Journal. It is with great pleasure and some satisfaction at the completion of this worthy task that we complete this inaugural Editorial.

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GROUNDWATER LEGAL PROTECTION IN MALAYSIA: LESSONS FROM UK EXPERIENCE

by NORHA ABU HANIFAH*

Introduction

In modern industrial societies, surface water quality is fast deteriorating because of pollution from urban and industrial waste, improper management of land development works and poor control of agricultural activities. In Malaysia, studies conducted by the Department of Environment in monitoring the quality of rivers for five years (1989-1993) reveal that, although the number of heavily polluted rivers remained unchanged, the number of slightly polluted rivers increased from 44 in 1991 to 56 in 1992.¹ The overall water quality in 1995 had deteriorated at a rate of 0.55%.² The increase in pollution and misuse of surface water has resulted in an urgent need for alternative sources of water supply. The development of groundwater as a supplementary source of water supply is the natural choice. However, the legislative framework for the control of groundwater in Malaysia has risen in an ad hoc fashion over the years.

This article describes the development of legislative measures to combat groundwater pollution in Malaysia. Some comparisons with the UK situation are made. It is hoped that Malaysia could improve its system of legal protection of the groundwater from land-based pollution by adopting the better policies and mechanisms of the UK system.

Definition of Groundwater

In the *Dictionary of the Environment* groundwater is described as water that occupies pores and crevices in rock and soil, below the surface and above a layer of impermeable material, as opposed to surface water, which remains at or close to the land surface.³

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1 Norhazni Mat Sani, "Status of River Water Quality in Malaysia", Kuala Lumpur, Department of Environment 1994, p 1-6.

2 Ibid.

3 M Allaby, *Dictionary of the Environment* (Macmillan, London 1983) 237.

The upper limit of the groundwater is the water table, whose level varies according to the quantity of water entering the groundwater, compared to the quantity lost, for example, through abstraction. Almost all groundwater constitutes part of the hydrologic cycle from other sources such as magmatic water (Picture 1).

An aquifer is a geological formation, which contains water and allows significant amounts of water to move through it under ordinary field conditions. To understand why groundwater is important as an environmental safeguard against contamination and pollution, it is necessary to know what is groundwater and how it flows (see Picture 1).

Source of Groundwater Pollution

Contamination of groundwater may occur because of improper disposal of liquid wastes, defective well construction and failure to seal the abandoned wells, which then provide openings for the downwards movement of water into subsurface formations without the process of filtration.⁴ Contamination may also take place through movement of waste water through large openings such as animal burrows, fissures in rocks, coarse gravel formations or man made excavations.⁵ Contaminated groundwater may appear clear and yet contained pathogenic organisms.⁶ Bacteria from the liquid effluents from septic tanks, cess pools, pit privies, and so on are likely to contaminate shallow groundwater aquifers.⁷ Sewage effluents discharged directly into water-bearing formations such as abandoned wells or soil absorption system contaminate the groundwater.⁸ In Malaysia sewage contributes the largest amount of organic pollution at 776.4 tonnes per day.⁹ Next comes pig rearing (304.5t/day), manufacturing sector (5.9t/day) and the agro-based industrial sector (8.4t/day).¹⁰

The degradation of water quality of rivers and lakes has been evident for many years. In general, solutions to this problem have been sought in the implementation of effective legislation for discontinuing contaminant emissions. In some parts of the world, effective emission abatement measures have led to great improvements in surface-water quality. Unfortunately, problems of groundwater quality degradation are in many ways more difficult to overcome.¹¹ Groundwater pollution often results in aquifers or parts of aquifers being damaged beyond repair.

Pollution sources can be divided into two types; Firstly, point sources and, secondly, diffuse sources. Point sources include waste water pipes discharging into a river.

4 National Rivers Authority Report, *Policy and Practice of the Protection of Groundwater* (London 1992).

5 Ibid.

6 Ibid.

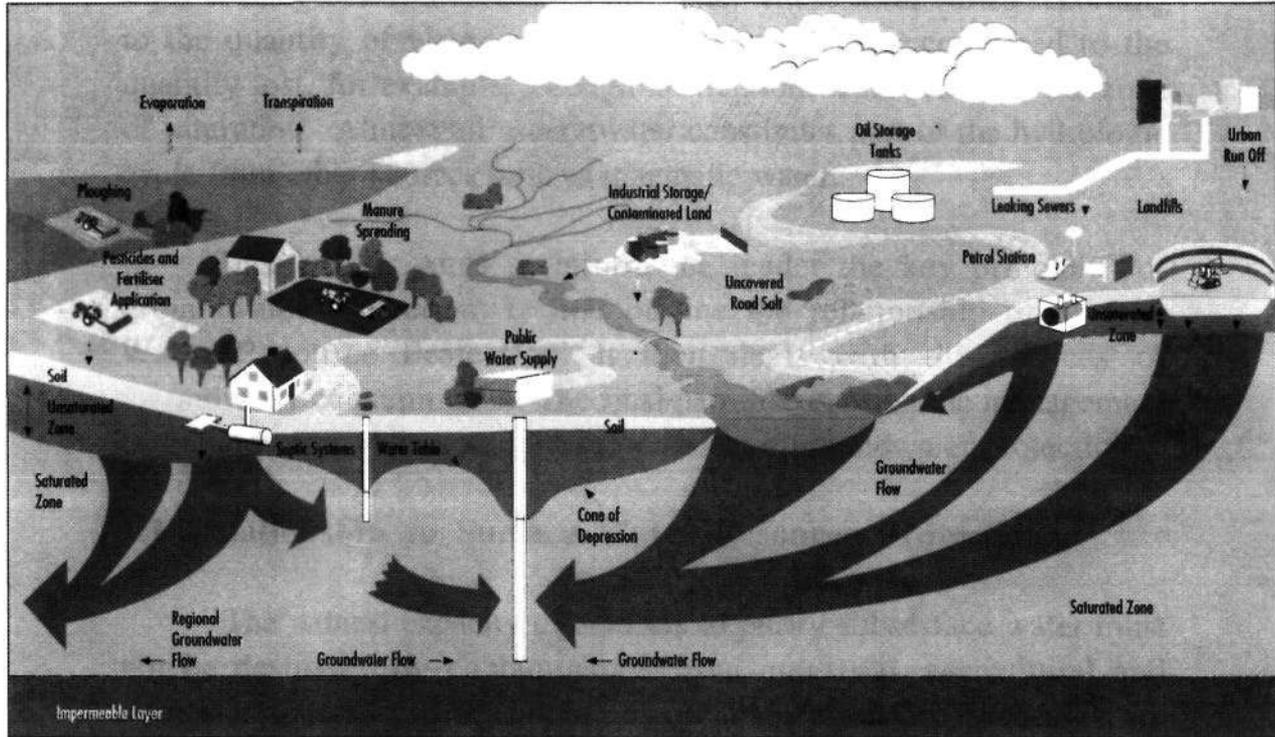
7 Ibid.

8 Ibid.

9 *The New Straits Times*, 25 May 1999.

10 Ibid.

11 R A Freeze and J A Cherry, *Groundwater* (Prentice Hall Inc. New Jersey 1979) 1.



Source: NRA Report 1992.

Picture 1

Picture shows a diagrammatic representation of the Water Cycle showing groundwater and surface water relationships and groundwater pollution risks

Diffuse sources are quite hard to pinpoint, for example, rainwater contaminated with traces of pesticides or herbicides from the land, draining down into a river basin.¹²

Most human activities are a potential hazard to groundwater. In trying to assess the level of risk of contamination from any given activity in order to make judgements about its acceptability, it is necessary to assess the total exposure to the hazard. This will depend on the natural geological and soil conditions. These will then define the vulnerability, that is that susceptibility of groundwater to pollution.

The Importance of Groundwater Protection

Groundwater makes up a very high proportion of the freshwater resources of England and Wales. The total number of groundwater abstractions is estimated to be 100,000 and there are nearly 2000 major public supply sources and a larger number of licensed private sources.¹³ While it is not a major source of water supply in Scotland, there are some counties that rely on this source such as in the northeast of the country where the whisky distilling industry is situated.¹⁴ Groundwater manifests itself on the surface in the form of springs and this plays an important role in Scotland's drink industries, both alcoholic and non-alcoholic.¹⁵ Distilleries and large breweries are often built near the best spring water and this "pure" source is often advertised as a sign of quality in the beverages. Scotland also has an important share of the bottle water market where priority and reliability by supply are again of paramount importance.

In Malaysia, groundwater is currently being used mainly for municipal/domestic supplies (estimated 60%), industrial supply (30%) and agricultural usage (10%).¹⁶ The groundwater is generally used conjunctively with surface water sources.¹⁷ In areas where there are constraints in tapping surface sources, groundwater becomes the primary source of supply.¹⁸ Usage of groundwater for industrial purposes, such as for boilers, cooling, cleaning and washing, is concentrated mainly in industrialised zones, such as the Klang Valley and in the various industrial estates, where numerous factories have drilled their own tube wells.¹⁹ Groundwater has also been commercialised and bottled for sale as mineral water.²⁰ Areas where groundwater

12 Friends of Earth, *River Pollution-A Sleuths Guide* (1992) 10.

13 National River Authority, note 4 at 7.

14 D A Reid, Regulation of Non-Point Source Water Pollution in Scotland", in P Thomas (ed). *Water Pollution Law and Liability*, (Graham & Trotman, London 1993) 90.

15 Ibid at 93.

16 Mohamad Ali Hasan, "Groundwater Resources: A Neglected Resource." Paper presented at National Review of Environmental Quality Management in Malaysia Seminar, 10-12 Oct 1995, Kuala Lumpur, p 8.

17 Ibid.

18 Ibid.

19 Ibid.

20 Ibid.

is or has been utilised for public water supply are Kota Bharu town and outlying areas such as Pengkalan Cepa, Tanjung Mas, Kubang Krian, Bachok, Wakaf Bharu and Tumpat; Kuala Terengganu, Arau (Perlis), Sg Ular (Pahang), Rompin (Pahang), Nenasi (Pahang), Bt Dundong and Kemboja (Langkawi).²¹

The Development of Groundwater Law

Surface water and groundwater are closely integrated in the water cycle. Legislation on water pollution has a long history. In the UK, water regulation can be traced back to the 14th century, where they were only concerned with the prevention of gross nuisances and threats to public health and not on the protection of the environment at large.

The main weapon of the law, at first, was the common law tort of nuisance, with its action for damages or possibly an injunction. Liability in nuisance for polluting groundwater will arise if causation can be proved.²² This was first established in *Ballard v Tomlinson*, where a brewery sued successfully for contamination of its well caused by a neighbour who used his adjacent well for the disposal of sewage.²³ Today, however, the common law has grown mainly as a defence and protection of the private rights of landowners.

In Malaysia, there is no specific legislation addressing groundwater pollution. With respect to river and water management, the Water Enactment 1920 was the fundamental law. It was enforced in the Federated Malay States of Negeri Sembilan, Pahang, Perak and Selangor. The Water Enactment 1920 was focused almost exclusively on the prohibition of diversion of river water, therefore the Act was not of much help in preventing water or groundwater pollution.

In 1929 the British administration subsequently introduced the Mining Enactment. Its main function is the regulating of water for mining purposes. Similarly to the Water Enactment 1920, it did not contain any specific provision on water or groundwater pollution control. Other important legislation in connection with the protection of rivers are the National Forestry Act 1984, the Land Conservation Act 1960, the Local Government Act 1976 and the Street, Drainage and Building Act 1974. It has been argued that Malaysia lacks groundwater data and trained personnel and has inadequate legislation and enforcement mechanisms for the management and protection of groundwater.²⁴

21 Ibid.

22 See *Rylands v Fletcher* (1865) 3H & C 774 and *Cambridge Water Co v Eastern Counties Leather* (1994) 2 AC 264 and 304 - 306. The House of Lords said that a polluter who causes foreseeable pollution, but who has taken reasonable care to prevent it, may still be liable under *Rylands v Fletcher*.

23 Ball and Bell, *Environmental Law* (Blackstone Press, London 1994) 394.

24 Mohamad Ali Hasan, above n 16 at 8.

However, the main weapon for the improvement of pollution control in Malaysia is the Environmental Quality Act 1974. It is the most comprehensive piece of legislation concerning environmental management passed by the Federal Government. The Environmental Quality (Scheduled Wastes) Regulations, 1989 provide that scheduled wastes shall be disposed of at prescribed premises only and should be stored in durable containers. Schedule wastes means any waste falling within the categories of waste listed in the First Schedule of the Regulations. Examples of schedule waste are mineral oil, paint sludges, aqueous alkaline solutions containing cyanide from treatment process of metal or plastic surfaces, aqueous chromic acid solutions and etc. On the other hand, the Environmental Quality (Sewage and Industrial Effluents) Regulations, 1979 also have provisions which protect the environment from pollution. For example, Part III of the regulations prohibits the discharge of any tar or other liquids immiscible with water, refuse, human or animal waste or solid matters into inland waters. Inland waters include any other body of natural or artificial surface or subsurface water.

Agencies Involved in the Protection of Groundwater

In Malaysia, there are several agencies involved in the protection of groundwater. Below are a list of the agencies involved and their roles and responsibilities.

Department of Environment (DOE)

This is the Ministry responsible for the control and protection of the environment. It has a role in making the regulations and directions under the *Environmental Quality Act 1974*. Groundwater development for industrial, agricultural or urban water supply of greater than 4,500 cubic meters per day is considered prescribed activity under s 34A of the Environmental Quality Act 1974. Any person intending to carry out any prescribed activity has to submit a report on the impact of that activity on the environment to the Director General of Environmental Quality for examination.

Public Works Department

For municipal or public supplies, groundwater is exploited mainly by the Public Works Department or the Water Supply Department.²⁵ The Geological Survey Act requires that any person who wishes to develop certain wells or carry out excavation must notify the Director General of Geological Survey Department. Since groundwater is not extensively develop in Malaysia,²⁶ it appears that there is no central agency or ministry that has the responsibility of implementing groundwater legislation.

25 Mohamad Ali Hasan, above n 16 at 3.

26 Ir. Hj. Keizrul Abdullah, "An Appraisal of Malaysia's Water Resources Problems and Prospects," Paper presented at National Review of Environmental Quality Management in Malaysia Seminar, 10-12 Oct 1995, Kuala Lumpur.

The Ministry of Agriculture - Department of Irrigation and Drainage (DID)

The Department of Irrigation and Drainage is an agency under the Agricultural Ministry. It is responsible for cleaning rivers and mitigating floods. Though DID is given the administrative task of taking care of the rivers, legally it does not have jurisdiction and control over the management of rivers.²⁷

With the revised National Agriculture Policy's emphasis on increasing food production and opening of more land for farming therefore the use of pesticides and agrochemicals will also be expected to increase. There is evidence to suggest that some of Malaysia's rivers are poisoned with pesticides.²⁸ Pesticide leaching has gone on unfettered because there are no laws to control the allowable limits of pesticides entering the water system.²⁹ The proposed Chemical Act, has not been passed despite years of lobbying by the DOE.

Flaws in Water Management Law

A major flaw in the approach to water management in Malaysia is that there is no single authority overseeing the management of water resources. To a large extent, laws governing forests, land and rivers are not cohesive. This results in less than satisfactory river management.³⁰

The Department of Environment can determine the quality of the rivers, but it cannot impose the standards it wishes to protect them because under the Federal constitution both the Federal and State legislatures have jurisdiction over matters relating to water. Therefore, the decision of one state on the use of its land, forests and highlands impairs the condition of rivers in another state if they originate from the same river basin.³¹

Even within the States, there is no integrated and holistic approach to river or water management but rather a highly sectoral, piecemeal and ad-hoc approach. This gives rise to conflicting decisions that weaken the quality of the river.³² Examples of this are as follows:³³

- Decisions about land-use in a State are in the hands of the State government. The local authorities and the State governments do not have technical expertise, but they are vested with powers on the utilisation of rivers and land. On the

27 *The New Straits Times*, 27 April, 1999.

28 *Ibid.*, 1 June, 1999.

29 *Ibid.*

30 *The New Straits Times*, above n 27.

31 *Ibid.*

32 *Ibid.*

33 *Ibid.*

other hand, agencies like DID and DOE are not given the power that comes with their technical expertise.

- Licensing of business/industrial areas is within the purview of the local government. Pollution control is in the hands of the Department of Environment and it has no control over the licensing of industrial activities. Thus, while the State authorities may approve development projects on the basis that they create jobs, they do so at the peril of not taking into account their impact on the capacity of the river to supply water and its ability to take on the additional pollution load.
- The Waters Act 1920 does not have national application as it only applies to Negri Sembilan, Pahang, Perak, Selangor, Malacca, Penang and the Federal Territory. To what extent the Waters Act has been enforced effectively remains doubtful, given the state of the rivers in the country.
- The National Forestry Act 1984 and the Land Conservation Act 1960 only apply to all states in the peninsular and come under the jurisdiction of the State authority. Through these laws designate the State authority can designate permanent forest reserved and hill lands as soil protection, flood protection and water catchment areas. It appears that rather than State Governments creating more areas as permanent reserved forest and hill lands, there has been a steady degazetting of permanent reserved forest and hill land for various developments.
- The Environmental Quality (Sewage & Industrial Effluents) Regulations 1979 is the primary law which protect the rivers from hazardous waste. Through these regulations, industries such as the textile, printing, metal finishing and food and beverage, to name a few, are required to treat their wastewater before releasing it into the waters. However, there are gaps in the law. The law does not stipulate a quota for how much waste each factory can release. Even if a particular factory's discharges comply with standards, the river cannot cope with the total load from all the factories located in the same industrial area. What is worrisome is that pesticides are not yet subject to the Environmental Quality (Sewage & Industrial Effluents) Regulations 1979.³⁴
- There is also the problem of limiting the substances and chemicals discharged into the inland waters. Although many potentially harmful substances can be detected in the rivers, the regulations only have provisions for 23 substances. Many other chemicals like ammoniacal nitrogen (which is found in sewage effluents), chloride, cobalt and radioactive material, have not been regulated. Thus, if companies discharge these substances into the water, the DOE has no power to charge them.
- Under the Environmental Quality Act (EQA) 1974, companies can be given a Contravention Licence, a licence to pollute. This licence is given to companies which have genuine difficulties complying with discharge standards. In 1997, the majority of such licences were given to the food, rubber-based, and textile

34 *The New Straits Times*, 1 June 1999.

industries. The weakness of this law is that it allows companies to go on discharging untreated waste into the rivers until they have upgraded their facilities to properly treat the waste.³⁵ These licences cost only RM100 each and are subject to abuse.

- A further possible weakness is the seemingly low fines imposed on industries. In the Federal Territory in 1996, 98 companies were fined a total of RM58,100. That is an average of RM593 per company. The maximum fine for violations under the EQA is RM100,000. However, the courts continue to impose low fines. It is not surprising that industries continue to act irresponsibly and violate guidelines despite crackdowns and enforcement by the DOE.

A Brief Comparison with the UK

Background

At the time of the Industrial Revolution, atmospheric pollution increased alarmingly. This opened a new chapter of environmental problems in UK, which led to early development of legislative intervention, such as the Smoke Nuisance Abatement (Metropolis) Act 1853 and the Public Health Act 1875. The chemical industry also gave rise to problems such as the devastation of crops and trees caused by emissions of hydrochloric acid from alkali works. This led to the passage of the Alkali Act 1863.

During the Industrial Revolution, apart from atmospheric pollution, water pollution became another serious problem. This is because of the emissions of industrial effluent, and the sewage of major conurbations. This led to the establishment of the Rivers (Prevention of Pollution) Act 1876 after inquiries into the pollution of rivers were carried out by the Royal Commissions. The Act was for the control of water pollution.

Public pressure for strict legislative measures had prompted the British government to introduce new laws. Thus, the Environmental Protection Act 1990, Water Resources Act 1991 and Water Industry Act 1991 were enacted.

In the UK, groundwater control and regulation have a top priority. The Department of Environment (DOE) is responsible for determining appeals on licences to extract groundwater and also for giving consents to discharges that affect groundwater. Decisions on appeals for waste management licences and planning appeals are also the responsibility of DOE. The Ministry of Agriculture is another Government Department involved in the protection of groundwater. It is the responsibility of the Ministry to control pesticides used in agriculture by Pesticide Regulations. Nitrate Sensitive Areas are also the responsibility of the Ministry. Under the Water

35 Ibid.

Resources Act 1991 it is the duty of the Ministry to have a Code of Good Agricultural Practice. The Ministry of Agriculture is also responsible for Natural Mineral Water Regulations.

For many years the number of different agencies involved in environmental protection reflected the fragmented nature of policy and law enforcement in this area.³⁶ However, the establishment of the Environmental Agency by the Environment Act 1995 has unified the various regulatory agencies which are mentioned below.

Her Majesty's Inspectorate

Her Majesty's Inspectorate of Pollution (HMIP) is responsible for overseeing integrated pollution control (IPC) in England and Wales. This regulatory regime aims to prevent or minimize the pollution of air, land and water by subjecting major industrial processes to a permit system. IPC is to control the potentially most polluting or complex industrial processes. Not every factory needs an IPC permit.

HMIP was established in 1987 to provide a more integrated and coherent approach to pollution control, especially through the introduction of concepts like the best practicable environmental options. It combines the Industrial Air Pollution Inspectorate of Health and Safety Executive, which was previously known as the Alkali and Clean Air Inspectorate, and the Radiochemical Hazardous Waste and Water Inspectorate of the DOE. It is part of the DOE itself.

Authorization from HMIP, plus agreement from National River Authority, is needed for any discharges to water involving substances from a prescribed list, usually known as the "Red List". It contained 23 substances which are regarded as the most potentially harmful or polluting in water environment. It is also the responsibility of HMIP to prevent land contamination by certain substances. HMIP is also responsible for the discharge of radioactive substances to groundwater as under the *Radioactive Substances Act 1960*.

Despite its name, it has few operational responsibilities for most types of water po, it has few operational responsibilities for most types of water pollution, waste disposal to land or other polluting activities.³⁷ Since its establishment in 1987, the HMIP has been beset with a shortage of resources, particularly staff.³⁸

36 Ball and Bell, above n 23 at 36.

37 Ibid.

38 Ibid.

The National River Authority

In the UK, the importance of a central agency to monitor and control water pollution was well recognised. The National River Authority (NRA) was established under the Water Act 1989 in September 1989. It is an independent, non-departmental public agency. In Scotland, the relevant body is the River Purification Authority (RPA).

Since the privatisation of the water industry, the control of water pollution in England and Wales has become the responsibility of the National River Authority. It was formed from the previous Water Authorities. It has primary responsibility for dealing with pollution of inland, underground and coastal waters, but where a process is subject to IPC then HMIP will take over.

The NRA has a duty under the Water Resources Act 1991 to monitor and protect the quality of groundwater and, under s 19, to conserve its use for water resources. Under s 16, it has a duty to maintain and, where appropriate, enhance conservation of the surface water environment that, in many cases, is dependant upon proper management of groundwater.

Under the EC groundwater Directive (80/68/EEC), the NRA is the competent authority in association with Waste Regulation Authorities and Mineral Planning Authorities. The NRA has the power to control waste of water resources by artesian overflow as under the *Water Industry Act 1991*.

Under s 24 of the Water Resources Act 1991, the NRA has powers to control by licence most types of abstraction. Section 30 says the NRA has the power to protect groundwater resources during dewatering. The Act also provides for definition of Water Quality objectives for controlled waters. Under s 88, the NRA has power to control discharges to controlled waters.

Section 92 of the Act gives the NRA the power to require pollution prevention measures to be taken under regulations. Section 93 is a provision for statutory water protection zones. The NRA is also responsible to direct and monitor identification of vulnerable zones for Nitrate Sensitive Areas, in accordance with the EC Directive on Diffuse Pollution by Nitrates (91/676/EEC) and under s 94 of the Water Resources Act.

To prevent pollution occurring or continuing, power to take remedial action is given to the NRA under s 161 of the Act. Section 199 of the Act states that the NRA has the power to preserve and protect groundwater during mineral exploration. The NRA has a role in imposing high standards on all new and enlarged installation for silage, slurry and fuel oil to minimise the risk of pollution, a power given to it by the Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991.

It is the duty of the NRA to protect the groundwater. In respect of groundwater quality, it has the power and duty to:³⁹

- i) Achieve statutory quality objectives for groundwater that may be set by the secretary of state.
- ii) Control discharges to groundwater via the groundwater discharge consent process.
- iii) Prevent pollution through regulation made by the Secretary of State.
- iv) Take action against pollution occurrences and
- v) Take up remedial action where pollution has occurred.

Where it involves groundwater yield and quantity, its powers include:

- i) To conserve water resources and ensure there is proper use.
- ii) To manage groundwater so that it will not prevent the maintenance of acceptable flows in rivers.
- iii) To control the abstraction of groundwater through abstraction concerning processes.
- iv) To take action against illegal abstraction.
- v) To take steps to redistribute or augment resources if necessary.

In the protection of groundwater, the NRA also has indirect powers : -

- i) To control discharges from prescribed industrial processes to natural waters.
- ii) To control waste disposal to land where it could cause pollution of water resources.

A key objective of the NRA is to devise a framework which covers all types of threat to groundwater, whether big or small, from point to diffuse sources and by both conservative or degradable pollutants. This is to provide a basis for implementation of legislation in England and Wales and anticipate, as far as possible, the likely requirements of future European legislation on the landfilling of wastes and on diffuse agriculture pollutants.

Local authorities involved in the protection of groundwater are as follows: -

- i) English County Councils, Metropolitan Borough Councils and Welsh District Councils.
- ii) County Councils and National Parks Authorities.
- iii) District Councils and Unitary Authorities.
- iv) Local and Regional, Regional Planning Authorities.

39 National River Authority Report, above n 4 at 3.

- v) English Nature and Countryside Commission for Wales.
- vi) Scotland's County and Regional Councils.

These agencies are involved in various activities which have a connection to groundwater such as waste disposal, redevelopment of contaminated land, development control over mineral extraction, storage of hazardous substances, compiling private water supply register and monitoring and so on.

Water Resources Act 1991

The Water Resources Act 1991 (WRA) is a comprehensive piece of legislation. The discussion here concentrates only on those points most relevant to groundwater contamination and clean-up. The Water Resources Act consolidates in respect of the control of abstraction from groundwater all provisions of the Water Resources Act 1963. The power to control the direct and indirect discharge of the majority of trade and all sewage effluent into controlled waters under Part III of the Water Resources Act 1991 is given to NRA. Additional preventive powers are given to the NRA under ss 92, 93 and 94 of the Act.

An important measure to prevent groundwater pollution is provided in ss 94 and 95 and schedule 12 of the Act. These provisions contain power for the Secretary of State to designate Nitrate Sensitive Areas (NSA) and to prevent entry of nitrate into water. Where an area has been designated as NSA, s 95 of the WRA 1991 further empowers Minister to supplement orders by making agreements with relevant land owners, whereby in return for payments made by ministers, obligations are accepted with regards to the management of the land, e.g. with regard to nitrate application.⁴⁰

Section 92 relates to regulations made for specific activities such as minimum standards for silage, slurry and agricultural fuel oil installation in England and Wales under the Control of Pollution (Silage, slurry and Agricultural Fuel Oil) Regulation 1991. Section 93 of the WRA allows the NRA to apply to the Secretary of State for orders designating areas of water protection zones.

The definition of controlled water is defined in s 104 (1) of the WRA 1991. Under this section "groundwater" includes "any water contained in underground strata". It does not, therefore, have to be contained in an aquifer or some underground "body" of water.

40 D Hughes, *Environmental Law* (Butterworth, London 1980) 346.

Town and Country Planning Act 1990

Many developments may pose a threat either directly or indirectly to groundwater resources. The only control where planning permission is required is by means of conditions in the permission document, an obligation by agreement or undertaking as under s 106 of the Act or by refusal of permission. Businesses that require planning permission include chemical stores, residential development, mineral extraction and industrial development. So, developments that may be a potential risk to groundwater must be recognised.

NRA will seek to ensure that planning permissions contain conditions designed to protect water resources. The use of conditions under s 106 of the Town and Country Planning Act 1990, to control and monitor ground and groundwater contamination during and after redevelopment is strongly encouraged. These should require a remediation plan/method statement to be submitted for approval by the NRA. They should include details of further site investigation, chemical analysis and criteria and standards for removal of contaminated soil and final restoration. Details of foundations, covering material, drainage and groundwater quality monitoring programmes should also be included.⁴¹

Criticisms of the UK system

However, the NRA is faced with some difficult problems in its relationship with developers, site owners and lawyers to improve standards for leached pollutants. There is a lack of a register listing contaminated land sites. Local authorities lack expertise in assessing contamination and have poorly defined standards.

The NRA has to rely on planning authorities to insert groundwater protection conditions in planning permissions or planning agreements and then to enforce them. It should be given the power to veto planning applications if there is insufficient water to supply or no possibility of development without degrading the environment. There is criticism that the NRA has brought only one successful prosecution for polluting groundwater and that was against a water company.⁴²

The Principal of the NRA groundwater department commented that it is easy to prosecute dischargers for pollution of streams, rivers and such like, since the proof is easy to collect. However, groundwater presents more of a problem since it is difficult to satisfy the standard of proof necessary to establish that a particular source at a particular time caused certain pollution in a borehole.

The pollution may have taken many decades to travel from source to borehole. Hence, there have been few prosecutions. Further, it may be unproductive to

41 Ball and Bell, above n 23 at 344.

42 Friends of the Earth, above n 12.

prosecute a company for pollution which may have occurred as a result of activities carried out 50 years ago. The NRA wish to concentrate on the present day and ensuring that practices today do not cause continuing problems.

The Environmental Protection Act 1990 introduced a framework of environmental protection and conservation and a system through which environmental control can be policed and implemented.⁴³ It also provides for a system of integrated pollution control (IPC) affecting industrial, commercial and other processes. It appears that the Inspectorate (HMIP) in England and Wales and Her Majesty's Industrial Pollution Inspectorate in Scotland will control at all stages major processes such as power, oil, cement, asbestos, and chemical industries. Other less polluting processes will be subject to lesser control by local authorities.

However, the process has proved to be rather unsatisfactory. The EPA does not set absolute targets for levels of discharge but establishes a framework in which the Inspectorate can look at the whole of the manufacturing process to select the best method of discharge to ensure the best outcome for the environment.⁴⁴ This method, on the other hand, might involve an increase in emissions to the air to avoid a much more dangerous discharge to water.⁴⁵ The implication would still be the same because, if the air become more polluted, acid rain will find its way into the ground and contaminate groundwater.

The present law on long term reduction in pollution from agriculture is complicated. Groundwater is extremely vulnerable to incidents of pollution from agriculture. Where there is contamination of groundwater, it may take many years to recover. It appears that, while the Water Resource Act 1991 policy is more towards "one of containing and disposing" of wastes from agriculture, the high risk of major incidents will remain.

It was suggested by NRA that if rapid progress is not made with farm waste management plans, new provision under s 92 of the WRA should be provided to the effect that persons with custody or control of defined waste-including such materials as pesticides and other chemicals and their containers, animal carcasses, and animal slurry, should take certain precautions in their disposal under a "duty of care" system.⁴⁶ The water protection zones envisaged in s 93 of the WRA 1991 appear to be an excellent tool for protecting against groundwater pollution. It is for the NRA to initiate the designation of Water Protection Zones (WPZs) and Nitrate Sensitive Area's (NSAs) by applying to Ministers for orders. Schedules 11 and 12 of the WRA lay down the requirements as to publicity for proposals and procedures

43 T G Peterkin, "Groundwater Contamination: Approaches to the Regulative and Clean-up in the UK and EC," in P Thomas (ed) *Water Pollution Law and Liability*, (Graham & Trotman London 1993) 33.

44 Ibid.

45 Ibid.

46 Ibid.

for making, receiving and consideration of objections. Schedules 12 further provides that the NRA shall not apply for an NSA designation unless it appears to them that pollution is likely to result from the entry of nitrate into controlled waters as a result of agricultural purposes carried out on particular land.⁴⁷ But ironically no water protection zones have yet been designated under the WRA or COPA 1974.⁴⁸ This is partly because the use of those powers has always been strongly opposed by agricultural interest and, in Britain, farmers seem to have strong influence on the Government.⁴⁹

The main features of the proposed Water Protection Zones (River Dee Catchment) Designation Order 1993 would be a requirement for the NRA's consent before the storage and use of particular chemicals substances within certain industrial sites.⁵⁰ However, the power has not been used.⁵¹ This is partly because of the complex nature of chemical pollution where it involves other requirements such as demonstration of a satisfactory risk assessment for both the operation and storage of the substances concerned.

Another limitation of s 93(3) of WRA is that a water protection zone should not concern itself with nitrate from agricultural sources because protection against nitrate is provided in s 94. It was also argued that s 94 was hurriedly written into the legislation due to public pressure and concern about high nitrate content in drinking water. Another argument is that it was introduced because of political reason after an action was brought against the British Government in the European Court of Justice for non-compliance with the EC Directive 80/778 on Drinking Water.

Section 161 allows the NRA to carry out operations itself to prevent or clean-up pollution if the circumstances warrant it, and recover the cost from the person responsible. Potentially, s 161 is an extremely powerful weapon. Nevertheless, in practice this power is only of limited use in controlling disposal of, for example, slurry, animal carcasses and used pesticide containers.⁵² It appears that groundwater which is vulnerable to nitrate pollution may also be vulnerable to pesticide pollution.

Another shortcoming of the WRA 1991 is that a licence to abstract water or a right to abstract without the need for a licence, gives rise to a "protected right" under the WRA 1991. Significant proportions of those protected rights are held by farmers.⁵³ This has resulted in a serious constraint on the NRA's ability to manage water

47 D Hughes, above 40 at 389.

48 Ball and Bell, above n 23.

49 Ibid.

50 Stephen Tromans (ed), *Water Protection Zones, Environmental Law Bulletin* (London-Sweet and Maxwell 1994) 19.

51 Ibid.

52 National River Authority Report, above n 4.

53 T G Peterkin, above n 43 at 86.

resources properly. To ensure full protection of the rights, they should be registered with the NRA.

On closer analysis, the legislation above remains weak with regard to the environmental controls on the storage and use of raw materials in industrial processes which present a similar, if not greater, risk of pollution. For example, industrial usage of chlorinated solvents is not specifically controlled in relation to the water environment, although the opportunity to bring in regulations exists under s 94 of the Water Resources Act 1991. It seems that at present small amounts marginally contaminated waste are spilled onto, and soak away into, land as a daily occurrence. Consequently chlorinated solvent contamination of aquifers beneath urban areas such as Coventry, Birmingham and Dunstable is widespread. These are good examples of where numerous point sources of pollution have combined to produce the effect of diffuse pollution over widespread areas.⁵⁴ The intensification of farming has resulted in nearly 2.5 million tonnes of mineral fertilisers as plant food being applied annually to land (Fertiliser Manufacturers Association, 1990). In 1990, the DOE's nitrate Co-ordination Group reviewed long term data from 25 rivers and short term data from 144 sites and concluded that nitrate concentrations had increased at varying rates.⁵⁵

It is argued that, since too much flexibility is given to farmers on nitrate control, the objective of the legislative will not be reached. The increase in part-time farming has increased the number of farms. This intensification had led to farmers breaking out of the pattern of traditional agriculture, where self-sufficiency resulted in little being brought into the farms, and where the land was capable of coping with its wastes.⁵⁶

Remedial solution

The fragmented system of pollution controls applicable in the United Kingdom was subjected to serious criticism in environmental management terms, and lacked a coherent and holistic approach to environmental regulation.⁵⁷

It was suggested that consolidation of pollution regulation authorities was needed to achieve greater integration of pollution control in relation to the environment as a whole, as contrasted with the previously sectoral approach to the different environmental media.⁵⁸ The legal response of this, under the Environment Act 1995, has been the consolidation in a single authority, the Environment Agency for

54 R C Harris, "Groundwater Protection and Risks" (NRA, Severn-Trent Region 1993) 7.

55 *Ibid* at 86.

56 *Ibid*.

57 William Howarth, "Self-Monitoring, Self-Policing, Self-Incrimination and Pollution Law" (1997) *The Modern Law Review Limited* at 202.

58 *Ibid*.

England and Wales, of the former functions of the National Rivers Authority (in relation to aquatic environment), the functions previously discharged by Her Majesty's Inspectorate of Pollution (in relation to industrial process regulation), certain functions which were previously the responsibilities of the local authorities (in relation to waste management regulation) and some environmental matters that were previously the responsibility of the Department of the Environment.⁵⁹

Hence, the establishment of the new agency has harmonised the system of pollution controls in the UK. In particular, the Agency is given an explicit duty in relation to sustainable development.⁶⁰

Conclusion

In order to maintain and improve the quality of groundwaters, it is necessary to minimise the risk of pollution from farms and other industries. The threats to groundwater are increasingly being recognised as widespread.

The UK has been several years ahead in legislative innovation in the protection of groundwater. Some of the weaknesses of the UK system offer relevant lessons for Malaysia. Malaysia could greatly improve its system of legal protection of groundwater by adopting the better policies and mechanism of the British system.

In the UK, the WRA 1991 helps to strengthen the legislation relevant to the protection of groundwater. It is suggested that the Malaysian government should emulate the British system by providing provision for the DOE to be fully equipped to reduce the impact of groundwater pollution. The DOE should be well prepared for the whole range of incidents which are likely to occur, for example pollution from nonpoint source, ie pesticide and nitrate.

It is recommended that the DOE promotes a structured approach to the planning and disposal of waste from farms and industrial and housing estates. It is also recommended that existing discharge consents for Industrial effluent are reviewed and revoked where appropriate. The DOE or Ministry of Agriculture may need to guide farmers and factory owners in formulating alternative disposal plans. Owners should have, as part of their individual waste management plans, a list of actions to follow in an emergency and also to inform the DOE promptly in case of any incident. It is also recommended that more regulations should be devised on agricultural practices, ie application of fertilisers and pesticides to land, run-off from highways, golf courses and parking lots.

59 Ibid.

60 Ibid.

It is necessary to implement overall river management plans and strategies at State and Federal levels, similar to coastal zones management plans which are being developed in some States.⁶¹ Industries and farmers should be more environmentally conscious and treat waste discharge as a serious issue. The large number of deaths from the recent outbreak of the viral encephalitis in the pig farming community is a lesson for all communities.

Water related diseases are a human tragedy, killing millions each year.⁶² The natural capacity of aquifers to purify ground water must not be destroyed by contamination from human activities. Rehabilitation of contaminated soils or aquifers, if possible at all, frequently requires many years, or even generations. Therefore, it is important to draft effective legislation and develop an integrated approach for the management of both surface waters and groundwaters.

Perhaps, Malaysia should emulate the UK by establishing a unified environmental authority where it would be easier for regulated bodies to have only one inspectorate to approach.⁶³ This would avoid overlap or duplication of effort which might arise with separate regulatory authorities.⁶⁴ On the other hand, combining authorities under one management would lead to greater consistency of approach across all pollution types and environmental media.⁶⁵

61 *The New Straits Times*, 27 April 1999.

62 *Ibid.* 30 May 1999.

63 See Howarth, above n 57 at 202.

64 *Ibid.*

65 *Ibid.*