

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/43344337>

Issues and Framework of Environmental Health in Malaysia

Article in *Journal of Environmental Health* · April 2010

Source: PubMed

CITATIONS

8

READS

4,245

2 authors:



Mazlin Mokhtar

National University of Malaysia (UNIVERSITI KEBANGSAAN MALAYSIA) ; UKM

272 PUBLICATIONS 2,568 CITATIONS

[SEE PROFILE](#)



Md Wahid Murad

University of South Australia

94 PUBLICATIONS 910 CITATIONS

[SEE PROFILE](#)

Some of the authors of this publication are also working on these related projects:



Links between Income and Energy Consumption in Bangladesh [View project](#)



Issues and Framework of Environmental Health in Malaysia [View project](#)

▶ INTERNATIONAL PERSPECTIVES

Issues and Framework of Environmental Health in Malaysia

Although most of the information presented in the Journal refers to situations within the United States, environmental health and protection know no boundaries. The Journal periodically runs International Perspectives to ensure that issues relevant to our international constituency, representing over 60 countries worldwide, are addressed. Our goal is to raise diverse issues of interest to all our readers, irrespective of origin.

Mazlin Bin Mokhtar, PhD
Md. Wahid Murad, PhD

Abstract Environmental health problems in Malaysia are mostly attributed to atmospheric pollution, water pollution, climate change, ozone depletion, and solid waste management, as well as toxic, chemical, and hazardous waste management. The Ministry of Health, Malaysia, has been vigorously pursuing the environmental health agenda by collaborating with other agencies at district, state, national, and international levels. This article discusses the issues and management framework of environmental health in Malaysia. Some issues requiring further investigation in order to clearly understand the trade-off between atmospheric change and environmental health are suggested. These suggestions are developed with particular reference to appraisals concerned with the development and implementation of environmental policy, programs, and practice. Research on the relevant issues is discussed and a framework is built involving a comprehensive review of the literature and existing framework of Malaysian environmental health.

Introduction

Malaysia has experienced remarkable social, economic, and environmental development over the last three decades. This development is mainly due to industrial development, technological advances, and a stable political environment. The country's social and economic transformation has resulted in both positive and negative environmental effects on the health and safety of its people. Malaysia has been ranked 59 out of 175 countries in the Human Development Index (HDI), with a medium level HDI of 0.79 (United Nations Development Program [UNDP], 2004). According to Wikipedia, "the HDI is an index used to rank countries by level of 'human development,' which usually also implies whether a country is a developed, developing, or an underdeveloped

country (Wikipedia, 2009b)." The HDI is claimed as a standard means of measuring human development, a concept that according to the United Nations Development Program (UNDP) refers to the process of widening the options of persons, giving them greater opportunities for education, health care, income, employment, and so forth. Among Association of Southeast Asian Nations (ASEAN) countries, Malaysia had the best sustainability index, with an Environmental Sustainability Index (ESI) score of 54.0 (Association of Southeast Asian Nations [ASEAN] Secretariat, 2006). The ESI is "a composite index tracking 21 elements of environmental sustainability covering natural resource endowments, past and present pollution levels, environmental management efforts, contributions to protection of the global

commons, and a society's capacity to improve its environmental performance over time (Wikipedia, 2009a)." Malaysia scored well in three of the five ESI components, namely, environmental systems, human vulnerability to environmental stresses, and social and institutional capacity to respond to environmental stresses. Related to environmental sustainability is the concept of ecological footprint, which is "a resource management tool that measures how much land and water area a human population requires to produce the resources it consumes and to absorb its wastes under prevailing technology (Global Footprint Network, 2006)." Malaysia's ecological footprint (including food, fiber, timber, and energy footprints) was the highest among the eight countries in the Southeast Asian region where data were available. Malaysia needed 2.4 global hectares per person per year to meet its resource requirements. Its footprint in 2002 was higher than the average of the entire world, middle income countries, and Asia Pacific countries (ASEAN Secretariat, 2006). Malaysia's total bio-capacity (or resource supply) was higher than its ecological footprint (or resource demand) resulting in a reserve of 0.9 global hectares per person.

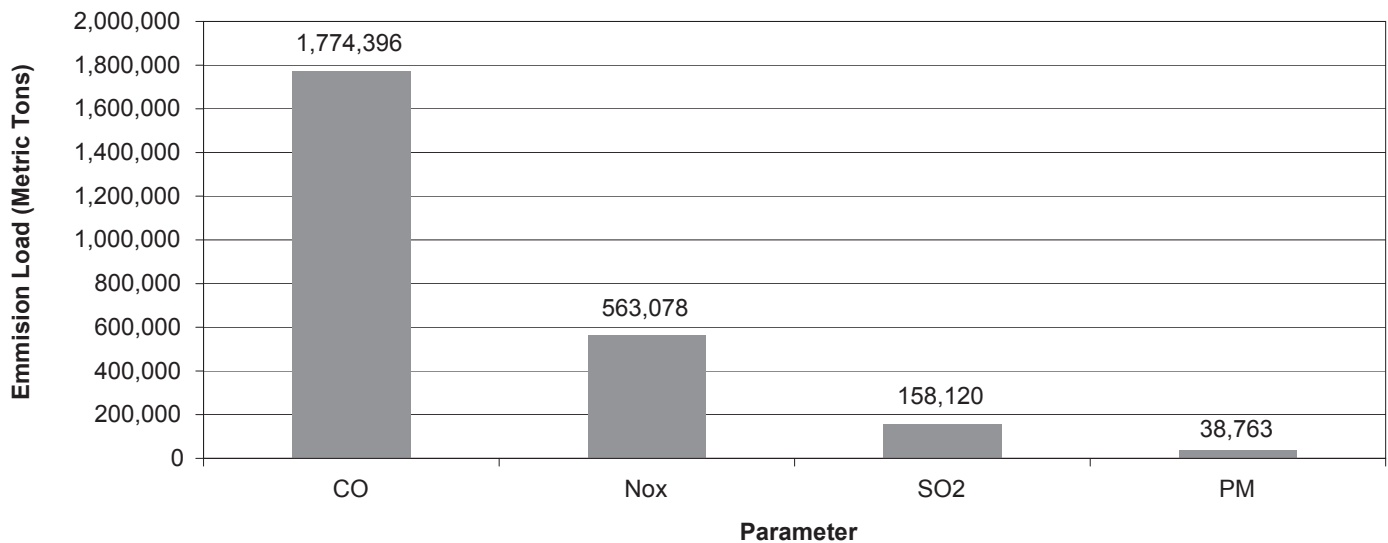
Key Issues and Management Framework

Air Quality

Malaysia installed nationwide air quality monitoring networks to keep track of air quality in various places such as residential areas, industrial areas, commercial areas, roadside areas, and reference areas. The Department of Environment (DOE) of Malaysia contracted out national air quality monitoring to a pri-

FIGURE 1

Air Pollutant Emission Load from All Sources in 2007



Source: Compiled from Department of Environment (2007).

vate company, namely Alam Sekitar Malaysia (ASMA) Sendirian Berhad (Private Limited). The company provides continuous ambient air and manual air quality monitoring using 51 continuous and 25 manual monitoring stations. In addition, the Department of Environment, with assistance from Germany, has designated four “hotspots” in Kuala Lumpur where air quality is measured by a MiniVol Portable Air Sampler. To further ensure the protection of ambient air, the DOE has taken steps to ensure that fuels used in industries and motor vehicles do not produce harmful air pollutants or only produce the minimum of harmful air pollutants that may adversely affect the health of people and the quality of the environment. The main sources of air pollution identified, however, were stationary sources (e.g., industries), mobile sources (e.g., motor vehicles), open burning, and transboundary haze pollution. Only during a few sudden occasions has the Air Pollution Index (API) in some areas of Malaysia reached dangerous levels (Department of Environment, 2007) (Figure 1).

Water Quality

Water resources in Malaysia belong to the state and thus water supply management and development in the country is not centralized, but is managed on a state-by-state basis. In 2002,

the WHO/UNICEF Joint Monitoring Program in its Country, Regional, and Global Estimates on Water and Sanitation revealed that 95% of Malaysian households have access to improved drinking water facilities. In 2001, the percentages of water samples that were able to meet the national standards were 98% in terms of bacteriological quality, 96% in terms of residual chlorine, and 96% in terms of turbidity (Pillay, Sinha, & Talha, 2003). Over the last two decades a decline has occurred in food-, water-, and sanitation-related diseases in the country, which can be attributed to improvements in the supply of safe water, hygienic food practices, and sanitation.

The government of Malaysia continually outlines the policies and strategies to ensure accessibility to safe and clean drinking water supply and sanitary facilities in its national plans. These policies and strategies promote collaboration between relevant agencies in preventing and controlling contamination of raw water sources used for consumption and the continuous monitoring and surveillance of drinking water quality. The country also formulated several acts that serve to protect water sources from contamination. The Ministry of Health established the National Drinking Water Quality Standards (NDWQS) in 1983 stipulating limits for physical, chemi-

cal, microbiological, and radiological parameters and compliance with these standards is mandatory for all private water suppliers.

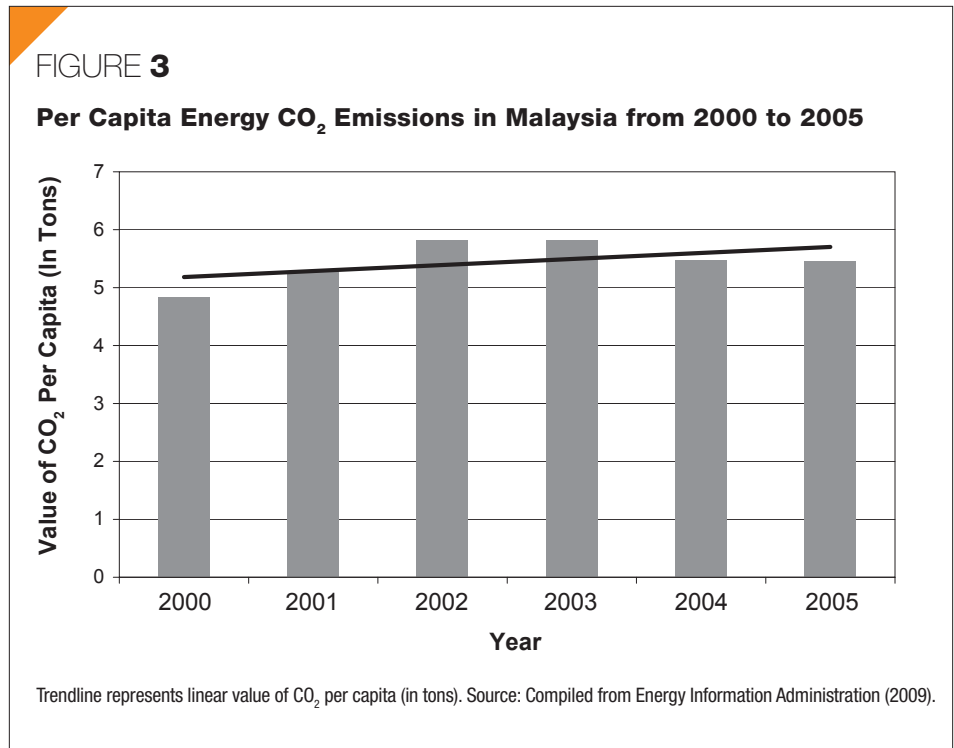
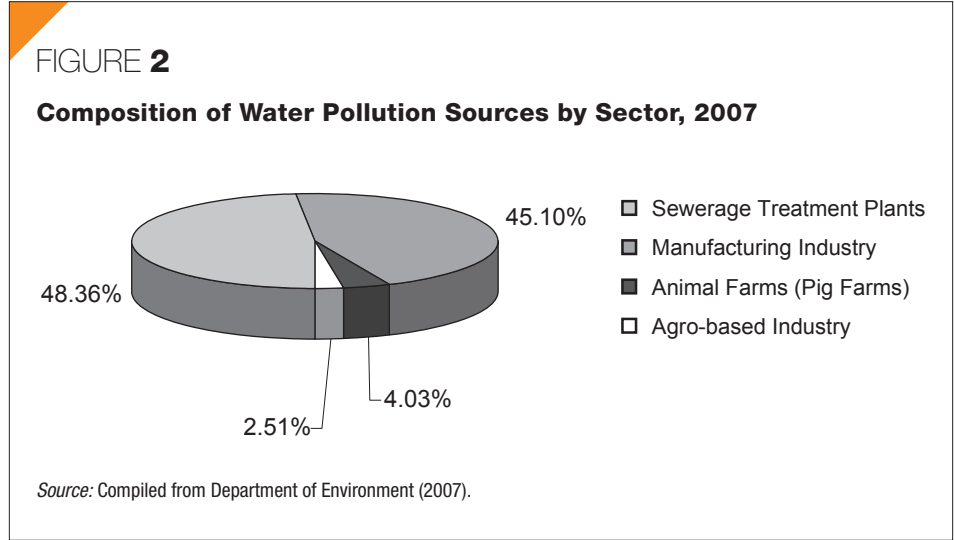
The main sources of river water pollution include discharge of domestic sewage, pollutants from agro-based industries/farming, run-offs from earthworks and land clearing, and effluent discharge from manufacturing activities. Malaysia implemented integrated water resources management (IWRM) and integrated river basin management (IRBM) approaches to improve river and groundwater quality and to reduce the number of polluted rivers in the country (Economic Planning Unit, 2006; Mokhtar, 2003; Mokhtar, Lee, & Nawawi, 2001). Under these approaches, public sewerage systems have been upgraded and additional centralized sewerage treatment plants have been constructed to reduce the discharge of inadequately treated wastewater into river systems. Gross pollution traps and sedimentation ponds have also been installed at critical locations in river basins to reduce the outflow of nonpoint-source pollutants. Siltation and erosion control have been tackled through the amendment of existing laws. Relevant law enforcement has been intensified to ensure that effluent discharges adhere to environmental standards in order to maintain environmental health (Figure 2).

Climate Change

Malaysia has ratified the United Nations Framework Convention on Climate Change and Kyoto Protocol, which aims to reduce the amount of greenhouse gases in order to deal with global warming. The total amount of carbon dioxide emissions in the country is still much lower than most developed countries, but it is increasing. Malaysia has undertaken a number of measures to reduce greenhouse gas emissions including improving public transportation and introducing cleaner fuels such as natural gas and biofuels. The country is also actively participating in the Clean Development Mechanism (CDM) under the Kyoto Protocol. Malaysia has developed programs to increase renewable energy share in its energy mix for energy supply security (Yen, Sopian, Ali, & Mokhtar, 2008). At present there are nine companies involved in energy generation using biomass and one involved in fuel switching. The emission reductions from these projects were estimated to be 1,615,972 tons equivalent CO₂ per year (UNDP, 2006). Also, the country has programs to adopt low CO₂ emission measures and technologies such as replacing oil and coal with natural gas and adopting clean coal technologies. Malaysia provides various fiscal incentives to encourage the use of renewable energy and to improve energy efficiency. The companies providing energy conservation services can apply for pioneer status with tax exemption of 70% of statutory income for a period of five years or an investment tax allowance (ITA) of 60% on the qualifying capital expenditure incurred within a five-year period. The companies are also given import duty and sales tax exemptions for equipment used in related projects that are not produced locally. Equipment purchased from local manufacturers is given a sales tax exemption. For companies that incur capital expenditure for conserving energy for their own consumption, the incentives provided are accelerated capital allowance on related equipment that can fully be given up for lost within a period of one year and import duty and sales tax exemptions for equipment used in energy conservation (Figure 3).

Ozone Depletion

Malaysia has long been a consumer but not a manufacturer of ozone-depleting substances (ODS), which, until recently, have been imported mainly from the U.S., the United



Kingdom, Germany, Italy, Greece, and Japan (UNDP, 2007). Malaysia had been involved with the Montreal Protocol in 1987 when the country was invited to attend the Conference of Plenipotentiaries on the Protocol on Chlorofluorocarbons (CFCs) at the Vienna Convention for the Protection of the Ozone Layer, which was held in Montreal. Upon recognizing the importance of the conference, Malaysia responded with an outline of its future environmental strategies and action plans, and subsequently ratified the Vienna Conven-

tion and the Montreal Protocol on August 29, 1989. Since ratification, the country has formulated policies and strategies to restrict and limit the use of ozone-depleting substances, and it closely monitors the importation and consumption of controlled substances. It also promotes the use of non-ozone-depleting substances substitutes and alternatives in existing industries. Malaysia's success in implementing the Montreal Protocol can be seen in declining imports and consumption of CFCs, from 3,442 metric tons in 1995 to 662 metric tons

FIGURE 4

Solid Waste Management Conditions in Malaysia

- About 17,000 tons of waste are generated per day in peninsular Malaysia.
- Average per capita generation of waste is 0.85 Kg/per day.
- Per capita generation of waste in Kuala Lumpur is about 1.5 Kg/per day.
- About 76% of waste generated is collected by private and municipal waste collection agencies.
- 1%–2% of waste is recycled and the rest is taken to disposal sites.
- Over 40% of 179 disposal sites are being operated as dump sites.
- Intermediate treatment is limited to small-scale thermal treatment plant in remote islands.
- Generation of solid waste is expected to reach 30,000 tons per day in 2020.

Source: Compiled from Ministry of Housing and Local Government (2007).

in 2005. This indicates that there was an overall decrease of more than 80% between 1995 and 2005. Globally, the Montreal Protocol is seen as one of the most successful international conventions and Malaysia has made substantial progress in implementing the Protocol. In implementing the Montreal Protocol, the country has also strengthened its institutional framework by establishing the Ozone Protection Section (OPS) under the DOE. The Malaysian government was awarded the following awards for its successful efforts with other stakeholders including the private sector and non-governmental organizations (NGOs) in meeting the ODS targets well before the deadlines: United Nations Environment Program (UNEP) Global Ozone Award 1995, U.S. Environmental Protection Agency (U.S. EPA) Stratospheric Ozone Award 1996, UNEP Ozone Award 1997, and U.S. EPA Best of the Best Stratospheric Award 1997 (Mokhtar, Ghani, Mohamed, & Manaf, 2003).

Solid Waste

Malaysia has significantly resolved solid waste-related problems by formulating necessary policies, taking appropriate actions, and engaging both public and private sectors. Due to a growing population and increased consumption, the amount of solid waste generated in peninsular Malaysia increased from 16,200 tons per day in 2001 to about 17,000 tons in 2007. This indicates that an average of 0.85 kilograms of waste is generated by one person per day with an increasing trend in waste generation. Over the period from 1991 to 2020, waste generation is estimated to increase by an average of 3.24% per annum, although this

is expected to fall subsequently in later years with the implementation of waste management measures (Said, 2003). In Malaysia, environmental health problems that originate from improper solid waste management are mainly related to people living in urban, underdeveloped areas and informal settlements. Since the government has been working to minimize developmental disparity throughout the country and resettle the urban poor in low-cost flats and long-houses, the problems of urban poverty and resulting solid waste management are expected to be minimized in the years to come. At present, 76% of municipal solid wastes are disposed of properly while the rest is thrown into illegal dumps, drains, canals, and rivers. Disposal methods for municipal solid waste in Malaysia comprise of 10% composting, 50% open dumping, and 30% landfilling (United Nations Environment Program [UNEP], 2004) (Figure 4).

The National Strategic Plan for Solid Waste Management has already been implemented with emphasis on upgrading unsanitary landfills as well as construction of new sanitary landfills and transfer stations with integrated material recovery facilities. Priority will continue to be accorded to the reduction, reuse, recovery, and recycling of waste as well as greater use of environment-friendly materials such as bioplastics. Legislation to streamline solid waste management has been enacted to facilitate the implementation of strategies and measures in the strategic plan. The activities and campaigns for raising awareness have been promoted to educate the public on the benefits of practicing sustainable consumption and solid waste management. The Department of National Solid

Waste Management has been established under the Ministry of Housing and Local Government with the view to establish a comprehensive, integrated, cost-effective, sustainable, and socially acceptable solid waste management system.

Toxic, Chemical, and Hazardous Wastes

Malaysia practices the most acceptable method of disposal for hazardous wastes through the use of sanitary landfills. The country has developed hazardous waste incinerators. 2004 data reveal that the total amount of hazardous wastes generated in the country was 460,866 metric tons, out of which approximately 18.8% was treated and disposed in the toxic waste treatment and disposal facility in Bukit Nanas, Negeri Sembilan State; 58.0% was recycled and recovered at licensed premises; 19.7% was treated and stored within the premises of generators; 0.7% was exported for recycling; and 2.7% was disposed at clinical waste incinerators (Economic Planning Unit, 2006). The Department of Environment (DOE) established an inter-agency body, namely the Technical Committee on Banned and Severely Restricted Chemicals, to oversee the implementation of a national plan and country program on toxic, chemical, and hazardous wastes.

Malaysia approaches the management of toxic, chemical, and hazardous wastes in an integrated manner, involving various actors and agencies (Mokhtar et al., 2003). These include the National Task Force on the Ozone Layer, various ministries, universities and research institutions, industry, and NGOs. Three regulatory instruments have controlled the generation, distribution, treatment, and disposal of toxic chemicals and hazardous wastes since 1989. These regulatory instruments include: 1) Environmental quality: Regulation 1989; 2) Environmental quality (prescribed premises): Order 1989; and 3) Environmental quality (prescribed premises): Regulation 1989. A comprehensive act, namely the Environmental Quality Act 1974, with its latest amendment in 2001, is being developed to consolidate all toxic chemical related rules and regulations, including proper use, storage, handling, transport, labeling, and disposal. The DOE promotes and sponsors various programs including: 1) training on the environmentally sound management of toxic, chemicals, and hazardous wastes; 2) education and awareness building for the general public; 3) consultations with industry sec-

tors; 4) regional and international cooperation; and 5) research and development. The government provides incentives to promote the recovery and reutilization of wastes. Various incentives are available under the Promotion of Investment Act of 1986, which grants pioneer status to companies for a five-year period to receive, store, and treat hazardous wastes in an integrated and environmentally sound manner. Companies are required by law to inform the authorities on the types and quantities of hazardous wastes they generate and the associated collection, storage, and processing methods used (UNEP, 2004). In addition, companies have to pay for the services on the basis of the polluter-pay principle.

Malaysia actively participates in the UNEP Food and Agriculture Organization (FAO) Prior Informed Consent (PIC) procedure, among other similar notification mechanisms. The DOE established the PIC Working Group to provide support and policy guidance to implement PIC, the UNEP's London Guidelines for the Exchange of Information on Chemicals in International Trade, and FAO's Code of Conduct on toxic chemicals. The country also ratified the Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes in 1993. Malaysia participates in various bilateral and multilateral agreements on hazardous waste management with neighboring countries such as Brunei, Indonesia, Thailand, and Singapore. It has also taken an initiative to develop the National Life Cycle Inventory Database for the development of eco-friendly products and services. The National Life Cycle Assessment (LCA) project is a mandate from the government of Malaysia under the Ninth Malaysia Plan (2006–2010). This database will be used to conduct life cycle assessment studies, support the national eco-labeling program, and fulfill the requirements of foreign legislations that demand evidence on the control measures taken to reduce environmental impact of products and services throughout their life cycle. The Malaysian government is now very committed to be a part of the global synergized effort in moving the agenda of the strategic approach to international chemicals management (SAICM) including being active in promoting the GHS (i.e., globally harmonized system for classification and labeling of chemical and hazardous substances) (Mokhtar, Ta, & Yen, 2007). The Malaysian Network on Integrated Management of Chemicals

and Hazardous Substances for Environment and Development (MyNICHE) was also established in June 2005 by the Institute for Environment and Development (LESTARI), National University of Malaysia, with collaboration of Conservation and Environmental Division, Malaysia's Ministry of Environment and Natural Resources, and support of the private sector and NGOs.

Key Issues to Be Investigated

In addition to the major environmental health issues discussed above, the following issues are important and they require a deeper investigation in order to realize appropriate directions in mitigating environmental health problems in the country:

1. Analysis on how variations in climatic conditions in Malaysia affect environmental health. Studies on heat waves and floods and resulting deaths and effects of warmer temperatures on airborne, foodborne, waterborne and insect/mosquito-borne infections could help materialize the target.
2. Investigation on the impacts of prolonged flood, drought, and unusual drying trends on well-being and health of people living in rural areas of Malaysia.
3. Assessing and identifying health risks of urban people due to changes in atmosphere. This would require an evaluation of urban development, with a focus on environmental and human health outcomes.
4. Exploring ways to strengthen capacity in public health and urban management workforces at local, state and national levels, and in the private sector. This will require the strengthening of teaching programs in public health and urban management and professional development for the existing workforce.
5. Need to develop and support a large-scale interdisciplinary approach to studying the ways in which the natural, built, and social environments influence patterns of human behaviors, exposures, and health outcomes. Studies on evaluation of natural resource management; design of cities and transport system; and types, sources, and distribution of foods could help develop and support such approach to mitigate consequential negative impacts on environmental health.
6. The drive to meet the targets of the millennium development goals should be

capitalized by all stakeholders in their continuing efforts to balance development and environment by taking into consideration the intricate and complex relationship between the human system and ecosystems.

7. Integrated and holistic approaches and initiatives should be supported by various religious groups in the country because a large majority of the citizens of Malaysia and southeast Asia and south Asia regions are believers of a specific religion or faith, and the teaching of these religions states that their believers must be stewards of the earth by safeguarding the natural resources and environment while not jeopardizing their right to develop sustainably.

Conclusion

No country in the world could ever overcome the challenges and problems of environmental health until and unless its economic, social, and environmental activities are stopped. The World Health Organization (1992 & 2003) had thus reasonably stated "we are living in an era when a range of newly recognized 'modern' environmental health issues have emerged as a direct result of overdevelopment and as yet poorly understood interactions between our economic, social, and physical environments." Malaysian government is committed to preserve and conserve the quality of environment for health, develop the environmental health unit as a center of excellence for provision of environmental health research and programs, and empower communities through awareness programs and health promotion. In view of the management of environmental health, Malaysia faces the challenges of driving the process through facilitating appropriate collaboration and producing environmental health practitioners. The country continues to play an active role in planning and implementing environmental health activities at the national level and emphasizing regional and international cooperation in addressing related environmental health issues. 🐼

Corresponding Author: Md. Wahid Murad, Senior Lecturer in Environmental and Resource Economics, Universiti Malaysia Terengganu (UMT), Department of Economics, Faculty of Management and Economics, 21030 Kuala Terengganu, Terengganu Malaysia. E-mail: mwmurad@gmail.com.

References

- Association of Southeast Asian Nations Secretariat. (2006). *Third ASEAN state of environment report 2006—Towards an environmentally sustainable ASEAN community*. Jakarta: Author.
- Department of Environment. (2007). *Malaysia environmental quality report 2007*. Putrajaya, Malaysia: Author.
- Economic Planning Unit, Prime Minister's Department. (2006). *Ninth Malaysia plan 2006–2010*. Putrajaya, Malaysia: Author.
- Energy Information Administration. (2009). *Official energy statistics from the U.S. government*. Retrieved March 8, 2009, from <http://www.eia.doe.gov/>
- Global Footprint Network. (2006). *2006 annual report*. California: Author.
- Ministry of Housing and Local Government. (2007). *Annual report 2007*. Putrajaya, Malaysia: Author.
- Mokhtar, M.B. (2003). Water and health in Malaysia: Integrated water resources management approach for sustainability. *Environmental Health Focus*, 1(2), 64–68.
- Mokhtar, M.B., Ghani, S.A.A., Mohamed, A.F., & Manaf, N.H.A. (2003). Managing and regulating hazardous and toxic substances. *Environmental Policy and Law*, 33(6), 268–273.
- Mokhtar, M.B., Lee, Y.H., & Nawati, H.M. (2001). Water quality of discharge from a golf course and its effect on the Langat River: Towards an integrated river basin management. *The Malaysian Journal of Analytical Sciences*, 6, 157–161.
- Mokhtar, M.B., Ta, G.C., & Yen, C.H. (2007). *Roundtable dialogues no. 13: Stepping stones towards a sound chemical management system for Malaysia (MyNICHE-2)*. Bangi, Selangor, Malaysia: Institute for Environment and Development (LESTARI).
- Pillay, M.S., Sinha, K., & Talha, M.Z.M. (2003). Water quality and health. *Environmental Health Focus—Managing the Environment for Health in the Asia Pacific*, 1(2), 8–11.
- Said, M. (2003). Solid waste management in Malaysia—The way forward. *Environmental Health Focus—Managing the Environment for Health in the Asia Pacific*, 1(2), 12–16.
- United Nations Development Program. (2004). *UNDP human development report 2004*. New York: Author.
- United Nations Development Program. (2006). *Malaysia—Achieving the millennium development goals: Success and challenges*. Kuala Lumpur: Author.
- United Nations Development Program. (2007). *Protecting the ozone layer: Malaysia implementing the Montreal Protocol*. Kuala Lumpur: Author.
- United Nations Environment Program—Division of Technology, Industry and Economics-International Environmental Technology Centre. (2004). *State of waste management in South East Asia*. Osaka, Japan: Author.
- Wikipedia. (2009a). *Environmental sustainability index*. Retrieved December 11, 2009, from http://en.wikipedia.org/wiki/Environmental_Sustainability_Index
- Wikipedia. (2009b). *Human development index*. Retrieved December 11, 2009, from http://en.wikipedia.org/wiki/Human_Development_Index
- World Health Organization. (1992). *Our planet, our health. Report of the WHO Commission on Health and Environment*. Geneva: Author.
- World Health Organization. (2003). *Climate change and human health: Risks and responses*. Geneva: Author.
- Yen, C.H., Sopian, K., Ali, B., & Mokhtar, M.B. (2008). Energy indicators for sustainable development in Malaysia. *European Journal of Social Sciences*, 6(2), 213–231.

Advertise

in the **Journal of Environmental Health**

Be seen by **20,000+** environmental health readers!

Call now! 303.756.9090, ext. 340

Ask about special rates for first-time advertisers and long-term contracts.

Copyright of Journal of Environmental Health is the property of National Environmental Health Association and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.