

SUSTAINABLE DEVELOPMENT INDICATORS REPORT FOR MALAYSIA

By FORUM 21

CHAPTER 1: INTRODUCTION

Since the concept of sustainable development arose, the Malaysian government has sought to promote holistic development. It began to implement proactive policies and strategies at different levels from the 7th Malaysia Plan onwards.

However, the rapid pace of development undertaken in Malaysia has also resulted in severe environment degradation, depleting non-renewable resources and social inequity whilst bringing improvements in economic growth.

After 22 years of the historic Rio Summit in Rio de Janeiro, how far has the Malaysia been successful in achieving sustainable development? How sure are we on the right path in achieving better quality of life for everyone now and for generations to come?

Sustainable development indicators [SDIs] provide an empirical and numerical basis for evaluating performance, for calculating the impact of our activities on the environment and society, and for connecting past and present activities to attain future goals. These indicators should be able to give a broader, clearer state of the phenomenon. Hence, sustainable development should address not only economic growth but also social progress and environmental protection, the three pillars of sustainable development being interdependent. Without a proper measurement to track all types of valuable assets, we will lose these assets without realizing it.

In the Malaysian context, assessments of sustainable development have been attempted [more as quality of life indices] by government as well as international institutions. This is the first attempt by a Malaysian group of non-governmental organizations (NGOs) to establish its own set of SDIs to assess Malaysia's sustainable development performance. This initiative has come from Forum 21 which aims to put in place a system which can help the public and policy makers focus on the objectives, link them to clearer goals and targets and assess the effectiveness of policies.

Forum members have sought to use publicly available data to draw up the SDIs. There have been problems because of the paucity of data and the difficulty of tying such data to sustainable development concepts. Hence this first attempt is limited in scope.

In this Report, the SDIs deal with **health** [Federation of Family Planning Associations, Malaysia (FFPAM)], **gender equity** [National Council of Women's Organisations (NCWO)], **energy** and **transportation** [Centre for Environment, Technology and Development, Malaysia (CETDEM)], **water resource utilization** [World Wide Fund for Nature Malaysia (WWF-Malaysia)], and **social equality** [Socio Economic & Environmental Research Institute (SERI)].

We hope that through this Report, policy makers as well as the public can fully use these indicators to know what sustainability we have achieved and what irreversible impacts we have had to the environment. Of course, learning from mistakes should help steer us to the correct path.

CHAPTER 6: WATER RESOURCES

World Wide Fund for Nature Malaysia (WWF-Malaysia)

1.0 Introduction

Development is not possible without water¹. Therefore, water resources must be developed and managed in a sustainable manner to ensure the social, economic and environmental development of the current and future generations are not jeopardized.

Because of the strong water-development linkage, and as water is a common factor that cuts across all sectors of development, monitoring the sustainability of water resources can effectively provide an indication of sustainable development in a country. Hence, the Sustainable Development Indicators (SDI) for water as compared to other SDIs is perhaps the most representative of sustainable development.

This paper presents the assessment of major issues pertaining to the sustainability of water resources use and development in Malaysia, and recommends appropriate SDIs for measuring the sustainability of water resources.

1.1 Water Resource Availability

Malaysia is considered a country "rich" in water resources. The country receives an average of about 3,000mm rainfall annually which makes up a total volume of some 990 billion cubic metres (BCM) (1 BCM = 1 million Mega litres) of total annual water resources. Of this amount, 360 BCM comprise unavailable water that is needed to maintain the process of evapo-transpiration within the water cycle. The remaining 630 BCM (i.e. groundwater of 64 BCM plus surface runoff of 566 BCM) constitute the country's total available water. This amount translates to approximately 20,000 cubic metres of water available per person per year. However, due to the degradation of water resources and water catchments, the amount of available and usable water may be much less than this figure. Based on this premise, an estimate of 5,400 cubic metres per capita per year was suggested by Salmah Zakaria & Rafidah Kassim (1999). Yet when compared with the amounts of water resources available to people in many of the African countries where the per capita renewable water is commonly less than 1,000 cubic metres per capita per year, the corresponding amount available to Malaysians is truly enormous.

Table 1: Estimated Total Annual Water Resource in Malaysia

(Source: Hj. Keizrul bin Abdullah, 1998)

(Note: 1 BCM (Billion Cubic Metres) = 1 Million Mega litres)

Hydrological Parameter	Total Volume per Annum (Billion m³)
1. Annual Rainfall (3,000 mm)	990
2. Evapo-transpiration	360
3. Effective Rainfall (1 – 2)	630
4. Surface Runoff	566
5. Groundwater Recharge	64
6. Total Water Demand	15.5 (2.7 % of Surface Runoff)

¹ Water is taken to mean freshwater, unless specified otherwise.

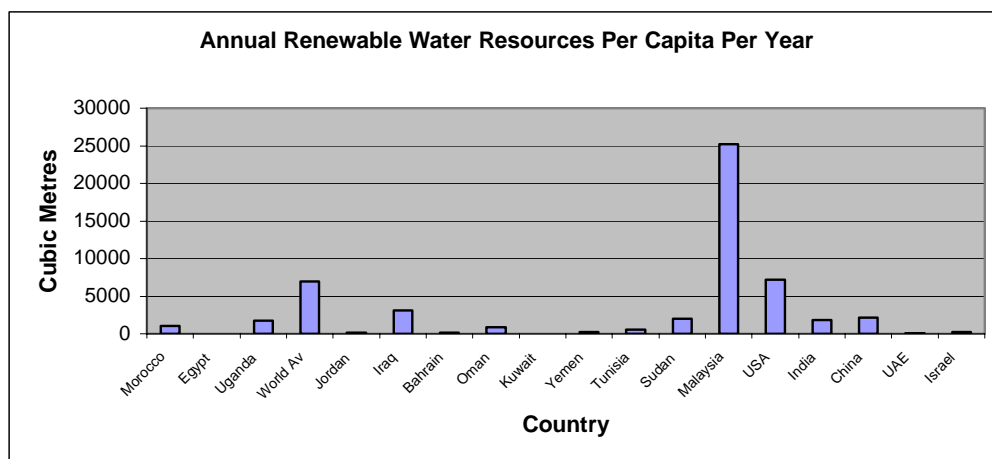


Figure 1: **Per capita renewable water** (m³/year) in selected countries compared with Malaysia (Note that the stress line is about 1,700 m³/year) (Source: <http://earthtrends.wri.org/text/FRE/variables/694.htm>)

1.2 Major Water Issues Affecting Sustainable Development in Malaysia

Amongst the many water issues affecting the sustainable development of the country, the major issues were identified and explained in Table 2.

Table 2: Major Water Issues Affecting Sustainable Development in Malaysia

(Source: Chan 2003)

No.	Issues	Explanation
1	Over-emphasis on Water Supply Management (WSM)	The traditional approach of WSM (involving the building of dams, water treatment plants, pipes for water supply distribution) in solving increasing water needs in Malaysia is not sustainable. A more comprehensive approach of managing water supply and demand (involving elements such as water conservation and recycling) is required to ensure a more sustainable utilization of Malaysia's water resources.
2	High rates of water wastage	Rates of water wastage are very high in the domestic, industrial and agriculture sectors. For example, in 2001, Malaysia's national average for per capita water use per day was 287 litres, which was 70% higher than the 165 litres per capita water use per day recommended by the United Nations.
3	High rates of Non-Revenue Water (NRW)	The national average of NRW is 40% (40 litres loss out of every 100 litres). By addressing the NRW issue, there would be adequate water supply and hence, no immediate need to build more new dams now.
4	Destruction and degradation of water catchments	Very few water catchments have been gazetted and legally protected. Many water catchments are exposed to incompatible development that could adversely affect our water resources.
5	Legislation and Enforcement	Most legislations relating to water are either indirect or outdated and need to be reviewed in today's context. Enforcement needs to be strengthened to address water pollution, water abuse and other water related problems.
6	Institutional issues	Too many agencies have jurisdiction over water resources both directly and indirectly. This has lead to sectoral management of water, and conflicting / competing objectives and disputes between agencies.
7	Changing weather patterns	The weather and climate changes (i.e. <i>El Nino</i> 1997/98) occurring globally and locally may render water resources inadequate in the long term. This issue needs to be taken into account in planning water resources development.

No.	Issues	Explanation
8	Privatization of the water sector	Unsuccessful privatization means unsustainable water management. The success of privatization is determined among others by transparency and accountability, and requires equity, economic and environmental considerations.
9	Low water tariffs	Water tariffs in Malaysia are amongst the lowest in the world and this leads to blatant wastage and over-usage of water. Water tariff review is needed and the process needs to be transparent, professional and involve public participation.
10	Inefficient agricultural water use	Agriculture uses about 68.2 % of total water consumption. Irrigation efficiency needs improvement because at best, it is about 50% in larger irrigation schemes and less than 40% in smaller ones. Water recycling and sustainable agriculture practices also have to be encouraged.
11	Water pollution	Water pollution significantly reduces the sustainability of water resources because the increasing cost involved in treating polluted water will not be economically viable in the long term.

2.0 Methodology

Secondary data obtained from relevant published reports that are available in the public domain were used in the assessment. Two major groups of water issues that warrant immediate attention were considered. Group 1 comprises issues relating to water availability while Group 2 comprises issues concerning water use. Under each group, the appropriate SDIs were selected according to the issues and assigned weightage by comparing with the relevant international standards in order to derive their respective SDI indices namely the **Water Availability Index (WAI)** for Group 1 and **Water Utilisation Index (WUI)** for Group 2. Finally, these two indices are combined to produce the **Water Sustainability Index (WSI)**.

3.0 Data Analysis – Water Availability and Water Use

The relevance of Group 1 issues on water availability is justified on the basis that water availability, or the lack of it, has profound impacts not just on the sustainability of water resources per se but also on the overall sustainable development for the country. The issues considered include availability of water supply based on annual surface runoff and total extractable water. Data on these issues were used to determine Malaysian's Average Annual Per Capita Renewable Water (APCRW). The Malaysian APCRW was then compared with the United Nation's recommended APCRW (or also known as water stress line which is about 1,700 m³/year) to derive the **Water Availability Index (WAI)** (Appendix B).

Meanwhile, the justification for Group 2 issues on water use is based on the grounds that uncontrolled water consumption can deplete supplies, rendering water resources unsustainable. The issues considered include water demand based on water consumption and NRW rates. Data on these issues were used to determine the Annual Actual per Capita Daily Water Consumption, which was then compared against the International Standard for water use (which is 165 Litres of Water per Capita per Day (LPCD)) recommended by United Nation to derive the **Water Use Index (WUI)**.

The WAI and WUI can be used to examine the sustainability of water availability and the sustainability of water use respectively. Higher percentage of WAI and WUI can be interpreted to mean greater sustainability in water resources availability and utilization. From the results shown in Appendix B, the WAI was found to be decreasing since the Rio Summit in 1992 from 68 % to 64 % in 1995 and declined further to 26 % in 2002. The WUI was also found to have decreased from 60 % in 1992 to 40 % in 1995 and remained at 40 % until 2002.

The **Water Sustainability Index (WSI)** derived by combining the WAI and WUI has also shown a decreasing trend from 64 % in 1992 to 52 % in 1995 and 33 % in 2002.

This reflects that water resources in Malaysia are being rapidly depleted in an unsustainable manner.

4.0 Limitations

The limited timeframe for undertaking the assessment did not allow for the generation of primary data, and therefore data were obtained entirely from published sources. As it was also not possible to carry out any analysis to verify the reliability of the data collected, the selection of data used in this study was carefully done to ensure data are from reliable sources. Other limitations include the lack of more recent data, and hence, older date sets had to be used. The lack of data also limits the number of indicators that can be used. For example, many countries use the 'Annual Surface Runoff' (i.e. water from precipitation that flows/remains on land in the form of rivers, lakes, and other types of surface water sources) as an indicator of the 'actual' amount of water available for use. However, realistically, not all water flowing in rivers or kept in lakes are clean enough to be used due to pollution. Hence, the 'Volume of Treatable Runoff' may be a better indicator of total available water but unfortunately, due to lack of data this indicator cannot be used in the assessment.

5.0 Conclusion and Recommendations

It is expected that more robust SDIs for water resources can be developed as more data becomes available. In future studies, it is recommended that more specific indicators such as Water Resources Availability Indicators, Water Supply Adequacy Indicators, Water Catchment Adequacy Indicator, Water Pollution Indicators, Water Consumption Indicators, Non-Revenue Water Indicators and Water Tariff Indicators be further developed and incorporated into the Water Sustainability Index to make it more comprehensive and indicative of the actual state of sustainability of our water resources.

The SDI has steadily declined over the period 1992 – 2002.