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“Yes! Keep the Sustainable Lifestyle Going”

Saving the World through Education for Sustainable Development

On 28 September 2015, a historic moment took place at the United Nations in New York. On the eve of the closure of the Millennium Development Goals (MDGs) programme, launched 15 years ago, a new agenda termed Sustainable Development Goals (SDGs) is in the making.

Saving the World through Education for Sustainable Development

Like the MDGs programme which was signed by all world leaders in an attempt to make the world more equitable and just and more importantly sustainable, the SDGs were accorded the same commitment. This means that the needs of the present generation can be met without compromising the future generation to meet their own needs. In a manner of speaking, it recognises that “there is enough for everyone, forever”!

Where Are We Today?

This is in stark contrast to the current reality. Today, the majority of the world's population are leaving on less than USD 3 a day. Some 60% are said to be in such a dire situation that the state of humanity appears to be an untenable one. This divide, like many others, is drawn along the Global North and Global South line with the latter being most disadvantaged. The MDGs were designed with the aim of closing the gaps on at least eight major fronts ranging from tackling world hunger and starvation to the state of poverty; from the issues of maternal health to infant mortality; and from the threat of environmental degradation to the spread of fatal diseases like malaria and HIV-AIDS. It also recognises the importance of global partnerships and collaboration in achieving these goals which are mainly directed at the developing countries of the Global South. Under the circumstances, meeting the targets of MDGs is a challenging task from just the perspective of resource mobilisation alone. Pledges from their counterparts in the North are generally unreliable, if inadequate. Hence, it is not surprising that the MDGs as a programme is widely considered as “unfinished business.” This means that the state of the world's disparities in some measures is not being satisfactorily met. The aspiration to end world poverty by the end of 2015, for example, remains unfulfilled, in fact hard pressed, as the population continues to expand globally. The overarching goal for an equitable, just and sustainable future is still far off.

Why Sustainable Development Goals (SDGs)?

Consequently, it is deemed imperative that we continue the agenda of the MDGs post-2015. Some of the shortcomings of the past were taken into consideration in designing the SDGs in order to make it more “comprehensive” and “accurate.” Three aspects are very significant in this regard. First, the eight goals of the MDGs have been expanded to more than double, 17. New themes like justice and societal well-being are included to make it more holistic in seeking for long standing global solutions. Second, it recognises that all the 17 goals are linked to each other making their achievements interrelated and the approach integrated, thus being sustainable for the long haul. Third, the programme and goals are universal in nature and not directed only to the developing countries as before. Increasingly, it is seen as unitary global goals that must have the commitment of all as signified by the meeting of leaders on 28 September. While many criticise that the new global agenda is too varied and numerous to effectively track, let alone achieve, it is a matter of how the world can jointly partner to save the only planet it has for all humankind. The artificial demarcation of developed and developing, East and West, or rich and poor will not make a difference if this civilisation comes to an end because its inhabitants failed to act in unison and a consistent manner towards a common aspiration.

Global warming and Climate Change: Are we Doomed?

Framed this way, perhaps there is no more urgent challenge that must be dealt with other than the on-going issues of global warming and climate change. For example, as late as 2010, Frank Fenner, Emeritus professor of microbiology at the Australian National University predicted that the human race, along with some animals, will be extinct within the next 100 years. He claimed that the human race will be unable to survive a population explosion and “unbridled consumption”

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From the desk of the Director General

“Yes! Keep the Sustainable Lifestyle Going”



Without a doubt, much is being done around the globe to save Mother Earth from an irreversible environmental catastrophe. Some of the best brains of academia and government are working feverishly on solutions that will bring about a new and greener tomorrow. But it never seems to be enough.

For with each passing day, as we unearth more and more facts about the deleterious effects of our past unsustainable practices, our current efforts seem inadequate and miniscule. Environmentally speaking, we have put ourselves between a rock and a hard place. There is little wiggle room left and even less of time.

But we must never give up. We simply cannot. Our future generations depend on us to fight and fight on. And so, as in the past issues of IMPAK, we ask this question: What more should we do to accelerate the pace of environmental recovery, of rescuing the environment before it is too late?

In this issue we go back to basics – food, shelter and clothing but with a difference – we do it in the context of modern life. Today “food” is both food for thought and food for biological sustenance. Likewise “shelter” is for businesses, people, forests and wildlife while “clothing” is broadly represented today by lifestyle in all its varied forms all over the world.

Our consumption of the various outputs and inputs required for these three basic necessities of life is a severe drain on the now rapidly depleting material resources of the world. But consumption in itself is only half the equation because consumption inevitably generates waste of all kinds, food waste, scheduled waste and infectious waste. Of course, given the complexities of modern life, some waste is unavoidable but not when it pollutes our seas, rivers and farms. Some of this waste can be turned to good use if we all put our hearts and heads together and do our small part in minimising waste.

But sadly many are not aware that their small part can make a world of a difference! So why are we not giving a hand to this planet we call Home? Education is key like in so many other global problems confronting us. It should strike us as odd that even as the bells toll for Mother Earth, sustainability principles and practices are not given greater emphasis to our youth in schools and universities as compulsory subjects. But change is coming, and it is coming from a world body, the United Nations. The issues and new initiatives for sustainable development through education are discussed in the lead article “Saving the World through Education for Sustainable Development”.

That is surely food for thought and now we turn to food for our biological needs. Needless to say, a sustainable, healthy diet is the cornerstone of a sustainable lifestyle. After all we are what we eat. But modern man has made eating a pleasure, a gastronomic delight. We work less physically but eat more. More for less is obviously unsustainable. Now we must unlearn how to eat. We must eat to sustain ourselves and others around the world. Eating cannot be a selfish act. Less is more when it comes to food. The article on a sustainable diet points us to the right direction. Mindful consumption coupled with efficient and humane food production methods is the key to feeding a burgeoning human population. Both food waste and wasting food destroy our efforts to sustain life on Earth.

“Waste not, want not” should be the new creed the world over. Almost everything can be recycled. The rubbish dump should become a relic of our past. If pursued aggressively, lifestyle changes, smarter buildings and intelligent food production will help us carefully husband the material resources on Earth, giving us sufficient time to work out solutions to a greener living. Some of the articles in this issue cast more light on these initiatives in different parts of the world.

We earnestly hope that in the upcoming World Climate Summit in Paris, the countries of the world will take the proverbial bull by the horns and redouble their efforts to save Mother Earth from an impending disaster of our own making. There is also an urgent need for richer, more advanced countries to agree to targets and timelines, including funding for poorer nations in the frontlines of climate change. For it is now clear that climate related disasters are increasingly becoming an obstacle to economic growth and human wellbeing at a very fundamental level – food, shelter and clothing. Surely we human beings have the capacity, capability and foresight to put our lifestyle on a sustainable path.

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Director General
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pattern that they have created. This phenomenon is irreversible. He lamented, "I think it's too late. I try not to express that because people are trying to do something, but they keep putting it off."

Accordingly, as humans enter an unofficial scientific period known as the Anthropocene - the time since industrialisation - he reckoned that "we have had an effect on the planet that rivals any ice age or comet impact." He put the blame on the onset of climate change. The Easter Island, off the coast of Chile, is cited as the ill-fated example.

More recently, Professor Nicholas Boyle of Cambridge University was quoted as saying that a 'Doomsday' moment will "determine whether the 21st century is full of violence and poverty or will be peaceful and prosperous." According to him, in the last 500 years there has been a cataclysmic 'Great Event' of international significance at the start of each century. If so, the world is predictably embarking on its sixth mass extinction, faster than used to, scientists warned. Humans could be among the first victims.

Based on statistical documentation from scientists at Princeton and Stanford Universities and the University of California Berkeley, the Earth is reportedly experiencing a mass extinction event unrivalled since the end Cretaceous mass extinction of 66 million years ago. It eradicated not only the dinosaurs, but virtually all large land animals. The lead author of the study, Gerardo Ceballos, predicts that homo sapiens are likely to die off early on in this sixth great extinction. The study published in the journal *Science Advances* "shows without any significant doubt" that this is now happening. Ceballos further adds, "If it is allowed to continue, life would take many millions of years to recover, and our species itself would likely to disappear early on."

Higher Education Sustainability Initiative (HESI)

Relevant to this forthright concern is a significant important event that took place in Paris a fortnight after the SDGs launch in support of sustainable development in general, and climate change action, in particular. This in conjunction with the XXI Session of the Conference of the Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC), hosted by the French government. Themed "From Rio to Paris: Higher Education for Climate Change Action", a network of United Nations entities, including UNESCO and UNEP and United Nations University, called Higher Education Sustainability Initiative (HESI) was formed in the lead up to the UN Conference on Sustainable Development or popularly called Rio+20. The aim is to provide higher education institutions with a unique interface between education, science,



and policymaking. With the involvement of some 300 universities around the world, it accounted for more than one-third of all voluntary commitments that came out of Rio+20.

Since its inception, HESI has facilitated commitments on behalf of 272 organisations from 47 countries to take up an active role in building a more sustainable society, representing 36 % of all commitments made during the Rio+20 Conference. Following a report made as a background for the UNESCO World Conference on 'Education for Sustainable Development' in November 2014, a promising 73% of all pledging institutions were found to have made at least partial progress on their commitments, either directly or indirectly. This provides an "optimistic" outlook that the majority of the institutions involved are, in some shape or form, moving sustainable development forward, albeit at varying levels of progress. Notwithstanding this, there are noteworthy patterns in the types of outcomes and the implementation methodologies used to achieve these outcomes especially related to education, research, operations and outreach programmes.

In short, the trend is encouraging, particularly for those that are "new" to the field of sustainability education. For these institutions, Rio+20 provided a much needed platform to join the movement, notably by catalysing or reinforcing participation in international sustainability networks from which they could learn and grow. This was further substantiated at the International Conference on Higher Education for Sustainable Development - 'Higher Education Beyond 2014' held in Aichi-Nagoya on 9 November 2014 to celebrate achievements and review initiatives that were developed throughout the United Nations Decades of Education for Sustainable Development (2005-2014). It was even further enhanced by the contributions made by the Regional Centres of Expertise on Education for Sustainable Development that met a week before in Okayama, Japan.

Priority Actions

The five priority actions that were focused on included: (i) advancing policy; (ii) transforming learning and training environments, namely, the whole-institution approach; (iii) building capacities of

educators and trainers; (iv) empowering and mobilising youth; and (v) accelerating sustainable solutions at the local level. They are well in line with the two-pronged Global Action Programme (GAP) on Education for Sustainable Development post-2014 aimed at reorienting education and learning so that everyone has the opportunity to acquire the knowledge and skills, values and attitudes—and make a difference. The aim is also to strengthen education and learning in all agendas, programmes, and activities to promote sustainable development.

Other major documents that outline higher education commitments are: (i) the Rio+20 People's Sustainability Treaty on Higher Education; (ii) the 2014 International Association of Universities Statement on Higher Education for Sustainable Development; and (iii) the Nagoya Declaration on Higher Education for Sustainable Development. A Sustainability Literacy Test was also initiated in an effort to set and track the agenda beyond 2014.

With such rich experience and enormous efforts expanded over more than a decade, the HESI event held in Paris is poised to provide an invaluable academic facilitation, "best practices" and scientific inputs to COP21 especially in the attempt to achieve a legally binding and universal agreement on climate change, and also other related initiatives that are aligned to GAP. Essentially, the HESI network is committed to (a) teach sustainable development across all disciplines of study; (b) encourage research and dissemination of sustainable development knowledge; (c) develop green campuses and lend support for local sustainability efforts; and (d) engage and share information with international networks in the promotion of education, training, and public awareness on climate change.

Indeed, the 2014 UNESCO World Conference on Education for Sustainable Development demands that higher education institutions make more profound contributions to achieving sustainable development through transformative changes in their vision, leadership, knowledge structure, and engagement.

However, this conference does acknowledge the major challenges faced in up-scaling and mainstreaming new and innovative practices in learning and knowledge development, as well as creating a conducive environment for facilitating the transformative processes.

Source

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A Sustainable Diet for a Sustainable Lifestyle

A sustainable, healthy diet is the cornerstone of a sustainable lifestyle. It is a lifelong commitment with benefits that no amount of money, trendy diets or modern medicine can buy.

What's killing Malaysians

The socio-economic status of Malaysians has improved by leaps and bounds over the past decades. More food has become available, people have become more affluent and health care facilities have improved tremendously. People suffer less from infectious or communicable diseases. On the other hand, the non-communicable diseases (NCDs) have become more important causes of morbidity and major causes of death.

The biggest killer of Malaysians is coronary heart disease (CHD), and has been for the past 40 years. CHD, which most commonly leads to a stroke or heart attack, can cause severe disability, with expensive treatment costs and lengthy medical care. Of course, the worst case scenario in heart disease is death. Heart disease is also increasingly affecting younger people, crippling young adults in their prime.

Other NCDs, such as obesity, diabetes and cancers, have also been on the rise over the past decades. Once known as diseases of the affluent, they now strike all Malaysians, rich or poor. Once common only in urban towns, NCDs are now just as widespread in rural areas. These diseases are a tremendous economic burden to the nation. Huge financial resources that can be used for national development need to be siphoned away for managing these diseases. For families with members suffering from these conditions, it can be an economic disaster, as the medications are usually extremely expensive and need to be taken for life.

Malaysia has already earned the dubious recognition of being the fattest country in South East Asia! The National Health and Morbidity Survey 2011 found that 50% of adults are overweight or obese, about 21% of Malaysian adults have diabetes, 33% have hypertension and 35% have high cholesterol.

Childhood obesity is also on the rise and up to 30% of primary school children have been found to be overweight or obese. Adolescent diabetics is not uncommon in this country.

It would appear that being an increasingly sick nation is one of the unfortunate 'side effects' of development – rising affluence and urbanisation lead to unhealthy lifestyles, including inappropriate eating habits and a sedentary lifestyle.

7 Tips for a Healthy Diet towards a Sustainable Life:

1

Balance and variety: To have balanced meals means making sure that every meal contains all the main food groups in the right proportions. To have variety means eating different foods every day to ensure you get all the different types of nutrients and other health components in foods (phytonutrients). Make a conscious effort to eat more vegetables, and eat fruits after every meal. Use the food pyramid to guide you in putting these principles into practice.

2

Remember **moderation:** Eating in moderation means eating appropriate serving sizes at appropriate intervals. Eating a huge plate of mee mamak goreng meant for two persons is not eating in moderation. Eating a favourite food every day is not eating in moderation. There is no need to pile up all the food in the buffet line onto your plate. Overeating is a sure way of becoming overweight.

In other words, you can still eat nasi lemak, curry laksa or ice-cream, just not every day or in huge amounts. Make these a treat that you have once or twice a fortnight.

3

Eat **regular** meals: Breakfast is the most important meal of the day. Lunch and dinner are also important, along with light, healthy snacking. Some people have the mistaken belief that by skipping meals, one can lose weight. This is untrue, as skipping meals will only make you hungrier and eat more next time or snack on unhealthy foods.

4

It's all about **choices:** Every meal is about making a wise choice. Choose grilled chicken over deep-fried; choose not to drink all the curry gravy; choose to drink plain water, instead of a sugar-sweetened soft drink.

5

Exercise **consumer rights:** It is entirely possible to have healthier choices even when eating out. Don't be shy to ask for less sugar, salt and oil, when ordering meals. For prepared dishes, opt for those with less fats, oil and salt. Choose a place that offers variety in their menu.

6

Make your **own** meals: The best way to eat healthily is to practise the principles of nutrition at home. You can be in control of the ingredients and cooking methods, and eat in the comfort of your own home. Remember to control your portion size: size does matter!

7

Read **food labels:** Look at the ingredients and nutrition information on food packaging so that you can choose products that meet your needs. Knowing the nutritional value of food, such as the amount of calories, fat, fibre, vitamins and minerals, will help you make wise choices. Look for labels that state: less salt, less fat or less sugar. Opt for labels that claim: 'more fibre, more whole grains, fortified'.

However, I have always believed that we can be a developed nation, and yet not suffer from these diet-related chronic diseases. We just need to look at developed nations such as Japan or Korea, where the main causes of death in these countries are not heart disease or diabetes.

What this means is that we can prevent Malaysians from suffering NCDs.

A Lifestyle You Can Sustain

Our lifestyle is the most important factor that determines whether we are at risk of developing NCDs.

Most people are not born with diabetes or coronary heart disease. I call these diseases by choice. By choosing to lead a life of excessive eating and inactivity, people eventually develop these diseases. It is well established that the two main causes of these diseases are unhealthy eating patterns and a sedentary lifestyle. Tackling these root causes is the only way to prevent these diseases. Therefore, eating a nutritious, balanced diet and exercising regularly go a long way in preventing NCDs.

Where are the shortcuts, the magic bullets, I hear you ask? What about all those 'proven' celebrity diets or miracle supplements and cures?

These diets and quick fixes are often not based on sound nutrition principles. Their aim is not to maintain the body and all its organs in good health, and may even have disastrous effects. All the organs in the body, such as the heart, kidneys, liver, and especially the brain, need steady nourishment so that they can stay in good working order throughout our lifetime.

That is why our eating habits need to be sustainable, long-term approaches. We need to start educating and empowering Malaysians from a young age, so that healthy lifestyle habits become ingrained in them and can impart lifelong beneficial effects.

As it is said, good habits begin at home, so start teaching your toddlers and primary-age children about nutrition. Be a role model yourself so that your children will follow.

Even for adults, it is not too late! Empower yourself with the appropriate knowledge and

take action by changing your daily habits for a sustainable life. Healthy eating has to be your choice; nobody can force you to change your behaviour.

How to Do it

Many people fear the concept of healthy eating because they think that they have to eat tasteless food and give up their favourite Malaysian delicacies. Others think that healthy eating is expensive, where they have to buy food from specialty stores, imported from developed countries.

These are misconceptions of healthy eating.

We can continue to enjoy Malaysian cuisine, from home-cooked to hawker food, without having to sacrifice the best part of our culture. What we need is to balance our love for eating with moderation and wiser food choices so that we can have a *makan sihat* (healthy eating) culture.

What we need is some basic knowledge about the nutrient content of foods and a sensible approach towards eating.

A Healthier Choice

A particular type of food can be cooked in many different ways. Choose the "healthier" versions more often. Some examples include:

Eat this MORE frequently	Eat this LESS frequently
Clear soup noodles	Curry mee
Kueh-tiau soup	Fried kueh-tiau
Steamed chicken rice	Fried chicken rice
Steamed yong-tau foo	Fried yong-tau foo
Steamed dim-sum	Fried dim-sum
Nasi lemak with more cucumbers, boiled egg and roasted ikan bilis	Nasi lemak with rendang and fried egg
Fresh popiah	Fried popiah
Pasta in olive oil	Pasta in cream sauce
Salad with balsamic vinegar or honey and lemon dressing	Mayonnaise dressing
Baked potatoes (topped with herbs, not cheese or cream)	French fries
Clear green bean or sweet potato soup with less sugar	Green bean or sweet potato soup with santan (coconut milk)
Kuih talam	Kuih apam

A Key Message

Underpinning all these healthy eating habits is the fundamental principle of discipline. Like every other aspect of a sustainable lifestyle, including eco-friendly practices, healthy eating requires commitment – make it something you do every day until it becomes as natural as breathing.

Healthy eating is one important aspect of preventing NCDs. Another important aspect is active living. We have to consciously and conscientiously build in physical activity into our daily lives.

Take up a game or sport with friends and make it a weekly activity. Do some jogging, brisk walking or go on the treadmill several times a week. In addition, be active in the work place or around the house. Even if you do not have a gym membership, there are many ways one can be physically active – and it should not be something you get bored of within a month.

You need to believe whole-heartedly in your journey to good health. It is all in the word 'lifestyle'. Adopt this 'style' for 'life', and you will be rewarded for life!

Source

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Feeding a Growing Population Sustainably

Today, the world's population stands at 7.4 billion and in 2100, it is projected to hit 10 billion. It is going to be a challenge to feed a growing population sustainably in the future, given the scarce resources available at hand. Thomas Malthus, a famous political economics scientist, postulated that the power of the population is indefinitely greater than the power of the earth to produce subsistence for mankind. He framed this hypothesis on the assumption that population will increase in a geometric ratio (exponential) while food production will increase in an arithmetic ratio (linear) (Figure 1).

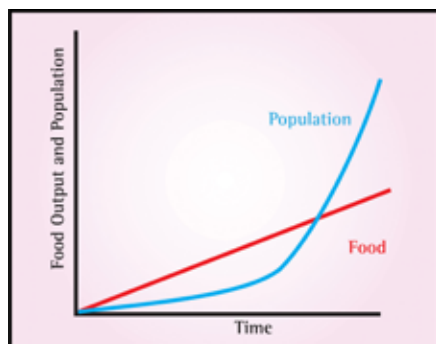


Figure 1: Population growth and food production over time (excerpted from Thomas Malthus 'Essay on the Principle of Population' which was published in 1798)

Challenges of Feeding a Growing Population

Reports by the World Bank and the Royal Society of London indicate that the world will require between 70 -100% more food by 2050. Balancing the demand and supply of food within the framework of being environmentally-friendly and socially-responsible requires us to assess how food is produced, stored, processed, distributed, and accessed.

Population growth will mainly occur in urban areas. By 2100, the bulk of the world's population is anticipated to be urban. Urbanisation will lead to income growth that will lead to higher consumption and a greater demand for processed food, meat, dairy, and fish (Godfray *et al.*, 2010). As a result, demand for grains and other staple crops will decline (FAO, 2009). The World Health Organisation (WHO) also shared similar findings in 1990. As the gross national product of a nation increases, components of the population's diet would tend to shift towards an "affluent" diet which is characterised by protein-rich food.

To cater to the growing demand for food, farmers will inevitably face competition for land, water and energy (Tilman *et al.*, 2001; WRI, 2005). Additionally, with greater emphasis placed on protecting

biodiversity and the ecosystem, new lands would no longer be brought into cultivation (Balmford *et al.*, 2005). There are also no new major discoveries of fishing grounds and virtually all capture fisheries have been either fully exploited or overexploited (Godfray *et al.*, 2010). So where is all the food going to be sourced in order to feed the growing world?

In the 18th and 19th centuries, industrial and agricultural revolutions and the 20th century green revolution transformed agricultural practices and raised crop yields dramatically. Unfortunately, the effects of these practices have levelled off. If we continue to rely solely on these practices, we would not be able to feed the growing population sustainably. Increasing food production becomes even more strenuous when the effects of climate change, rampant and sporadic cases of pest and disease outbreaks, and natural disasters are not easily and readily computed to quantify the extent of damage in real time so as to provide immediate recourse.

Additionally, greater demand and better market price for non-food outputs from agriculture such as biofuels and industrial biomaterials have led to competition between food and fuel crops. As a result, farmers tend to either substitute food crops with energy crops or cultivate food crops with the sole intention of harvesting them for energy processing. As such, policies promoting the use of food-based biofuels need to be reassessed with the intention of reducing the competition between food and fuel from scarce resources.



Strategies for Feeding a Growing Population

Food productivity has to be increased. Meanwhile agricultural innovation has to generate new products and/or processes that will enhance the production of livestock and crops. Innovation includes traditional and advanced crop and livestock breeding, and continuous development of better chemical, agronomic and agro-ecological control measures.

What sort of agricultural innovations do we have in mind to minimise unintended impacts on the environment and ecosystem while increasing production?

1. Use of climate-smart modern technologies such as biotechnology in the context of genetically modified crops;
2. Bioinformatics and cloned animals that have innate immunity to diseases;
3. Precision agriculture in the context of site- and time-specific application of production inputs so as to match the spatial and temporal variability inherently present in most crop fields and animal paddocks.

While there are controversies concerning the adoption of genetically modified crops, it is a valuable technology that offers tremendous opportunity and hence, should not be dismissed without first undergoing a science-based assessment. It is also crucial that a nation's genetic materials are preserved and conserved. This is to ensure that local crop and livestock germplasms are not lost due to the utilisation of modern and improved varieties and breeds.

Reducing food wastage is crucial. Approximately 30-40% of food is lost as waste across the food supply chain, i.e., on-farm, via transport and processing, at retail, food service, home and municipalities (Nelleman, 2009; Stuart, 2009). In most developing countries, losses are attributable to the absence of proper infrastructure and lack of knowledge and investment in storage technologies. In developing countries, about 35-40% of fresh produce is wasted because of inadequate cold storage facilities in wholesale or retail outlets (Nelleman, 2009). In the developed world, losses are apparent in the retail and post-retail channels of the food supply chain. The causes for such wastage are variable. Retailers discard foods that have lower cosmetic standards despite the fact that these foods may still be fit for human consumption. Food service industry serves super-sized portions which more often than not are not fully consumed. There is also over-reliance on expiry or use-by date which

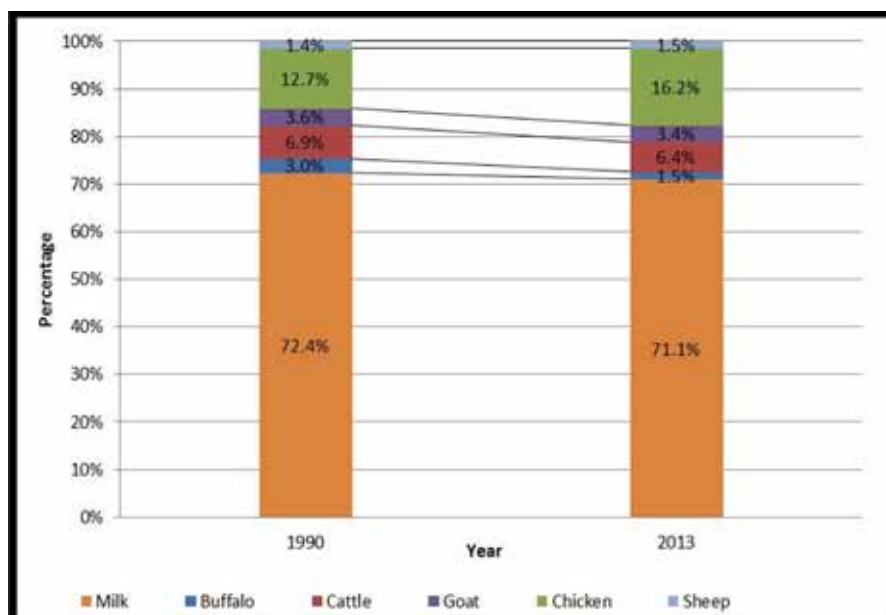


Figure 2: Comparison of meat and dairy production between 1990 and 2013

(Source: FAOSTAT, 2015)

results in disposal of foods that are still fit for consumption. A large portion of food is also discarded in homes of wealthier consumers, who either lack the knowledge of proper storage methods or are more influenced by the cosmetic standards of food items. Hence, it becomes more important for consumers to be mindful of their consumption patterns—one that emphasises nutritional content rather than culinary appeal.

Changing diets are becoming more apparent. As previously mentioned, an increase in wealth has led to an increase in demand for meat and dairy products. In Asia, demand for chicken meat has increased between 1990 and 2013 while other meat-based proteins have decreased (Figure 2). The livestock industry has switched from traditional, open-air methods of animal husbandry to closed “battery” systems to cater to the increased global demand for animal protein. Unfortunately, in the closed house system, animals are confined to cages and their diet, health and movement are rigorously controlled and monitored. These practices have raised red flags as they violate good animal welfare guidelines.

The conversion efficiency of plant into animal matter is approximately 10% and more people could be supported from the same amount of land dedicated to raising animals if people became vegetarians (Godfray *et al.*, 2010). While this suggestion is a little radical, the alternative is to reduce the consumption of animal proteins and replace the meat proportion with other nutrient-efficient sources. It is claimed that a diet rich in grains and other vegetable products is healthier than diets containing a high proportion of meat and dairy products. Additionally, consuming more meat in combination with high-sugar and high-fat foods leads to obesity, diabetes and cardiovascular diseases, which are now rampant among the younger age groups. However, reducing or substituting the portion of meat with vegetables and grains in diets can also have health implications, and this phenomenon must be studied in greater depth. Assessing a diet that is not rich in animal protein is crucial to determine its impact on human health in the long run.

Expanding the aquaculture industry is a strategic move. Aquatic products provide nearly 3 billion people with at least 15% of their animal protein intake (Smith *et al.*,

2010). To overcome the negative externalities of aquaculture production due to the release of organic effluents or disease causing chemicals into water bodies, sustainable certification programs are being introduced (Godfray *et al.*, 2010). Additionally, site-specific selection of location is recommended to help set up aquaculture farms far from water bodies to avoid contamination.

Conclusion

Revolutionary approaches via efficient and humane production methods, and mindful consumption patterns are required to feed a growing population sustainably. Perhaps the time has come for all of us to embrace a food consumption pattern that places greater emphasis on nutritional content rather than gastronomic demand.

Clearly there is a need for greater awareness about our food options while greater attention has to be paid to the way our food is produced. The question to ask of ourselves: ‘Does our food consumption behaviour bring about positive changes to the way our food is produced and served?’

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Source

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Sustainable Living Initiatives

Sustainable living can be viewed from many angles such as reorganising living conditions (sustainable cities), reviewing economic sectors (green building and sustainable agriculture), adopting new technologies (green technologies and renewable energy), reviewing work practices (sustainable architecture), and adjusting individual lifestyles that conserve natural resources.

Efforts toward practising a sustainable way of life would mean leaning towards low carbon and water footprints, renewable energy adoption, a 3R (reduce, reuse or recycle) economy with minimal usage of natural and personal resources, and sustainable transportation.



Figure 1. Sustainable conditions

Sustainable Energy Usage

The aim of energy sustainability is not to reduce a user's convenience, but to maintain the current level while saving energy, through the use of energy-efficient devices and intelligent management applications. It is also preferable to choose devices that can limit drawing power from the network (by using power controllers, programmers, etc.), and ones that can work with electricity derived from renewable energy sources for thermal applications (such as heating, hot water, etc.). Through these sustainable approaches, the demand for electrical energy can be controlled with better use of the electricity consumed and reduced energy wastage. According to the United States Department of Energy, homes account for up to 20% of all the energy used in the country and much of them is wasted.

Meanwhile, in a survey by CETDEM (Centre for Environment, Technology and Development Malaysia) on local household energy consumption, energy in a home is mainly consumed for space cooling (46%), water heating (10%), refrigeration (15%), washing and cooking (8%) and lighting (6%). Hence, energy efficiency should be a major consideration during the purchase of electrical appliances such as refrigerators, air-conditioners, electronics, and lighting, especially those that come with the ENERGY STAR or Energy Rating label. By using the certified products, users enjoy the benefits of energy-efficient products that offer savings on energy bills without sacrificing performance,

features, and comfort and at the same time, help reduce greenhouse gas emissions and other pollutants caused by inefficient use of energy. Energy-efficient appliances use 20-40% less energy than non-energy efficient new appliances, and about 50% less energy than a 20-year-old appliance.



Figure 2. Endorsement label for energy-efficient certified products

Source: Suruhanjaya Tenaga

Solar energy as a source of sustainable power is gaining increasing importance among the several renewable energy technologies available such as biomass, wind and hydropower. As part of the Malaysian Government's encouragement for the generation of renewable green clean energy, Sustainable Energy Development Authority of Malaysia (SEDA Malaysia) was formed to administer and manage the implementation of the feed-in tariff (FIT) mechanism. Home owners who install a home solar system can sell the generated solar electricity to Tenaga Nasional (TNB) at higher than the electricity rate that is being paid to TNB for every kilowatt hour (kWh) of electricity. These advantages not only bring in a lower carbon footprint and energy bills, they allow for greater self-sufficiency in energy, and passive income generation.

Sustainable Water Consumption

A major sustainable living factor involves water consumption. Unsustainable water use can bring about a negative impact on the environment and humankind. As fresh water is only 1% of total world water supply, it is important that we protect this critical and precious resource. A typical Malaysian family uses about 220 to 250 liters per person daily, which is higher than users in Singapore (140-160 litres) and Thailand (160-170 litres). Out of that amount, only approximately 30 is for actual consumption such as for cooking and drinking, while the rest is used for utilities like washing clothes, cars, and garden and pool cleaning. Compounding this problem is the wastage of water in leaking toilets and sinks, and taps running continuously when not in use. By addressing these problems with simple alterations in behaviour and upgrades to water-efficient appliances, it is believed that each person could save up to 135-150

litres of water a day, and prevent wastage of thousands of litres of water each month.

In sustainable living, water efficiency is the smart use of our water resources through water-saving technologies and practical everyday measures such as installing water efficient home appliances, controlled outdoor water use, and daily water use awareness. Older, inefficient toilets use as much as 12-18 litres per flush, and implementing a low flush toilet reduces water consumption to only three to six litres per flush. Showering is another activity that makes us consume a high amount of water, and for maximum water efficiency, installing a low-flow shower head with a flow rate of less than 7 litres per minute (2 gallon per minute) meets the US EPA WaterSense requirements. Since these water savings will reduce demand on water heaters, they will also save energy. Meanwhile, for commercial complexes and office buildings, waterless urinals could well be the answer to sustainable water use because of the near zero water use for flushing and sanitation.

For outdoor use, landscape irrigation consumes huge amounts of water. However, this can be reduced significantly through employing a combination of water-efficient irrigation technology, mulching, reduced turf or no turf grasses, using non-potable or recycled water, and choosing adaptable plant species suitable for landscape design. When we take conscious approaches such as reducing shower time, using a mug when brushing teeth, and washing dishes and vegetables in a bowl instead of under a running tap, and washing clothes on a full load, a minimum of 10 litres of water can be saved effortlessly. Meanwhile, washing a car using a bucket as opposed to a continuous running hose can bring down water consumption by up to 30 litres.

Sustainable Space Design

Sustainable architecture seeks to minimise the negative impact on the environment by designing buildings and homes based on the principle of efficiency and moderation in the use of materials, energy and development space. With the help of site analysis, architects can exploit the local climate and energy-related factors in the form of daylight, solar heat/cool and ventilation to introduce passive design elements such as window placement and size, glazing type, thermal insulation, thermal mass and shading. These principles ensure buildings and homes offer thermal comfort to the occupants as compared to constant heating and air-conditioning, low heating and cooling bills, and reduced greenhouse gas emissions from better energy efficiency. Having trees in the compound, porches, and having pergolas also contribute positively

towards comfortable living, because they can prevent the thermal mass of the house from absorbing unwanted heat while creating a cooler environment around the house.

Window designs also play a part in assuring adequate ventilation and airflow. Long horizontal strip windows can ventilate a space more evenly, while for a room with several windows, a smaller inlet can be paired with a larger outlet opening for increased cooling effectiveness by making the inlet air travel at higher velocity. As for lighting, good daylighting design can illuminate offices and homes in an effective way that can help

decrease the building's energy use and make the interior environment more comfortable for people to live and work in. For a typical commercial building, lighting accounts for as high as 50% of total electricity consumption, and strategic use of daylight element placements can reduce the energy demand, besides improving comfort and productivity.

Sustainable Cities

An eco-city is a sustainable city built on the principles of living within the means of the environment. The ultimate goal of many eco-cities is to eliminate all carbon waste, produce energy entirely through renewable sources,

and incorporate the environment into the city, while striving for a balance in development by stimulating economic growth, reducing poverty, achieving higher population densities, and improving health.

Smart cities champion energy efficiency and sustainable development, and these two key principles are reflected in their urban landscape. What makes living in these cities interesting is that the building and homes are built with and powered by renewable energy sources such as solar panels, geothermal or miniature wind turbines, and electricity storage units. Meanwhile, advanced public transportation systems (metro systems, trams and electric car charging systems) have intelligent energy management systems and transfer interfaces built within the infrastructures that allow for the energy produced by braking to be recovered and stored, and subsequently released into the urban electricity grid, hence reducing the city's carbon footprint.

In Europe, one sustainable city is selected each year to be the winner of the European Green Capital. Some of the past winners from 2010 to 2014 are Stockholm (Sweden), Hamburg (Germany), Vitoria-Gasteiz (Spain), Nantes (France) and Copenhagen (Denmark). They have proven that energy-management, construction, transport, telecommunications and other types of technology can be planned and managed well, as well as showcase that economic demands, quality of life and sustainable development can co-exist. The city residents are fortunate to live in a city that is developed close to the green lung, has low carbon emission from efficient transportation and a healthy cycling culture.

Conclusion

Living sustainably is about taking responsibility, making proactive decisions and driving innovation that minimise negative impacts and maintains a balance between ecology, economy, politics and culture given the many challenges facing the world such as climate change, energy consumption, waste production, poverty, and loss of biodiversity. Energy independence would be an ideal proposition in the move towards sustainability. A lifestyle that allows for off-grid living and self-sufficiency will be both challenging and rewarding. As the saying goes, living sustainably means "Doing More for Less".

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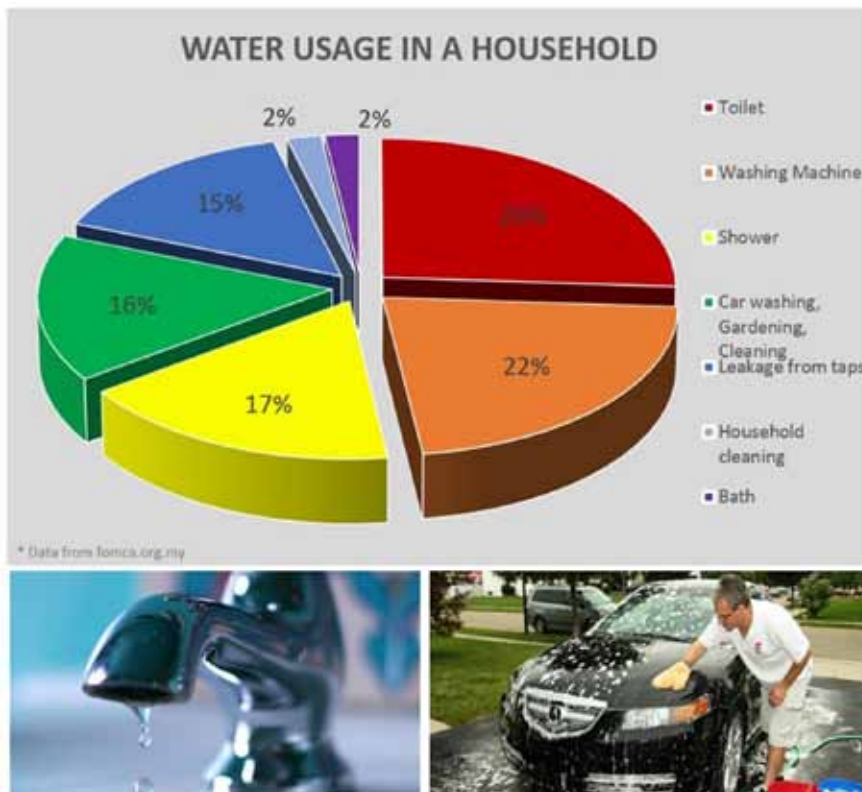


Figure 3. Water use in a household



Figure 4. Passive design in buildings



Figure 5: European Green capitals

Energy, 'In and Out': Current Practices in Sustainable Buildings

Sustainability has emerged as a mainstream concept in the construction industry over the last twenty-five years. Worldwide, established stakeholders, be they architects, quantity surveyors, developers, contractors and building owners themselves have come to appreciate the value of sustainability in their projects and purchasing decisions. This has affected and changed the entire 'value chain' of the construction industry. The issue of 'sustainable buildings' in today's world must therefore take into account the energy used in construction (energy 'in') as well as the energy used to inhabit the premises (energy 'out'). This paper will focus on both these concepts and more.

Choosing a Site

Sustainable construction starts with the choice of a building site. In the main, the construction industry is faced with two major categories of 'development land', i.e. the 'greenfield' site and the 'brownfield' site. A smaller category, 'reclaimed land', is also especially relevant in sea-side locations such as Penang, Malacca and Singapore, and will also be discussed in this paper.

'Greenfield' sites are sites which have never been previously built on, but have been earmarked for development either in national or local master-plans. In Malaysia, greenfield sites waiting to be built on, typically consist of mature rubber plantations, former palm oil estates, or more controversially, secondary forests earmarked for clearance.

Building on a greenfield site often involves clearing the land of all existing vegetation, whether natural or planted. In the case of permissible hill-slope developments, it also requires the flattening and/or terracing of a natural topography in order to create 'platforms' for construction. This process often leads to siltation of water bodies and localised climate-change, a phenomenon clearly evident in Cameron Highlands over the past quarter century.

A 'Brownfield' site is land which has previously been host to another building. In countries with stagnant or shrinking populations (such as Japan or much of Western Europe), or those with particularly strict planning regulations (such as parts of the United Kingdom), brownfield sites constitute much of 're-development' land where limited new construction is allowed. Though the use of brownfield sites is encouraged in many countries for the purpose of urban regeneration and environmental sustainability, the need to demolish an existing building must be 'measured' against the sustainability of brownfield developments vis-à-vis 'greenfield' construction.

Although 'reclaimed land' creates new 'real estate', the sustainability (or otherwise) of this practice hinges on the vast amount of energy required to mine sand from another location in order to fill the sea-bed in the reclamation zone, as has occurred on a large-scale in Singapore since the 1960s. Compacting the soil and building the necessary sea-walls

to protect the new platforms from wave erosion further involves the consumption of large amounts of 'embodied energy'. The destruction of marine habitats, natural mangroves and/or coral reefs may also lead to a loss of biodiversity, another potential result of land reclamation, especially in tropical countries.

Embodied Energy

Embodied energy is the main focus of sustainable buildings up until their delivery to a client. It is a measure of the cumulative amount of energy (calculated in either kWh equivalent for energy use or CO₂ production in tons for greenhouse gases emitted) required for the construction and completion of a given building, prior to its hand-over to an owner or tenant.

Similar to how an expensive car with a hybrid engine can have a very low running cost, it is possible for a building containing a high level of embodied energy to require relatively low levels of energy to inhabit. Common examples include houses fitted with expensive solar heaters which add to the embodied energy of the home but reduce its weekly energy consumption, or extremely well-insulated buildings which reduce the required heating load (in a cold country) or cooling load (in a warm country). This is important, given that for the majority of 'highly-serviced' buildings with an average life-cycle of fifty years or more, the 'usage stage' produces more greenhouse gas emissions than those 'embodied' by the 'carbon footprint' of the building when new.¹

Whether or not a building with high-levels of embodied energy is ultimately 'sustainable' therefore greatly depends on its life-span and/or the 're-usability' of its components. Materials which require many stages of processing in order to arrive at their final usable state (for example the conversion of iron ore into steel or bauxite into aluminium) contain far greater amounts of embodied energy than 'low-process' materials like timber and clay or natural stone. If a building utilising high-energy materials is designed to last, or to allow re-cycling and/or re-use of its components, it can however mitigate its 'sustainability deficit' vis-à-vis 'low embodied energy' buildings.

Examples of buildings with low-levels of embodied energy include those built in a 'renewable material' such as timber and/or utilising mostly natural, lightly-processed materials. The characteristics of the building's components however, affect not just its embodied energy level, but also its 'life-cycle sustainability', by affecting its energy efficiency in use.



Figure 1: Low embodied energy building (bungalow, Fraser's Hill)

This is because, after completion, buildings do not inherently consume energy of their own accord. Energy use in occupied buildings is, rather, a function of their users' and/or owners' behaviour. Because providing comfortable and convenient human occupation is the ultimate goal of most buildings, sustainable buildings are those which meet these targets by using as little energy and/or resources as possible, or those which generate their own energy and/or resources in a renewable way. The issue of sustainable buildings can therefore be approached either by way of 'passive' or 'active' design.

Sustainability via 'Passive' or 'Active' Design Strategies

Passive design exploits natural, existing landscape and/or climatic elements to minimise a building's energy use. Examples of passive design include taking consideration of:

- A building's location (topographical patterns affecting wind and shade)
- Solar orientation (positioning windows away from direct sunshine to prevent excessive heat gain)
- Landscape (using natural filters such as trees and plants to reduce the need for tinted glass, louvres or overhanging sun-shades)
- Massing (using the shape of a building to improve its thermal performance, for example by minimising the ratio of external wall area to internal volume, as in the case of circular buildings)
- Material selection (using low-embodied energy materials in construction)
- Openings and insulation (positioning openings to gain access to the prevailing wind and insulating exposed surfaces against excessive heat-gain)

These passive strategies used by conscientious architects for centuries remain some of the most effective and cost-efficient strategies for creating sustainable buildings, especially in the case of small to medium-sized properties. Sustainable, passive design is especially suited to owner-occupied residential buildings, where users' lifestyles are taken into consideration when designing houses in order to minimise their energy bills.

Expanding interest in active strategies has occurred especially following concerns surrounding global warming from the 1990s onwards. 'Active' design uses active building services to create comfortable conditions. Typical building services which seek to be environmentally sustainable (or at least efficient) include air-conditioning systems in hot countries and heating systems in cold countries. The use of energy-efficient lights, whilst also important and popular with the general public, accounts for only a tiny percent of typical residential energy use in Malaysia, and a similar percentage around the world.²



Figure 2: High embodied energy building (hotel, Macau)

The bulk of energy consumption in buildings therefore revolves around heating and cooling services, including the refrigeration of food. These have generally become more efficient (in terms of energy use per degree of temperature change in a given volume of space) as building systems increase in sophistication with each passing year.

Current practices in sustainable buildings are therefore a combination of passive design, where architects lead the way by creating buildings that respond well to the climate and natural topography in order to minimise energy consumption, and active strategies, where service engineers spearhead the design of building systems to minimise the amount of energy required to deliver the same levels of thermal comfort and building functionality.

Passive and active solutions do occasionally overlap in areas such as the installation of solar panels and the harvesting and re-use of rainwater, as these require appropriately designed roofs married to efficient and well-maintained building services.

Conclusion

The 'professionally-guided' process of 21st century buildings is, however, merely the beginning of the life-cycle of a sustainable building, mostly controlling how much energy is used during the fabrication of the building's components and its construction on site, or the 'Energy In'.

The way the building consumes energy for the rest of its existence, the 'Energy Out' is,

however, a partnership between construction industry professionals, via the operations and maintenance manuals/guidelines they issue to tenants regarding their buildings, as well as the behaviour of tenants and the general public themselves. This forms the bulk of energy consumption attributable to buildings worldwide, with the choice of thermal comfort levels making a huge and immediate difference. In response to this, for example, Putrajaya dictated that government buildings in Malaysia fix their internal temperatures at 24°C beginning in late 2011, to prevent excessive wastage of energy from staff preferring 'cold' offices.³

On average, buildings contribute around 30% of global greenhouse gas emissions in their life-cycle.⁴ This percentage, however, may be set to fall, because the use of renewable energy in buildings, especially solar power, is at the cusp of a world-wide lift-off as the cost of solar cells drops and the efficiency of their power generation increases. Although the recent drop in global oil prices beginning in 2015 has temporarily affected the competitiveness of 'renewable' energy vis-à-vis fossil fuels, the long term trend is in favour of green energy solutions, both 'in' and 'out'.

Footnotes

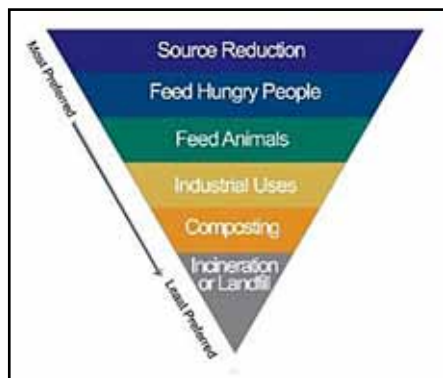
- ¹ International Journal of Sustainable Built Environment
- ² Tenaga Nasional Berhad
- ³ As reported in The Star, August 12, 2011
- ⁴ United Nations' Environment Programme, 2009

Source

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Treating Food Waste at the Individual Level

Malaysia generates about 33,000 tonnes of solid waste every day. As a country known for its love of food, food waste accounts for 45-50% of the total solid waste. Worse still, a study indicates that about 10-15% of food categorised as waste is actually good food which is edible but simply unconsumed. The overall waste management in Malaysia faces various obstacles including the lack of landfills and mandatory waste separation at source; low collection fees; allocation of the greatest part of public funds to the collection of waste; weak enforcement; and limited coordination among stakeholders. Figure 1 below indicates the systematic approach to food waste minimisation efforts.



Source: www.epa.gov/smm

Figure 1: Food wastage minimisation pyramid by USEPA

The National Strategic Plan for Municipal Solid Waste in Malaysia set targets of 20% recycling and 100% separation at source for organic wastes by 2020. The proper implementation of the Solid Waste Management and Public Cleansing Act 2007 has seen recent government waste minimisation efforts focused mainly on recycling and landfill diversion efforts. To promote the efforts, an order under the ACT came into effect on 1st September 2015, which imposes compulsory household waste separation in several states - Federal Territory of Putrajaya, Kuala Lumpur, Pahang, Johor, Melaka, Negeri Sembilan, Kedah and Perlis. Waste separation calls for segregation according to the types of solid waste namely materials to be recycled, waste remnants, bulk garbage and garden waste. However, food waste has not been specified and only classified as waste remnants.

The high moisture content of food waste further draws attention to the need for



Figure 2: Composting materials

such waste to be effectively reduced and eliminated within the cycle before final disposal in an incineration or landfill. Food waste is usually the wettest component of the waste stream with a typical moisture content of 70%; thus food waste also aggravates the incineration or landfill disposal systems.

But there are no specific regulations or legal framework to control food waste generation and management and there is no attractive business model at the moment. Implementation of a sound plan for minimising and sustainably recycling food waste faces major obstacles due to lack of effective food waste segregation and recycling systems. Thus food waste is currently disposed-off in landfills with other organic waste. Therefore it is essential that public awareness and education on food waste minimisation methods is increased. One minimisation method is composting which can be undertaken at the household level. Some basics on composting are described in the following paragraphs.

Basics of Composting

Basically, if you toss food waste into a pile and wait for a while, ensuring that carbon and nitrogen are in good ratio and regulating the moisture content, you will end up with compost, which is the finest soil amendment, conditioner, and fertiliser. This method is one of the most sustainable ways to keep the plant-food-soil lifecycle balanced. Whilst it is easy, the type of material to be used for composting is important to avoid unwanted smell or insects.

Items in Figure 2 are the best and worst types of waste to be included in home composting. Cooked items are biodegradable, but they are not preferred as they are likely to cause problems in the compost. Cooked items cause very bad odour when the food starts decomposing, especially if you add meat or fish. It may also attract vermins and pests. However, cooked items can be composted if an aerobic method (air tight) or some kind of culture acceleration is chosen.



Figure 3: Basic Composting - composting in a barrel / trench

Theoretically, the main elements of composting can be generally divided into Greens and Browns. Greens are generally the wet and live matter which decompose quickly and give the required moisture to the compost. They contain and provide nitrogen – proteins required for the microbes to digest and thrive. Without greens, the decomposition will take much longer, and the compost will become too dry. Browns provide the carbon required for the microbes to multiply. Less carbon would make the compost smelly (due to rapidly fermenting nitrogen into ammonia), overly moist and fungus prone. The rule of thumb is to ensure there is equal amounts of greens and browns in the compost mixture which roughly creates a mixture with 30:1 ratio of carbon to nitrogen in the final compost.

A well balanced ratio of Greens and Browns together with a good moisture level and heat creates good compost. If the composting mixture is too wet, it will get smelly and become prone to fungus and slime. Add more browns like shredded paper or cardboard to absorb the excess moisture, which will also help to create air pockets.

The compost itself will generate heat. You may keep the pot indoors or outdoors. Better results can be expected outdoors, as there is more external heat which helps decompose matter faster. It helps to chop or shred the materials into smaller pieces to accelerate decomposition. Materials which take longer to decompose should ideally be placed at the bottom of the pile and in moderate quantities.

Types and Methods of Composting

Conventional Composting - Bin

The conventional method involves keeping the compost heap or bin in a balcony or

garden. An insulating box or bin is essential. You can make this on your own from pieces of wood or buy a readymade wooden or recycled plastic version. A slightly modified metal trash can is one of the best homemade compostors. To make one, punch several holes in the bottom of a 20- or 30-gallon trash can with a hammer and a large nail. Flip the can over and set it on a few bricks so air can circulate underneath it.

To compost, fill the bin with about three inches of garden soil, followed by three inches of kitchen scraps, three inches of shredded newspaper, and finally three inches of leaves or grass clippings. Keep the lid on the can, and continue building more layers until the can is full. Within about three months, the compost will be cooked to perfection, all without turning or watering.

A lid or covering, such as a piece of old carpet, keeps the contents of the bin warm and the rain out. Position the bin on an area of soil so that composting creatures such as worms and soil micro-organisms can help to break down the organic waste in the bin. If you want to pre-compost your food waste and accelerate the composting process, add Bokashi active bran to the food waste and leave it to pickle for two weeks in a bucket before adding it to the compost bin.

Conventional Composting - Heap

If you plan to create a heap of compost (suitable for a house with a garden), then you can create a trench and layer the food waste as in the case of the bin and cover with soil. Check the base of the heap after several months and dig out any dark, well-rotted compost. Mix up the remaining matter with a fork, and water it if it seems dry; if the heap is too wet, add some dry, bulky material. Acidic conditions inhibit decomposition, so occasionally add a little ground limestone or gardener's lime.

Kitchen waste is high in moisture and has very little structure once it has decomposed. Add a supply of dry material, such as cardboard, scrunched-up paper, coarse twigs and stems to stop the compost heap collapsing in and becoming slimy. Wine corks, party hats and streamers can also be added to the compost heap, as can tissue paper, which biodegrades quickly. Cardboard packaging from food and gifts can also be composted.

Anaerobic Composting

In anaerobic composting, the absence of oxygen encourages anaerobic bacteria to break down food scraps and other natural waste. This type of composting does not require regular turning and other maintenance demanded by oxygen-based composting. This method of composting works well in urban areas and warm climates but may create very strong odour issues.

Worm Composting

Worm composting is small enough to keep on a balcony, patio or a porch, so it is ideal if you do not have

much outside space or if you live in a high rise residential area. It is also one of the cleanest, neatest and easiest composting systems to adopt. A ready-made kit provides both the bin with its lid and the worms. As you fill each layer with small amounts of scraps and leftovers, the worms work their way up through the layers, eating the waste (they consume up to half of their body weight a day). It is this action that speeds up the composting process, leaving you with rich, dark compost in the lowest tray after only a few months.

If you regularly add a few handfuls of chopped food waste and shredded dry fibre (cardboard is best), ensure good air circulation, a fairly constant temperature and prevent water logging, this efficient composting system should last for years.

Conclusion

A paradigm shift to enhance composting at household level can be only achieved through creating awareness in understanding the very basics of composting. Composting can be wrongly understood by the public as a non-hygienic and low aesthetics system. Thus learning about the right methods of composting pre-empts such perceptions. Choose the right methods for composting depending on space availability and the type of food waste consistently accumulated by the specific household. Some people think it is a lot of work while some do not know how to get started.

At a more advanced state, household or office/industrial facilities wanting to accelerate their compost may dwell into introducing biocultures. The most common is Bokashi which is a bran containing yeast, fungi and bacteria which ferments cooked food, especially meat and fish in a few days, without risking pests or flies.

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Source

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Treating Scheduled and Infectious Waste

Scheduled and infectious waste poses a serious threat to human health and the environment if not treated properly. Some of the chemicals are very toxic even in small doses while others are carcinogenic or accumulative in human bodies. Clinical waste from hospitals and clinics can be very infectious as it can cause diseases; moreover, the impact can be very fast or over a longer time period.

By the late 1980s, realising the need to treat scheduled waste, the Government promulgated laws and regulations and started planning for treatment of the scheduled wastes which fall under the Environmental Quality (Scheduled Wastes) Regulations 2005 (EQ[SW]R2005).

An integrated facility, Kualiti Alam, was set up in 1996 for collection, detoxification and final disposal of the scheduled waste. The plant has run successfully since then and has become the national facility for proper treatment of scheduled waste in Malaysia. At Kualiti Alam, well established technologies were implemented over the period 1996 to 1999 for treatment of scheduled wastes; this has proven to be successful over the last 16 years of operation.

Being a national benchmark for disposal of scheduled waste, Kualiti Alam has also encouraged the recycling of scheduled waste and has set up its own recycling business. This has been followed suite by the setting up of recycling facilities by private recycling companies. The existing system therefore provides an optimum mix for the recycling of large volumes of scheduled waste in an environmentally friendly manner and for the treatment of such waste that cannot be recycled.

Treatment of Scheduled Waste

Almost 3 million tonnes of scheduled waste are generated in Malaysia (DOE, 2010). Scheduled waste is treated as described in Table 1 below.

Table 1. Treatment of scheduled waste in Malaysia (DOE 2013)

Treatment	t/y 2013
Special waste management	1,574,042
On-site treatment	630,221
Local off-site treatment	566,507
Kualiti Alam	111,861
On site storage	41,742
Trienekens	19,330
Off-site clinical	18,201
Export	3,708
Total	2,965,611

Scheduled waste is mostly generated in the larger industries. Smaller industries and households also generate a small amount, which has a larger exposure to the public and therefore must be collected and treated.

The amount of scheduled waste has grown with increased industrialisation. But this has been accompanied by a higher awareness and better enforcement by the authorities resulting in more and better collection of these wastes. With a more efficient collection of municipal solid waste and especially the new 2+1 system, it will be possible to collect some scheduled household waste. Scheduled household waste is normally 4-5% of the total volume of scheduled waste in a country, while the amount of scheduled waste in minor industries could be approximately 10-15%

Treatment of Clinical Waste

In terms of clinical waste, more than 36,000 tonnes are generated every year in Malaysia and it is growing fast in tandem with the increasing number of beds and treatments in hospitals and clinics. The rapid growth in clinical waste in the last decade has imposed a major strain on the capacity for further development in the treatment of scheduled waste.

Clinical waste must be collected and packed separately (double yellow bag packaging and hard plastic boxes for sharps) in order to avoid contamination and infection of the health and waste management staff. All aspects of clinical waste collection, transportation and disposal are under the supervision of the Ministry of Health.

Clinical waste in Malaysia is treated mostly by:

- Centralised treatment by Kualiti Alam
- Centralised treatment by three concessionaires for public hospitals
- Local treatment by the hospitals and clinics.

The clinical waste amount grows with the population, but its growth is slow due to more advanced treatment and more treatment per capita. It is therefore important that the capacity of the treatment facilities follow waste generation closely.

To drive sustainability, Kualiti Alam introduced microwave sterilisation for treatment of clinical waste in 2014, which has proven to be more reliable and more environmental friendly.

Scheduled Waste Treatment by Recycling and Disposal

Industries in Malaysia are increasingly trying to minimise their waste and treat it on-site to reduce the amount that has to be sent off-site for recycling or final disposal. The financial incentives in terms of treatment cost at off-site recyclers and disposal further encourage waste minimisation and on-site treatment. Government incentives are in the future expected to further enhance on-site treatment. There are, however, large waste groups like waste oil, solvents, some metals etc. which are more efficiently recycled at larger off-site recyclers.

The recycling facility of Kualiti Kitar Alam was established in 2006 and at the moment is being expanded with new facilities especially for the treatment of waste oil; the facility is also able to recycle solvents and metals.



Figure 1: Kualiti Alam Waste Management Center in Sendayan, Negeri Sembilan

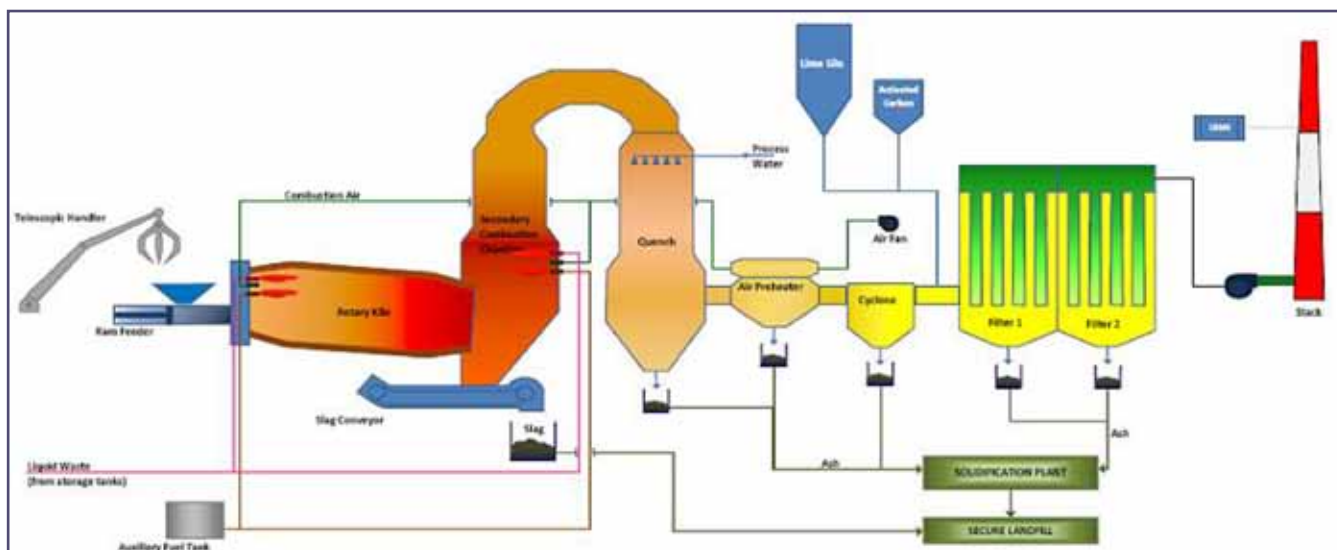


Figure 2: Thermal treatment incinerator (designed and made in Malaysia), operational since 2009.



Figure 3: Microwave machine for sterilisation of clinical waste at Kualiti Alam

Advancing with Technology

Although new technologies for recycling scheduled wastes are being continuously developed, the experience from developed countries, however, indicates that there will always be a certain amount of scheduled waste that cannot be recycled and has to be disposed off.

Overall, the sophistication of the Malaysian collection and treatment system for scheduled waste is akin to the systems in developed countries like Japan, Korea and Europe. Some of the challenges facing Malaysia are to capture all the waste from small industries and households and particularly in upgrading the recycling industries to meeting all environmental standards.

European experience shows that recycling industries must be carefully monitored to ensure that they meet good environmental practices and that they do not leave a legacy of waste, polluted soil and water that leads to the government incurring expenses to clean up the sites.

Drawing on its expertise, between 2006 and 2009 Kualiti Alam designed and constructed its own thermal treatment plant, which has been in full operation for more than 6 years.

Now a more advanced “Scheduled Waste to Energy Plant”, is being constructed to recover energy from waste, minimise operational cost and improve the environment even further. The plant, treating 100 t/day, will be operational in November 2016. Improved methods have been introduced in the Physical/Chemical Treatment plants and the scheduled waste landfill especially to treat new types of waste.

Promoting a Sustainable Lifestyle

Waste has to be treated for us to lead a sustainable life. The facilities at Kualiti Alam render the scheduled waste harmless to humans and the environment. By treating the scheduled waste, Kualiti Alam helps in cleaning the environment from the negative effects of scheduled waste.

The continuous improvement and introduction of new improved technologies, for example, microwave treatment for clinical

and scheduled waste to be converted to energy, has further contributed to enhancing the environment in Malaysia.

A Center of Excellence is being established by Kualiti Alam in Negeri Sembilan for training of authority staff, academicians, students, operators etc. in waste management and environmental protection. The Center of Excellence will further disseminate information on the operation of waste management facilities to the public. The Center of Excellence will be completed in October 2016.

The Scheduled Waste Management Center of Kualiti Alam in Negeri Sembilan is thus a critical part of the national industrial infrastructure, and the services enable further growth of the industrial capabilities of Malaysia as it also functions to attract investors to Malaysia. Given the services of a scheduled waste facility in Malaysia, international companies with high environmental standards are more likely to invest in Malaysia. The Kualiti Alam facility has and will continue to play a major role in the development of Malaysia Incorporated.

Source

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MINGGU ALAM SEKITAR MALAYSIA (MASM)

Peringkat Kebangsaan 2015

Persidangan Ketua-Ketua Kerajaan Komanwel (CHOGM) pada 18 - 24 Oktober 1989 telah memperkukuhkan lagi pengurusan alam sekitar dengan termaktubnya Deklarasi Langkawi Mengenai Alam Sekitar pada 21 Oktober 1989. Bersempena tarikh bersejarah tersebut, Kerajaan Malaysia telah menetapkan bahawa sambutan Hari Alam Sekitar Malaysia ditetapkan pada 21 Oktober setiap tahun bagi memperingati Deklarasi Langkawi. Hari Alam Sekitar Malaysia disambut selama seminggu dari 21 Oktober hingga 27 Oktober dan dikenali sebagai Minggu Alam Sekitar Malaysia (MASM). Objektif utama MASM adalah untuk meningkatkan tahap kesedaran alam sekitar di kalangan masyarakat Malaysia melalui pelbagai aktiviti kesedaran bagi menggalakkan masyarakat untuk lebih prihatin, peka dan bersama-sama memainkan peranan melindungi dan memulihara alam sekitar. Ia juga berperanan untuk mengeratkan dan mempertingkatkan kerjasama di antara Kerajaan Persekutuan dan Kerajaan Negeri di dalam pengurusan alam sekitar serta menggalakkan penglibatan kerjasama di antara pelbagai pihak termasuk agensi kerajaan, badan-badan berkanun, swasta, industri dan pertubuhan-pertubuhan bukan kerajaan.



Artis Istimewa Enviro Doodle

Pada tahun ini, sambutan MASM membawa tema "Ya! Teruskan Gaya Hidup Lestari" ("Yes! Keep the Sustainable Lifestyle Going"). Tema ini merupakan kesinambungan dari Tema MASM pada tahun 2014 yang lalu. Pemilihan tema ini adalah sebagai kesinambungan agenda Jabatan Alam Sekitar untuk memupuk masyarakat Malaysia agar terus membudayakan amalan gaya hidup lestari dalam usaha menjaga kualiti alam sekitar negara supaya sentiasa berada di tahap yang baik.



Pertandingan Mewarna Bagi Kanak-kanak

Pada tahun ini, Minggu Alam Sekitar Malaysia Peringkat Kebangsaan diadakan pada 17 Oktober 2015 bertempat di Taman Tasik Titiwangsa, Kuala Lumpur dan ianya telah disempurnakan oleh YB Dato' Sri Dr. Haji Wan Junaidi Bin Tuanku Jaafar, Menteri Sumber Asli dan Alam Sekitar. Antara aktiviti yang diadakan adalah seperti berikut:

1. Program Cinta Alam (kerjasama Alam Flora Sdn Bhd)
 - Pertandingan 'Face Painting'
 - Pertandingan Pakaian Beragam - 'Waste Is A Maze'
 - Pameran Taman Mini
 - Taman Floria
 - Lukisan Mural
2. Aktiviti Promosi Pengumpulan Bahan Buangan Barangan Elektrik dan Elektronik (e-Waste)
3. Kuiz Alam Sekitar
4. Pemeriksaan Kesihatan
5. Senamrobik
6. Envirohunt
7. Pameran Peranan Pemilik dan Penjagaan Kucing Kesayangan
8. Pertandingan 'Enviro-Doodle: Doodle Dash for the Environment'
9. Karaoke Alam Sekitar
10. Pertandingan Mewarna Kanak-kanak (kerjasama Bank Rakyat)
11. Pameran Interaktif
12. Demonstrasi Pengkomposan Baja
13. Demonstrasi Seni Batik
14. Jualan

Selain dari aktiviti-aktiviti tersebut, turut diadakan program RHB Trex Broga Challenge di Bukit Broga (anjuran RHB), DOE MTB Ecoride (kerjasama Persatuan Berbasikal Putrajaya), wawancara radio IKIMfm, BERNAMA24, Nasionalfm; wawancara televisyen Al-Hijrah, 1News dan RTM.

MASM juga disambut di Peringkat Negeri dengan penganjuran oleh semua Jabatan Alam Sekitar Negeri. Pelbagai pengisian program diadakan dengan kerjasama pelbagai pihak termasuk Kerajaan Negeri, syarikat swasta, industri dan pertubuhan bukan kerajaan. Penganjuran MASM 2015 turut mendapat kerjasama daripada Rakan Strategik Jabatan Alam Sekitar termasuk organisasi yang telah menandatangani Memorandum Persefahaman Kerjasama dalam Pelaksanaan Program Kesedaran Alam Sekitar dan Rakan Alam Sekitar dengan Jabatan Alam Sekitar. Sehingga kini, sebanyak 246 organisasi telah menandatangani Memorandum Persefahaman Kerjasama dalam Program Kesedaran Alam Sekitar dan Rakan Alam Sekitar dengan Jabatan Alam Sekitar.



Aktiviti Senamrobik



Peserta DOE MTB Ecoride yang sedang bersedia untuk dilepaskan. Program tersebut diadakan di MAEPS Serdang pada 24th Oktober 2015



Peserta dalam RHB Trex Broga Challenge yang diadakan di Bukit Broga pada 31th Oktober 2015



YB Menteri NRE bersama peserta Envirohunt di MASM 2015, Taman Tasik Titiwangsa pada 17th Oktober 2015



YB Menteri NRE dan timbalan beramah mesra dengan peserta program MASM 2015



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