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Seven Billion Dreams. One Planet. Consume with Care.

11th Malaysia Plan's Green Growth Thrust: Aligned to 'Consume with Care'?

The issue of consumption arguably lies at the heart of many of the global concerns we face today, and it is not purely from an environmental perspective. When resources become scarce or unattainable, the resultant disruption ranges from increased individual poverty through the deprivation of basic necessities, increased health concerns, reduction or even collapse in economic functionality to civil strife and political instability.

Sustainable Resource Management

Though Malaysian policy in the past has recognised the importance of sustainable resource management, it would be true to say that the overall model has been one focused on economic growth without placing a strong emphasis on managing the invisible components that enable this growth. Given our rich natural resource endowment, Malaysians may have unwittingly created a more wasteful attitude towards these resources.

We have sought to manage some resources that nature has blessed us with, like timber or mineral resources, with their inherent economic values, but failed to attribute proper recognition and value to the vast expanse of this blessing in terms of services that enable many activities, not just economic ones, but also social, recreational, cultural and spiritual ones.

Our lush environment, full of diverse flora and fauna that regulate our water cycle, provides soil nutrient, transforms waste, protects the integrity of our slopes and coastlines, provides food and suitable living conditions and helps regulate the climate as well as create climate resilience. Unfortunately, it is is not adequately recognised for all these critical services within our current economic model.

We have to make changes to our current production and consumption patterns. It is reported that on a daily basis Malaysians waste a staggering 8 tonnes of food. Malaysia's Ecological Footprint was 3.90 global hectares per capita in 2013. We need to half our footprint to stay within sustainable limits. The Ecological Footprint represents the productive area required to provide the renewable resources humanity is using and to absorb its waste. Hence we need a paradigm shift that conservation and sustainable use of resources are not only fundamental to development, but also promote wellbeing and sustainability.

Key Issues

The world community in 2010 adopted the Global Aichi Biodiversity Targets (2011-2020) to arrest biodiversity loss by mobilising 20 ambitious targets. The Global Biodiversity Outlook-4, which was published in 2014, however, shows that despite the Aichi Targets, biodiversity continues to be lost at an unprecedented rate. One of the key drivers of biodiversity loss is our consumption patterns. According to the Global Footprint Network, we humans use up to 40% more resources in one year than nature can regenerate. Accelerating this problem is the anthropogenic cause of climate change. The Inter-Governmental Panel on Climate Change (IPCC)[1] warns that we are far from achieving the reduction in greenhouse gas emissions necessary to keep global warming below the science based goal of 2 degrees. If we fail in this, all the development gains brought about by industrialisation that the world has enjoyed will not only be reversed, but humanity's survival itself will be threatened.

While the global scenario seems challenging, we in Malaysia need to make some changes to halt environmental degradation and biodiversity loss. For instance, the Sumatran Rhino is extinct in the wild in Sabah (in 2008 there was an estimated 50 rhinos in the wild in Sabah); also the drop in the Malayan tiger numbers to an average of 300 in the wild (we used to have around 3000 tigers about five decades ago). Then, there is the loss of almost 90% of Malaysia's demersal fish stock. All these reflect a trend of biodiversity decline and serve as an important indicator of the status of biodiversity in the absence of proper biodiversity monitoring and inventory. If we do not arrest this rapid decline of biodiversity, our development agenda will be compromised as biodiversity provides crucial ecosystem and provisioning services as well as cultural and aesthetic values that are so vital to the development, well-being and identity of this nation.

Green Growth in the 11th MP

It is hence timely that the 11th Malaysia Plan (11th MP), which is touted as a people-centric plan, has identified the concept of Green Growth as one of its six strategic thrusts and game changers. The fundamental notion that is to be transformed has been aptly described as follows in the Plan:

> "Achieving these aspirations requires a fundamental shift away from a 'grow first, clean up later' development model towards one that views resilient, low-carbon, resource-efficient, and socially inclusive development as an upfront investment that will yield future gains over multiple generations to come" (pp. 1-14)

Given that the "grow first, clean up later" notion has been firmly entrenched not only in Malaysia, but globally, the Plan makes bold moves in seeking to change this and unlock a path to a more comprehensive and viable development model that consumes wisely.

In order to do so, the structures that support the conventional model have to be revamped in a systematic manner to

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From the desk of the Director General

Seven Billion Dreams. One Planet. Consume with care

It is timely the 11th Malaysia Plan has indicated a shift away from a developmental model of 'grow first, clean up later' to one that is more viable, more resilient, low carbon, resource efficient and socially inclusive which at its centre advocates 'consumption with care'. For surely, consumption in all its varied forms is the key to improving the fragile health of the world's ecosystem and of averting the frightening spectre of human induced global climate change.

This shift in policy thinking is not a choice but an imperative. Just look at some facts: On a daily basis Malaysians discard a staggering 8 tonnes of food; our 2013 Ecological Footprint at 3.90 global hectares per capita is twice the sustainable limit; we have lost some 90% of our demersal fish stocks; there are only some 300 tigers in the wild from 5000 five decades ago and the Sumatran Rhino is virtually extinct.

If this is not startling, consider a resource we have always taken for granted in this tropical paradise – water. A dramatic population increase in urban and sub-urban areas has made it increasingly difficult to meet demand for treated water. Water catchment areas need greater protection based on the increasing number of water treatment plant shutdowns both for routine maintenance and for emergency response purposes following contamination. It is estimated that water treatment plant shutdowns were spread over nine thousand hours in 2014 alone. Meanwhile, we continue to consume more water per capita than our neighbours.

Perhaps we are fooled into careless consumption, surrounded as we are by seemingly abundant flora and fauna and a living lush green environment all year around. But now environmental degradation and biodiversity loss is upon us and hardly noticed or acknowledged by most citizens of this country for these phenomena are largely invisible and very intangible until it is too late. And things are no better in the rest of the world. That does not mean we can point our fingers at others and continue with business as usual. All it means is, we must pull together with the rest of the world to save ourselves.

The Earth's population is now 7 billion strong and still growing. The wealthiest 10% are consuming an estimated 59% of global resources. Is it any surprise we are consuming more resources that the Earth's ecosystem is capable of producing? At the same time, billions of the Earth's poor suffer from inadequacy of food, water and shelter. These two matters of inadequacy and disproportionality of consumption highlight the twin threats to the continuity of human civilisation: resource depletion and inequality of resource distribution.

Unfortunately, changes in governmental policy thinking and making take time. Meanwhile, we are running out of time to confront these twin threats to human civilisation. But fortunately there is much we can do as individuals to help save the world. The Secretary General of the United Nations, Ban Ki-Moon put it this way: "Although individual decisions may seem small in the face of global threats and trends, when billions of people join forces in common purpose, we can make a tremendous difference."

Yes indeed! Like when we travel as tourists. It is estimated that in 2014, there was a record 1,133 million international tourist arrivals worldwide, all crossing borders to see our planet's natural and man-made wonders. But the multiplier effect of what a billion plus tourists can do to the environment must be understood by all who travel. Sadly, tourism operators have limited concerns on the impact of mass travel on a country's resources, be it water, food or emissions. And hardly any country has successfully developed a low-carbon tourism strategy. Dare we suggest Malaysia should become one of the first?

Meanwhile, the next time we load our plates with food from the buffet table in some distant country, spare a thought for the fact that food waste is a local problem that creates global environmental problems. Dumped in landfills, it is a major source of greenhouse gas emissions, emitting methane, more harmful than carbon dioxide. Likewise we should stay in hotels that are committed to conservation by promoting energy and water efficiency. Then, we can also rent a bicycle or simply walk when sightseeing. Also, we can buy local products as shipping and transportation account for significant increases in carbon emissions. Shower when necessary and conserve energy when using aircons and unplugging electrical items when not in use.

In a million different ways, we can all consume with care. And it will add up because we are seven billion people living on one planet. So it is time we make it a better place for future generations to live and to love.

Dato' Halimah Hassan
Director General
Department of Environment, Malaysia

reap optimal benefits from this game changer. The 11th MP hence identifies all-encompassing changes ranging from policy making, regulating institutions, sharing responsibilities right down to individual behavioural change. Recognising that all these elements take considerable time to be realised, the Plan seeks to "Pursue Green Growth" by setting the stage for these changes to occur over time and envisages this to go beyond 2020. The Plan hence adopts a balanced, step-wise and realistic approach towards a 'wise consumption' model. The Malaysian concept of green growth is also broadly defined to include resource efficiency and is not confined to the more common low carbon growth notion.

Pursuing Green Growth

The five-fold shift in this transformative thrust is shown in Figure 1.

The Plan also describes a successful green growth trajectory as one that (a) integrates the environment into decision making, hence reducing socio-economic impacts; (b) accords recognition to the myriad of goods and services provided by the environment, ecosystems and biodiversity as "Natural Capital" which is valued and sustainably managed; (c) protects development gains and thus ensures cross-generational well-being; and (d) achieves energy efficiency and greater renewable energy uptake.

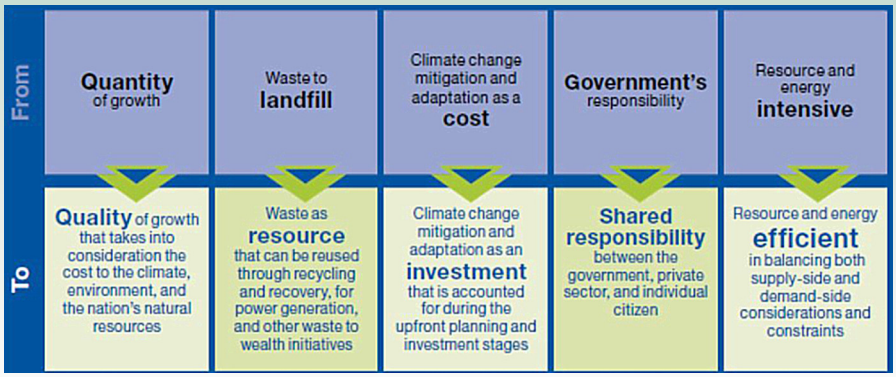

Figure 1: Shifts towards pursuing green growth

Source: 11th MP

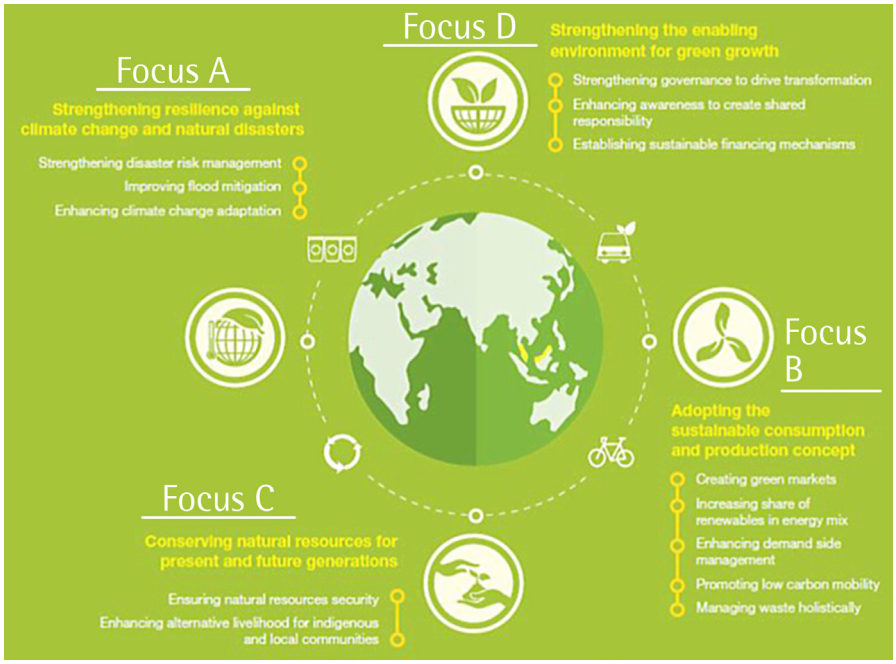

Figure 2: Summary of focus areas

Source: 11th MP

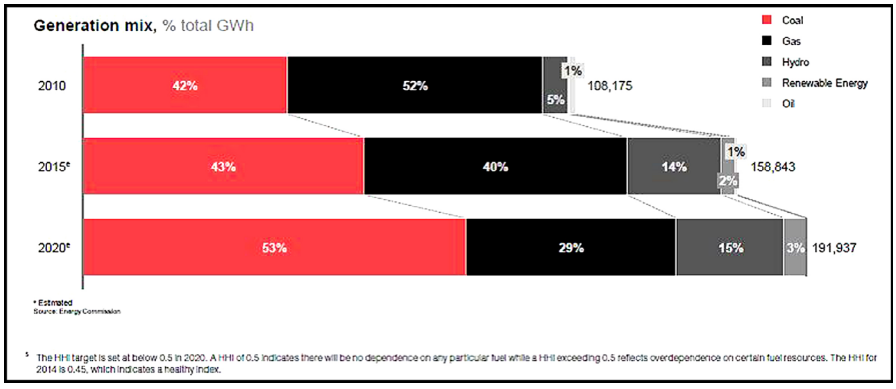

Figure 3: Generation mix

Source: 11th MP

Four focus areas have been identified as shown in Figure 2.

The Plan recognises that demand drives supply and hence demand or consumption needs to be addressed systematically. Although Focus B on *Adopting the Sustainable Consumption and Production* concept can be regarded as most relevant to this article, all four focus areas in fact do contribute towards this. Focus A, *Strengthening the Enabling Environment for Green Growth,* for example, identifies sustainable financing mechanisms as a tool to steer investments towards more responsible practices, hence reducing the pressures wrought by careless production leading to resource intensive practices and excessive/wasteful consumption. Focus C, *Conserving Natural Resources for Present and Future Generations,* secures ecosystems and biodiversity protection to enable a more balanced consumption of the various goods and services provided. Rather than destructive takings, it facilitates reaping benefits equitably on an ongoing basis, including identifying new genetic resources with its attendant contributions to food security and the pharmaceutical and cosmetics industries. Focus D, *Strengthening Resilience against Climate Change and Natural Disasters,* secures the gains from resources already consumed or transformed for a longer timeframe, hence optimising its utility and reducing the rate of material consumption that would otherwise be required to reconstruct/compensate for disaster damage.

Observation

There may be concerns as to whether the Green Growth thrust is a stand-alone notion, or if it permeates throughout the Plan to shape the other five Thrusts as well. The Plan identifies Green Growth as not only a strategic thrust but also a game changer that fosters a development trajectory that considers all three pillars of sustainable development[2] and prepares the nation for future challenges.

Some initiatives in other thrusts, however, may be deemed to run contrary to this. For example, while there is sufficient language to highlight the need for energy supply and demand management in both the *Green Growth Thrust* and *Thrust 7, Strengthening Infrastructure to Support Economic Expansion*, the energy mix shows an increased reliance on coal which is emissions intensive, by 2020 (Figure 3). This would have a lock-in effect extending into the future beyond 2020, as power plants have long operational lifespans.

It is hoped that this is a temporary measure while transitioning into more efficient energy use and that future energy needs will thus be modest, and increasingly met by sustainably produced renewable energy.

Another issue relates to the principle outcomes to be delivered by the Green Growth Thrust which are framed to meet Malaysia's international commitments:

- The UNFCCC[3] voluntary target of reducing emissions intensity of GDP by up to 40% compared to 2005 levels by 2020

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Consume with Care

Consumption is the driver of production. The United Nations Environment Program (UNEP) studies shows that food, mobility, and use of electrical appliances dominate the life cycle impact of final consumption. Among these, agriculture for food production is identified as one of the important drivers of environmental pressures and habitat change, climate change, water use and toxic emmision. The use of fossil fuels or petroleum products as energy carriers for heating, transportation and the production of manufactured goods causes the depletion of fossil energy resources, impacts the environment and leads to global warming.

Challenges to 'Consume with Care'

If we consume only what we need in order to survive and flourish without compromising the needs of others, food waste and environmental degredation can be reduced to a minimum. However, in reality, the increase in in income levels and spread of supermarkets and large department stores offering a variety of products, has resulted in a tendency to buy things not because they are needed but to statisfy our wants and desires. We tend to buy and consume more than necessary. Given the inequality of wealth, there is a need to reduce over-consumption by doing more with what we have, for example, by sharing, reducing consumption and moving towards a pradigm shift in how we operate businesses. 'Consume with care' should start with us as individuals. This article will focus on food, water and energy consumption at several levels.

Food

Food production requires land and other resources that have an impact on the environment. Clearing large areas of the jungle for mass food production for export can cause land erosion and impact the environment. Good practice in producing and consuming food with care will have many benefits. Eating what is needed will be good for our health and provide an opportunity to give the extra food to the less fortunate. Locally grown organic food is fresher than imported food and helps to support the economy of the local farming community. Consuming locally produced food means less requirements for packaging, transportation and distribution. The energy spent on processing, packaging, refrigeration, distribution and transportation can be reduced when food is moved from farm to table.

Water

Clean water is perhaps the most precious of the earth's resource. With the increasing effect of global climate change, the ability to have sufficient high quality water across the globe, could likely be jeopardised in the near future. Being conscious of efficient water use would help reduce the strain on water treatment and wastewater treatment plants.

By shifting away from bottled water, we can reduce global greenhouse emissions by not using petroleum derived plastic that adds to the volume of of waste (from empty bottles) that are trucked to our landfills or pollute our rivers as thrash.

Electricity consumption

Electricity is a secondary form of energy that we consume every day. Electricity is needed for lighting and to run appliances such as refrigerators, fans, air conditioners, washing machines, rice cookers, and television sets.

We can contribute towards sustaining the earth's resources by consuming electricity with care, using our appliances only when necessary and switching off room's lights and fan or air conditioning system on leaving the house.

It is advised that in future, consumers purchase appliances such as refrigerators, air conditioners, fan and lamps with star lables to reduce electricity consumption. The labels specify the minimun energy performance of the products, with five star being the most efficient energy user.

Endorsement Label used by Suruhanjaya Tenaga (Energy Commission)

At the organisational level, continuous monitoring and tracking of electricty consumption will enable the manager or the person in charge to detect abnormalities and take immediate action. Often, unnecessary wastage due to poor maintenance and the use of inefficient equipment could be the culprits leading to high electricity consumption. For companies that consume much electricity, a good energy management team is necessary to address energy issues.

Petrol consumption

Walking or cyling instead of driving to the nearby shops is not only good for our blood circulation and health but also helps to minimise our petrol consumption. Where public transport is conveniently available, driving should be minimised to reduce petrol consumption and congestion. Collectively, we can help to slow down the rate of global warming and delay the depletion of our fuel resources.

Fuel Consumption in Industries

Fuel is used by industries to process heat. The heat is commonly generated from burning of fuel such as oil, gas, coal or biomass. In rice mills, for example, the rice husk is burnt to generate hot combustion gases which are used to heat water and produce hot water. The hot water is in turn is used to heat air which is used to dry paddy. In other cases, steam is generated at high pressure using diesel as fuel, though at the point of use, only low pressure steam is required. The question is 'how efficient is the energy conversion process'? There is therefore a need to check the energy balance of the systems to ensure that demand can be met at the lowest cost.

Fuel switching or fuel substitution

Burning fuel will generate combustion products. The quality of heat produced and the composition of the combustion products depend on the efficient operation of the conversion equipment and the properties of the fuel burnt. Black smoke is produced when the combustion process is not complete due to insufficient excess air supplied or poor mixing of air and fuel. Solid fuel is more difficult to burn and needs more excess air

(25%) than liquid fuel (15%). Gas fuel is easy to burn and only requres 10% excess air.

Solar as Energy Source

Can we have heat, especially low grade heat, without burning fuel?

Our sun was created to provide both light and heat. Today many governments the world over are promoting the use of solar heat to reduce the use of fossil fuel that generates carbon emission. Technologies are available to enable light from solar to be converted to electricity using solar photovoltaic panels and the heat can be tapped using solar collectors to produce hot fluid. Water and air are the usual fluids used as heating medium to process heat.

Our climate is hot and humid throughout the year. On average, we receive 4000 – 5000 Watthour/m^2 of sunshine daily within 4 to 8 hours. By tapping this free solar heat using solar water heating systems, some industries can reduce their dependence on commercial fuel oil to process heat.

Solar water heating systems can replace or complement existing systems. The common flat plate collector can generate hot water up to 60-70°C. For higher temperature applications, the water can be preheated to raise the temperature from ambient up to 70°C using solar water heaters. Continued heating of the hot water will produce steam in the oil fired boilers. Efficient use of solar energy can help reduce the consumption of fuel oil in factories.

Solar PV for electricity generation

National Solar Thermal Project

A national project on "GHG Emission Reductions in Targeted Industrial Sub-Sectors through Energy Efficiency and Application of Solar Thermal Systems" was approved in April 2014. The objective of the project is to reduce emission of Green House Gases (GHG) by promoting and demonstrating sector-specific energy efficiency and solar thermal technology applications in industry. The United Nations Industrial Development Organisation (UNIDO) is the Global Environment Facility (GEF) agency for this project and SIRIM is the leading executing agency. This project will run over a term of five years with the other local counterparts being the Ministry of Science, Technology and Innovation, Ministry of Energy, Green Technology and Water, Federation of Malaysian Manufacturers, Solar Research Institute, Ministry of Natural Resources and Malaysia Industry-Group of High Technology (MIGHT).

The project comprises three components: (i) the development of the policy framework, (ii) awareness and capacity building, and (iii) the demonstration projects.

This project aims to encourage industries to integrate solar systems into their existing heating systems. For a start the project will focus on low heating processes. At present the focus industries are the food, poultry, palm oil, rubber gloves and pharmaceuticals. Initial activities are factory visits to explain about the project and to identify potential candidates for demonstration projects. SIRIM calls on more companies in the sectors identified to participate and invest in the project and reap the benefit of free and clean solar heat.

The Caring Future

Consume with care is a pervasive concept that conserves resources for the future well-being of mankind. However, there needs to be a paradigm shift in our consumption patterns, right from individual to institutional and industrial levels. Universal adoption of this concept will enable us to not only enhance the quality of life but also the quality of the environment.

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Source

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• The CBD[4] Aichi Targets of conserving at least 17% of terrestrial and inland water areas, along with 10% of coastal and marine areas as protected areas

While the above are important, more ambitious outcomes would really drive the agenda forward. The Plan states that Malaysia has already achieved 33% of the 40% emissions intensity target over the last 6 years. In terms of the CBD targets, it is not sufficient to simply meet these figures, the quality of the protected areas should also be factored in.

Conclusion

Policy coherence is required and needs to be reinforced continuously. If not, there is the danger of slipping back into the more familiar and easily measurable quantitative growth that depends on material consumption, ignoring quality. Hence, apart from the welcome policy push in the Plan, it is equally important to have a clear implementation plan. Many strategies have been identified in the Strategy Papers supporting each Thrust which should be implemented in a systematic, integrated and synergistic manner, avoiding a silo approach. This will certainly advance the transformative Green Growth agenda.

The challenge for Malaysia is to overcome the barriers in mainstream thinking resulting from the dominance of conventional economic reasoning that focuses on production without fully appreciating all elements of the production base, with the consequence being wasteful consumption. Awareness of the state of the world's ecosystem health and human induced climate change needs to be brought to centre stage. While governments must and have to be the main actors to drive and deflect the trajectory of unsustainable consumption patterns, the general public too has a role to play.

People must be made aware and must realise that while they are a source of the problem, they can also be a fervent catalyst of change.

A change which is imperative for a healthier planet and greater well-being, and not confined to materialism. The other stakeholders too have to act collectively towards this goal and we can achieve our vision for Malaysia to be developed in harmony with nature.

Footnotes

[1] Intergovernmental Panel on Climate Change

[2] These are the economic, social and environment pillars

[3] United Nations Framework Convention on Climate Change

[4] Convention on Biological Diversity

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Source

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Unlimited Wants, Limited Resources: Sustaining the Earth

Background

The Earth's population is now well over 7 billion and is still growing.[1] The population has reached a stage where the amount of resources needed for sustainable living exceeds what is available in the Earth which means we are consuming more resources than the Earth's ecosystem is capable of producing (Williams, 2015). Some researchers conclude that we are already living three times beyond the earth's capacity (WPB, 2015). In fact some of the latest studies state that the Earth's resources are marginally enough currently to sustain only about 2 billion people at a western European standard of living.[2]

The micro details of the pattern of consumption or allocation of resources among the population are much more alarming. The poorest 10% are consuming only 0.5% and on the other hand, the wealthiest 10% are consuming about 59% of all total consumption (Brueggemann, 2013).

To ensure sustainability of the earth's resources, what are our choices? Scientists often refer to the two different ends of the earth population's problem:

(i) depletion of the resources, and

(ii) scarcity created by unlimited wants while the resources are limited.

Thus, there is a conflict of interest for the demand vs. limited resources regardless of developed and developing countries within the rich and poor.

Each day, the poor of the world have to deal with problems of inadequate food, water and shelter given the unequal distribution of wealth and unequal access to the earth's resources. There are about 928 million people who are homeless and 2.4 billion people are without proper sanitation facilities. Over 460 million people face shortages of water and about 1.2 billion people still have no proper access to safe drinking water (UNEP, 2015). The Worldwide Fund for Nature (WFN) estimates that by 2050, the population will need 100% more of the earth's land, fisheries and forestry just to maintain their current life (Williams, 2015). In contrast, the world's billionaires - just 497 people worth $3.5 trillion and who are approximately 0.000008% of the world's population - consume over 60% of total natural resources (e.g. over 7% of world GDP). Their recourses accounted for more than the total recourses of 2.4 billion people from lower income countries (World Bank, 2008; Forbes, 2007).

To overcome the disparity and to maintain sustainability between the earth's resources and our lifestyle, what are our plans, strategies and actions for the future? Should resource consumption be reduced by 50%? Is it more likely that a combination of both large declines in human population and consumption will preserve the resources for the future? These are not frivolous questions. Rather, they are the most fundamental problems facing the earth.

Inadequate Food

There are six major reasons for the existence of chronic hunger and inadequate food in some parts of the earth. Importantly, the reasons are mostly interconnected. They are:

(a) Lack of agricultural investment;

(b) Poverty trap;

(c) Concerns of capitalism and unstable markets;

(d) War and displacement;

(e) Lack of resources; and

(f) Climate and weather (IFAD, 2014).

Inadequate food leading to hunger in some parts of the Earth is one of the most striking challenges resulting from the current uneven distribution of resources. In the past decade, some progress has been achieved to combat global inadequate food, water and shelter concerns. Chronic hunger has dropped since the 1970s. Unfortunately hunger levels have been again increasing overall globally since 2004. Moreover, the recent food price surge is causing a food crisis and pushing further chronic hunger.

Inadequate Shelter

The prevalence of homelessness[3] or inadequate shelter is estimated to affect a 100 million worldwide[4] while 1 billion people lack adequate shelter. The large majority of homeless are males (75–80%) compared to females. The living place for the homeless people particularly in the slums is considered most unsafe. There are about 928 million people living in slums, and they are mostly (over 50%) from South and East Asia (GHS, 2015). The vast majority of slums are without clean water supply and proper sanitation. The United Nations Millennium Declaration set a target of improving the living conditions in slums of at least 100 million people by 2020 (UNMD, 2000).

Inadequate Water

Statistics show that over 1.2 billion people on earth still do not have access to safe drinking water and 460 million people face daily shortages of water. About 85% of the world's supply of water is used by only 12% of the world's population, the remaining 15% of water is used by the developing countries (UNEP, 2015). Of the people who lack access to clean water, 2 in 3 people live on less than USD2 a day, with 1 in 3 living on less than USD1 a day (Shah, 2013).[5]

Unequal Distribution of Wealth and Poverty

Recent statistics indicate that 76.6% of total private consumption is by the wealthiest 20% of the world and just 1.5% by the poorest fifth (Figure 1). The poorest 40% and 20% are estimated to consume less than 5% and 2% respectively of natural resources (Shah, 2013). The wealthiest 10% - 700 million people are responsible for the majority of the problems related to unequal distribution of wealth (IFAD, 2014). Moreover, the developing nations are poorer than data indicate and are therefore less successful in fighting poverty issues (Figure 2).

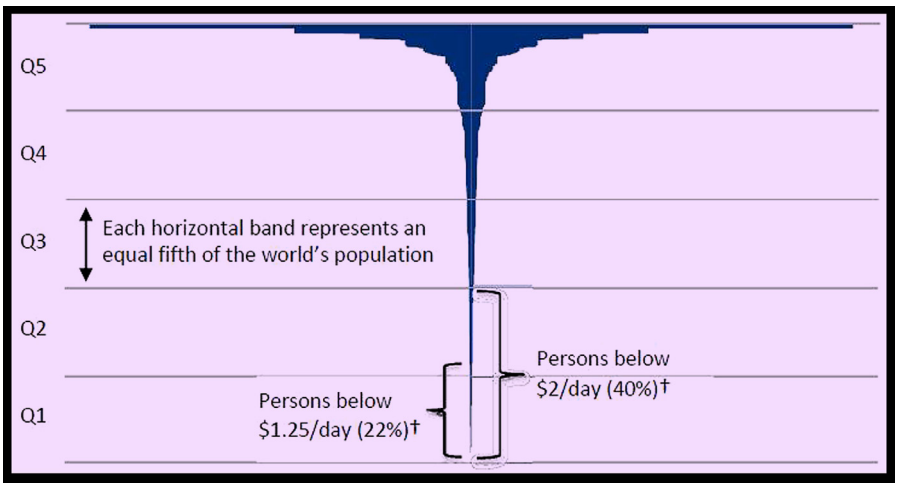

Figure 1: Unequal distribution of wealth and poverty

Source: World Bank (2011)

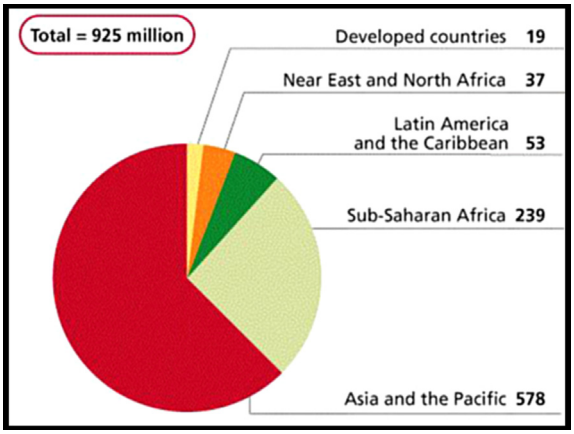

Figure 2: Poverty facts and statistics *Source:* IFAD, 2014

Illiteracy and Unequal Distribution of Resources

Illiteracy is believed to be a cause and a consequence of poverty, social inequality, deprivation, the unequal distribution of resources and power in society. This is particularly so in Africa, the Arab world and South Asia, though there has been some progress in the last decades. Today there are still 126 million youths and 781 million adults who are illiterate. Women account for two-thirds of this number (UIS, 2015). The Millennium Development Goals target a reduction in adult illiteracy rates to 50% by 2015 which is expected to fall short (Figure 3). The highest gaps in literacy rates are found in the states of Arabia (85% male vs. 69% female), sub-Saharan Africa (68% male vs. 50% female) and South and West Asia (74% male vs. 52% female). Thus, gender parity has not been reached. Increased literacy rates correlate with a decrease in the share of the population living in poverty and unequal distribution of resources (UIS, 2015).

Concluding Remarks

The fundamental concern for the continuity of our civilisation can be divided into two aspects: (i) resource depletion and (ii) inequality of resource distribution. Thus, currently the question of preserving the resources for future generations in an efficient manner is an important choice; minimising the conflict of interest of the distribution of the limited resources within the rich and poor is another major consideration.

There is no single universal technological fix or a single policy to meet the challenge of meeting unlimited people's wants with the limited resources of the earth, with equal intergenerational justice for all. A bundle of actions needs to be put forward for a sustainable Earth. Efforts towards the preparation of an effective developmental policy should focus on environmental care and responsibility, where environmental degradation and exploitation are minimised and a rights-based approach is taken for future development.

Future development should focus on promoting a transition to environmentally friendly technologies by taking environmental damage into account under existing climate regimes. The production process should focus now and onwards on neutral technological change rather than conventional technological development. The six principles for sustaining the earth, such as (a) universality and inalienability, (b) indivisibility, (c) interdependence and inter-relatedness, (d) equality and non-discrimination, (e) participation and inclusion, and (f) accountability and rule of law, must meet as the common interests of all nations. All nations must work together with the United Nations Millennium Declaration on one hand and the six principles on the other for sustaining Earth.

Footnotes

[1] There is a total of 1,730,725 species known to currently exist in the world and out of them vertebrate animals 66,178; invertebrates 1,305,250, and total plants/forests 307,674. The mammal species a total of 5,513 and fish species a total of 32,900 fall under the vertebrate animals. Human-being and population in the earth fall under the mammal species (IUCN, 2014).

[2] 1.5 billion people at an American standard of living.

[3] Homeless indicates those who may be residing in inadequate settlements such as slums, squatting in structures and those who relocate frequently (GHS, 2015)

[4] According to latest published homeless survey (GHS, 2015)

[5] In the United Kingdom the average person uses more than 50 litres of water a day flushing toilets where average daily water usage is about 150 litres a day. The highest average water use in the world is in the US, at 600 litres a day.

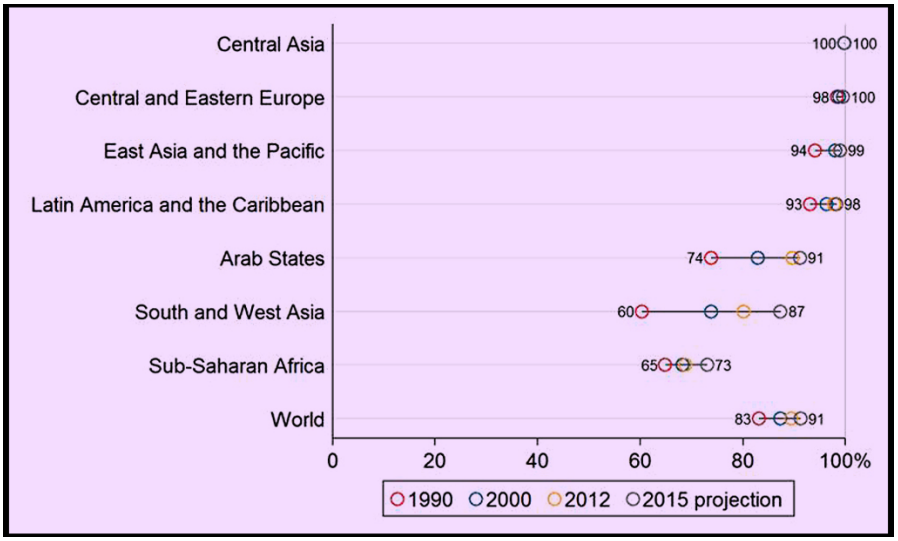

Figure 3: Youth and adult literacy rates, 1990-2015 *Source:* UIS (2015).

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Source

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Sustainable Management of Our Water Resources

Lessons about Climate and Water

Lesson 1

Drought or prolonged period without rain or very little rain is part and parcel of our equatorial climate. Cyclic extreme climatic conditions (e.g. El-Nino) are also part of the equation.

Lesson 2

Since early civilisations, humans have learnt to adapt with changing weather patterns. Construction of dams, huge lake reservoirs and systematic irrigations are living examples of human innovations to survive.

Lesson 3

A drastic increase in urban and sub-urban areas' population density makes it harder to meet increasing demand for treated water. This is a major phenomenon throughout the world. Water resources are usually far away from demand zones with high population density. High population density also causes high pollution load to any water body (river) that passes through such areas. This is basically due to the fact that rivers are part of our drainage system.

Lesson 4

Half a century ago, there was more dense forest cover. Therefore, the impact of drought or dry season was not severe. The heat waves were kept in check by the forest itself. Massive concentrated developments and mass clearing of forest have given drought or dry season its "claw" to strike us harder. In undisturbed natural forests, the forest itself controls its local climate. When the forest is brought down to make way for development, logging and other activities, this function is dramatically reduced.

Instances of water crises in 2014

1. Taiping, Perak (dubbed as the wettest town in Malaysia) was hit by water rationing. The Bukit Larut catchment failed to receive rain as usual.
2. High ammonia content in Langat River caused a shut-down of the Cheras 11th Mile and Bukit Tampoi water treatment plants and prompted water rationing to affected areas.
3. Sembrong flood mitigation dam caused water rationing in parts of Johor due to lack of rain.
4. Failure of Gemencheh dam to continue to function has raised the alarm bells in Negeri Sembilan.
5. Sungai Selangor Dam that supplies almost 60% of raw water for Selangor, Kuala Lumpur and Putrajaya almost hit the bottom of the barrel and caused large scale water rationing for a few months.

Lesson 5

This is not the end. Advances in technology and better demand side management will allow us to meet the increasing demand for water. This is, however, directly related to how we protect our water catchment areas.

Protecting Water Catchment Areas

Raw water pollution will cause shut-down of water treatment plants leading to disruption of treated water supply to consumers. Water treatment plant shut-downs between 2008 and 2014 are shown in Table 1.

States with high population density and development intensity like Johor and Selangor (including Kuala Lumpur and Putrajaya) will see higher water treatment plant shut-downs compared to less developed states. A prolonged dry season will also increase the probability of a treatment plant shut-down due to a drop in base flow in rivers which leads to an increase in the concentration of contaminants. One such incident occurred in Sg Langat due to ammonia pollution last year. Table 1 also shows that from 2012, Perak had no plant shut downs, largely due to its program of upgrading water treatment facilities.

Gemencheh Dam in Negeri Sembilan is another example of failure to protect the dam's water catchment areas. The catchment areas were periodically converted into palm oil plantations causing forests to lose their ability to control local climate. To resolve this problem that could lead to a serious water crisis around the affected zones, a back pumping system which costs approximately RM 36 million will be constructed to pump water from Sg Jelai to the Gemencheh Dam. Sg Jelai has murky water and this will cause high wear and tear for the pump systems as well as a high siltation problem for the Gemencheh Dam. The RM 36 million and electricity cost from the pumps as well as cost of de-silting the dam will probably be passed on to consumers as higher water tariff due to failure in protecting water catchment areas.

What Should be Done by the State Governments?

All state governments must gazette the water catchment areas (including forests, rivers, lakes, etc.) as permanent reserve by end of year 2015. The gazetting of catchment areas must also take into consideration the future

Table 1. Water treatment plant shut-downs in Peninsular Malaysia and Labuan, 2008 - 2014 (in hours)

STATE	Water Treatment Plant Shutdowns (in hours)						
	2008	2009	2010	2011	2012	2013	2014
Selangor	274	3,374	859	334	280	308	2,838
Johor	926	467	269	294	1,241	2,352	1,720
Malacca	0	0	20	0	0	0	4,296
Negri Sembilan	0	0	302	190	270	75	0
Perak	412	617	1,256	120	0	0	0
Kedah	6	76	132	0	71	37	0
Pahang	0	44	5	16	115	128	0
Terengganu	0	0	0	0	0	0	0
Kelantan	0	0	0	0	0	0	0
Perlis	0	0	0	0	0	0	0
Penang	0	0	0	0	0	0	0
Labuan	225	170	19	0	0	0	0
Total (in hours)	1,843	4,748	2,862	954	1,977	2,900	8,854

Source: Suruhanjaya Perkhidmatan Air Negara (SPAN)

(Published in *The Star,* 11 May 2015, "Dirty water major cause of disruption" by Patrick Lee)

need for raw water. No human activities should be allowed in these gazetted areas including recreational activities.

For existing developed areas, the wastewater discharge standards must be upgraded periodically and implemented by the state governments and Department of Environment. In addition, pre-treatment facilities can be developed to further improve the quality of raw water.

Demand Side Management – Water Efficiency

Demand side management is vital to ensure sustainable development. This comprises both raw water demand and treated water demand. A comprehensive demand side management for water must be developed to outline steps and procedures to assist domestic, industrial and agriculture sectors to optimise water usage to achieve water efficiency. An online tool, "Catch d' Hydro"[1] has been launched to assist domestic consumers to be water efficient.

Demand side management also includes labelling of appliances. For a start, water efficiency labelling should be introduced as voluntary labelling for washing machines, dishwashers, shower heads, taps and toilet flushes. Voluntary labelling should be made mandatory in the near future with a Minimum Water Efficiency Standard (MWES) imposed. Via MWES, it is possible to stop the sale of products that are not water efficient and indirectly assist consumers to reduce water consumption at home.

Similarly, industrial and agriculture sectors that rely highly on water should also be assisted to be more water efficient via a water footprint benchmark.

Water footprint helps us to determine water consumption for many sectors. This is a better demand management and cross-cutting tool for all sectors. For example, we use 140 litres of water to produce 1 cup of coffee, 184 litres of water for 1kg of tomato, 1000 litres of water for 1 litre of cow milk and 20,000 litres of water to produce 1 laptop.

Through these water footprint values, both the industrial and agriculture sectors can be more water efficient and reduce dependency on water.

Reduction in Non-Revenue Water (NRW)

Since 2011, AWER has been carrying out modelling studies to determine the loss of revenue due to Non-Revenue Water (NRW). The results were released in 2011 and 2012 and this led to the formation of a National NRW Reduction Taskforce to implement a NRW reduction plan.

Now, let's look at how much Malaysia has been leaking?

Table 2. State and national non-revenue water for 2012 and 2013

State	2012		2013	
	Non-Revenue Water		Non-Revenue Water	
	MLD	%	MLD	%
Johor	427	27.8	417	26.4
Kedah	653	50.6	675	50.9
Kelantan	219	53.9	228	53.1
Labuan	12	20.4	16	25.9
Melaka	113	23.8	107	22.1
N. Sembilan	298	40.4	267	36.3
Pulau Pinang	170	17.6	180	18.2
Pahang	586	54.2	561	52.7
Perak	349	30.1	365	30.4
Perlis	133	66.4	132	62.4
Sabah	528	49.9	602	53.2
Sarawak	320	29.4	359	31.3
Selangor	1,429	33.1	1,575	34.5
Terengganu	226	36.8	210	33.8
MALAYSIA	5,464	36.4	5,694	36.6

(MLD: Million litres per day)
Source: Suruhanjaya Perkhidmatan Air Negara (SPAN)

Table 3. Estimated* loss of revenue due to NRW in each state for 2012 and 2013

State	Estimated Loss of Revenue due to NRW (RM million)	
	2012	2013
Johor	198.7	196.8
Kedah	174.5	179.1
Kelantan	52.9	69.7
Labuan	3.9	5.3
Melaka	46.1	43.7
N. Sembilan	107.8	98.4
Pulau Pinang	32.2	34.1
Pahang	181.6	170.6
Perak	101.4	106.8
Perlis	29.1	30.4
Sabah	173.4	197.8
Sarawak	84.8	95.1
Selangor	667.1	718.8
Terengganu	61.3	56.9

*Estimates from AWER

Table 2 shows the breakdown of NRW for each state and national average. Only Johor, Kelantan, Melaka, Negeri Sembilan, Pahang, Perlis and Terengganu recorded a drop in NRW percentage. National NRW levels have increased from 36.4% in 2012 to 36.6% in 2013. Perlis recorded the highest NRW loss in percentage that is, 66.4% in 2012 and 62.4% in 2013. Selangor (including Kuala Lumpur and Putrajaya) recorded the highest NRW loss in volume, that is 1,429 MLD (Million Litres per Day) in 2012 and 1,575 MLD in 2013.

Table 3 shows estimated loss of revenue due to NRW for each state in 2012 and 2013. Only Johor, Melaka, Negeri Sembilan, Pahang and Terengganu recorded a drop in loss of revenue. The lowest estimated loss of revenue was recorded by Labuan amounting to RM 3.9 million in 2012 and RM 5.3 million in 2013. The highest loss of revenue was recorded by Selangor (including Kuala Lumpur and Putrajaya) amounting to RM 667.1 million in 2012 and RM 718.8 million in 2013.

The NRW Reduction Action Plan is designed to cover the detailed NRW reduction targets for each state, technical specifications, standards, identification of severity of NRW (critical, sub-critical and non-critical), contractual obligations (with strict benchmarking) and funding (from Pengurusan Aset Air Berhad (PAAB)).

AWER will continue to monitor the progress of the NRW programme as Selangor, Kedah, Kelantan, Terengganu, Pahang and Labuan have yet to restructure under the Water Services Industry Act 2006 (WSIA) model. All these states should have completed the restructuring process during the 9th Malaysia Plan which ended in 2010. Sabah and Sarawak did not join the WSIA model.

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Food Waste, Hunger & the Environment

Malaysia is well known as a heaven for food, offering a wide range of Malay, Chinese, Indian, Nyonya, Thai, Japanese, Korean, Western, Arabian and other cuisine. Most Malaysians not only have three meals a day, but also have afternoon hi-tea and supper at night markets or even midnight meals at 24-hour '*mamak*' stalls. But there is a dark side to our food consumption activities everyday– the amount of food that is wasted!

Malaysians generate about 33,000 tonnes of solid waste everyday, of which about 40-50% is food waste. Sad to say, about 10-15% of this wasted food is actually good food that is still edible but simply unconsumed. This is equivalent to throwing away 1,500 to 2,000 tonnes of food, every day. This is particularly true when another study found out that about 30% of food served at a traditional Chinese wedding dinner ends in the waste bin and subsequently at disposal sites. On the other hand, during Ramadhan, the fasting month, food waste generation is actually increased, rather than decreased!

Having visited more than 50 landfill sites throughout the country over the past 15 years, I have observed a lot of food in the dumpsites. This includes boxes of expired chocolate, hundreds of packs of cookies, and even a full truckload of potatoes and vegetables. Food wastage is a serious problem in Malaysia as we have been living in a comfort zone for far too long.

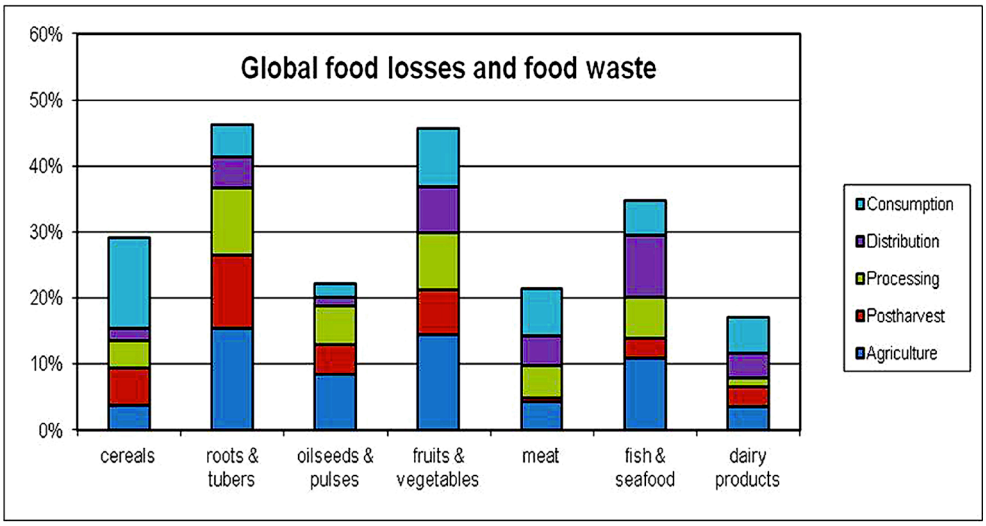
Food Wastage vs World Hunger

Food wastage is an enormous problem not only in Malaysia, but also in many parts of the world, especially in developed countries.

According to the Food and Agriculture Organization (FAO) of the United Nations, about 1.3 billion tonnes or one-third of the world total food production is wasted or lost every year, causing major economic loses and also wreaking significant harm on the natural resources.

This is equivalent to the same amount of food produced in the whole region of sub-Saharan Africa, which is sufficient to feed four times the number of hungry peoples in the world.

An article published in an internationally renowned journal (FAO, 2011) reveals that more than 3 million children died of malnutrition in 2011, equivalent to about 1 death in every 10 seconds. Although the number of people living in chronic hunger has declined by 130 million people over the past 20 years, the FAO announced that approximately 870 million people in the world still do not eat enough to be healthy, which means one in every 8 people on Earth goes to bed hungry. This happens not only in more than 30 countries in the African region, but also in 60% of countries where hunger occurs such as in India, Bangladesh, Myanmar, Cambodia and North Korea.



Source: FAO. 2011. Global food losses and food waste
Figure 1: Global food losses and waste, estimated at 1.3 billion tonnes/year

In Malaysia, we hear many people complaining about gaining weight, and being inflicted by ailments such as diabetes, high cholesterols and blood pressure, all caused by over-consumption. The Ministry of Health also reported that 1 in every 4 children in Malaysia is overweight, one of the highest figures among the Asian countries, even higher than many developed countries such as England, Germany and the Netherlands.

Do we have enough food for all? The world actually produces enough food to feed everyone but poverty is the principal cause of hunger, resulting in an imbalanced distribution of the food produced. At the same time, there are people who have too much food. What is even worse is that this abundance of food is left to expire and rot, unconsumed, and finally ends up in the waste bins, which will finally be disposed off at the landfill sites.

Food Wastage vs Environmental Impacts

Food waste is a local problem that creates global issues. From an environmental perspective, food waste is one of the major sources of greenhouse gas (GHG) emission,

particularly from food waste degradation at the landfill sites which emits methane gas, which is 21 times more harmful than carbon dioxide in terms of causing damage to the atmosphere. According to a report by the Ministry of Natural Resources and Environment (NRE) and the United Nations Framework Convention on Climate Change (UNFCCC), a total of 26.4 Mt CO_2 eq. was emitted from the waste sector alone in Malaysia, although the highest contributing sector for GHG is still the energy sector (66%).

The issue of greenhouse gas emissions has drawn serious attention from the United Nations because it has reached an alarming level, and it is recognised as one of the major sources that creates global environmental issues including ozone depletion, climate change and global warming.

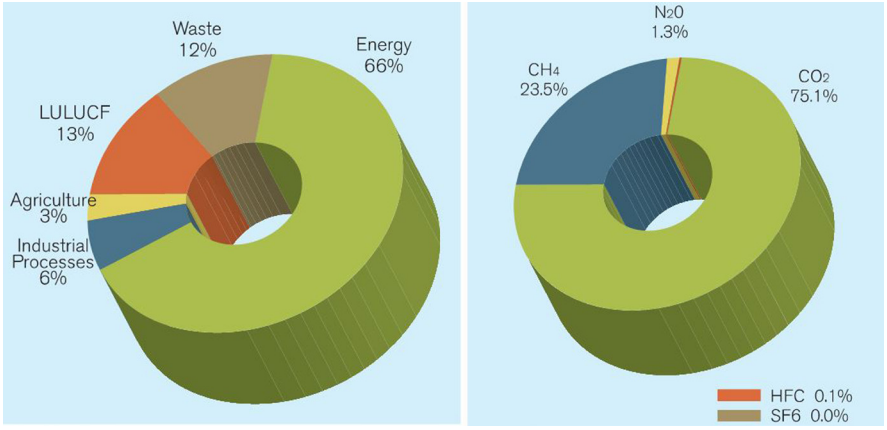


Figure 2: Greenhouse gas emission from the waste sector

Figure 3: Treatment of food waste

Treatment Methods	Description
Food Waste to Energy 	• Waste-to-energy includes treatment by incinerator or anaerobic digestion. Incineration of food waste is not so practical as the moisture content of food waste is normally too high for efficient combustion. Anaerobic digestion or biogas production of food waste is more common, but it requires higher purity of food waste segregation (except in dry anaerobic digestion system). • The energy produced is either in the form of steam or biogas, which can be converted into electricity for direct consumption or connection to the grid.
Food Waste to Fertiliser / Compost 	• Food waste can be turned into fertiliser or compost by the composting process. The composting process is conventionally carried out by windrow system or vermi-composting; however, there are many innovative composting systems in place currently such as bin system, in-vessel system, pot system and many others. • The fertility of the compost or fertiliser produced from composting is subject to the type of food waste, method of composting and possible mixing with other waste such as animal manure and agricultural or green waste.
Food Waste to Solid Fuel 	• Food waste can be converted into fuel by a carbonisation process to increase the energy content or caloric value. However, much energy is needed for the carbonisation process, hindering economic viability in most cases. • Usually, carbonisation is carried out on a mixture of waste including food waste, plastics and green waste etc., to further increase the calorific value.
Food Waste to Animal Feed 	• Turning unwanted food waste to animal feed is one of the easiest ways to solve the waste problem. However, there are some disease-related concerns that prohibit converting food waste into animal feed in some countries. • Food waste can be fed to animals directly with more strict control on the quality, or alternatively pre-treatment is required to sterilise or re-cook the food waste with other food sources such as soybean to ensure better quality nutritious animal feed.
Food Waste to Other Resources 	• Some other initiatives are being carried out to turn food waste into other resources such as ethanol, biofuel, enzymes and specific purpose products such as landfill cover materials. • These initiatives are, however, still not commonly applied as they are subject to economic viability as well as efficiency compared to other available food waste treatment methods. Some of these initiatives are still in the R&D stage.

Table 1: Challenges to food waste treatment

Legal Framework	There is no specific regulation or legal framework to control food waste generation and management among the generators at the moment. Therefore, food waste generators do not see food waste as a problem and dispose of it as they like in the easiest way.
Lack of Facilities	Proper waste management facility is generally still lacking in Malaysia, except for landfill sites throughout the country. Establishment of food waste treatment facility is not supported by a legal framework or an attractive business model.
Low Willingness to Pay	Waste generators are not willing to pay for proper treatment of waste, despite the fact that they should be responsible for any waste generated. As a result, some food waste treatment facilities become economically not viable without sufficient willingness to pay among the generators.
Market Constraints	Market for products from food waste is still very limited in Malaysia, such as composts or animal feed. Incentives and support from the Government are still lacking.

At micro level where the generated wastes are collected, transported and disposed either by the contractors or authorities, food waste is also recognised as one of the most problematic wastes to manage, due to the fact that food waste is the major source of foul odour (as it attracts rodents, flies & maggots) and generates leachate that contaminates the soil, surface and underground water etc. Furthermore, the food waste of Malaysia has plenty of oily stuff such as gravy and various kinds of soups and curry etc., which normally start to turn sour and undergo degradation process, given the hot climate of Malaysia.

Food Waste as Resources

Food waste can be a useful resource, if properly handled and treated. Food waste can be treated in several ways, which can be summarised generally as shown in Figure 3.

Food Waste Management – The Challenges

Although several options are available for converting food waste into useful resources, food waste in Malaysia, is generally disposed off at landfill sites directly without any treatment, except for some food and beverage industries that sell their food waste to farmers and some industries that treat food waste by using small scale composters or biogas machines (Table 1).

Conclusion

Food waste is an environmental problem while food wastage is sinful behaviour spiritually. Food hunger is everywhere but does it matter for Malaysians? Education on the issue should start from a young age and parents should be motivated to train their children not to waste food, and be thankful for the food resources we own and have access to. We need to craft the next Malaysian generation that appreciates and cares not only for themselves, but also for the people of the world, and Mother Earth.

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Tourism on the Move: Environmental Impacts

According to United Nations (UN) Secretary-General Ban Ki-Moon, *"Although individual decisions may seem small in the face of global threats and trends, when billions of people join forces in common purpose, we can make a tremendous difference."*

The well-being of humanity, the environment, and the functioning of the economy, ultimately depend upon the responsible management of the planet's natural resources. Evidence is building that people are consuming far more natural resources than what the planet can sustainably provide.

According to United Nations World Tourism Organisation (UNWTO) Secretary-General Taleb Rifai on the occasion of World Environment Day 2015 (UNWTO, 2015), international tourist arrivals (overnight visitors) hit a record 1,133 million worldwide in 2014 (up from 1,087 million in 2013). Demand continued to be strong in most source markets and destinations, despite ongoing geopolitical, economic and health challenges in some parts of the world. With 46 million more tourists travelling the world (+4.3%), 2014 marks another robust growth for tourism. In 2015 too, growth is expected to continue at a sustained rate of 3% to 4% worldwide (see Figure 1).

In short, the growth of the largest industry in the world is alarming: 3.8% growth from 2005 to 2014 for the world, and a high 6.1% for Asia Pacific region, with Southeast Asia hitting a record 7.9% (see Table 1). With high mobility of tourists in the region, the impact on the environment is going to be detrimental. More than a billion tourists are crossing the borders annually to see our planet's natural wonders.

Figure 1: International tourism arrivals and tourism receipts 2014 (UNWTO, 2015)

According to UNWTO (2015), currently tourism constitutes 9% of world GDP, 1/11 of all employment, USD1.4 trillion in exports, 6% of world exports and 30% of service exports. Thus, tourism's impact on the environment is inevitable. Our biodiversity and natural resources are also facing unprecedented environmental challenges.

Hence, the WED 2015 is indeed a reminder of our immense responsibility to make the correct choice to sustain the environment by adopting sustainable and responsible tourism practices. The multiplier effect of what one billion tourists can do to the environment is great, for the better or for the worse. In the age of travel today, especially with the emergence of low cost carriers across the globe, the more we explore, the more we become aware of Earth's infinite wonder and that we have a responsibility to preserve it for the future generations. Hence, every tourist needs to make his actions count

Table 1. Average annual growth in tourist arrivals (2005-2014)

	International Tourist Arrivals (million)							Market share (%)	Change (%)			Average annual growth (%)
	1990	1995	2000	2005	2010	2013	2014*	2014*	12/11	13/12	14*/13	'05-'14*
World	**435**	**527**	**674**	**809**	**949**	**1,087**	**1,133**	**100**	**4.2**	**4.6**	**4.3**	**3.8**
Advanced economies[1]	**296**	**336**	**420**	**466**	**513**	**586**	**619**	**54.7**	**4.0**	**4.7**	**5.8**	**3.2**
Emerging economies[1]	**139**	**191**	**253**	**343**	**435**	**501**	**513**	**45.3**	**4.4**	**4.5**	**2.4**	**4.6**
By UNWTO regions:												
Europe	**261.5**	**304.7**	**386.4**	**453.0**	**488.9**	**566.4**	**581.8**	**51.4**	**3.9**	**4.9**	**2.7**	**2.8**
Northern Europe	28.7	36.4	44.8	59.9	62.8	67.4	71.3	6.3	1.5	2.9	5.9	2.0
Western Europe	108.6	112.2	139.7	141.7	154.4	170.8	174.5	15.4	3.6	2.8	2.2	2.3
Central/Eastern Europe	33.9	58.1	69.3	95.1	98.4	127.3	121.1	10.7	9.1	7.7	-4.9	2.7
Southern/Medit. Europe	90.3	98.0	132.6	156.4	173.3	201.0	214.9	19.0	1.9	5.6	6.9	3.6
- of which EU-28	230.1	268.0	330.5	367.9	384.3	433.8	455.1	40.2	3.0	4.0	4.9	2.4
Asia and the Pacific	**55.8**	**82.1**	**110.3**	**154.0**	**205.4**	**249.8**	**263.3**	**23.2**	**6.9**	**6.8**	**5.4**	**6.1**
North-East Asia	26.4	41.3	58.3	85.9	111.5	127.0	136.3	12.0	6.0	3.4	7.3	5.3
South-East Asia	21.2	28.5	36.3	49.0	70.5	94.3	96.7	8.5	8.7	11.3	2.6	7.9
Oceania	5.2	8.1	9.6	10.9	11.4	12.5	13.2	1.2	4.2	4.6	5.7	2.1
South Asia	3.1	4.2	6.1	8.1	12.0	16.0	17.1	1.5	5.9	11.4	6.8	8.6
Americas	**92.8**	**109.1**	**128.2**	**133.3**	**150.1**	**167.5**	**181.0**	**16.0**	**4.5**	**3.1**	**8.0**	**3.5**
North America	71.8	80.7	91.5	89.9	99.5	110.2	120.4	10.6	4.1	3.6	9.2	3.3
Caribbean	11.4	14.0	17.1	18.8	19.5	21.1	22.4	2.0	3.1	2.8	6.2	2.0
Central America	1.9	2.6	4.3	6.3	7.9	9.1	9.6	0.8	7.3	2.6	5.6	4.8
South America	7.7	11.7	15.3	18.3	23.1	27.1	28.6	2.5	6.3	1.5	5.4	5.1
Africa	**14.7**	**18.7**	**26.2**	**34.8**	**49.5**	**54.4**	**55.7**	**4.9**	**4.8**	**4.7**	**2.4**	**5.4**
North Africa	8.4	7.3	10.2	13.9	18.8	19.6	19.8	1.7	8.7	6.0	0.9	4.0
Subsaharan Africa	6.3	11.5	16.0	20.9	30.8	34.7	35.9	3.2	2.8	4.1	3.3	6.2
Middle East	**9.6**	**12.7**	**22.4**	**33.7**	**54.7**	**48.4**	**51.0**	**4.5**	**-5.3**	**-3.1**	**5.4**	**4.7**

while travelling to consume with care. A carbon offset plan must be put in place sooner than later for all travelling visitors.

In a changing climate situation, the risk and adaptation that the tourism industry has to face such as rising temperatures, high sea levels and degraded habitats will certainly impact every sub-sector of the tourism industry.

A study conducted by University of Cambridge (2014) on climate change and the implications on tourism indicated that the appeal of many destinations will fade when temperatures rise. For example, winter sports will become less viable in some locations; coastal tourism will become vulnerable to rising sea levels; and many of the natural phenomena such as coral reefs and forests with its bio-diversified flora and fauna will be degraded or disappear.

In addition to all this, the tourism sector will also face other indirect impacts, such as more expensive insurance, limited water availability, reduced food security and greater conflicts affecting some communities in which it operates. In short, tourism will be affected by policy changes and efforts to reduce Green House Gas (GHG) emissions causing global warming. Destinations will be impacted and there are bound to be operational impacts (see Box 1).

Box 1. Tourism impacts and risk due to climate change (University of Cambridge, 2014)

Climate change will impact the tourism sector at the destination level, and at the operational level. These impacts will force necessary lifestyle changes.

Destination impacts:

- Rising sea levels and extreme weather will threaten coastal tourist infrastructure and erode and submerge beaches.
- Ocean acidification and rising sea temperatures will degrade and destroy coral reefs.
- Rising temperatures will reduce the viability of some winter sports destinations, affect biodiversity and lead to more forest fires.

Operational impacts:

- Reduced water availability could lead to disputes with local industry and communities.
- Extreme weather events will increase operational uncertainty, particularly in poorer countries.
- Insurability will decline in areas exposed to extreme weather or sea-level rise.
- Efforts to cut emissions may add costs to the industry, particularly from transport emissions.

Lifestyle changes necessary:

- Emission reductions from improvements in fuel efficiency and technological fixes are expected to be offset by growth in tourism.
- Strong policy measures are likely to be necessary, especially to change passenger transport behaviour, where a "large price signal is needed".
- Changes in lifestyle are therefore likely to be an important component of any effort to drive emission reductions from tourism, for example, a reduction in the demand for long-haul tourism in favour of holidaying more locally.

Over the past decade, there have been numerous academic reports particularly in terms of climate impacts. Nonetheless, all these studies on tourist behaviour lack reliability and are often contradictory, making it hard to draw all-encompassing conclusions. Many of these studies also tend to project on how tourists are likely to behave, rather than look at how tourists are actually responding. Projected changes in the attractiveness of certain destinations have rarely been tested against observed tourist behaviour. There have been limited studies on environmental degradation and the effects on urban tourism, and the likely changes to the economic value of tourism due to this dilapidation.

As for the industry itself, there seems to be limited concern among tourism operators on the impact of the environment on the industry. Most operators are confident of being being able to adapt easily, or that the uncertainty around environmental degradation is too great for early investment in adaptation to make any sense.

There is hardly any country that has successfully developed a low-carbon tourism strategy despite the environmental uncertainties that have been highlighted in many of the global environmental summits over the past few years. The impact of the environment may not be affecting the tourism sector uniformly. Obviously, coastal tourism is more vulnerable than urban tourism. Tourism activities in the beach, angling, or even nature watching, will be more affected than visiting friends and relatives (VFR), pilgrimage or gambling. The choice of attraction of a destination will change as temperatures rise with some parts of the world being more sensitive to climate change than others.

On the other hand, changes in the climate may provide opportunities, with new destinations and new types of alternative tourism emerging. Nonetheless, these new opportunities may be short-lived if the negative impact due to environmental degradation is significant and affects the industry on the whole.

As a responsible tourist, "consume with care" is an important part of the theme for WED 2015. Most responsible tourists hope their trip will give enriching experience. The travel experience should not only be practised as a means of individual fulfilment but also collective accomplishment. Reducing one's carbon footprint or offsetting it is an important contribution towards a greener industry. By becoming more aware and making even small adjustments to the way we travel, we can all contribute to the preservation of the travel destinations. Some of the ways responsible tourists can play their part are outlined in Box 2.

In conclusion, the environment that the tourism sector is operating is considerably uncertain. Environment is the platform in which tourism activities thrive. It becomes pertinent that this platform is protected and conserved for continuous tourism development. Tourism activities can be equated to a double edged sword; while it brings substantial enhancement of the environment, in depth research often reveals some extent of degradation to the natural environment. It can put enormous pressure on an area and lead to impacts such as soil erosion, increased pollution, discharges into the sea, loss of natural habitats, loss in biodiversity, increased pressures on endangered species and heightened vulnerability to forest fires. Tourism should be made more viable than being destructive to the environment, as the satisfaction of visitors will erode when the natural attraction of the tourism setting loses its desirability.

Box 2. Tips for Greener Travel

Tip1: Planning your trip

- Choose accommodations that are committed to social and environmental conservation.
- Find hotels that have a demonstrated commitment to sustainability.
- Support hospitality and tourism establishments that promote energy and water efficiency and also usage of sustainable technologies through green-building guidelines/procurement policy.

Tip2: Reduce travel emissions

- Reducing the greenhouse gas emissions from your trip is one of the most important ways to help prevent global warming on your vacation.
- If you do have to fly, try to minimise the number of flights you take by combining trips, fly the most direct route possible (since take-offs and landings use the most fuel), fly during the daytime (studies have shown that flights taken at night have a greater impact on the climate), fly economy (more people per plane means fewer emissions per person), pack light (lighter planes mean less fuel is burned).
- You may want to also consider taking a vacation closer to home.
- Offset your CO_2 emissions with one of many available carbon neutralisation programs, such as CarbonFund.org and MyClimate.org.
- At the destination, rent a hybrid car, or use public transportation. For shorter distances, rent a bicycle or simply walk.

Tip3: Reduce your impact at your destination

- Make small changes in your travel behaviour at the destination.
- Buy local (use local products, since shopping for food and other products is a huge contribution to global carbon emissions); opt for locally-owned restaurants, bars, and hotels is often a rewarding choice, not only in terms of financial and CO_2 savings, but especially because of the unforgettable experiences you gain.
- Low-impact recreation (to enjoy the rich natural and cultural environment, do so in a low-impact way, e.g. choose kayaking, snorkelling, or surfing instead of speed-boating or jet-skiing; walk and cycle instead of renting a motorbike).
- Reduce your water consumption (take shorter showers and turn off the water when you are not using it, and reuse your sheets and towels).
- Conserving electricity (be sure to turn off and unplug electrical appliances after using them, turn down your air-conditioning, and be sure to turn off the lights when leaving your hotel room).
- Use video-conferences for meetings and webcams to keep in touch with family and friends who live far away.

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Source

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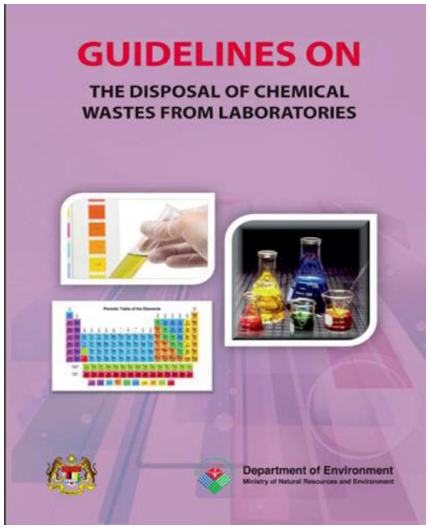
Guidelines on the Disposal of Chemical Wastes from Laboratories



The proper storage and disposal of chemical wastes generated in a laboratory is important not only for efficient management of the laboratory but also for ensuring the safety of those working in that environment. In Malaysia, there is increasing concern over the management of chemical wastes produced daily in laboratories as well as waste generated from chemicals that have exceeded their expiry dates or have been discarded or abandoned. The long-term impact of improper disposal of chemical wastes into the environment could be far-reaching and prove to be costly.

In Malaysia, the control of wastes is governed by the Environmental Quality Act 1974. The Environmental Quality (Scheduled Wastes) Regulations 2005 requires all wastes to be handled properly and as far as possible, be rendered innocuous prior to disposal and be treated at prescribed premises or on-site treatment facilities only. Currently, there are a number of scheduled wastes generated by laboratories such as SW409 (Disposed containers, bags or equipment contaminated with chemicals, pesticides, mineral oil or scheduled wastes), SW410 (Rags, plastics, papers or filters contaminated with scheduled wastes), SW429 (Chemicals that are discarded or off-specification) and SW430 (Obsolete laboratory chemicals).

As far as possible laboratory chemical wastes should be minimised in order to reduce the amount generated and their toxicity through the following approaches:

1. Practise the concept of source reduction by ordering the smallest quantity of chemical materials required;
2 Keep an inventory of chemicals on hand;
3 Systematically segregate waste according to their properties;
4 Change practices so that less waste is generated;
5 Select processes that inherently produce less waste;
6 Reduce the volume of waste that will undergo disposal (e.g., centrifugation);
7 Substitute with chemicals that are non-hazardous or less toxic.

The overall goal of the Department of Environment is the prevention of pollution as the best management practice. The present *Guidelines on the Disposal of Chemical Wastes from Laboratories* have therefore been developed with prevention in mind and as a handy tool for laboratory personnel's use. The Guidelines are envisaged to assist in proper techniques of handling chemical laboratory wastes and their subsequent disposal in a manner that will not degrade the environment nor endanger health and safety. In the course of the preparation of these guidelines, sound inputs were provided by many agencies and institutions of higher learning. This sharing of their experiences and knowledge in the handling of chemical wastes from their own laboratories has provided useful information on the proper and practical aspects of safe disposal of hazardous chemical wastes.

Toxic or hazardous wastes should not be disposed of down the sink, drain or into the atmosphere. Acidic or alkaline wastes should be neutralised before they are disposed down the sink or the drain or disposed into a pit. Waste chemicals should be disposed off quickly to avoid accumulation of large stocks. Chemicals immiscible with water must not be discarded into sinks or drains. Flammable solvents must similarly not be discarded. All waste solvents should be collected in the appropriate waste containers and clearly labelled. The waste containers should not be filled to the brim as air space is required.

Laboratory chemical wastes should be stored in containers which are durable to prevent spillage or leakage of the contents into the environment. These containers should be able to withstand the chemical erosion likely to be caused by their contents and must be leak-proof and gas tight. Chemical waste containers from laboratories should be clearly identified and labelled with warning notices in accordance with labelling requirements for scheduled wastes.

Wastes generator premises are required to use 'e-SWIS' web application to include information in accordance with the *Sixth Schedule (Regulation 12) Environmental Quality (Scheduled Wastes) Regulations 2005* for every outward movement of scheduled wastes from waste generator's premises *(www.doe.gov.my)*. A waste generator is required to keep accurate and up-to-date inventory in accordance with the Fifth Schedule *(Regulation 11) Environmental Quality (Scheduled Wastes) Regulations 2005* of the categories and quantities of scheduled wastes being generated, treated and disposed.

Pelan Strategik Pengurusan Buangan Terjadual Pasca 2015

Dengan penamatan hak ekslusif Kualiti Alam Sdn. Bhd. di dalam melaksanakan dan mengendalikan kemudahan bersepadu buangan terjadual pada 28 Februari 2015, pengurusan buangan terjadual kini telah memasuki era baru yang lebih terbuka dan mencabar. Lebih komitmen dan kerjasama semua pihak khususnya industri dan pegawai-pegawai Jabatan Alam Sekitar (JAS) diutamakan dalam pengurusan buangan terjadual bagi meneruskan kesinambungan pengurusan buangan terjadual yang selamat dan mapan.

Pelan Strategik Pengurusan Buangan Terjadual Pasca 2015 ini dikeluarkan dengan tujuan memberi panduan tadbir urus kepada JAS di seluruh Malaysia di dalam kerja-kerja penguatkuasaan, pengendalian data, keupayaan menilai keberkesanan teknologi dan juga penetapan dasar dan polisi berkaitan buangan terjadual. Pelan ini menggariskan lapan strategi yang menjadi asas kepada pengurusan buangan terjadual dengan sasaran perlaksanaannya mulai tahun 2016 sehingga tahun 2020:

1 Memperkasa dasar dan perundangan pengurusan buangan terjadual Negara;
2 Memantapkan penguatkuasaan buangan terjadual;
3 Menggunakan pendekatan forensik alam sekitar dalam penguatkuasaan;
4 Mempertingkatkan aplikasi prinsip 4R (reduce, reuse, recycle dan recover) dan kaedah pelupusan selamat;
5 Memperkukuhkan kerjasama antarabangsa;
6 Meneroka opsyen-opsyen baru ke arah pemantapan pengurusan buangan terjadual;
7 Memperkasa dan membudayakan modal insan pegawai JAS dan pihak berkepentingan dalam pengurusan buangan; dan
8 *Stakeholder engagement.*

Pelan ini telah disediakan berdasarkan pendekatan terkini iaitu prinsip "cradle to cradle" dengan meperkukuhkan Prinsip 4R selaras dengan matlamat menjadiakan sektor buangan lebih kompetitif dan berupaya menjana ekonomi negara.

WORLD ENVIRONMENT DAY 2015

Temubual bersama Puan Muhibbah Selamat, Pengarah Bahagian Komunikasi Strategik, Jabatan Alam Sekitar bertajuk "Seven Billion Dreams. One Planet. Consume with Care" untuk program Selamat Pagi Malaysia, RTM, pada 5hb Jun, 2015

HARI ALAM SEKITAR SEDUNIA 2015

Hari Alam Sekitar Sedunia buat pertama kalinya diraikan pada 5 Jun, 1973 dan semenjak itu ia disambut setiap tahun di seluruh dunia. Tema pada tahun ini ialah 'Seven Billion Dreams. One Planet. Consume with Care'. Tema ini memfokuskan kepentingan kita dalam mengamalkan penggunaan sumber secara berhemah serta gaya hidup lestari.

Konsep kelestarian adalah teras bagi tema tersebut dan konsep kelestarian ini juga selari dengan misi Jabatan Alam Sekitar (JAS), dalam memastikan pembangunan lestari dalam proses memajukan negara. Selaras dengan itu, JAS juga telah meminda undang-undang dan peraturan- peraturan agar kelestarian alam sekitar dapat dicapai. Pindaan-pindaan yang terkini memberi tumpuan kepada Penilaian Kesan Kepada Alam Sekeliling yang lebih dikenali sebagai EIA. EIA memainkan peranan yang penting dalam proses mencegah pencemaran dan kemusnahan alam sekitar di peringkat perancangan sesuatu projek pembangunan.

Peranan dalam memastikan pembangunan lestari bukan hanya terletak di bahu pihak industri atau pemaju projek sahaja. Orang ramai juga perlu memainkan peranan masing-masing dengan mengamalkan amalan mesra alam seperti seperti memadamkan lampu apabila keluar daripada bilik, menggunakan peralatan elektrik jenis jimat tenaga, berkongsi kereta ke pejabat, mengurangkan penggunaan beg plastik, mengumpul dan mengguna semula air hujan dan pelbagai lagi boleh diamalkan setiap hari.

Hari Alam Sekitar Sedunia ini merupakan sambutan global yang menyatukan masyarakat seluruh dunia melalui pelbagai aktiviti. Sempena Hari Alam Sekitar Sedunia pada tahun ini, marilah kita bersama-sama berganding bahu menganjurkan serta menyertai aktiviti-aktiviti yang boleh menyumbang kepada kelestarian alam sekitar seperti pembersihan pantai, penanaman pokok bakau, program kitar semula, forum alam sekitar, dan sebagainya.

Pada hari yang bermakna ini, dalam usaha mencapai pembangunan lestari, marilah kita bersama-sama mengamalkan penggunaan sumber secara berhemah serta gaya hidup lestari.

Dato' Halimah Hassan
Ketua Pengarah Alam Sekitar Malaysia

Temubual bersama En Sivanathiran Subramaniam, Ketua Penolong Pengarah, Bahagian Komunikasi Strategik, Jabatan Alam Sekitar bertajuk "Seven Billion Dreams. One Planet. Consume with Care" untuk program Hello Malaysia, Bernama TV, pada 5hb Jun 2015

Aktiviti Berwarna bersempena 'Program Kesedaran Alam Sekitar Bersama Komuniti' yang diadakan pada 6hb hingga 7hb Jun 2015 di MARDI, Cameron Highlands

This advertorial was published in local newspapers in conjunction with World Environment Day.

Event Highlights
Department of Environment, Malaysia

March 2015

Green Industry towards Green Growth

"A green industry is committed to environmental management through prevention, reduction or minimisation of resources consumption and waste generation in its manufacturing process and services towards carbon dioxide equivalent emission reduction for sustainable environment."

DOE organised a seminar on 'Green Industry to Promote Cleaner Production for Small and Medium Enterprises (SMEs)' under the 11th initiative of "River of Life" (RoL) program. Held on 26 March 2015 in Putrajaya, the seminar aimed at promoting Green Industry practices and providing information on concepts, mechanisms and benefits of implementing Green Industry practices to SMEs in the Klang Valley, the Federal Territory of Kuala Lumpur and Selangor and, especially those involved under "River of Life" (RoL) program. Dr Zulkifli Abdul Rahman, Deputy Director General (Operations) officiated the launch of the seminar. The four papers presented at the seminar were:

1. 'Pengenalan kepada Program River of Life (RoL)'
2. 'Program Latihan Industri Hijau dan Faedahnya kepada Perusahaan Kecil dan Sederhana (PKS)'
3. 'Keperluan Pematuhan Terhadap Akta Kualiti Alam Sekeliling 1974 dan Peraturan-Peraturan di bawahnya'
4. 'Program Latihan Pengeluaran Bersih Kepada Perusahaan Kecil dan Sederhana (PKS) dari Perspektif Perunding'

The presenters were Tuan Haji Ismail Ithnin, Director of Enforcement Division, Mr. Wan Abdul Latif Wan Jaaffar, Director of Marine Division, Mrs. Zuraini Siam, Head of Green Industry Section and Profesor Ir. Dr. Abdul Aziz Abdul Rahman of the Engineering Faculty, University Malaya.

The implementation of Cleaner Production among industries is currently not bound by any existing law. It will become mandatory after the amendments to the Environmental Quality Act, 1974, which is currently being drafted, are concluded. In the long term, government's commitment alone will not suffice – the involvement and commitment of all industry players is essential.

25 Mei, 2015

Pelancaran Pusat Kecemerlangan Pengurusan Bahan Berbahaya dan Industri Hijau, Taboh Naning, Melaka

Pusat Kecemerlangan Pengurusan Bahan Berbahaya dan Industri Hijau telah dilancar penubuhannya oleh YB. Datuk Seri G. Palanivel, Menteri Sumber Asli dan Alam Sekitar pada 25 Mei 2015. Pusat Kecemerlangan Pengurusan Bahan Berbahaya dan Industri Hijau dijangka menjadi sebuah pusat setempat (*one-stop centre*) dan gateway bagi mendapatkan gambaran keseluruhan kepada pengurusan buangan terjadual di Malaysia. Ianya akan beroperasi kelak sebagai pusat rujukan dan demonstrasi bagi bahan berbahaya dari segi aspek siasatan pengendalian buangan terjadual, kaedah dan cara pemeriksaan buangan terjadual, teknologi dan juga rujukan bagi komitmen negara kepada konvensyen buangan dan bahan berbahaya seperti Konvensyen Basel, Konvensyen Rotterdam, Konvensyen Mercury.

Terdapat beberapa program yang turut dilaksanakan bersempena pelancaran, antaranya Majlis Dialog di antara pihak pengeluar buangan terjadual dan pihak Premis Yang Ditetapkan (PYDT) bersama pihak pengurusan tertinggi JAS. Perlaksanaan *Bengkel Pembawa Yang Ditetapkan* yang melibatkan secara terus pemandu kenderaan buangan terjadual turut berlangsung pada hari kedua program.

Seminar *Pengurusan Khas Buangan Terjadual dan Success Story* adalah salah satu program yang dilaksanakan bagi meningkatkan pemahaman peserta khususnya bagi pengeluar buangan tentang peruntukan Peraturan 7, Peraturan-Peraturan Kualiti Alam Sekeliling (Buangan Terjadual) 2005 dan menerangkan secara terperinci keperluan permohonan pengurusan khas mengikut garispanduan berdasarkan hiraki pengurusan buangan terjadual. Seminar ini telah dijalankan selama dua hari.

Jabatan Alam sekitar turut melancarkan beberapa Pelan dan garispanduan berhubung pengurusan bahan berbahaya seperti *Pelan Strategik Pengurusan Buangan Terjadual PASCA 2015, Kod Amalan Perlabelan Buangan Terjadual, Garispanduan Co-Processing, Sistem eSWIS* dan *Garispanduan Pengurusan buangan dari Makmal.*

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