

Population Change and Environmental Issues in Malaysia

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1. The Science of Population-Environment

Human influence on ecological footprint was negligible for thousands of years until population numbers started to increase dramatically. For instance, prior to the Industrial Revolution, the forests of many European countries were cleared mainly for subsistence, with little effect on ecosystem functioning. By the late 17th century, the fall in mortality and higher birth rates had catalysed the spread of settled agriculture with a rapid decline in Europe's forest cover. The population growth also triggered migration within Europe. When some natural resources fell into short supply, European powers started to search other parts of the New World. These explorations later on resulted in migration not just for subsistence, but also for settlements, agriculture and industry.

Parts of Asia in contrast, have been densely populated for a longer period. In the year 1700, estimates for the South Asian region start at 146 million people. However, the population hardly increased for a

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long time period to 176 million in 1800, and about 325 million in 1900. Later on, growth became exponential resulting in 486 million in 1950 and 1357 million in 2000 (Goldewijck 2005).

Globally, between 1960 and 2012, the human population more than doubled, from three billion to over seven billion, while the size of the world economy increased by sevenfold (Crist and Cafaro 2012). By 2050 that number is projected to expand to 9 billion people. More babies, children, and adults have survived because of improved nutrition, vaccination, and better hygiene, but not by increased fertility. The explosion of humanity has decimated many animal and plant populations, or biodiversity, and causing the deterioration of many ecosystems services. Leading scientists coined the age of the Anthropocene, whereby the human species has become a powerful geological force in its own right.

Conceptually, these growth figures informed the linear perspectives assuming a direct, causal and deterministic relationship between population and environment. This view is known as Malthusian, whereby population growth is perceived to cause environment depletion because more people exert higher pressure on environmental stock through their consumption activities, which if left unchecked will lead to ecological catastrophe. According to this conventional wisdom, population growth in developing countries is regarded as a major cause for ecological degradation and natural resource depletion. The policy prescription is to urgently reduce population growth and fertility rates in the South through population policies.

There are at least two alternative views to the mono-causal Malthusian idea – the *multiplicative* approach and the *mediating* perspectives. In multiplicative approaches population is central, but linked to economic activity and technological factors associated with sustainable development. The most common formulation is the $I = P * A * T$ identity. In this scheme, environmental impacts (I) are the product of population (P), affluence (A), and technology (T). IPAT models of ‘sustainable development’ focus on reducing population pressure on the environment through improved technologies.

The mediating perspective argues that factors such as policy context, institutions, market, science and culture link population factors with environmental outcomes. Also influential are local- or region-specific dynamics and the view that population-environment relationships do not happen in a vacuum. These mediating factors deny the existence of direct, causal relation between population and environment.

As opposed to the Malthusian view of exponential population growth outstripping food production capabilities, the Boserupian hypothesis holds that agricultural production increases with population growth owing to the intensification of production (greater labour and capital inputs). High fertility in traditional societies is seen beneficial to older generations, owing to the net flow of wealth from children to parents. Also, high fertility is seen as a traditional adaptation to peak labour demands during the short cropping season. The other distinction is that Malthus saw technology as being exogenous to the population-resource condition and Boserup sees it as endogenous.

Although a dominant paradigm in the mainstream environmental discourse, many social scientists have rejected the Malthusian view because of its underlying biological/ecological underpinnings, treating humans in an undifferentiated way from other species that grow beyond the local “carrying capacity.” Cultural adaptation, technological developments, trade, and institutional arrangements that have allowed human populations to grow beyond their local subsistence base must be taken into considerations when analysing the population environment relationship.

This paper encourages the development of a richer and deeper understanding of the ways population processes interact with environmental change in the context of Malaysia. A related challenge is how to ensure this improved understanding is made available to a wide range of researchers and policymakers.

2. The Politics of Population-Environment

In the 1960s and 1970s much attention was paid internationally to the world's rapidly growing population. The view then was that because individuals simply could not act in the best interests of society, it was incumbent upon the government to intervene to appropriately manage the commons. But population growth has always been a sensitive subject since it involves religion, reproduction, cultures and severe inequities across the world. The Catholic Church, for instance, considers contraception a sin, while abortion is legal in some Muslim countries such as Tunisia and Turkey.

In 1994, the United Nations International Conference on Population and Development (ICPD in short) in Cairo was the turning point in removing the population subject from the global policy discourse, and in silencing the population-environment nexus. Many social activists became upset by India and China's population stabilization policy, calling it 'coercion'. One hundred seventy-nine countries joined the ICPD consensus, agreeing that they had a collective duty to respect and promote the right of their respective populations to decide their own reproductive outcomes, to improve their health and well-being, and to distribute such well-being more equitably among the world's many inhabitants.

Drawing attention to any connection between population growth and environmental destruction is deemed as taboo, as it is seen as disadvantageous to women who want to decide on how many children to have. The language of family planning and birth control in population programs was overtaken by a more comprehensive and rights-based notion of reproductive health. This broader approach includes not only family planning, but maternal and infant health, prevention of gender-based violence, empowerment of women and the prevention and treatment of sexually transmitted infections. Going beyond the achievement of demographic objectives, and parting with the neo-Malthusian approach, the ICPD embraced an individualistic tradition, where freedom, autonomy, capacity and desire were given more policy emphasis. As a result of this policy, funding for international family planning dropped substantially.

Because of the complexity of population interactions as well as political issues, population issues were not considered in formulation of the Kyoto Protocol and have also been largely excluded from the Intergovernmental Panel on Climate Change (IPCC) assessment reports. Some scientists and activists see the current attention to the issue of climate change as an opening in which to make the case that global warming cannot be alleviated or reversed without slowing population growth. They believe that linking population growth and climate change will help governments to see the exigency of the matter, and will place family planning back into the political realm as an urgent matter of national and environmental security. They see evident that population growth, both in industrialized or developing countries, is a contributing factor, especially so when consumption is considered the primary driver of environmental degradation and climate change.

3. Environmental Impacts of Development in Malaysia

In the debate on sustainability, the elephants in the room are population and consumption. Malaysian's per capita consumption of resources such as water and energy are on a steady climb concomitant with the country's economic success. Even Malaysia's earlier economic rise was made possible by rich natural resources such as tin, petroleum and timber together with agricultural commodities like rubber and palm oil (Aiken et al. 1982; Vincent and Ali 1997). These resources had alleviated poverty and increased human wellbeing considerably. The country has largely achieved the MDG objective of eradicating poverty, which fell from 17 per cent in 1990 to 3.8 per cent in 2009, based on the national poverty line (EPU & UNCT 2010; Hezri 2013). It has also achieved gender parity at all levels of education, surpassing parity at the universal level. With this success, Malaysia currently aims to graduate from an upper middle income to a high income economy (Hill et al 2012). Figure 1 illustrates the country's material flow from 1970 to 2008, indicating that consumption and

production patterns of natural resources and minerals have been increasing steadily throughout the years.

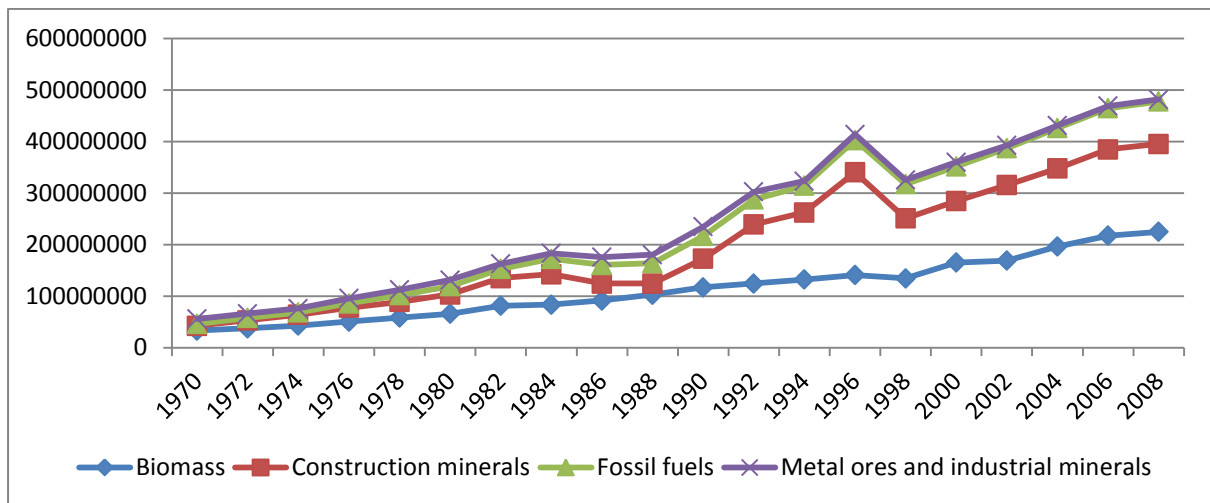


Figure 1: Material Flow Malaysia, 1970-2008
Source: CSIRO & UNEP Database, 2010

As an outcome, however, the state-of-the environment is altered from a pristine nature to a modified human landscape in just one century. The provision of environmental goods and services by the natural ecosystems is compromised as a consequence of rapid development. Indicators of unsustainability include worsening floods, escalating per capita CO₂ emission, unchecked land use conversion to agricultural and urban landscapes, poor river water quality and inefficient waste management.

3.1. GHGs emissions and energy usage

On the 2010 Climate Change Performance Index, which rates the emission levels, emission trends and climate policies of the world's 57 largest carbon dioxide emitters, Malaysia appeared in the bottom-ranked group of countries alongside countries like Canada, Australia, the USA and Saudi Arabia. Malaysia's increasing per capita energy use, if prolonged, will result in overconsumption that will end its energy-exporting status. Malaysia's total final energy demand is expected to almost double between 2010 to 2030, from 47 Million Tons of Oil Equivalent (Mtoe) in 2010 to almost 93 Mtoe in 2030 (APERC 2009; KETTHA 2008). The total primary energy supply is projected to more than double its 2005 value, increasing from 66 Mtoe in 2005 to 130 Mtoe in 2030, where fossil fuel is expected to constitute more than 90% of the total primary supply.

3.2. Water resources

The perceived abundance in water resources had also resulted in inefficiency in water usage. A survey undertaken in collaboration between the Federation of Malaysian Consumers Associations (FOMCA) and the Energy, Green Technology and Water Ministry found that Malaysians use an average of 226 litres of water a day, compared with 155 litres and 90 litres in neighbouring countries Singapore and Thailand respectively. This was much more than the 200 litres per capita per day recommended by the United Nations. It was estimated that only 80 litres of water a day is required, equating to a possible saving of up to 136 litres per person (Salleh et al 2010).

3.3. Minerals

There are indications that a new scarcity in global resources has led to renewed importance of natural resources to Malaysia's economy. For instance, whilst mining is often seen as a sunset industry in recent times, and the importance of mining to the overall economy of Malaysia has declined, some minerals have seen resurgence. Iron ore for example, has seen an increase of 934 per cent in production from 1990 to 2010. This includes a rapid 275 per cent increase from 2005 and 2010 alone with an increase of production from 949,605 to 3,557,813 tonnes within those five years (Department of Statistics 2011a). Iron ore is bringing huge returns to state governments with it being reported that the Pahang government received royalties amounting to RM 5.5 million in just for months, while the Kedah government expects revenue of RM 10 million a year (Hezri 2012). Extractive industries are known to be environmentally damaging if stringent law enforcement is not put in place.

3.4. Pollution

Urbanization, population and industrialization pressures continue to threaten the remaining natural areas and environmental quality in Malaysia. In 2011, the Department of Environment reported that 39 rivers were polluted, 3,177 open burning cases were lodged, and about 12 illegal disposals of scheduled wastes were still practiced by unscrupulous offenders (DOE 2012). Throughout 2012 and 2013, environmental degradation received wide press coverage in the mainstream news outlets in Malaysia. Despite the constellation of policies and programs on the environment by the government, in reality, it is extremely hard to bridge the gap between stated policy goals and practical strategies to achieve those goals. Inevitably, the gap had allowed environmental degradation to persist within the background of increasing land scarcity.

3.5. Biodiversity

Although Malaysia embraces biodiversity conservation, protected areas serve only as surrogate indicators for biodiversity conservation status. A study by Reza and colleagues (2013) revealed that a number of protected areas in Peninsular Malaysia are unsuitable for large mammals with big home range. Some mobile species such as elephants often move outside of protected areas, resulting in conflicts with humans. In this regard, these protected areas do not function effectively as tools for conservation. The most biologically diverse areas, the lowland dipterocarp have been excised for development long ago, whereas most protected areas are located at higher elevation with lesser constituent species to begin with. Policy reversal on protection status also threatens the outcome of biodiversity conservation. Since 1960s, backed by powerful economic forces, a number of key wildlife protected areas have been rescinded to give way to agricultural land use in Peninsular Malaysia (Abdullah et al 2012). More so when considering that the MDG target of reducing the rate of loss of forest cover has not been achieved. The MDG indicators indicated the proportion of land area covered by forest has dropped from 68.2 per cent in 1990 to 62.4 per cent in 2010 (EPU & UNCT 2010). Hence, ensuring the survival of biodiversity in protected areas alone is insufficient for conservation, especially under the condition of incessant habitat loss. On the biodiversity side, the 2008 Red List of Threatened Species published by the International Union for Conservation of Nature (IUCN) ranked Malaysia as the country with the third-highest number of endangered species (1,141), after only Ecuador (2,208 species) and the USA (1,192 species).

3.6. Solid waste

Generation of municipal solid waste in Malaysia has increased more than 91% over the past 10 years, due, in particular, to the rapid development of urban areas, rural-urban migration, increase in per-capita income, and the change in consumption patterns brought about by development. In Peninsular

Malaysia (West Malaysia), the daily generation of waste escalated from 13000 tonnes in 1996 to 19100 tonnes in 2006.

A survey on waste management issues showed that 59% of respondents were moderately aware with some basic knowledge and were mildly alert to solid waste issues (Hassan et al 2000). This may come as a surprise to some because as much as 50% of public complaints lodged to the government are on waste and cleanliness issues. Dumping of wastes in open fields and rivers by industries and households is still common even until today. A study of waste disposal behavior in the squatters area in Kuala Lumpur disclosed that 31.9% of waste were disposed by open burning, while 6.5% were thrown into the river system (Murad & Siwar 2007). This situation is different to developed countries where the goal of sanitation and the objective of collection and disposal, even though not infallible, are generally considered as a thing of the past. Thus, the goals to ensure public health and sanitation are still considered a big challenge in managing solid waste in developing countries.

4. The Interplay of Population-Environment Nexus

At the global scale there is no doubt the pattern of population growth is indeed worrying. But at the national level, attention should be paid to the nuance of interplay between population dynamics and arising environmental challenges.

The Malay Peninsular, Sabah and Sarawak were only sparsely populated before the colonial intervention. The floodplains of Thailand and Myanmar or the fertile volcanic soils of Java in contrast have developed a substantial population density for thousands of years. The population of Malaysia multiplied in the order of 11 times over the past 110 years. Most nations in Southeast Asia recorded only around 7 times multiplication. According to the Department of Statistics population projections, Malaysia's population will reach 38.5 million people by the year 2040, comprising 19.6 million males and 19 million females.

Kuala Lumpur in particular has experienced strong growth since the last century. From a mere 900,000 population in 1950, its resident more than doubled by the 1980s. With more economic opportunities in the next three decades, the population in Kuala Lumpur core and suburbs in 2010 had tripled from its 1980 level. By 2030, it is estimated that Kuala Lumpur will be home to anywhere from 6.8 to 10 million people.

In 2012, Southeast Asia's megacities of Jakarta and Manila, both clocked a whopping population of 26 million and 22 million respectively. By far the world's densest urban areas are on the Indian subcontinent. Dhaka's density is 44,400 people per square kilometer. By comparison, the Kuala Lumpur region in 2013 has an estimated population of 7.58 million with an urban density of 3,400 per square kilometre.

A glance at Malaysia's population dynamics (e.g., population size, growth, density, age and sex composition, migration, urbanization, vital rates) figures will not ring an alarm for any demographers. Malaysia is a not a population hotspots of the scale and magnitude of Indonesia and the Philippines. That is if we reduce population and environmental change nexus to a mere function of population size or growth.

As future policy and research agenda, we should ask how do specific population changes (in density, composition, or numbers) relate to specific changes in the environment (such as deforestation, climate change, or ambient concentrations of air and water pollutants)? In other words, we need to unpack and disaggregate population dynamics (e.g., in density, composition, numbers, sex/age structure, and life histories) in empirical studies. In what follows, we outline three areas for further enquiry:

4.1. Forest loss in natural resources frontier

Land cover dynamics are the most evident mark of human occupation of Earth. Population growth in the rural areas in the 1960s and 1970s as a result of migration has contributed to significant deforestation. The area of arable land increased fivefold between 1900 and 1950 as forested land gave way to agriculture and rubber plantations. Later on, the Federal Land Development Authority was the dominant agent of change, converting more than 100,000 hectares of forested land annually from the mid-1950s until 1965 (Goh 1990). In 1966, 9 million hectares – or 68 percent of Peninsular Malaysia's total land area of 13.3 million hectares – was under forest cover (Ooi 1976). By 1977 this had declined to 7.2 million hectares, or 55 per cent of the total land area, of which approximately 3.4 million hectares had been logged (Rowley 1977).

The agricultural frontier had then advanced in areas that are both biodiverse and ecologically fragile. The ecological effects of land clearing included high sediment loads in rivers from soil erosion and the pollution of river systems with effluent discharged from rubber and palm oil mills. These pollutants have a high organic content, and have been estimated to account for 90 per cent of the total industrial pollution load of local rivers (Abdullah 1995). However, population is but one among many factors that influence forest loss and land degradation. Other variables include local governance, market linkages and social conditions.

Another impact of migration was the increasing conflicts between wildlife and rural population as the natural habitat for these animals has been modified for agriculture. The damage to agriculture is often high. Removing or translocating a 'problematic' elephant usually cost around RM40,000. Agriculture and human settlement have pushed the boundary of natural areas in Malaysia to only four large islands of forests which are fragmented and disconnected. The Central Forest Spine is a government initiative to protect the backbone of Peninsula Malaysia from further development encroachment that will not only threaten wildlife populations, but also the environmental security of people living here.

4.2. Displacement of forest-dwelling population

Apart from land cover change in Malaysia's frontier, logging and infrastructure projects had also affected the wellbeing of forest-dwelling communities. There are many instances whereby land alienation and other forms of socio-economic marginalization have undermined the population and identity of Malaysia's indigenous tribes. The plight of the Penan in the 1980s for instance had attracted worldwide attention on unscrupulous logging practices in the state of Sarawak. There is also evidence that the native stake in the timber industry or palm oil is tenuous, easily replaced by cheaper labour from neighbouring Kalimantan. Subsequent to that, the resettlement of indigenous tribes in Kampung Asap to accommodate the construction of the Bakun hydropower dam has also caused a lot of grief. Gone with their sense of place was the sense of identity loss when they are forced to leave behind their traditional agricultural practices.

In Peninsular Malaysia, the return to resource extraction is causing a great strife among the affected communities. Environmental degradation is allowed to persist within the background of increasing land scarcity. This in turn resulted in a resentment brewing among the public (Hezri, 2012). Unprecedented environmental protests have occurred, such as against the siting of an iron ore processing plant in a biodiversity hotspot in Perak, forest clearance for agriculture in Cameron Highlands (Lai 2013) and the mining of iron ore around Lake Chini, the only UNESCO Man and Biosphere Reserve in Malaysia (Hezri and Chan 2012).

4.3. Urbanization and high-density living

While charting the way forward for realizing the investments in the Greater Kuala Lumpur, we must be mindful of the pathology of high-density living or the impact of crowding on social behavior. In many dense cities, social life of a population is disintegrated and replaced by maladies such as increased anxiety, mental disorder, family breakups, crime, and violence.

Some signs suggest that the city dwellers are yet to develop sufficient adaptation capacities to live in a high-density environment. One example is the public nuisance of double-parking in the city and its suburbs. Few things get the blood boiling than being blocked by a car without a driver in it. It has gotten to the point of people are double-parking in front of empty spaces to avoid getting parked in. While most of us suffer the scourge of double parkers in frustrated silence, others have resorted to aggressive behaviours.

A balanced approach involves complementing physical or ‘hardware’ improvements with the cultivation of collective ethics or ‘heartware’. High urban density is tolerable only if civility and regulations mediate social relations in the city. Managing common resources such as streets, parks and rivers requires manners that maximize the gain for all and not individually. The polite ways of the Japanese motorists for instance circumvent the problem of on-the-road driving anger. Such self-control lubricates the frictions of urban space. The alternative is regulation for formal social control of anti-social behavior in dense urban ecosystems. The city council on its part must modernize its regulations to permit social order in dense parts of the city.

5. Concluding Remarks

There exists an uneasy relationship between population issue and sustainable development. On one hand, population growth is always used as a proxy measure for social sustainability because data on population is readily available in contrast to other human variables such as values, culture and institutions. On the other hand, population policy prescription such as birth control is seen as antithesis to the rights-based approach to sustainable development.

The preceding discussion points to areas of action that are within the reach of government authority to influence through instruments of public policy. It also brings home the fact that the absence of population pressure does not automatically eliminate the causes of environmental degradation. Some decisions require appeal to personal choices. For instance, even if population growth is not the issue but where people choose to live will influence the environment and the level of exposure to risk. One factor with least control perhaps is the nexus between migration dynamics and environmental change. Arguably, the influx of migrant workers from Asian neighbours may have something to do with them being environmental refugees from unfavourable resource conditions in their own countries. A worthy area of research would be to understand the effects of their migration on Malaysia’s human-environment systems, be they on socioeconomic stratification, urban livability, gender dynamics, and cultural factors.