

Lecture 1

Sustainable Development (I): Definition and its Tenets



KEY QUESTION:

What is sustainable development?

With the completion of this lecture, attached readings and tutorial, you should be able to understand:

- the concept of sustainable development, as defined in “Our Common Future”
- the interdependence between economic, social and environmental dimensions
- the possible trade-offs between economic, social and environmental dimensions
- the limits on ability to meet present and future needs

Lecture Outline

- 1.1 **Introduction: The evolving meaning of ‘development’**
 - (a) Economic Growth
 - (b) Development
 - (c) Sustainable Development
- 1.2 **Sustainable Development: Definition and its underlying key tenets**
 - 1.2.1 **The Brundtland Report – “Our Common Future”**
 - (a) The concept of ‘needs’
 - (b) The idea of ‘limitations’
 - 1.2.2 **The Interdependent Dimensions of Sustainable Development**
- 1.3 **Summary**

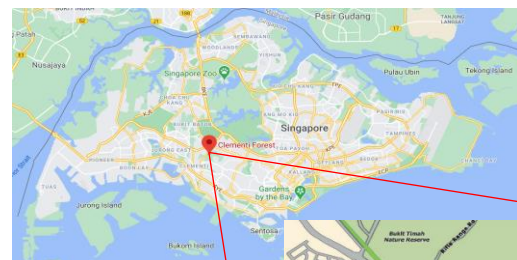
Readings:

- (1) The Transboundary Haze in Southeast Asia
- (2) Chek Jawa

The 2019 URA Masterplan, earmarked the 85-ha Clementi Forest for residential development. The forest is known to have a wide variety of flora and fauna, some of which are rare or threatened species.

National Development Minister Desmond Lee explained that “after weighing the alternatives and trade-offs, there will be areas that we cannot avoid developing.” There are however no immediate plans to do so now for this forest.

What are your views? Should the forest be conserved? Or perhaps, be cleared to make space for your housing in future?



1.1 Introduction: The evolving meaning of 'development'

- In general usage, 'development' refers to 'a process of change operating over time'. Traditionally, in the study of development of countries, this would be synonymous with their **economic growth** (see **Section 10.1a** below), and is seen as the process by which countries advance and become richer. *But*, growth in average income alone does not guarantee that the full range of human needs and aspirations will be satisfied. In fact, more recent awareness of that the needs of future generations should also be taken into considerations have further challenged the notion of 'development'.
- Conceptions of what 'development' means have therefore evolved over time. In this section, we see how the concept of **sustainable development** (see **Section 10.1c**) builds upon, and extends, two other key concepts – **economic growth** and **development** (see **Section 10.1b**) – both of which are still widely used, and in fact, sometimes confused. Just as the concept of development was devised to overcome the limitations of economic growth, so the emergence of sustainable development reflects a similar frustration with the conventional concept of development.

(a) Economic Growth

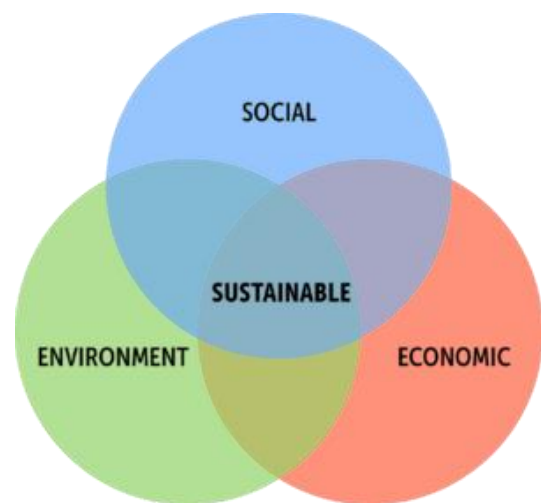
- **Economic growth** refers to **an increase in an economy's output of goods and services, and the overall amount of income that it generates**. Often measured by the gross domestic product (GDP) index, it is still given a high priority by governments all over the world.
- This is despite its lack of emphasis on aspects of people's lives beyond production and consumption, such as their access to healthcare, education, shelter, etc. (See **Section 10b**)
- Environmentalists have long protested that economic growth destroys the environment and depletes stocks of natural resources because it prioritises consumption to generate income. (See **Section 10c**)
- Politicians feel obliged to continue to proclaim the virtues of economic growth because of the almost universal attractions of higher income.

(b) Development

- More updated definitions of development have departed from the traditional notion (see above) which is based only on wealth. Development is now accepted to be wide-ranging and complex concept. **It includes wealth, but it includes other important aspects of our lives too**. For example, many people would consider good health to be more important than wealth.
- For our purpose, **development** can be defined as **a rise in the well-being of society as a whole, as reflected in the expanded set of opportunities available to the present generation**. It requires **not just a rise in mean income**, but that this income **be distributed as**

equitably as possible among a population (i.e. over space) to increase the welfare of the whole of society – for example, by increasing access to food, clean water and housing, and improving standards of health and education.

- Development would thus lead to greater **intra-generational equity**, though no particular degree of equity is specified as a target that a country should meet in order to be called 'developed'.
- **Fig. 1** shows one view of the factors making up the well-being of a society. Development **goes beyond** the consideration of only **economic** dimensions of life. To geographers, **development must consider both economic and social dimensions**.



(c) Sustainable Development

- The concept of *development* (see above), however, takes little or no account of the environmental impacts of the activities needed to generate the income upon which it depends. This is because its view of human welfare considers mostly social welfare.
- The theoretical concept of *sustainable development*, as we shall learn later, is different from development in that it *adds* to the economic and social dimensions and the notion of intra-generational equity included in the concept of development:
 - (a) an **environmental** dimension; and
 - (b) an **inter-generational** equity element.
- Inter-generational equity involves the idea of **time**, and requires that the judgement of whether a country is or is not developing sustainably must be determined by the quality of its long term *development path*, with a consistent rate of improvement rather than short spurts of economic growth.

- **Fig. 2** is an often-used representation of sustainable development. It gives attention to its objective of seeking to maximise the goals across all three dimensions at the same time. (More on this in **Section 10.2.2**)

1.2 Sustainable Development: Definition and its underlying key tenets

- Many environmental issues (e.g. climate change, and biodiversity loss) now are of a global nature. In fact, since about 40 years or so ago, there have been calls for the global community to completely rethink the way we view these issues, and for a change in the philosophy that lies behind the ways in which people interact with the environment.
- The approach most widely advocated by this rethink is **sustainable development**, which proposed that the objectives of **economic development** and **environmental conservation** should no longer be incompatible.
- To lead the world in this movement, the UN established the **World Commission on Environment and Development** (WCED) in 1983. The result of WCED's work was the very well-known report published in 1987, entitled **Our Common Future**, also referred to as the **Brundtland Report**, from which the most oft-cited definition of sustainable development was obtained (see **Section 10.2.1**).

1.2.1 The Brundtland Report – “Our Common Future”

- The Brundtland Report defined **sustainable development** as:

[Development that] meets the needs of the present without compromising the ability of future generations to meet their own needs... It contains within it two key concepts: the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given, and the idea of limitations imposed by the state of technology and social organisation on the environment's ability to meet present and future needs.

Our Common Future (WCED, 1987; added emphasis)

- However, as concise as it may be, we need to unpack the two concepts that the definition rests on, but ironically are often neglected by people who use it.

(a) The concept of 'needs'

- WCED noted that the **essential needs** of vast numbers of people in developing countries for food, clothing, shelter, jobs – are not being met. In addition, beyond their basic needs, these people too have legitimate aspirations for an improved quality of life. It thus called for efforts to **reduce poverty**, so as to meet the needs of the developing countries:

Poverty is not only an evil in itself, but sustainable development requires meeting the basic needs of all and extending to all the opportunity to fulfil their aspirations for a better life. A world in which poverty is endemic will always be prone to ecological and other catastrophes. Meeting essential needs requires not only a new era of economic growth for nations in which the majority are poor, but an assurance that those poor get their fair share of the resources required to sustain that growth.

Our Common Future (WCED, 1987)

- WCED argued that **environmental degradation would continue unless poverty and inequality in developing countries were addressed urgently.**
 - Poor people who are desperate for food, fuel or income cannot always afford to have regard for the future environmental consequences of their actions. Consequently, economic growth must continue in order to alleviate poverty and maintain development.
 - Sustainable development requires **that societies meet human needs both by increasing productive potential and by ensuring equitable opportunities for all.**
- Beyond essential needs, there are **perceived needs** which are socially and culturally determined. These living standards that go beyond the basic minimum are sustainable only if consumption standards everywhere have regard for long-term sustainability. Yet many of us live beyond the world's ecological means, for instance in our patterns of energy use. **Hence, sustainable development requires the promotion of values that encourage consumption standards that are within the bounds of the ecological possible and to which all can reasonably aspire.**

(b) The idea of 'limitations'

The concept of sustainable development does imply limits - not absolute limits but limitations imposed by the present state of technology and social organization on environmental resources and by the ability of the biosphere to absorb the effects of human activities. But technology and social organization can be both managed and improved to make way for a new era of economic growth.

Our Common Future (WCED, 1987)

- WCED drew caution on possible **limitations** posed by ecological crises that may hinder the progress towards sustainable development as a result of human activity. The WCED however left the understanding of "limitations" broad. We attempt to classify these limitations in the following manner.
- 'Limitations' linked to **current level of technology**:
 - WCED acknowledged that the use of both renewable and non-renewable resources is necessary for development, and hence *allowed the continued use of these*. The accumulation of knowledge and the development of technology can enhance the **carrying capacity** of the resource base.

(Note: Carrying capacity here refers to the maximum number of people that the resource base can carry and sustain.)
 - **But there remain limits to their use.** So, long before these are reached, the world must ensure equitable access to the constrained resource and be equipped with the necessary technology to prevent the limits to be breached.

- In general, **renewable resources** like forests and fish stocks need not be depleted *provided* the rate of use is within the limits of regeneration and natural growth. The maximum sustainable yield must be defined after taking into account system-wide effects of exploitation.
- As for **non-renewable resources**, like fossil fuels and minerals, their use reduces the stock available for future generations. In general the rate of depletion should take into account the *criticality* of that resource, the *availability of technologies* for minimising depletion, and the *likelihood of substitutes* being available.
- 'Limitations' linked to **the environment's ability to meet our present and future needs:**
 - **Biodiversity.** Development tends to reduce the diversity of species. And species, once extinct, are not renewable. The loss of plant and animal species can greatly limit the options of future generations; so sustainable development requires the conservation of plant and animal species.
 - **Environmental quality.** So-called free goods like air and water are also resources. The raw materials and energy of production processes are only partly converted to useful products. The rest comes out as wastes. Sustainable development requires that the adverse impacts on the quality of air, water, and other natural elements are minimised so as to sustain the ecosystem's overall integrity.

With the cautionary notes on limitations, what can be done to ensure sustainable development?

- The environmental economist Herman Daly has been promoting three rules, known as the 'Daly Rules' to help operationalise WCED's notion of sustainability (see **Fig. 3**), and to stay within the "limitations".

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|---|
| <ol style="list-style-type: none">1. Renewable resources (such as fish, soil, and groundwater) must be used no faster than the rate at which they regenerate.2. Non-renewable resources such as minerals and fossil fuels must be used no faster than renewable substitutes for them can be put into place.3. Pollution and wastes must be emitted no faster than natural systems can absorb them, recycle them, or render them harmless. |
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Fig. 3 The 'Daly Rules'

1.2.2 The Interdependent Dimensions of Sustainable Development

- As we have learnt by now, sustainable development demands a consideration of the three dimensions of **economy** (we have to ensure economic growth), **society** (the needs of different groups of people must be looked after) and **environment** (environmental impacts occur due to human activities). But such a consideration cannot be taken for granted.

- A number of models have been proposed as a way of simplifying the evidently complex notion of sustainable development. All encompass the dimensions of economy, society and environment. **Fig. 4C** is the one we must be familiar, but a full appreciation of it is not possible without comparing it with **Figs 4A and 4B**.

(a) What are the elements of Fig. 4A?

- Confirms the need to consider all three 'pillars' of sustainable development together and equally

BUT:

- Does not communicate the interconnections between the dimensions.
- Implies that there is no need to integrate thinking and action in sustainable development across disciplines and policy making.

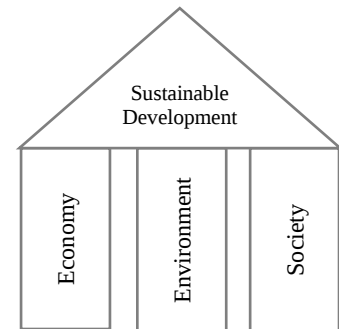


Fig. 4A

(b) What are the elements of Fig. 4B?

- Shows that spheres of economy and society are embedded in wider circle of environment.
- Emphasises environmental limits setting boundaries within which a sustainable society and economy must be sought.
- Illustrates how all human activities depend on fundamentally on nature.
- Portrays how activities that damage the functioning of natural systems ultimately weaken the basis of human existence.

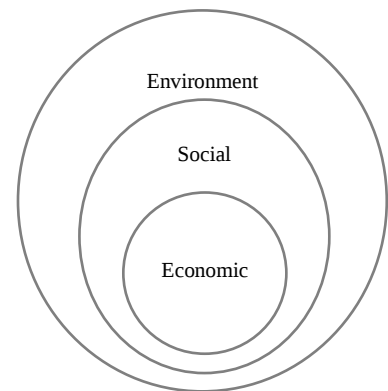


Fig. 4B

(c) What are the elements of Fig. 4C?*

- Gives attention to the objective of sustainable development as **seeking to maximise the goals across all three dimensions** at the same time and the possibility of **mutually supportive** ('win-win-win') **gains** that can be made.
- Small area of overlap relative to the whole sphere portrays the unsustainable nature of much activity, but also opens the idea of the potential to expand this area of positive overlap.
- Supports understanding that achieving sustainable development in practice regularly **involves trade-offs** (see **Readings 1 and 2**) across different spheres.
- Shows certain goals can be compromised in the achievement of others.
- Shows any action will have unequal impacts for different interests and groups of people.

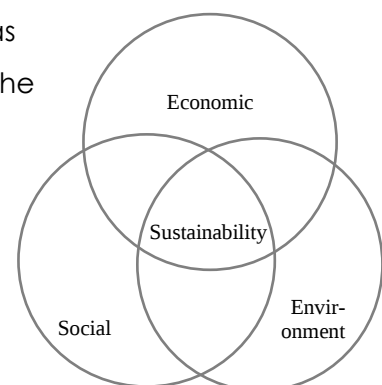


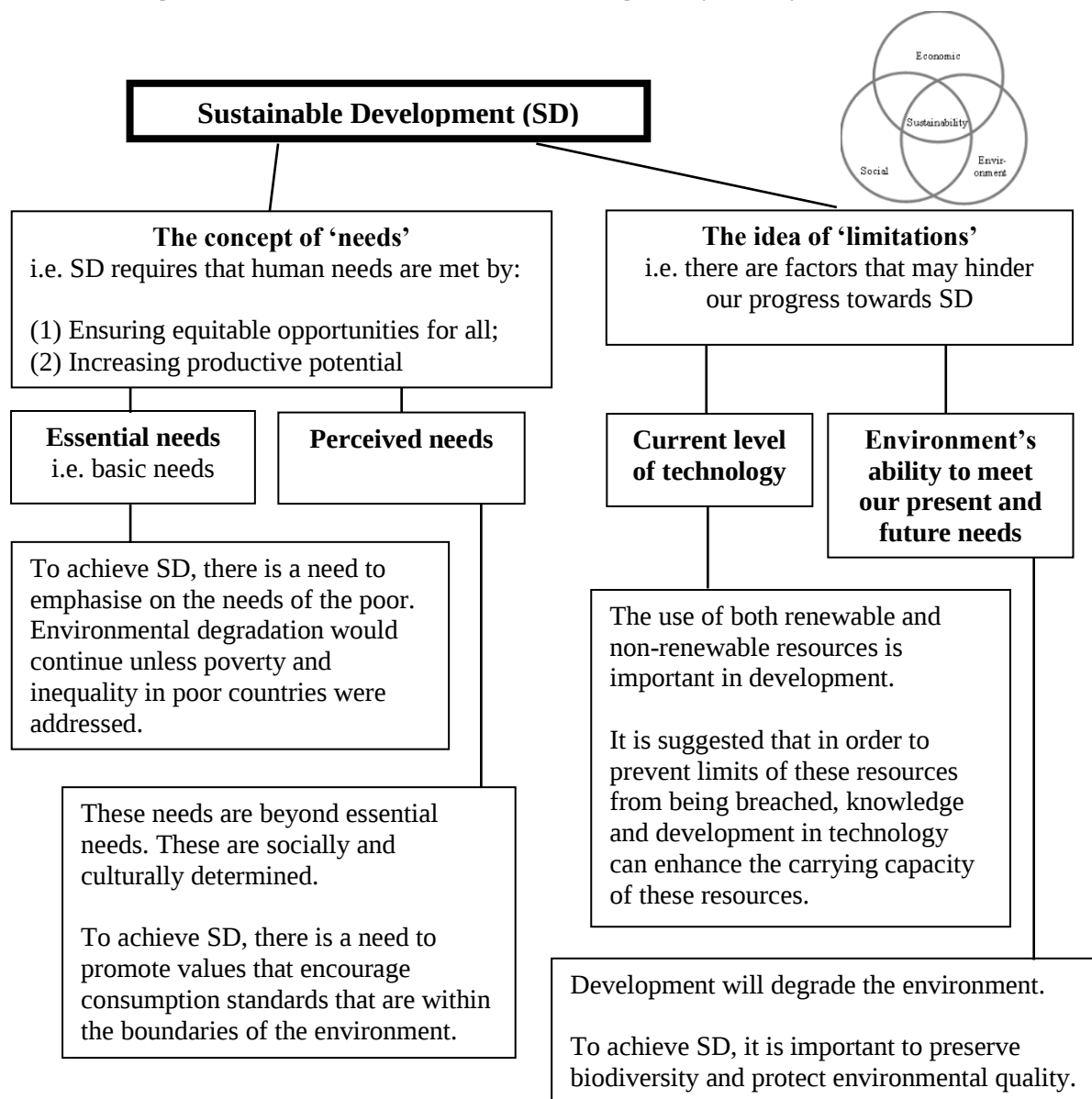
Fig. 4C

1.3 Summary

- According to 'Our Common Future' published by the WCED in 1987, sustainable development is "[development that] **meets the needs of the present without compromising the ability of future generations to meet their own needs...**"

It contains within it two key concepts...

- The concept of '**needs**', in particular the essential needs of the world's poor, to which overriding priority should be given; and
- The idea of **limitations** imposed by the state of technology and social organisation on the environment's ability to meet present and future needs.
- Sustainable development involves **maximising the goals across the three interdependent dimensions (economic, social and environmental)** and yet may involve trade-offs.



Reading 1: The Transboundary Haze in Southeast Asia

Transboundary smoke haze from land and forest fires during the traditional dry season from June to October has presented great problems in the Southeast Asian nations for the past few decades. The smoke, which can create a thick haze which lasts for weeks, affects several countries throughout the Southeast Asian region, with differing levels of severity.

The haze is caused mainly by land clearing and 'slash and burn' practices in Indonesia, predominantly in Sumatra and Kalimantan. Illegal agricultural fires created by slash and burn are instigated to clear the land, quickly, easily and at a minimal cost, so that timber can be sold for pulp and land can be sold and used for activities such as palm oil production. The smoke created by the slash and burn can be carried over to neighbouring countries by prevailing winds.

Indonesia is categorised as a NIC (Newly Industrialised Country) with a GDP per capita PPP of US\$11,633 in 2016 and a medium (Human Development Index) HDI score of 0.684. The country has the third largest area of tropical rainforest on Earth, with approximately 68% of its landmass covered by forests. Deforestation rates in Indonesia are high, estimated at over 1 million hectares per year. This rapid deforestation has mainly been driven by the growth of agri-business, especially palm oil plantations. Once cleared, Indonesia's forests and the space they can provide for monoculture give them instrumental value.

The country makes 11% of its \$5.7bn export earnings from palm oil and looks set to increase these earnings in the future. However, while Indonesia slashes and burns, the transboundary haze problem continues with the pollution having adverse effects on human health and livelihoods, causing contention within the Southeast Asian region.

Besides the haze being detrimental to human health and wellbeing, animal species are also adversely affected. Indonesia is a biologically diverse country, with the western portion of the Indo-Malayan archipelago being designated as a biodiversity hotspot (Sundaland) due to its many endangered and endemic species. The orangutans, native to this region, are known to suffer respiratory problems and fevers as a result of the fires; some have to flee the area and become dehydrated in the search for fresh water whilst others are burnt. Fires are steadily decreasing the habitats available for the

orangutans, tigers and other endangered species in the region, forcing them into smaller land areas, threatening their survival and reproductive capabilities.

Helen Varkkey, an academic expert on the transboundary haze issue, highlights the irony that nearby countries Singapore and Malaysia are amongst the worst affected by the haze. The palm oil industry is important in both Indonesia and Malaysia and between them the countries produce around 90% of the world's oil palm supply, whilst Singapore is an important player in refinement of the product. Therefore, these countries all have a vested interest stemming from the instrumental value of this land, to ensure that the lucrative palm oil industry continues to thrive. Varkkey suggests that this vested interest seems to be holding back efforts to alleviate the issue, favouring economic growth over social development and protection of the environment.

There have been efforts to move towards sustainability in palm oil production, such as the International Roundtable on Sustainable Palm Oil (est. 2001), which encourages sustainable plantation practises.

Singapore has also worked with Indonesian farmers to encourage sustainable practices, with campaigns targeting consumers to 'vote with their wallets' to show distaste towards the harmful practices creating the forest fires in Indonesia. Whilst people are becoming more aware of the environmental issues associated with the transboundary haze problem in Southeast Asia, the extent to which people have made efforts to alleviate the issue, and also to which efforts have perhaps been hampered, are probably driven more by worries for the impacts that the issues have or will have on humans, than they are by environmental concerns.

Indonesian law forbids the use of fire to clear land, but this rule is weakly enforced, and Indonesia was the last country to sign the intergovernmental Agreement on Transboundary Haze Pollution in 2014. What message might this send out about the country's desire and ability to play a part in monitoring and dealing with the problem?

We often consider the environmental consequences of doing something (clearing the forests), but we don't consider the social and economic consequences of ceasing to do something. What are the different ways in which many Indonesians might be affected if they are discouraged from exploiting the environment? To what extent might the belief systems of Indonesians be at odds with their actions?

Reading 2: Chek Jawa

Chek Jawa is a cape and 100-hectare intertidal wetland area situated on the south-eastern point of Pulau Ubin, an island off the north-east coast of Singapore. Singapore is an entirely urban small island nation with a population approaching 5.8 million and a land area of 697 km². The city-state's population has grown by over 25% in the last decade and the population growth rate stood at +1.86% in 2016. The nation is highly developed with a Gross Domestic Product (GDP) (at purchasing power parity) per capita of US\$85,300 and a (Human Development Index) HDI score of 0.912. Chek Jawa is unique in Singapore – it has a rich and diverse collection of several ecosystems and it is one of the few places left in the nation with a natural rocky shore, providing a home for many plants and animals that are no longer common elsewhere on the island. Chek Jawa was reserved for reclamation in 1992 with plans for the reclamation to take place in 2001.

Singapore's Urban Redevelopment Authority (URA) released a 'Concept Plan' in 1991 which outlined the intention to reclaim Pulau Ubin when the nation's population reached 4 million to provide space for housing for hundreds of thousands of people. The URA's decadal Concept Plans are seen as vital in catering for all land use needs within the constraints of a small and densely populated land area.

Before Chek Jawa's reclamation was initiated, conservationist volunteers carried out a survey which revealed the immense level of biodiversity within the area. Seeing value in the wetlands, the conservationists submitted a report and, along with other interest groups, petitioned to the government for their plans to reclaim this intertidal zone to be reconsidered. In 2001, in response to the campaign, the government agreed to leave Chek Jawa untouched, deferring reclamation for as long as Pulau Ubin and surrounds were not required for development. Since then, conservation of the area has been carried out and supported by the Ministry of National Development, the National Parks Board, the National Biodiversity Centre, the Nature Society of Singapore and various other groups and volunteers.

The conservation and appreciation of Chek Jawa shows that the area is not seen as a resource to be exploited for its wares in the most traditional sense of the word, but to be admired and bring joy through its perceived beauty and ecological uniqueness. Guided tours of Chek Jawa are carried out, or visitors are allowed to explore the wetlands unaccompanied. Tens of thousands of visitors have flocked to see the area since it came to the public's

attention in the early 2000s. The human use and enjoyment of this area has been supported by the Singapore Government who invested S\$7 million in various visitor amenities which aided accessibility and enjoyment.

Chek Jawa provides a good example of a human-environment relationship, arguably in which both humans and the environment can benefit. But how long can this last?

Wanting to protect nature can be problematic. Despite best efforts to preserve and protect the environment damage over time is almost inevitable. Increasing pressures also exist to use the land, which is in very short-supply, to cater for what many may consider to be a more pressing need for the population of Singapore than enjoyment of an interesting and unique natural environment – that is, having a place to live and providing space for the infrastructure essential to social and economic development.

If Singapore's population has grown by 25% in the last decade and is still growing each year, it may become unrealistic to continue protecting the wetlands. Singapore's population density is already in excess of 6,000 persons per km²; can the choice of assigning such value to Chek Jawa for humans to enjoy be rationalised? Land reclamation will only increase the available land area by 15% and projected population growth and housing demand may well outstrip this availability. Would it be worth it? Once such land was reclaimed, this unique area of overlapping ecosystems would be lost forever.

Singapore is a nation with a reputation for successful environmental management, but the extent to which efforts place humans at the centre rather than the environment is open to discussion. Whilst the URA has become increasingly aware of the ways in which 'green spaces' can contribute to higher qualities of life for city dwellers, the Government takes a pragmatic approach to nature conservation and therefore the current situation which protects Chek Jawa may be revisited and reviewed in the future if needs arise. Is there anything that could stop such a situation from coming about?