WWF

REPORT

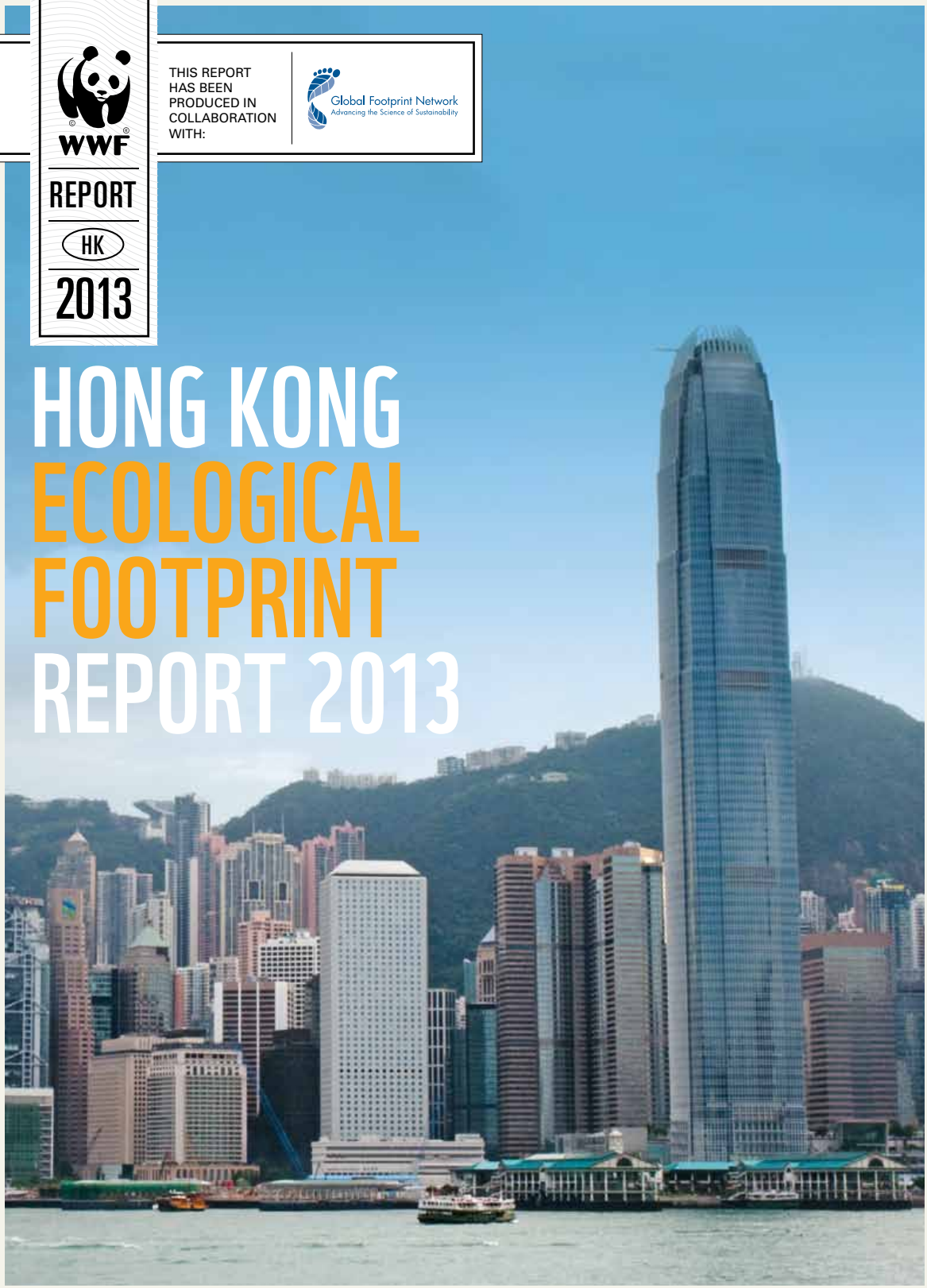
HK

2013

THIS REPORT HAS BEEN PRODUCED IN COLLABORATION WITH:

Global Footprint Network
Advancing the Science of Sustainability

HONG KONG ECOLOGICAL FOOTPRINT REPORT 2013



WWF

WWF is one of the world's largest and most experienced independent conservation organizations, with over five million supporters and a global network active in more than 100 countries.

GLOBAL FOOTPRINT NETWORK

Global Footprint Network promotes the science of sustainability by advancing the Ecological Footprint, a resource accounting tool that makes sustainability measurable. Together with its partners, the Network works to further improve and implement this science by coordinating research, developing methodological standards, and providing decision-makers with robust resource accounts to help the human economy operate within the Earth's ecological limits.

Editor: Scott Mattoon

Contributors

Global Footprint Network
Mathis Wackernagel
David Moore
Michael Borucke
Katsunori Iha
Alessandro Galli
Martin Halle
Haley Smith Kingsland
Steve Goldfinger
Elias Lazarus
Ryan Van Lenning
Geoff Trotter

WWF-Hong Kong
CW Cheung
Allen To

We would like to thank Richard McLellan, Stefane Mauris of WWF-International, Natascha Zwaal of WWF-Netherlands, Gavin Edwards, Alicia Yeh, June Ng, Kerry Lee and Carrie Li of WWF-Hong Kong for valuable advice and support.

Cover: Ben Halford
Publisher: WWF–Hong Kong
Editor: Michael Quinn
Design: adeddesign

FOREWORD

The Earth is mankind's only home. Implicit in this statement is the fact that we are entirely reliant on this one planet to produce all the natural resources we need for our existence: clean air, food, fuel and water, as well as the materials and land we need for our homes and infrastructure.

This planet of ours also happens to be the only place where we can dispose of our waste materials. Likewise, it must also absorb the greenhouse gas emissions emanating from our activities. For a very long time humanity has taken for granted the availability of these resources but now, increasingly, our demand for natural resources is exceeding supply.

WWF, in partnership with Global Footprint Network, has been producing the global Living Planet Report every two years since 1998. This report tracks humanity's demands on the biosphere and the impact of these demands on global biodiversity. The latest report warns that we are over-taxing the finite resources of our world. The planet now needs 1.5 years to regenerate the natural resources we use in a single year! Put simply, we are over-spending and if we continue to maintain our consumption patterns, by 2050 the human race will need the equivalent of nearly three Earths to sustain us.

Hong Kong is one of the world's most affluent cities, but we are also one of the top cities for the per capita consumption of goods and resources. This report, the third Hong Kong Ecological Footprint Report, confirms that Hong Kong's Ecological Footprint has been increasing over the last few decades. If everyone on Earth lived the lifestyle we lead in Hong Kong, humanity would need 2.6 Earths to sustain our resource needs.

Hong Kong is also running at an "ecological deficit" as our success has been built almost entirely on natural resources imported from overseas. Our trade partners are also running similar deficits and may soon begin to feel a "resource crunch" themselves. Nevertheless, Hong Kong is still a trading partner of choice because of our purchasing power. But will this situation be sustainable in the future?

Hong Kong is now at an important crossroads. We know more than ever about our impact on the planet and our vulnerability to resource constraints, but equally we are better informed as to how these problems can be solved. It is high time that we begin to reduce our Ecological Footprint by improving our governance and use of resources.

WWF-Hong Kong is well-placed to take the lead in building on the foundation set out in this report and working with stakeholders to overcome the many challenges we face. The time has come for all of us — the government, the business sector and individuals — to rethink our positions and react to the challenges ahead.

T.C.H. Yang

Chairman, WWF-Hong Kong

EXECUTIVE SUMMARY

This report explores how much nature we use and how much we have, in Hong Kong and the wider world. Its aim is to catalyze Hong Kong's government, business sector and public into rethinking the city's roles and vulnerabilities in this increasingly resource-constrained world. It invites these audiences to create strategies and solutions which will help Hong Kong overcome these imminent challenges.

The Ecological Footprint is an accounting tool used to measure mankind's demand for the regenerative capacity of our planet: Earth's biocapacity. Human demand for biocapacity is determined by adding up all demands placed on the productive surfaces of the planet. These may be local surfaces, or surfaces in distant locations that produce traded goods or provide services such as CO_2 sequestration, crops, timber, seafood or meat products. The Ecological Footprint is measured in global hectares (gha), which are defined as hectares with world-average biological productivity.

This report illustrates the following:

At the global level:

- From 1961 to 2008, the global population increased by 118 percent while the per capita Ecological Footprint grew from 2.4 to 2.7 gha and the per capita biocapacity fell from 3.2 to 1.8 gha.
- In 2008, the global Ecological Footprint was 1.5 times the available biocapacity; meaning it would take 1.5 years for the Earth to regenerate what humanity demands in one year. If the current trend continues, by 2050, humanity would require three Earths – and that may be physically impossible.

At the Asia-Pacific level:

- In Asia-Pacific, demand for biocapacity exceeds the region's supply by 90 percent. Japan and South Korea demand six to seven times more from nature than their ecosystems can provide, while China's demands are 2.4 times greater than its ecosystems' capacity.
- In 2008, Hong Kong's per capita biocapacity was just 0.03 gha. The per capita Ecological Footprint exceeded this biocapacity by more than 150 times. Only eight countries in the world have larger per capita biocapacity deficits than Hong Kong. Within Asia, Hong Kong has the second largest per capita deficit, just after Singapore.

Hong Kong's status:

- From 1962 to 2008, Hong Kong's population increased by 120 percent but its per capita Ecological Footprint increased nearly 400 percent, to 4.7 gha. Only 25 countries with populations larger than one million have larger per person Footprints. If everyone in the world lived the lifestyle we lead in Hong Kong, we would need 2.6 Earths to fulfil our needs.

Hong Kong in the global context:

- Due to the high demand for and low domestic availability of natural resources, Hong Kong is substantially dependent on imports from overseas and therefore highly reliant on its trade partners. However, Hong Kong's most important trade partners are already running biocapacity deficits.
- Hong Kong consumes many products from mainland China and overseas, meaning that the products we consume locally affect biodiversity and ecosystems in other parts of the world. Hong Kong therefore has an obligation to act responsibly and source and consume resources more sustainably.
- Liquidation of natural assets and constraints on resources creates economic risks, particularly for ecological debtors without the financial strength or national power to compete for the biocapacity which they lack.
- Hong Kong's relatively high income still allows it to successfully bid for and import natural resources from overseas. There is no guarantee that Hong Kong's competitive advantage will remain forever though, meaning the city may be increasingly exposed to world market price volatility and supply disruption.
- Hong Kong has made significant gains in human development, however these developments may have been achieved at the expense of Hong Kong's Ecological Footprint. Hong Kong's current model of human development is far from sustainable when viewed from the Ecological Footprint perspective.

The way forward:

- It would be in the interest of the Hong Kong government and business sector to reconsider the importance of operating within the boundaries of finite natural resources in order to minimize a number of risks. They may want to clarify their goals and establish a road map that will lead to change; it may be necessary to continuously track the city's Ecological Footprint trend; and formulate long-term development strategies that will stabilize and eventually reduce its Ecological Footprint.
- Some examples are already emerging: The Hong Kong government is drafting its first Biodiversity Strategy and Action Plan (BSAP) under the Convention on Biological Diversity (CBD). This is a timely opportunity to incorporate the concept of sustainability into the planning process, and transform Hong Kong. Hong Kong could become an Asian sustainability leader, which would also bring economic advantages.

Hong Kong is well-positioned to revolutionize itself and become a leader in reducing the city's Ecological Footprint; and a city which prides itself on truly sustainable development. Our influence as a financial and trading hub can create positive change throughout Asia-Pacific. After all, a future where Hong Kong is held prisoner by scarce resources is not our destiny; quick action can steer our fate towards sustainability.

CONTENTS

Cities are engines of creativity, cultural centres and drivers of economic success. No city, however, can exist without using resources sourced from outside its boundaries. Every economy, every metropolitan area and the well-being of all human populations in these areas depends upon the material flows provided by nature. Without these flows of food, fibre, waste absorption, energy, clean water and fresh air, cities would soon come to a standstill. In every case, the size of these flows far exceed what a city's local ecosystem can provide.

Hong Kong's dependence on distant ecosystems is immediately obvious, but the implications of this fact are less obvious. The vast biocapacity deficit that Hong Kong faces — that is, the difference between how much is taken from nature versus what is available within Hong Kong's borders — leaves the territory facing an uncertain future.

County, provincial, state and national governments all operate in a world where the demand for ecological resources and services outstrips global supply. As biocapacity — the planet's ability to renew natural resources — increasingly fails to keep pace with rising populations and rising consumption; competition for these ecological assets heats up.

In this ecologically-constrained world, Hong Kong's ability to succeed will become more and more dependent upon the city's ability to cope with the stresses caused by the limited supply of renewable resources and the services they provide. Cities that cannot keep pace with rising costs, or that cannot gain sufficient access to biocapacity, will inevitably decline.

If Hong Kong — indeed, if any city or country — is to prosper, it must track its demand for the Earth's renewable resources and examine this demand in light of the availability of these resources. Planning for the future now means planning for a world in which there is greater competition for limited biocapacity.

With the right ecological accounting tools to make informed decisions, national and sub-national governments are more likely to succeed in a world of tightening ecological constraints. It is urgent that governments recognize this challenge before it is too late. Success emerges from new strategies that work in a world in ecological overshoot.

BIOCAPACITY

Biological capacity is the ability of an ecosystem to regenerate and provide services that compete for space. This includes producing useful biological materials and absorbing waste such as carbon dioxide emissions from fossil fuels.

ECOLOGICAL FOOTPRINT

A measure of the area of biologically productive land and water an individual, population or activity requires to produce all the resources it consumes and to sequester its waste. Because of data limitations, the main form of waste included in the National Footprint calculations is carbon dioxide from burning fossil fuels. Both Ecological Footprint and biocapacity results are expressed in a globally comparable, standardized unit called a "**global hectare**" — a hectare of biologically productive land or sea area with world average bioproductivity in a given year.

BIOCAPACITY DEFICIT

The difference between the Ecological Footprint and the biocapacity of a region or country. An biocapacity deficit occurs when the Footprint of a population exceeds the biocapacity of the area available to that population.

ECOLOGICAL OVERSHOOT

When a population's demands on an ecosystem exceed the capacity of that ecosystem to regenerate the resources demanded. Overshoot results in ecological assets being diminished and carbon waste accumulating in the atmosphere.

HONG KONG IS HUNGRY FOR NEW IDEAS

© WWF – HONG KONG

HONG KONG IS HUNGRY FOR NEW OPPORTUNITIES

© CLAIRE DOOLE / WWF – CANON

AND HONG KONG IS VERY HUNGRY FOR RESOURCES

KEY FINDINGS

Since 1980, Hong Kong's per capita Ecological Footprint — the average demand the city places on ecosystems — has nearly doubled.

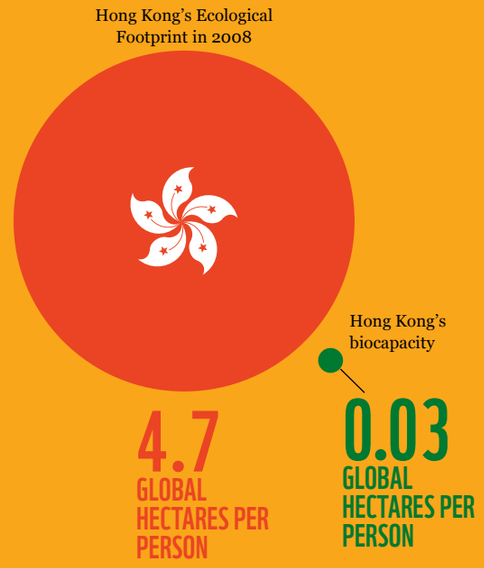
In 2008 — the year for which the most recent data is available — Hong Kong's Ecological Footprint was 4.7 global hectares per person.

This is more than twice the Ecological Footprint of China (2.1 global hectares per person), and nearly triple the average Footprint of people in the Asia-Pacific region (1.6 global hectares per person).

Hong Kong's biocapacity is a mere 0.03 global hectares per person.

This means that the demands Hong Kong places on ecosystems is more than 150 times greater than what its own ecosystems can provide.

Hong Kong is increasing its dependence on external ecosystems at a time when it is becoming ever more difficult to access those resources.



THE BIODIVERSITY DEFICIT IN THE HONG KONG CONTEXT

How does a country, city or territory track how much biocapacity it has, and how much it uses?

What contributes to Hong Kong's biocapacity deficit?

Because economies are fundamentally dependent on resource inputs, what are the consequences of Hong Kong's biocapacity deficit? Does Hong Kong have enough access to global biocapacity to safeguard its economy?

As demand for biocapacity is exceeding ever more what is available on this planet, how exposed is Hong Kong to supply and price volatility?

When Hong Kong's trading partners begin to feel the "resource crunch", will they remain reliable sources of biocapacity?

What kinds of pain points might be experienced as resources grow more scarce and more difficult to access? What are the options for avoiding these pain points?

GLOBAL BIOCAPACITY WHAT IS IT AND HOW MUCH IS THERE?

Global biocapacity is the ability of the world's ecosystems to provide the ecological services and natural resources that humanity needs. This includes absorbing waste products such as carbon dioxide emissions from burning fossil fuels and producing useful biological resources like live reef food fish, the trade and consumption of which is centred in Hong Kong and China.

BIOCAPACITY: WHAT IS IT?

Figure 1: The biocapacity of different categories of land use
Biocapacity tracks the ecological assets available in countries and regions and at the global level, and the capacity of these ecosystems to produce renewable resources and ecological services.

CROPLAND
The area required to produce food and fibre for human consumption, feed for livestock, oil crops and rubber.

GRAZING LAND
The area of grassland used to raise livestock for meat, dairy, hide and wool products

FOREST FOR PRODUCTS
The area of forest required to support the harvest of fuel wood, pulp and timber products.

FISHING GROUNDS
The area of marine and inland waters used to harvest fish and other seafood products.

BUILT-UP LAND
Biologically productive areas covered by human infrastructure, including transportation, housing and industrial structures.

FOREST FOR CARBON SEQUESTRATION
The forest area required to sequester human-produced CO_2 emissions, primarily originating from the burning of fossil fuels, that are not absorbed by the world's oceans.

BIOCAPACITY IS OUR "ECOLOGICAL BUDGET"!

Biocapacity is nature's regenerative capacity: it is a measure of the area of biologically productive land and sea available to provide ecosystem services for human use. A good description of biocapacity is that it is humanity's "ecological budget." These productive areas of land and sea are categorized into the six land use types described above.

The amount of biocapacity varies over time. The available amount is driven by changes in managing practices, agricultural inputs, water supply, climate and soil conditions. Overuse can also degrade biocapacity. Per capita biocapacity, or the amount of biocapacity available per person, declines as populations increase.

For centuries, the human race has treated biocapacity as an essentially limitless flow. This is no longer the case. Now, humanity's overall demand for biocapacity outstrips global supply by 50 per cent. In the Asia-Pacific region, the demands placed on biocapacity now exceed the region's supply by 90 per cent, while Japan and South Korea demand six to seven times more from nature than their ecosystems can provide. China, Hong Kong's primary source of biocapacity, demands 2.4 times more ecological resources and services than China's ecosystems regenerate.

150x

HONG KONG'S DEMAND FOR ECOLOGICAL RESOURCES IS MORE THAN 150 TIMES GREATER THAN LOCAL BIOCAPACITY

In Hong Kong, however, the demand for ecological resources exceeds local biocapacity by a factor of more than 150 — an astounding 15,000 per cent.

In a world of growing ecological overshoot — a situation where humanity's demands for nature's products and services exceed the planet's ability to renew them — this dependence on external biocapacity becomes a significant risk, particularly in places such as Africa, Borneo and the Amazon. Ecological overshoot means that humanity's economic activities are fuelled by depleting the planet's ecological assets — a strategy that has no long-term future and cannot last.

Cities and countries trapped in energy- and resource-intensive infrastructure and economic activities will begin to become fragile. If they cannot minimize their dependence on external resources, they will not be able to adapt in time to meet emerging challenges.

THE ECOLOGICAL FOOTPRINT

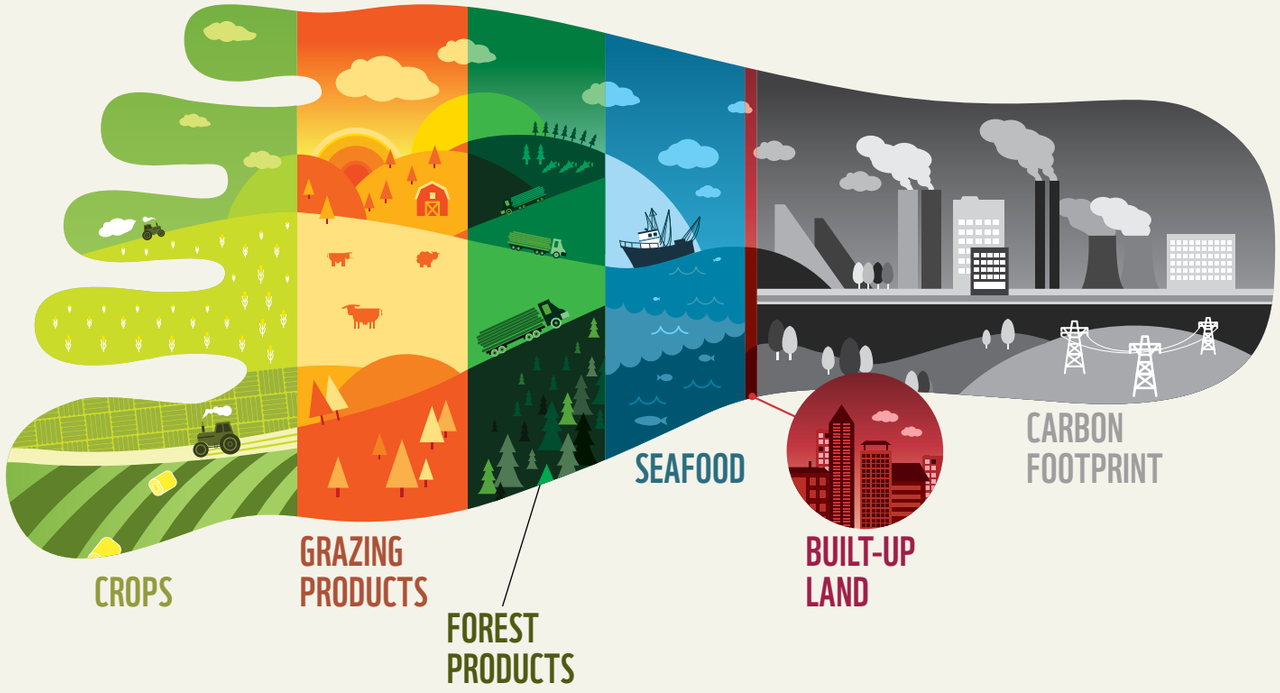


Figure 2: The Ecological Footprint measures the biologically productive areas of land and sea — the ecological assets — that a population requires to produce the renewable resources and ecological services it uses. This figure illustrates the Ecological Footprint of Hong Kong for these resources and services.

A country can meet its biocapacity deficit through trade with other countries, by turning to the global commons to provide seafood and uptake its carbon waste, or by overusing its own ecological assets. But a planet with a biocapacity deficit cannot turn to trade or the commons — there is no other entity to trade with, and no commons to turn to. For the planet, such a deficit means overshoot — a depletion of its assets.

While biocapacity measures the supply of ecological assets, the Ecological Footprint measures humanity's demand for them. More specifically, the Ecological Footprint is an accounting tool that measures the amount of biologically productive land and sea required to produce the renewable resources a population (or an activity) consumes and to absorb its waste, using prevailing technology and management practices.

A population's Ecological Footprint can be compared with the biocapacity that is available — domestically or globally — to support that population; just as expenditure is compared with income in financial assessments. If a country's demand for ecological assets exceeds the country's supply, then that country is running a biocapacity deficit. Conversely, when the demand for ecological assets is less than the biocapacity available within a country's borders, that country has a biocapacity reserve.

A local biocapacity deficit means that the country is either importing embedded biocapacity through trade — Hong Kong's seafood imports, for example; liquidating its own ecological assets — overfishing in Hong Kong's territorial waters; or turning to the global commons — Hong Kong ships fishing in international waters.

In contrast to biocapacity deficits at the national scale, a global biocapacity deficit cannot be compensated for through trade or using distant commons. Global biocapacity deficits therefore are by definition the same as "overshoot."

*Due to constraints in obtaining globally consistent data, current national calculations on the waste side include only the carbon dioxide produced by burning fossil fuels and by cement production.

THE METRIC: GLOBAL HECTARE

If a hectare of, for example, cropland is twice as productive as a world average biologically productive hectare, then it is classified as 2 gha.

If a hectare of, for example, grazing land is half as productive as a world average biologically productive hectare, then it is worth 0.5 gha.

Both the Ecological Footprint and biocapacity figures are expressed in global hectares (gha) — hectares of productive area with world average biological productivity in a given year. This expression standardizes the hectares and makes them globally comparable. Actual areas of different land use types (in hectares) are converted into their global hectare equivalents by using yield factors and equivalence factors (please refer to the online appendix for the methodology).

Different types of land use — forest, fisheries, cropland and grazing land — can vary in their biological productivity. In general, croplands occupy the most productive areas: they are typically flat, bestowed with good soils and have access to sufficient water. Global Footprint Network assessments estimate world average biological productivity for each area type.

Yields can also differ widely for each land use type. For example, some forests — such as tropical forests — are highly productive, while other forest types can be low in productivity — forests on the edge of savannahs with sparse trees and dry conditions, for example.

Global hectares therefore adjust physical hectares to account for their productivity. For example, a hectare of fertile cropland would be measured as having more global hectares than a hectare of grazing land; since cropland is able to generate and renew more biological activity than typical grazing land. Another way to look at it is that a larger physical area of grazing land would be needed to provide the same biocapacity as a particular physical area of cropland. Since world bioproductivity varies slightly over time, the value of a global hectare changes from year to year.

Using global hectares as a unit to measure biocapacity may seem complex, but it is similar to using a standardized monetary unit in the course of financial accounting, such as the US dollar or Hong Kong dollar.

GLOBAL TRENDS

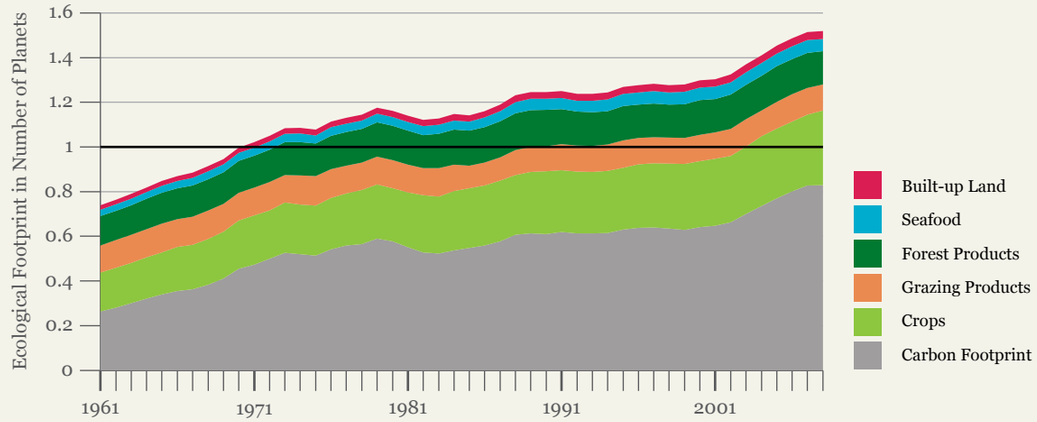


Figure 3: Humanity's Ecological Footprint by land area, 1961-2008. Today, the largest component of the human race's Ecological Footprint is the Carbon Footprint (55 per cent). According to Global Footprint Network's most recent National Footprint Accounts (2011), the carbon component represents more than half the Ecological Footprint for 25% of the countries tracked, and it is the largest component for nearly half of the 241 countries, regions and territories assessed.

Since the 1970s, humanity has been in ecological overshoot, meaning that the annual demand we place on the world's ecosystems exceeds what the Earth is able to provide. Prior to that, individual cities and countries ran biocapacity deficits; but now, humanity's aggregate demand exceeds what the Earth can renew.

According to Global Footprint Network's most recent National Footprint Accounts (2008), an ecological accounting data set that tracks global resource and consumption trends, in 2008, humanity

Humanity has been in ecological overshoot for more than 40 years. The costs are already high: depletion and degradation of natural capital, erosion of economic opportunities and an increase in social pressure.

Today, it takes the Earth one year and six months to renew the ecological resources that humanity uses in one year. If current trends continue, by the middle of this century, humanity will require the resources of almost three Earths.

OVERSHOOT IS POSSIBLE FOR A LIMITED TIME, BUT AT THE COST OF RESOURCE DEPLETION AND DEGRADATION

consumed ecological resources and services 1.5 times faster than Earth could renew them — a 100 per cent jump from 1961, when people used approximately three-quarters of the planet's biocapacity. If trends follow even the moderate projections of UN agencies, by the middle of this century, humanity will require the resources of almost three Earths.

The Earth cannot sustain such levels of overshoot. Overshoot is possible for a limited time, but at the cost of depletion and degradation of resources. Weaker natural capital stocks erode economic opportunities and increase social pressures, as a number of lower-income countries are already experiencing. Egypt, El Salvador and Pakistan are all facing severe economic burdens imposed by their biocapacity deficits.

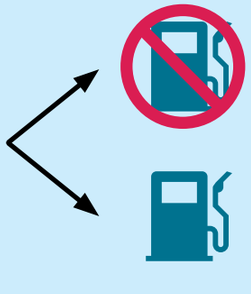
Today, several signs of overshoot can be seen around the globe: carbon accumulation in the atmosphere, depleted fisheries, deforestation and soaring food costs. These signs will become more frequent in the near future: costs of everyday inputs such as food and water will increase, while the value of economic assets that depend on cheap resource inputs (such as airplanes and airports, hotels in distant locations, aluminium smelters, or artificially-heated spas) will decline as they become over-proportionally more expensive to operate.

Fossil fuel use is now a prominent driver of overshoot. Today, the largest component of humanity's Ecological Footprint — 55 per cent — is the Carbon Footprint. In contrast, in 1961 the carbon component was only 35 per cent of humanity's total Footprint. For all the world's technological gains, developments in energy efficiency have not kept pace with the growth in populations and the increases in demand for energy used in transportation, electricity, heating and cooling.

THE BIOCAPACITY DILEMMA: IT'S NOT ALL ABOUT FOSSIL FUELS

5x

Currently, the Earth has five times more fossil fuels than humanity can burn if we are to avert dangerous levels of climate change.



We make significant cuts to fossil fuel consumption. But do we have enough biocapacity to produce alternative fuels?

We continue to burn all the fossil fuels for short-term gain. But what do we do as biocapacity continues to decline through climate change? Will we face social and economic failure? Why would moving away from fossil fuels be easier in the future than it is now?

IN EITHER SCENARIO, BIOCAPACITY IS LIMITED AND IS THE LIMITING FACTOR FOR ECONOMIC ACTIVITIES.

As with life itself, all economic activity is dependent on access to biocapacity — that is, ecological resources and the services they provide. In addition, nations compete for fossil fuels and rare earth metal elements (used in mobile phone manufacture, for example). As explained below, the use of these resources is also limited by biocapacity. In spite of increased technological sophistication, access to food, fibre and other ecosystem services continues to be fundamental for any economy.

An economy's use of fossil fuel energy is ultimately constrained more by biocapacity — specifically the ability of forests to absorb carbon dioxide (CO_2) emissions — than it is by access to underground fuel deposits. Nature has a limited ability to absorb anthropogenic (manmade) CO_2. This fact is a much greater limitation than our ability to extract and burn all the gas, oil and coal which exists under the ground. If human kind did use all the fossil fuels that have already been discovered, many climate scientists say that the CO_2 concentration in the atmosphere would rise above 1,700 parts per million gas molecules (ppm). Such levels, they warn, are far beyond the 450 ppm that most scientists, including the Intergovernmental Panel on Climate Change, consider to be the threshold level where the dangerous impacts of climate change begin.

400PPM

CO_2 CONCENTRATION IN THE ATMOSPHERE

Preindustrial: 270 ppm
In 1850: 285 ppm
In 1960: 315 ppm

In other words, from a climate perspective, there is very little room for future fossil fuel use. Humanity has already "found too much" — possibly up to five times more than what we should burn within the 450 ppm constraints . Additionally, many alternatives to fossil fuel — be they biodiesel, firewood or hydroelectricity — will also compete for biocapacity, further tightening constraints.

Alternative energy sources that do not compete for biocapacity can also negatively impact our access to resources. Accident-free nuclear energy, for example, may use very few natural resources; but the 2011 disaster at the Fukushima, Japan nuclear plant contaminated about 10 per cent of Japan's biocapacity with radiation above safe levels for many decades, if not centuries.

Humanity now faces a dilemma: If we continue to burn fossil fuels, even at significantly reduced levels, we propel ourselves towards climate change and increase the probability that ecosystems will lose productivity. In short, we put key inputs for any economy at further risk.

Limiting the exploitation of fossil fuel deposits to 20 per cent of what has already been discovered is necessary to avoid dangerous levels of climate change; but this is a challenging proposal: humanity would have to discourage stakeholders with an interest in exploiting the remaining 80 per cent of the fossil fuels from accessing those underground deposits in perpetuity. Furthermore, compensation for these stakeholders, regulations on usage limitations and other mechanisms of control may well need to be put in place at a time when it may be even more difficult to generate economic revenues than it is today; since future economies will no longer be run on cheap fossil fuels.

While it is essential that the world transitions to renewable energy sources and cuts its use of fossil fuels, doing so will have wider, unintended implications. The growing reliance on fossil fuels has constrained people's demand for other ecosystem services and masked the extent of our overshoot. One example is that if economies did not use fossil fuels to create plastics; they might harvest more wood as a substitute. If fossil fuels were not used to power tractors, pump water and manufacture fertilizers and pesticides; agricultural production might be lower. If energy was not available to run our freezers and refrigerators, more food might go to waste.

What serves humanity best? Will we strive to limit our fossil fuels usage to 20 per cent of what we have found? Or will we continue to put off making a decision while continuing to reap short-term gains and risking long-term social, ecological and economic failure?

WORLDWIDE DISTRIBUTION

4x

IN LESS THAN 50 YEARS, HONG KONG'S POPULATION INCREASED BY 120 PER CENT AND ITS PER CAPITA FOOTPRINT INCREASED NEARLY FOUR-FOLD.

Despite increasing forest loss, land degradation and all the other problems the world's ecosystems face, there is still some good news: in recent years, Earth's biocapacity has actually increased. Mainly due to more intensive management of agricultural lands and forests in some parts of the world, global biocapacity has grown by as much as 15 per cent over the last five decades.

While encouraging, this trend also brings with it risks. Intensive land use requires more inputs — such as fresh water and fertilizers — that may not be as easily available in the future. In some cases, intensive management has led to significant pollution and groundwater depletion. It can also increase the risk of soil depletion, biodiversity loss, further fossil fuel burning and loss of productivity due to shifting weather patterns. All these effects raise the question of whether biocapacity gains can be maintained over the longer term. There are actually a number of historical examples of intensive agricultural land use that led to a substantive loss of biocapacity, particularly in the Mediterranean region.

While total supply has increased only modestly; total demand — the product of rising populations and growing individual consumption — has jumped 140 per cent. In other words, global demand has increased at least nine-fold compared to world biocapacity gains.

These changes in total supply and demand have dramatically shifted the resource landscape. From 1961 to 2008, the global population more than doubled from 3 billion to 6.5 billion (a 118 per cent increase), while the world's per capita Ecological Footprint grew by 15 per cent (from 2.4 to 2.7 gha per person). This growing Ecological Footprint was met by a shrinking per person biocapacity, from 3.2 to 1.8 gha per person. In essence, this

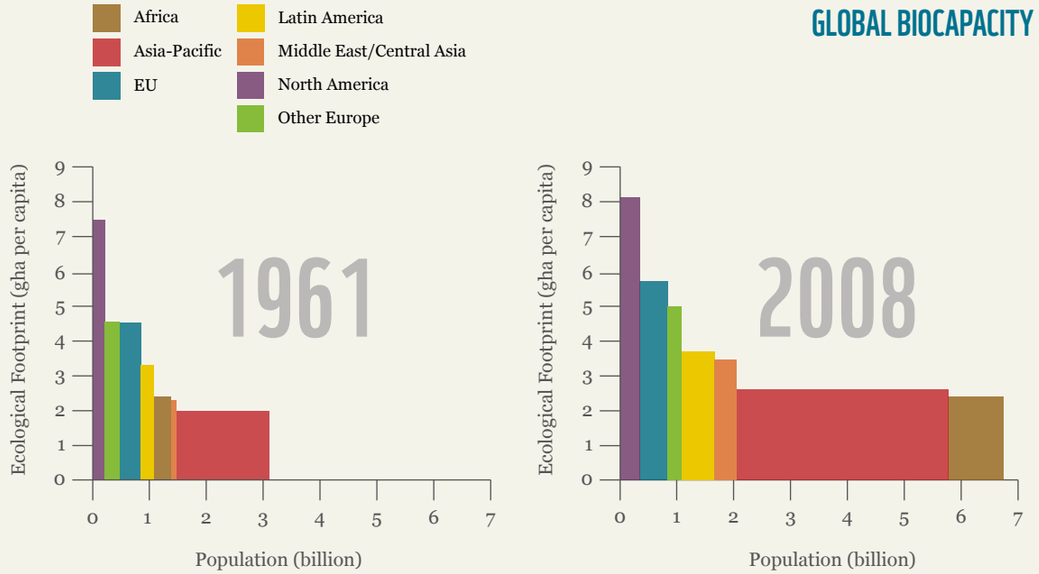


Figure 4: Graphs of Ecological Footprint and population by world region in 1961 and 2008. The area within each bar represents the total Ecological Footprint for each region.

means that more people are now competing for fewer resources.

These global trends mask the huge variability that exists between regions and countries, and within countries themselves. The European Union and Middle East-Central Asian regions had the largest per capita Footprint increase (+1.2 and +1.1 gha per person, respectively). In the European Union, population grew by 29 per cent, while in the Middle East and Central Asia it increased 330 per cent. North America had a smaller increase in per capita consumption (+0.6 gha per person), while its population expanded by 63 per cent; and Africa saw its already small per capita Footprint decline by -0.1 gha per person, yet its population increased by 255 per cent.

In the wider Asia-Pacific region, the per capita Ecological Footprint expanded by 0.6 gha per person from 1961–2008, while population grew by 136 per cent. Most countries in the region recorded large population increases, but Footprint trends have been inconsistent: Singapore's per capita Footprint grew 280 per cent, for example, while its population increased 180 per cent. Indonesia's per capita Footprint slightly decreased (-8 per cent) while its population rose nearly 150 per cent. Likewise, Australia's per capita Footprint decreased 25 per cent while its population increased 100 per cent. China's population also grew by almost 100 per cent, but its per capita Footprint increased nearly 150 per cent during this same period (1961-2008).

Hong Kong showed one of the world's most dramatic shifts: Between 1962 (the first year that consistent data for Hong Kong became available) and 2008, Hong Kong's population increased by 120 per cent, while its per capita Footprint increased nearly four-fold.

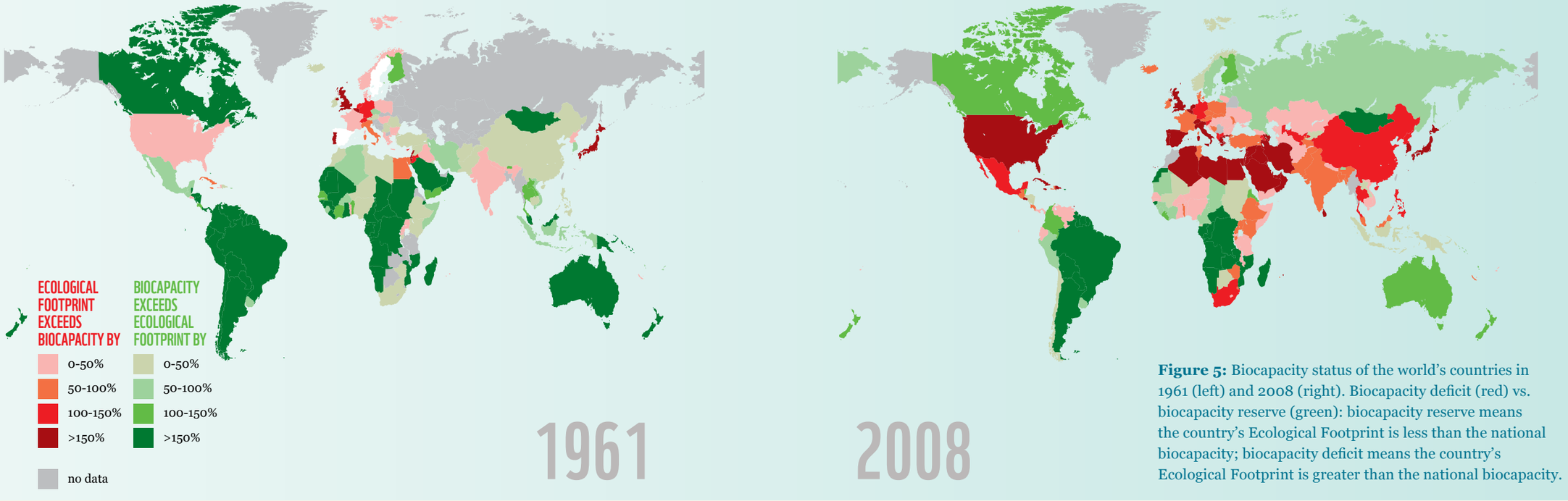


Figure 5: Biocapacity status of the world's countries in 1961 (left) and 2008 (right). Biocapacity deficit (red) vs. biocapacity reserve (green): biocapacity reserve means the country's Ecological Footprint is less than the national biocapacity; biocapacity deficit means the country's Ecological Footprint is greater than the national biocapacity.

ECOLOGICAL CREDITORS AND DEBTORS

Countries with biocapacity deficits import more resources than they export, deplete their ecological assets or depend on obtaining flows of resources from the global commons.

Dependence on imported resources exposes a country to both supply disruption and price volatility. Overharvesting causes a direct loss of ecological assets and hence affects supply. On the other hand, burning fossil fuels and emitting CO_2 into the global commons does not usually result in direct costs at the moment, except in a few countries. However, CO_2 taxes may be implemented in even more countries in future, in an effort to internalize the external costs of these emissions. The costs of fossil fuels themselves are also a significant economic factor — prices have risen sharply since the year 2000; in fact more so than any proposed CO_2 tax that might have been imposed. Additionally, the "real" price of anthropogenic climate change is only beginning to be seen.

6 BILLION
PEOPLE LIVE IN COUNTRIES WHERE POPULATIONS DEMAND MORE THAN THEIR ECOSYSTEMS CAN RENEW.

As the maps show, one key trend is clear: more and more countries are becoming ecological debtors. In 1961, 1.7 billion people lived in countries that had more biocapacity than their residents demanded. Today 6 out of 7 billion people live in countries where residents demand more than what their ecosystems can renew.

This global overshoot translates into the liquidation of natural assets and ever-tightening resource constraints and economic risks for all, particularly for ecological debtors without the financial strength, political clout, or national power to compete for the biocapacity they lack.

BIOCAPACITY VERSUS FOOTPRINT

WHAT WE HAVE AND WHAT WE USE

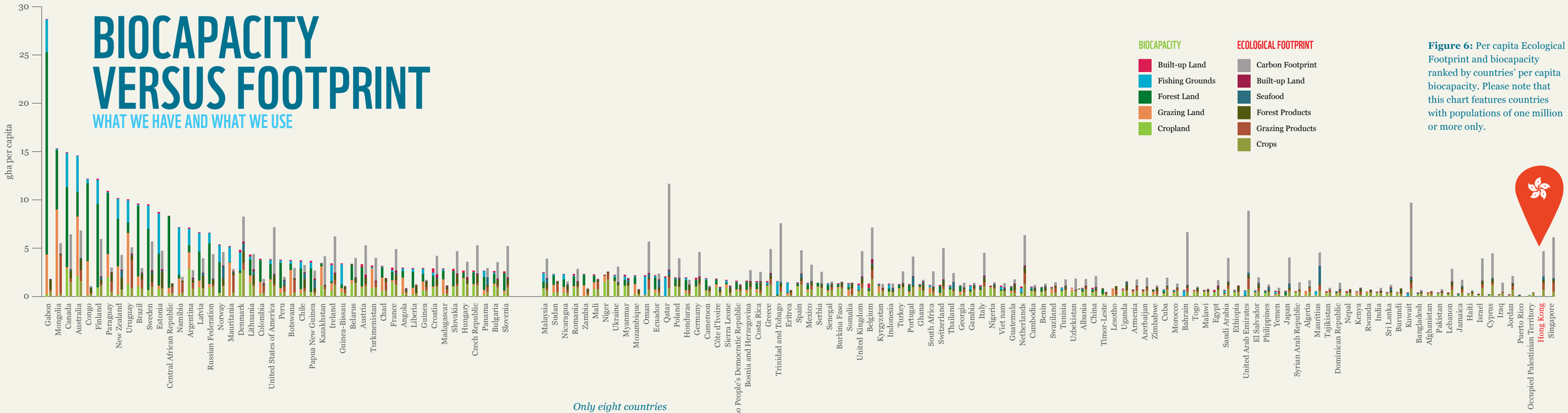


Figure 6: Per capita Ecological Footprint and biocapacity ranked by countries' per capita biocapacity. Please note that this chart features countries with populations of one million or more only.

Wealth allows us to produce income. The larger domain of wealth is made up of a number of different "capitals": human capital, social capital, built capital and natural capital, all of which are necessary. Today, natural capital, particularly biocapacity, is becoming the most critical category of wealth — it lies at the origin of every value chain, and, while most others are increasing, it is the only category which is not keeping up with growing demand,.

The world's "biocapacity wealth" is about 1.8 gha per person. However, this figure must also be pooled with the 10 million or more wild species with whom we share our planet. Further complicating this are the facts that biocapacity is unevenly spread across the globe and that humanity's demand for biocapacity varies considerably among nations, as shown in the figure above.

Only eight countries have larger per capita biocapacity deficits than Hong Kong. This means that, per person, Hong Kong is more dependent on external biocapacity than most of the world's economies.

For example, Brazil has 1.8 billion total gha of biocapacity (about 9.6 gha per person), more than any other country. Brazilians use 30 per cent of Brazil's biocapacity for their own consumption — in other words, Brazil's Footprint is about one-third of its biocapacity. By contrast, India has 575 million gha of biocapacity (0.5 gha per person), less than one-third of Brazil's. Yet India demands nearly twice as much from nature than what its ecosystem can provide — a deficit that has been increasing at a rate of 5 per cent annually.

Hong Kong has about 200,000 total gha of biocapacity, or 0.03 gha per person. However, the city's Ecological Footprint exceeds its available biocapacity by almost **30 million gha**.

Hong Kong's biocapacity deficit is significant. Only 25 countries with populations over 1 million have a larger per capita Ecological Footprint than that of Hong Kong. Only eight countries have a bigger per capita biocapacity deficit (Qatar, Kuwait and the UAE run the largest per capita deficits). This means that, per person, Hong Kong is more dependent on external biocapacity than most of the world's economies.

COUNTRY COMPARISONS

How individual countries are changing course and adjusting to tightening ecological constraints will almost certainly affect their future.

While there are many overarching global trends, ultimately each country is in a unique situation. How individual countries are changing course and adjusting to tightening ecological constraints will almost certainly affect their future.

For example, while Egypt's per capita biocapacity has remained fairly constant, at around 0.65 gha per person, both its population and its per capita Ecological Footprint have steadily increased. In 2008, the latest year for which data are available, Egypt's Footprint was 2.1 gha per capita — more than three times its available domestic biocapacity.

Even with these increases in consumption and population, Egypt's per person biocapacity has not declined, due to a significant increase in the country's agricultural yield.

However, much of that yield is dependent on finite inputs, such as fossil water sources that may not last. At the same time, Egypt's large biocapacity deficit continues to grow. This middle-income country, already under great stress, faces the possibility that its access to essential ecological resources will become extremely precarious. In turn, this will create significant challenges to keeping its society productive.

Residents in Tanzania have an Ecological Footprint well below the world average, yet their Ecological Footprint still surpasses domestic biocapacity. Both their per capita Footprint and biocapacity have been trending downwards for several decades.

Without the financial strength to import significant amounts of resources from abroad, Tanzania is limited to drawing on its own domestic biocapacity. In other words, Tanzania's per capita consumption is bound to decline at the rate of its available biocapacity per person. If the situation remains unchanged, a continued decline will severely impact Tanzanians' well-being, since their level of consumption is already low when compared to the global average.

On the other hand, Vietnam's recent history demonstrates that both Ecological Footprint and biocapacity trends can be shaped. Vietnam's changing agricultural practices, which focus on smaller but higher-yielding farms, combined with a drive to slow population growth, has led to an increasing trend in per capita biocapacity since the 1990s. At the same time, Vietnam's economic development has resulted in a rapid increase in resource demand. The country's Footprint trend has moved faster than its biocapacity trend. As a result, this Vietnam moved into biocapacity deficit by the year 2000. If this deficit persists, it may make it difficult for the country to maintain its fast-paced development.

Gabon is one of the "richest" countries in the world in terms of biocapacity — its ecological resources and services are 16 times the size of its Footprint. But because of the country's rapid population growth, its biocapacity reserve is dwindling fast — from around 90 gha per person 50 years ago to less than 30 gha in 2008.

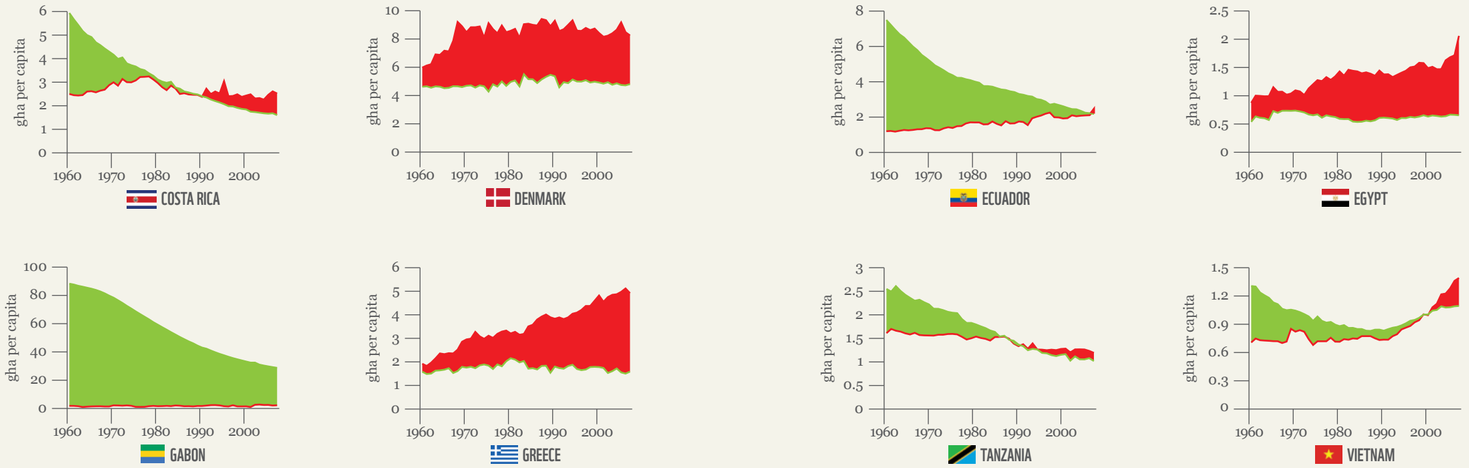


Figure 7: Per capita Ecological Footprint (red line) and biocapacity (green line), expressed in global hectares for selected countries.

WHERE DOES HONG KONG FIT IN?

The city that never sleeps, the prosperous Pearl of the Orient. The lights of Hong Kong burn brightly 365 days a year, illuminating our financial success and consuming large amounts of electricity. The “dark side” of this prosperity is Hong Kong’s ever increasing Ecological Footprint. Food, electricity, gas and other fuels, transport services and clothing are some of the major sources of Hong Kong’s Ecological Footprint.

HONG KONG'S BIOCAPACITY DEFICIT

From 1962 to 2008, Hong Kong's per capita Ecological Footprint increased almost four-fold.

The average Hong Kong resident now has an Ecological Footprint of 4.7 gha, balanced against the fact that Hong Kong's available biocapacity is only 0.03 gha per person. In less than 50 years, the rapidly-widening gap between supply and demand created a nearly four-fold increase in Hong Kong's biocapacity deficit.

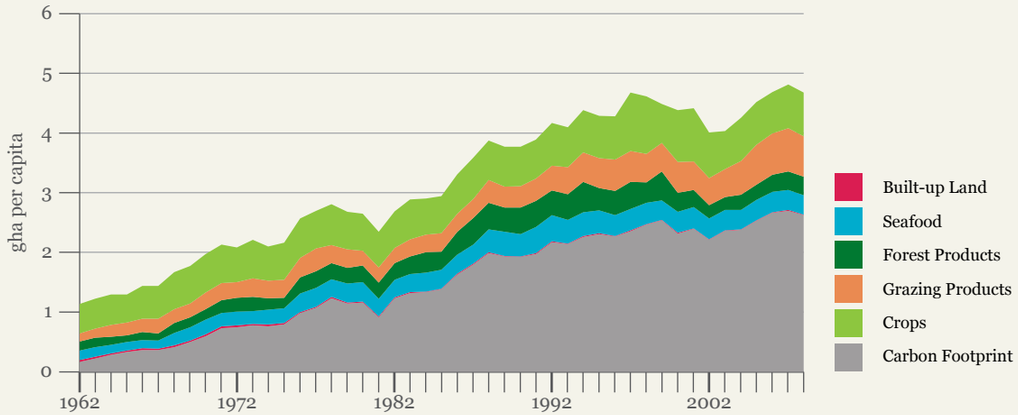


Figure 8: Hong Kong's per capita Ecological Footprint by land use type, 1961-2008. In 1961, carbon was the smallest component of Hong Kong's Footprint; today it is the largest.

In 1962, the demands of Hong Kong's population already exceeded its ecosystems' capacity to produce essential resources and services by a factor of fifteen. This number has now grown explosively and the exceedance is now more than 150-fold. By 2008, local ecological assets provided less than one per cent of Hong Kong's annual Ecological Footprint. Hong Kong compensated for this biocapacity deficit primarily from two sources: 1) the use of the global commons — by, for instance, fishing outside Hong Kong's territorial waters (four per cent of the Footprint) and emitting CO_2 from burning fossil fuels beyond local sequestration capacity (36 per cent of Hong Kong's Footprint); and 2) the importation of resources such as food, fibre, forest products and embodied carbon from outside the region (60 per cent of Hong Kong's Footprint).

© EDWARD PARKER / WWF – CANON

The widening gap between demand and supply makes Hong Kong's economy highly dependent on both the availability of ecological assets outside its borders and its ability to pay for access to the resources and services these resources produce.

The widening gap between demand and supply makes Hong Kong's economy highly dependent on both the availability of ecological assets outside its borders and its ability to pay for access to the resources and services these resources produce. For example, Hong Kong imports seafood from more than 150 countries and territories around the world — at a time when many fisheries are in decline.

HOUSEHOLD BREAKDOWN

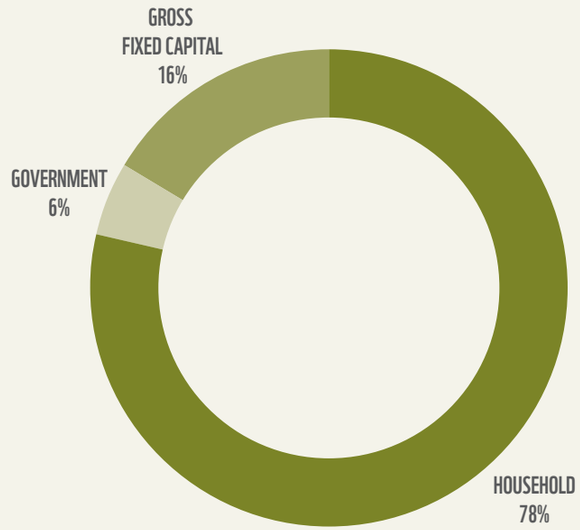


Figure 9: This chart indicates how much of the Ecological Footprint is paid for directly by households for short-lived goods, how much is paid for directly by the government, and how much is for expenditure on long-lasting goods.

THE DAILY CONSUMPTION DECISIONS MADE BY FAMILIES AND INDIVIDUALS SIGNIFICANTLY IMPACT THE SAR'S FOOTPRINT TRENDS

Determining the overall demand placed on nature by particular human activities requires an additional analytical step beyond basic Ecological Footprint accounting. Since statistical offices track how households, governments and industries spend their money, these statistics can be used to translate land-based Ecological Footprint results into activity-based Ecological Footprint results.

The figure above shows Hong Kong's Ecological Footprint divided into three specific final demands. Household consumption represents consumables purchased by households. This direct consumption by households accounts for 78 per cent of Hong Kong's Consumption Footprint. This indicates that the daily consumption decisions made by families and individuals significantly impact the SAR's Footprint trends.

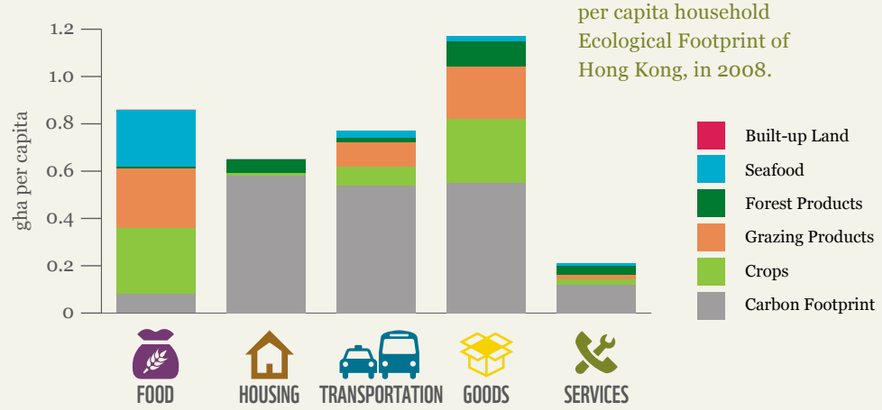


Figure 10: Breakdown of the per capita household Ecological Footprint of Hong Kong, in 2008.

The remaining Ecological Footprint includes consumable items paid for by the government, such as school supplies in public schools, police equipment, paper for public administration and so on (6 per cent of the total); and investments in lasting assets (GFCF, or Gross Fixed Capital Formation), such as the construction of buildings, roads, factories and equipment (16 per cent of the total).

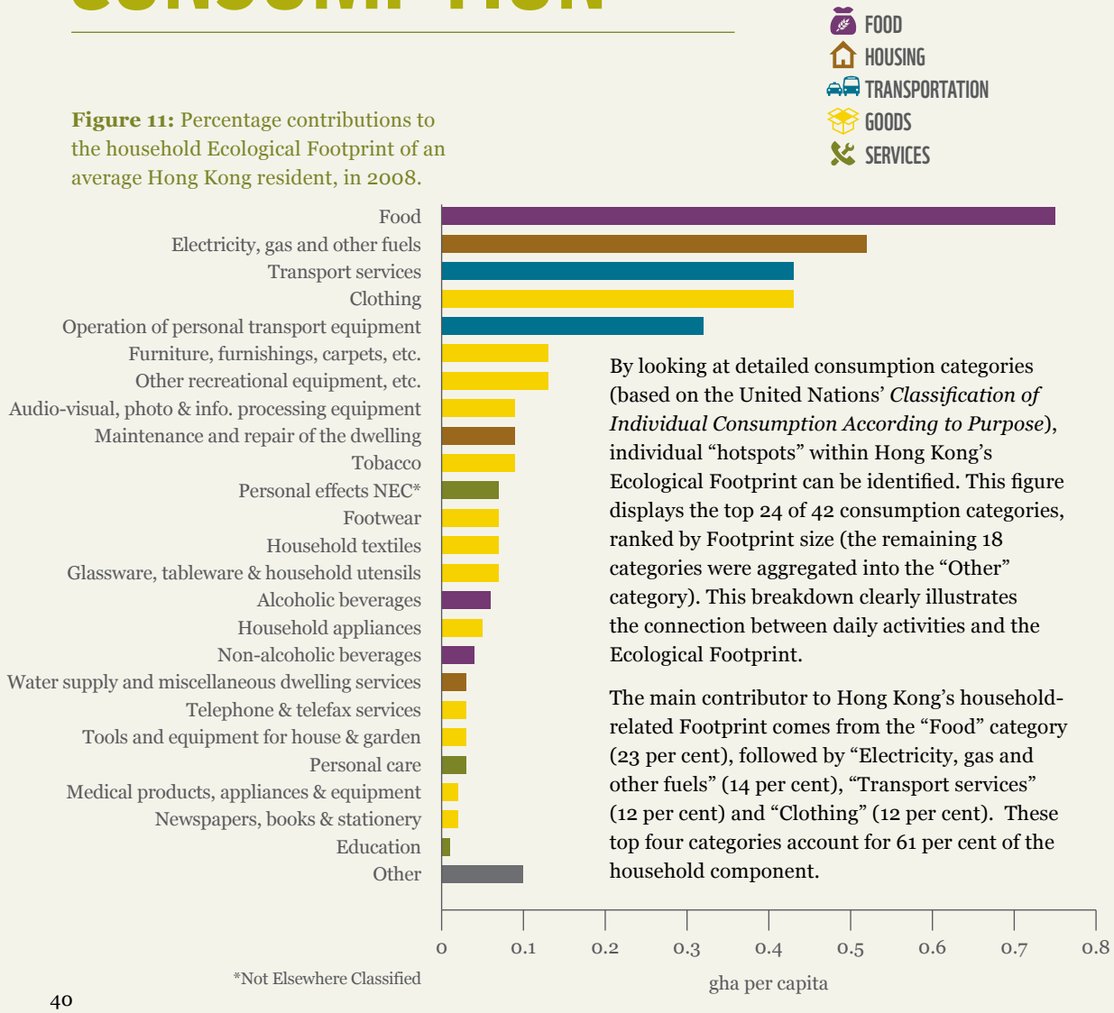
While this direct consumption by the government seems small, decisions made by governments have a large impact on how we build cities and infrastructure, which in turn strongly influences household consumption patterns.

The household portion of the Ecological Footprint can be broken down further into five major domains: food, housing, personal transportation, goods and services. Figure 10 shows that the Goods Footprint (32 per cent) and the Food Footprint (23 per cent) account for more than half of Hong Kong's household-driven Footprint.

Each domain provides an interesting "inside look" at Hong Kong's Ecological Footprint. For example, the main component of Hong Kong's Goods Footprint is the Carbon Footprint (47 per cent), while the Food Footprint shows that households places heavy demands on different land use areas, such as cropland (33 per cent), grazing land (25 per cent) and fishing grounds (29 per cent).

FOOTPRINT COMPOSITION: CATEGORIES OF CONSUMPTION

Figure 11: Percentage contributions to the household Ecological Footprint of an average Hong Kong resident, in 2008.



*Not Elsewhere Classified

By looking at detailed consumption categories (based on the United Nations' *Classification of Individual Consumption According to Purpose*), individual "hotspots" within Hong Kong's Ecological Footprint can be identified. This figure displays the top 24 of 42 consumption categories, ranked by Footprint size (the remaining 18 categories were aggregated into the "Other" category). This breakdown clearly illustrates the connection between daily activities and the Ecological Footprint.

The main contributor to Hong Kong's household-related Footprint comes from the "Food" category (23 per cent), followed by "Electricity, gas and other fuels" (14 per cent), "Transport services" (12 per cent) and "Clothing" (12 per cent). These top four categories account for 61 per cent of the household component.

WHERE DOES HONG KONG FIT IN?

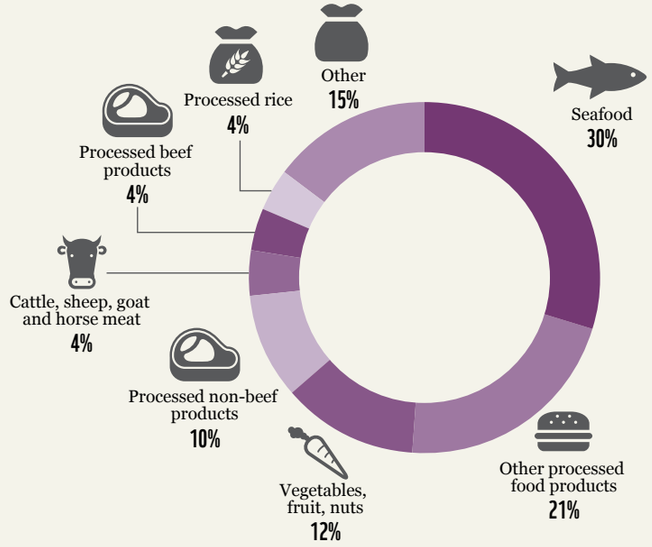


Figure 12: Breakdown of the "Food" category only.

The Food Footprint can also be examined at the commodity level. As can be seen from the breakdown above, the top three contributions come from the "Seafood" sector (30 per cent), the "Other processed food products" sector (21 per cent) and the "Vegetables, fruit, nuts" sector (12 per cent).

In a resource-constrained world, food supply could easily and rapidly become a national security issue. Hong Kong, which is highly dependent on imported biocapacity for its food, is in a particularly vulnerable position.

FOOD WASTE

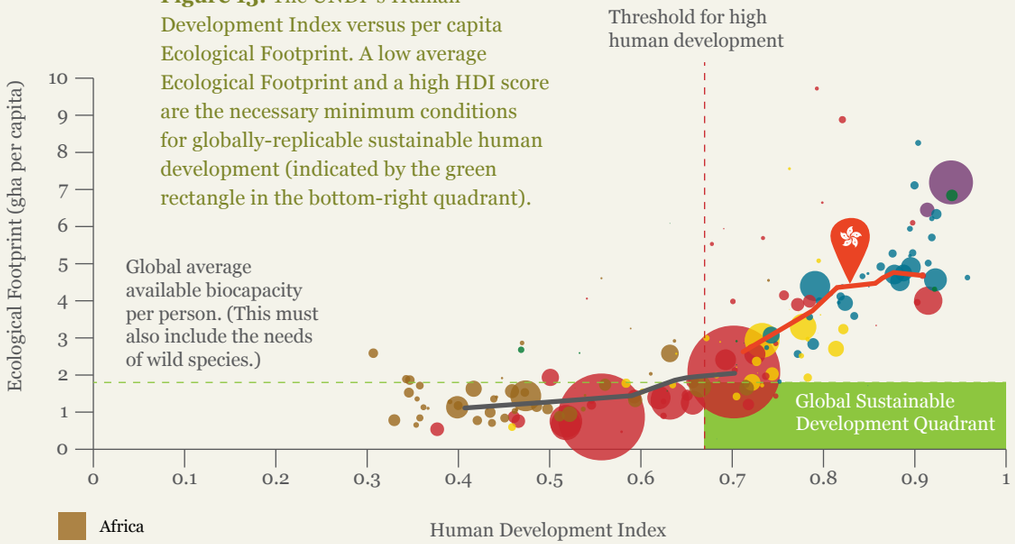
When developing strategies to reduce Hong Kong's Food Footprint, food waste should taken into consideration. Globally, 20–30 per cent of food is wasted due to either inefficiencies in production or to the short lifespan of certain foods on the consumer side. In high-income countries like Germany, up to 50 per cent of food is wasted; mainly driven by over-shopping and wastage in distribution. Most food is not lost in production or the field, but on the last three kilometres of the food supply chain — the greatest percentage occurring in the last three metres.

In Hong Kong, food waste has become an increasingly significant issue: 2011 government data indicates that Hong Kong wastes about 3,584 tonnes of food every day, or the equivalent of half a kilogram of food per person per day. Food waste has been increasing rapidly: The Hong Kong government figures indicate that food waste from the commercial and industrial sector, which accounts for about one-third of the overall food waste, grew by 150 per cent between 2002 and 2011.

Food waste is not only a growing problem in its own right: disposal of food waste takes up limited landfill space and generates greenhouse gases, particularly methane.

HUMAN DEVELOPMENT AND BIOCAPACITY

Figure 13: The UNDP's Human Development Index versus per capita Ecological Footprint. A low average Ecological Footprint and a high HDI score are the necessary minimum conditions for globally-replicable sustainable human development (indicated by the green rectangle in the bottom-right quadrant).



A graph of the world's Human Development Index vs. per capita Ecological Footprint. Dots representing each country are coloured according to their region and are scaled relative to the country's population.

At every UN conference it is expressed that sustainable development is humanity's shared dream. "Development" can be seen as the commitment to well-being for all the people of the world, while "sustainable" refers to the budget: in order for change to be lasting, development has to occur within our planet's ecological constraints.

Without a way to physically measure sustainable development, the debate about realizing this dream will remain abstract and hard to implement. Conversely, measuring sustainable development clarifies the debate and encourages nations and cities to take their fates into their own hands.

One way of measuring "development" is through the United Nations Development Programme's (UNDP) Human Development Index (HDI). This indicator reflects a country's achievements in terms of its citizens' longevity, education and income.

The traditional path to improving development has been resource-intensive: higher development achievements have involved increased resource use.

However, access to growing levels of ecological resources is no longer guaranteed in today's world and this reality may threaten long-term improvements in human welfare. Countries that pursue the path of sustainable development will be best positioned to meet their future needs.

One way to assess a country's progress toward sustainability — defined as achieving a high degree of well-being for its people within the means of its ecosystems — is by mapping the two dimensions of sustainable development (Human Development and Ecological Footprint) on the same graph. The per capita Ecological Footprint is plotted on one axis, while the UNDP's Human Development Index is plotted on the other.

The resulting graph compares nations' quality of life, including Hong Kong and China, with the amount of global biocapacity available, illustrating the challenge of creating a high level of human well-being without depleting the planet's or a region's ecological resource base. The graph appears in the UNDP Human Development Report 2013, which concludes:

"To sustain progress in human development, far more attention needs to be paid to the impact human beings are having on the environment. The goal is high human development and a low Ecological Footprint per capita (the lower right quadrant). Only a few countries come close to creating such a globally reproducible high level of human development without exerting unsustainable pressure on the planet's ecological resources."

As can be seen, in the period between 1980 and 2008 Hong Kong made significant gains in human development; moving from a high level (HDI=0.71) to a very high level (HDI=0.91). Yet these gains were realized at the cost of a great deal of resources. If everyone in the world lived the lifestyle we lead in Hong Kong, humanity would need 2.6 Earths to sustain our resource needs.

WHY SHOULD WE CARE?

Hong Kong is the second-largest per capita seafood consumer in Asia, and handles more than 50 per cent of the global trade in shark fin every year. Intensive over-fishing around the world has led to serious declines in many marine fisheries. Hong Kong is well-positioned to drive positive changes in the long-term sustainable use of marine and other resources in the countries where it obtains these resources.

THE GREAT GLOBAL AUCTION

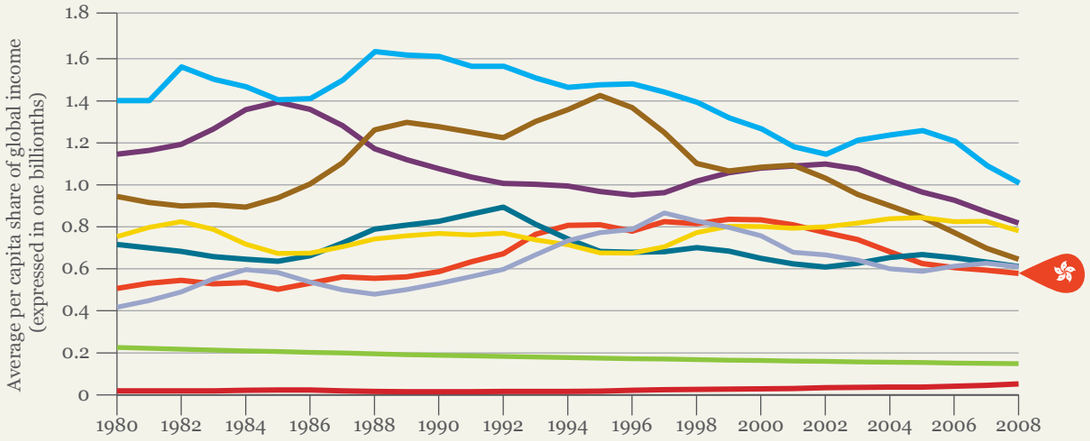


Figure 14: This figure shows the average proportion of the world's total annual financial income earned by residents of Hong Kong and seven other countries. This proportion is calculated by dividing a citizen's average income by the total income of the world. For example, in 1980, a Swiss resident earned about 1.4 one billionth of the total global income, while a Chinese resident earned 0.02 one billionth. By 2008, the average Swiss person earned 1 one billionth, while the average Chinese earned 0.05 one billionth. In other words, the Swiss lost 30 percent of their relative share, while the Chinese gained 170 percent. Hong Kong's per capita income relative to total world income increased by 14 percent over the same time period: from 0.51 one billionth in 1980 to 0.58 one billionth in 2008.

As mentioned previously, the needs of humanity have put the Earth into global overshoot: people are using more renewable resources and ecological services than our biosphere can replenish.

As more countries and cities, including Hong Kong, are becoming increasingly dependent on resources they do not have within their borders, the competition for the planet's limited natural capital is turning into a "global auction."

In an auction, what matters most is not how ones absolute income develops, but ones relative income. Relative income trends tell you whether you are gaining or losing strength vis-à-vis other bidders in the auction. Your absolute income may double, or even triple.But if income of every other bidder quadruples, your advantage has been eroded.

Resource and consumption data for the Asia-Pacific region highlights a fundamental conflict between the two major trends shaping this global auction:

WE HAVE ENTERED A NEW ERA OF CONSTRAINED RESOURCES

The demand for Earth's limited resources and services is continuously increasing in many countries. At the same time, the relative income of many people in those countries is declining. This makes it increasingly difficult for these countries to acquire the resources they lack domestically.

1) Biocapacity cannot keep pace with humanity's continuously-increasing demand for the Earth's limited resources and services.

Fifty years ago, 10 of the 32 Asian countries tracked in the National Footprint Accounts had at least twice the biocapacity of what their residents demanded. In 2008, only one still has this level of biocapacity reserve: Mongolia. After decades of population growth and increasing per capita consumption levels, Asian countries are showing a steady per capita decline in available resources and ecological services. Hong Kong, along with China, Singapore, India, Japan, South Korea, the Philippines, Thailand, Cambodia, Malaysia and Vietnam now run significant biocapacity deficits. Indonesia, Myanmar and Laos are still biocapacity creditors, but are nearing the threshold of biocapacity deficit.

2) The relative income of many countries is declining.

The average absolute income of citizens of many countries and sub-national regions may have increased, but their share of global income has fallen. High-income countries are not immune — many G20 nations, the largest economies of the world, are receiving a declining percentage of global income. Residents of Japan, for instance, earned 24 per cent less of the total global income in 2008 than they did in 1978 (measured in GNI according to World Bank statistics).

SHIFT OF COUNTRY POSITIONS FROM 1985 TO 2008

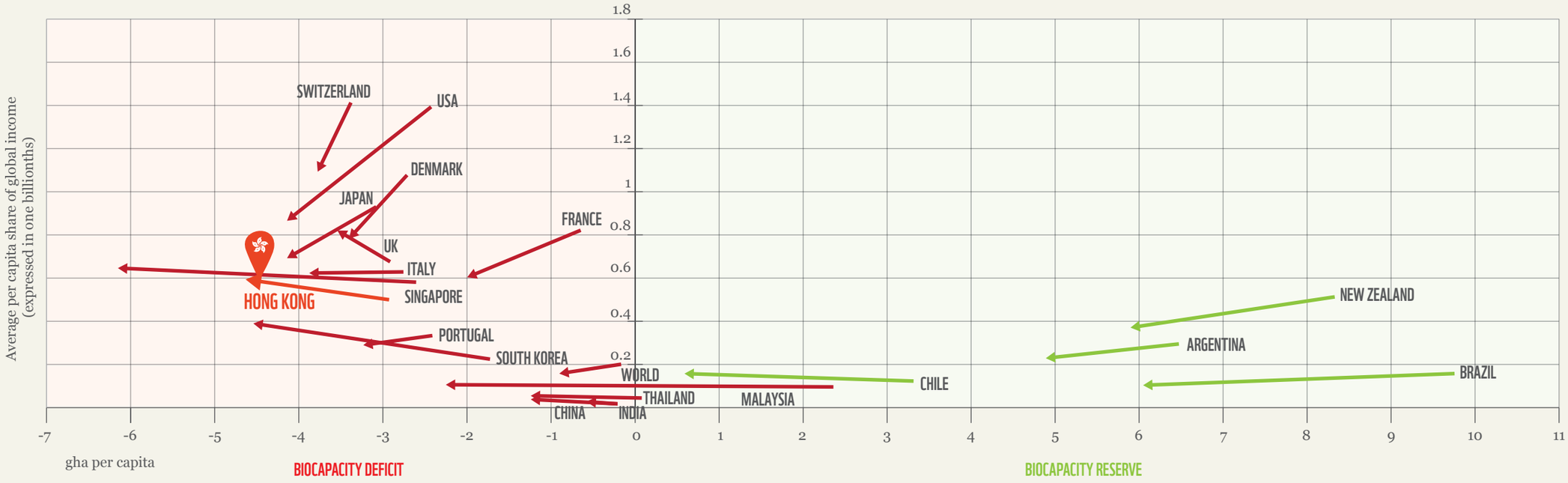


Figure 15: Between 1985 and 2008, biocapacity deficits went up while relative incomes came down; so how have countries shifted their position in terms of the global auction? The horizontal axis shows to what extent countries are running biocapacity reserves or deficits, while the vertical axis tracks how much of the global income is earned on average by residents of that nation. Many countries have increased their per capita biocapacity deficits while citizens' relative income shares have declined, indicating that the global auction positions of these countries have weakened.

This double trend of weakening bidding power and expanding biocapacity deficits is creating a new challenge for countries: since the vast majority of the world's countries have increasingly interconnected economies, having a lower relative income makes it more difficult for ecological debtors to compete for the world's limited resources.

Before the global auction for biocapacity existed — when resources were abundant — only absolute income mattered, as the supply of goods and resources was limited by market demands. But in this new world of absolute resource scarcity, relative income trends will shape the economic success of ecological debtors.

Even Hong Kong — where relative income has increased by 14 per cent since 1980 — may still face economic shocks since its increase in relative income has been less than its 20 per cent increase in biocapacity deficit.

Trends do not imply destiny — they only become destiny if action is not taken. A future where Hong Kong is held prisoner by scarce resources is not our destiny. The Hong Kong Ecological Footprint Report 2013 shows that these trends can be identified and tracked. This means that there are choices we can make; choices that matter.

Is it realistic for Hong Kong to rely on a continual increase in relative income to successfully make "bids" in the global auction? It is a mathematical fact that not every country or territory can have an above-average relative income, and even fewer can sustain an ever-growing share. No country or region is guaranteed a comparative advantage forever.

To remain economically competitive, countries with biocapacity deficits need to carefully manage their resource situation. Trends are not fate or destiny — they only become destiny if they are not addressed. The Hong Kong Ecological Footprint Report 2013 shows that we can track those trends, and, as we show in the following section that there are choices we can make, and that these choices matter.

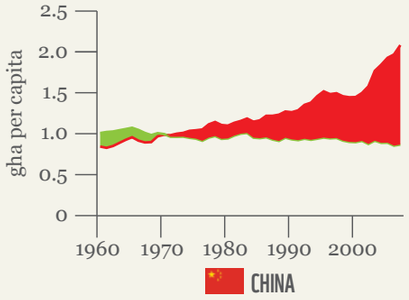
OUR TRADING PARTNERS ARE IN DEFICIT

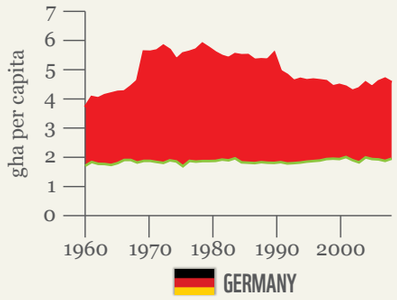
Figure 16: Hong Kong's major trading partners. The Ecological Footprint (red line) and biocapacity (green line) are expressed in global hectares per person. Biocapacity deficits are shaded red, reserves are shaded green.

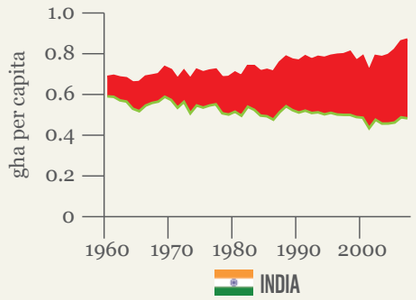
Hong Kong gains access to essentially all its ecological resources through trade, with virtually none coming from its own ecosystems. Reliance on foreign ecological assets, notably to provide food and other essential commodities, has increased nearly 400 per cent over the last three decades.

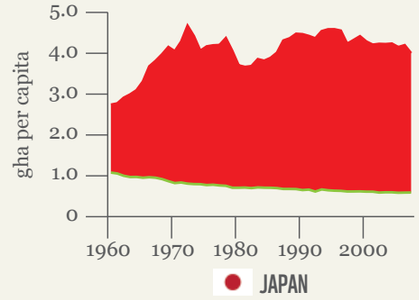
However, as these charts show, the ecological deficits of Hong Kong's major trading partners have steadily increased over the past 50 years, as their own biocapacity has diminished and their Ecological Footprints have increased.

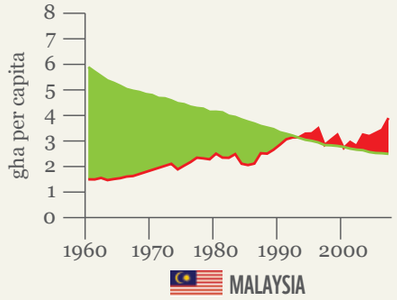
As resources become more scarce and competition for those that remain heats up, Hong Kong will become increasingly exposed to world market price volatility and supply disruption. Hong Kong must now recognize the risks its trading partners' resource constraints pose to its own economic prosperity.

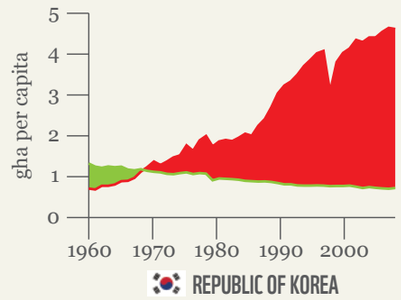


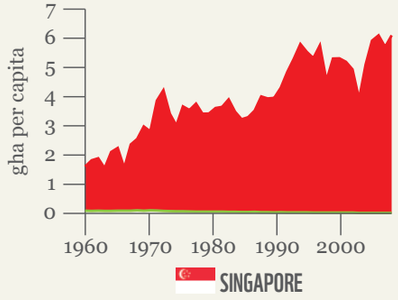


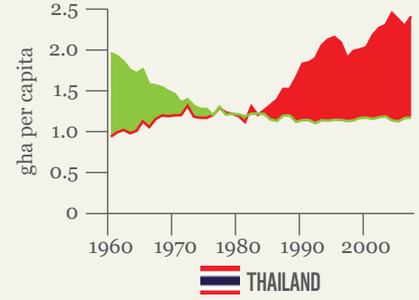


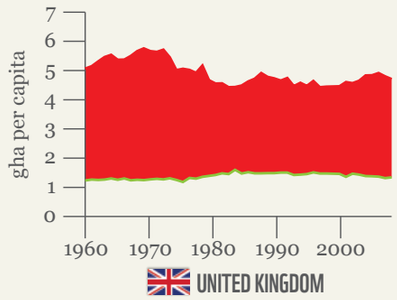


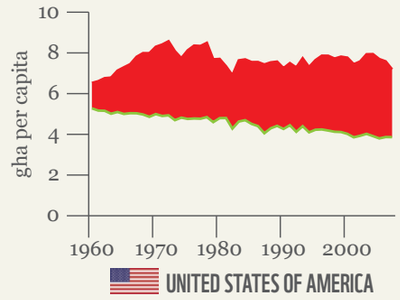












STRATEGIES FOR SUCCESS

The Hong Kong government is now working on its first Biodiversity Strategy and Action Plan under the Convention on Biological Diversity. The concept of sustainability needs to be urgently incorporated into the planning process. If successfully done, this will be an important first step in transforming Hong Kong from being one of the worst performers in Asia in terms of the Ecological Footprint into one of the best.

DO THE SLOW THINGS FIRST

Physical assets put in place today will exist for decades. Assets that depend on currently cheap but ultimately limited resource inputs may become "economic traps"; as they lock society into resource-hungry consumption patterns for decades to come. These assets will lose value as access to resources becomes harder. In contrast, resource-efficient assets will become opportunities as they provide vital services while placing minimal demands on resources.

In spite of the rapid technological and scientific advances that have been made in recent decades, the trend towards ever-greater ecological overshoot is showing no signs of being reversed. Even the most moderate projections of UN agencies suggest that by 2050, humanity will be using nearly three times the planet's regenerative capacity (the red line in Figure 17). In other words, we are on course for disaster.

Reaching this level of overshoot will lead to serious disruptions in supply chains and stiff competition for resources. This global threat is greatest for countries and cities like Hong Kong that have large biocapacity deficits — which should be food for thought for investors.

Infrastructure changes very slowly, yet is highly significant in determining consumption patterns. It follows that humanity needs to give priority to making infrastructure "fit" a resource-constrained future — hence, we need to "do the slow things first". Investment and budgets shape our future infrastructure. Poor investment choices can lock Hong Kong — and other cities, countries and businesses — into an ecologically and economically risky "business-as-usual" scenario. Wise investments will build a strong foundation for future prosperity by building assets that will gain value in a resource-constrained world. The decisions we make today will shape our fate for generations to come.

The earlier we invest in assets that maintain value in a resource-constrained world, the better-prepared our economies will be. Innovation, product development, retraining and education reform are all "slow" processes — some of these may even take decades. Significant time-lags mean that the right decisions need to be made as early as possible in order to avoid being locked into "infrastructure traps".

A city's infrastructure choices will determine the shape and size of their resource use for decades to come. One key to making cities

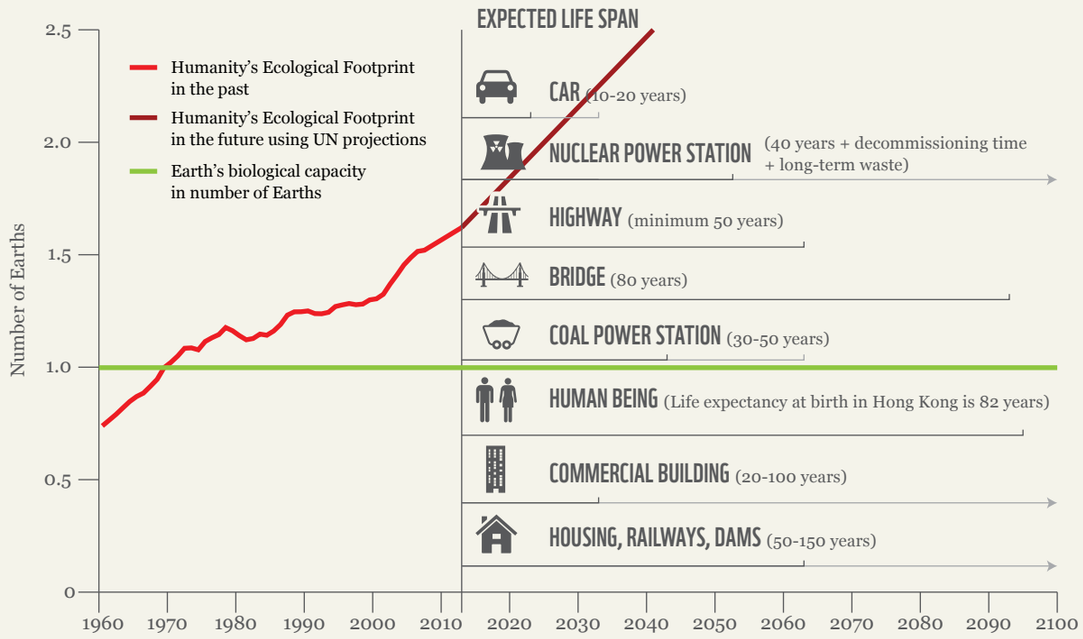


Figure 17: Do the slow things first. Infrastructure has a long life span and is replaced slowly, yet it determines people's consumption levels — therefore it needs to be addressed first.

efficient is compact urban design with integrated zoning: Hong Kong is already a global example of these concepts. Encouraging pedestrian mobility and public transportation — making cars practically unnecessary within the city — increases a city's livability and cuts its demand for resources.

Energy efficiency in housing is another important component of reducing a city's Carbon Footprint. In Hong Kong, if buildings were well-insulated and could capture energy (through photovoltaic cells for example), they could become net energy producers. Integrated production which efficiently uses recycled materials could minimize waste production while lowering Hong Kong's demand on biocapacity. Reducing food waste also has significant potential for lowering Hong Kong's resource demands.

Economic incentives, urban design, public campaigns, regulations and charges are all additional drivers which can be employed to boost Hong Kong's resilience in a resource-constrained future.

LIVING WELL WITHIN NATURE'S LIMIT IS POSSIBLE FOR HONG KONG

FIVE STEPS TO SECURING HONG KONG'S FUTURE IN A RESOURCE-CONSTRAINED WORLD:

1. COMMIT TO HONG KONG'S PROSPERITY AND ECONOMIC STABILITY

Understanding the ecological constraints the city faces is critical to Hong Kong's ability to protect its prosperity and economic stability. This understanding begins with an exploration of what is required to create a sustainable future that works in Hong Kong's interests. This exploration begins with questions: first, it needs to be determined whether the current resource trends are a top-priority risk for Hong Kong. If so, what are the economic implications of this risk? How can Hong Kong manage this risk alongside other priority risks?

The Hong Kong government's roadmap to implementing the Convention on Biological Diversity through the Biodiversity Strategy and Action Plan is a good opportunity for the city's decision-makers to demonstrate their commitment to conserving both local and overseas biocapacity impacted by our consumption. Moving forward, the government should also tackle the problem of ecological overshoot and reduce Hong Kong's overall Ecological Footprint.

2. CLARIFY THE GOAL

What must decision-makers focus on in this new era? If their goal is to secure the well-being of Hong Kong citizens, then a primary concern must therefore be securing sufficient access to resources. This requires managing both the demand for and the availability of biocapacity.

Income generated by using up ecological wealth is fragile and unsecure. Thus, public policy goals must shift from income maximization to wealth preservation. Such a strategy changes the focus from flows to stocks — from income to wealth. The main question is whether Hong Kong has sufficient wealth to maintain income flows in the future. A core part of this wealth is natural capital, particularly the biocapacity portion.

3. MEASURE WHAT DECISION-MAKERS NEED TO KNOW

Determine what critical information policy makers need to make the right decisions. First, they should recognize the need to prioritize wealth over income and know that wealth involves far more than financial assets — not all wealth can be measured in financial numbers (the value of human lives, for instance). The wealth situation of Hong Kong and its key partner countries can then be examined and analyzed.

Even today, global financial markets still undervalue natural capital, even though much of it is irreplaceable. Natural capital's lack of full substitutability may actually make it the most constrained of all forms of wealth. If natural capital inputs are so fundamental to economic processes, it is essential for every country and region to track its demand for and access to natural capital; within its own boundaries and through its trading partners. Careful, accurate measurements will give decision-makers the best context to work towards creating an economically and socially successful Hong Kong.

4. FOCUS ON "DOING THE SLOW THINGS FIRST"

Hong Kong's infrastructure is comprised of long-lasting assets: its transportation systems, buildings and power plants. The city's infrastructure determines not only its present consumption, but also its consumption patterns for decades to come. Some of this infrastructure enables resource-efficient lifestyles, but some of it forces users to consume a lot of resources.

As such, investors, whether private or public, should ask themselves: "Am I investing in a trap or an opportunity?". Traps are long-lasting assets like conventional power plants, packaging-intensive food industries or resource-inefficient real estate projects that will lose value in a resource-constrained world; while opportunities are long-lasting assets that will gain value in a resource-constrained world — highly energy-efficient housing, energy-efficient transportation and renewable energy sources, for example. In other words, Hong Kong needs to invest in long-lasting assets that will create future opportunities.

5. MAKE THESE CHANGES FINANCIALLY FEASIBLE

Securing Hong Kong's future does not have to cost more, but it will require budget reallocations. If decision-makers recognize biocapacity deficits as a real economic pain point, on par with other "traditional" risks like unemployment, inflation, slow or even negative growth — how would this affect the choices they make? Options for minimizing biocapacity deficits while increasing economic options and limiting fiscal pressures on the government need to be identified and explored urgently.

Our planet's limits are real. Strategists who take issues into account involving demand for and access to resources today will play a vital role in creating a sustainable tomorrow.

APPENDIX

ECOLOGICAL FOOTPRINT: FREQUENTLY ASKED QUESTIONS

How is the Ecological Footprint calculated?

The Ecological Footprint measures the area of biologically productive land and water required to produce the resources required and absorb the waste generated by an individual, population or activity.

This area is expressed in global hectares (standardized hectares of biologically productive area with world average productivity).

Ecological Footprint calculations use yield factors to normalize countries' biological productivity to world averages (e.g. comparing tonnes of wheat in UK hectares versus world average hectares) and equivalence factors to take into account differences in world average productivity among land types (e.g. world average forest versus world average cropland).

Global Footprint Network calculates the Ecological Footprint and biocapacity for countries annually. Collaborations with national governments serve to continually improve the data and methodology used for the National Footprint Accounts. To date, Switzerland has completed a review, while Belgium, Ecuador, the European Commission, Finland, France, Germany, Indonesia, Ireland, Japan, Luxembourg and the United Arab Emirates have partially reviewed or are reviewing their accounts. A formal review committee oversees the continuing methodological development of the National Footprint Accounts. A detailed "methods paper" and copies of sample calculation sheets can be obtained at this website: www.footprintnetwork.org.

Footprint analyses can be conducted at any scale. There is growing recognition of the need to standardize sub-national Footprint applications in order to increase comparability across studies and time periods. Methods and approaches for calculating the Footprint of municipalities, organizations and products are being aligned through a global Ecological Footprint standards initiative. For more information on Ecological Footprint standards, please visit www.footprintstandards.org.

What is a global hectare (gha)?

A productivity-weighted area used to report both the biocapacity of Earth, and the demand for biocapacity (the Ecological Footprint). A global hectare is normalized to the area-weighted average productivity of biologically productive land and water in a given year. Because different land types have different levels of productivity, a global hectare of cropland, for example, would occupy a smaller physical area than a global hectare of much less biologically productive pasture land; simply because more pasture land would be needed to provide the same biocapacity as one hectare of cropland.

Since the National Footprint Accounts 2011 Edition, global hectares are defined as "constant global hectares" pegged against the latest year's productivity. In other words, the global hectares in this report are normalized to world-average bioproductivity from a single reference year (2008). For further details on this process, please see Borucke et al., 2013.

What is included in the Ecological Footprint? What is excluded?

To avoid exaggerating the demands that humanity places on nature, the Ecological Footprint includes only those aspects of resource consumption and waste production for which the planet has regenerative capacity, and where existing data allows this demand to be expressed in terms of productive area. For example, toxic releases are not accounted for in Ecological Footprint accounts. Nor are fresh water withdrawals, although the energy used to pump or treat water is included.

Ecological Footprint accounts provide "snapshots" of past resource demand and availability. They emphatically do not predict the future. Thus, while the Ecological Footprint does not estimate future losses caused by current degradation of ecosystems, if this degradation persists these losses may be reflected in future accounts as a reduction in biocapacity.

Footprint accounts also do not indicate the intensity with which a biologically productive area is being used. Being a biophysical measure, it also does not evaluate the social and economic dimensions of sustainability.

How does the Ecological Footprint take into account international trade?

The National Footprint Accounts calculate the Ecological Footprint associated with each country's total consumption by adding together the Footprints of a country's imports and production, and subtracting the Footprint of its exports. For example, this means that the resource use and emissions associated with producing a car that is manufactured in Japan, but sold and used in Italy, will become part of Italy's — rather than Japan's — consumption Footprint.

National consumption Footprints can be distorted when the resources used and waste generated in making products for export are not fully documented for every country. Inaccuracies in reported trade can significantly affect the Footprint estimates for countries where trade flows are large relative to total consumption. However, these inaccuracies do not affect the total global Footprint.

How does the Ecological Footprint account for the use of fossil fuels?

Fossil fuels such as coal, oil and natural gas are extracted from Earth's crust and are not renewable in ecological time spans. When these fuels are burned, carbon dioxide (CO_2)

is emitted into the atmosphere. There are two ways in which this emitted CO_2 can be stored: sequestration of these emissions by human technological means (such as deep-well injection) or natural sequestration. Natural sequestration occurs when ecosystems absorb CO_2 and store it either in standing biomass like plants and trees, or in soil.

The Carbon Footprint component of the Ecological Footprint is calculated by estimating how much natural sequestration would be necessary to maintain a constant concentration of CO_2 in the atmosphere. After subtracting the amount of CO_2 absorbed by the oceans, Ecological Footprint Accounts calculate the area required to absorb and retain the remaining carbon based on the average sequestration rate of the world's forests. CO_2 sequestered by artificial means would also be subtracted from the Ecological Footprint total, but at present this quantity is negligible.

Expressing CO_2 emissions in terms of an equivalent bioproductive area absolutely does not imply that carbon sequestration in biomass is the key to resolving global climate change. On the contrary, it shows that the biosphere has insufficient capacity to offset current rates of anthropogenic CO_2 emissions. The contribution of CO_2 emissions to the total Ecological Footprint is based on an estimate of world average forest yields. This sequestration capacity may also change over time: as forests mature, their CO_2 sequestration rates tend to decline. If these forests are degraded or cleared, they may actually become net emitters of CO_2.

Carbon emissions from sources other than fossil fuel combustion are incorporated in the National Footprint Accounts at the global level. These include fugitive emissions from the flaring of gas in oil and natural gas production, carbon released by chemical reactions in cement production and emissions from tropical forest fires.

Non-CO_2 greenhouse gases (GHG) have not yet been incorporated in the National Footprint Accounts. Doing so would require globally consistent data sets on emissions and a reliable way to translate each type of GHG into CO_2 equivalents.

How does the Ecological Footprint account for carbon emissions absorbed by the oceans versus uptake by forests?

The National Footprint Accounts calculate the carbon Footprint component of the Ecological Footprint by considering sequestration from the world's oceans and forests.

Annual ocean uptake values are taken from Khatiwala et al. (2009) and used in conjunction with the anthropogenic carbon emissions taken from CDIAC (2011). Oceans provide a relatively constant uptake percentage, which varied between 28 per cent and 35 per cent from 1961–2008. The remaining CO_2 requires land-based sequestration. Due to the limited availability of large-scale datasets, the calculation assumes the world average sequestration rate for uptake of carbon dioxide into forests. The Carbon Footprint, as calculated in the Ecological Footprint methodology, is thus a measure of the area of world average forest land that is necessary to sequester CO_2 emissions not absorbed by the world's oceans.

Does the Ecological Footprint measure the impact on the biodiversity?

The Ecological Footprint compares human demand for biodiversity with the natural world's capacity to meet this demand. It thus serves as an indicator of human pressures placed on local and global ecosystems.

In 2008, humanity's demand exceeded the biosphere's regeneration rate by more than 50 per cent. This level of overshoot may result in depletion of ecosystems and overloading of waste sinks, and the resultant ecosystem stress may negatively affect biodiversity. However, the Ecological Footprint does not measure this latter impact directly, nor does it specify how much overshoot must be reduced if negative impacts are to be avoided.

Does the Ecological Footprint define the "fair" or "equitable" use of resources?

The Ecological Footprint documents what has happened in the past. It can quantitatively describe the ecological resources used by an individual or a population, but it does not prescribe what resources they should be using. Resource allocation is a policy issue, based on societal beliefs about what is or is not equitable. While Ecological Footprint accounting can determine the average biocapacity that is available per person, it does not stipulate how this biocapacity should be allocated among individuals or countries. However, it does provide a useful context for such discussions.

How relevant is the Ecological Footprint if the supply of renewable resources can be increased and advances in technology can slow the depletion of non-renewable resources?

The Ecological Footprint measures the current state of resource use and waste generation. It asks the following question: "in a given year, did the demands placed by humanity on ecosystems exceed the ability of ecosystems to meet those demands?" Footprint analysis reflects both increases in the productivity of renewable resources and technological innovation. For example, if the paper industry doubles the overall efficiency of paper production, the Footprint per tonne of paper will halve.

National Footprint Accounts capture these changes once they occur and determine the extent to which these innovations have succeeded in scaling back human demand and bringing it inside the capacity of the planet's ecosystems. If there is a sufficient increase in ecological supply and a reduction in human demand due to technological advances or other factors, National Footprint Accounts will reflect this by the elimination of global overshoot.

For additional information about current Ecological Footprint methodology, data sources, assumptions and results, please refer to Borucke et al., 2013.

In the 2010 Hong Kong Ecological Footprint Report, the Ecological Footprint of Hong Kong for the period 2001-2007 appears to be different than the results for the same period in the current report. Why is this?

Current results represent best estimates based on UN statistics. They provide a "proof of concept." Some UN statistics change historical data retroactively as data sets improve, which can lead to distortions. Also, each year, the National Footprint Accounts are improving, leading to shifts in results. Should the government of Hong Kong decide to base more detailed policy decisions on this analysis, we would recommend testing the accounts at a national level to make sure the best data is used for generating Ecological Footprint and biocapacity results.

Is "food mileage" considered in the calculation of the Ecological Footprint of food?

The energy used to transport materials, including food, is included under the category of "bunker fuels."

Why does the Ecological Footprint restrict the waste absorption to CO2, and not include other greenhouse gases?

Currently, only CO2 gases are included for simplicity's sake. More greenhouse gases can be incorporated, and this would lead to an even larger Footprint. However, doing so would require globally consistent data sets on emissions and a reliable method of translating every type of greenhouse gas into CO2 equivalents. This methodology has yet to be developed.

How are domestic and international flights incorporated into the Ecological Footprint?

International energy use, such as that used for international flights and international shipping is captured as "bunker fuels." Since it is impossible to determine a breakdown of the nationalities of the passengers on each flight operated around the world, bunker fuels have been proportionally allocated to the energy consumption of each country.

For example, if country A consumes twice as much energy as country B, then twice as much of the world's bunker fuels would be added to the carbon Footprint of country A than to country B.

Why has 2008 data been used, instead of more current data?

Data from 2009 was not available when this report was being compiled. This data is reported by UN agencies after a certain delay, which is exacerbated by the fact that processing data through the National Footprint Accounts is a time consuming process.

for detailed methodology of calculating the Ecological Footprint and biocapacity, and glossary, please visit: http://wwf.org.hk/en/whatwedo/footprint/

REFERENCES

Abdullatif, L., Alam, T., 2011. The UAE Ecological Footprint Initiative: Summary report 2007-2010. Available at: http://awsassets.panda.org/downloads/en_fi nal_report_ecological_footprint.pdf

Barnard, L., Cooney, H., Edwards, C., Etherington, K., Imwold, D., Jackson, H., Lord, M., Nally, J., Savage, A., Taylor, M. 2010. All of History. Elanora Heights, Australia: Millenium House.

Barnosky, A.D., Hadly, E.A., Bascompte, J., Berlow, E.L., et al., 2012. Approaching a state shift in Earth's biosphere. Nature, 486, 52-58.

Blainey, G. 2005. A Short History of the 20th Century. Chicago: Ivan R. Dee Publisher.

Borucke, M., Moore, D., Cranston, G., Gracey, K., Iha, K., Larson, J., Lazarus, E., Morales, J.C., Wackernagel, M., Galli, A. 2013. Accounting for demand and supply of the Biosphere's regenerative capacity: the National Footprint Accounts' underlying methodology and framework. Ecological Indicators, 24, 518-533. Also available at: http://www.footprintnetwork.org/images/uploads/Methods_Paper_2011.pdf

Butchart, S.H.M., Walpole, M., Collen, B., van Strien, A., et al., 2010. Global biodiversity: indicators of recent declines. Science, 328, 1164–1168.

Costanza, R. 1997. The value of the world's ecosystem services and natural capital. Nature, 387, 253-260.

Daniels, P., Hyslop, S. 2006. Almanac of World History. Washington, D.C.: National Geographic Society.DeFries, R.S., Foley, J.A., Asner, G.P., 2004. Land-use choices: balancing human needs and ecosystem function. Front. Ecol. Environ., 2 (5), 249–257.

Diamond, J. 2006. Collapse: How Societies Choose to Succeed or Fail. London: Penguin Books.

DG Environment, 2008. Potential of the Ecological Footprint for monitoring environmental impact from natural resource use. Available on-line: http://ec.europa.eu/ environment/natres/studies.htm

Dobbs, R., Oppenheim, J., Thompson, F., Brinkman, M., Zornes, M. 2011. Resource Revolution: Meeting the World's energy, material, food and water needs. McKinsey & Company. Eurostat 2006. http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KSAU-06-001/EN/KS-AU-06-001-EN.PDF
Ewing B., S. Goldfinger, A. Oursler, A. Reed, D. Moore, M. Wackernagel. 2010. The Ecological Footprint Atlas 2010. Oakland: Global Footprint Network.

Galli, A., Kitzes, J., Wermer, P., Wackernagel, M., Niccolucci, V., Tiezzi, E., 2007. An Exploration of the Mathematics behind the Ecological Footprint. International Journal of Ecodynamics, 2(4), 250-257.

Galli, A., Wiedmann, T., Ercin, E., Knoblauch, D., Ewing, B., Giljum, S. 2012. Integrating Ecological, Carbon and Water footprint into a "Footprint Family" of indicators: Definition and role in tracking human pressure on the planet. Ecological Indicators, 16, 100-112.

Global Footprint Network, 2012. National Footprint Accounts 2012 Edition. Available at: www.footprintnetwork.org.

Global Footprint Network, 2011. Resource Constraints and Economic Performance in Eastern Europe and Central Asia. Report to UNDP Bratislava, Global Footprint Network, Oakland, and UNDP, Bratislava. Available at: http://www.undp.org/

Global Footprint Network, 2012. Why Are Resource Limits Now Undermining Economic Performance? Available at: www.footprintnetwork.org/med

Global Footprint Network and UNEP Finance Initiative, 2012. A New Angle on Sovereign Credit Risk. E-RISC: Environmental Risk Integration in Sovereign Credit Analysis. www.footprintnetwork.org

Environmental Protection Department, Government of Hong Kong. Waste: Problems and Solutions Available at: http://www.epd.gov.hk/epd/english/environmentinhk/waste/prob_solutions/owt_food.html

Heinberg, R. 2007. Peak Everything: Waking Up to the Century of Decline in Earth's Resources. Forest Row: Clairview Books Ltd.

Hoekstra, A.Y., 2009. Human appropriation of natural capital: a comparison of ecological footprint and water footprint analysis. Ecological Economics, 68, 1963–1974.

Huchet-Bourdon, M., 2011. Agricultural Commodity Price Volatility: An Overview. OECD Food, Agriculture and Fisheries Working Papers, No. 52, OECD Publishing. http://dx.doi.org/10.1787/5kg0t00nrthc-en

Khatiwala, S. et al., 2009. Reconstruction of the history of anthropogenic CO2 concentrations in the ocean. Nature, 462, 346-350.

Kitzes, J., A. Galli, S.M. Rizk, A. Reed and M. Wackernagel. 2008. Guidebook to the National Footprint Accounts: 2008 Edition. Oakland: Global Footprint Network.

Kitzes, J., Galli, A, Bagliani, M., Barrett, J., et al., 2009. A Research Agenda for Improving National Ecological Footprint Accounts. Ecological Economics, 68 (7), 1991–2007.

Krausmann, F., Gingrich, S., Eisenmenger, N., Erb, K.H., Haberl, H., Fischer-Kowalski, M., 2009. Growth in global materials use, GDP and population during the 20th century. Ecological Economics, 68(10), 2696–2705.

Monfreda, C., Wackernagel, M., Deumling, D., 2004. Establishing national natural capital accounts based on detailed Ecological Footprint and biological capacity assessments. Land Use Policy, 21(3), 231-246.

Moore, D., Galli, A., Cranston, G.R., Reed, A. 2012. Projecting future human demand on the Earth's regenerative capacity. Ecological Indicators, 16, 3-10.41

Robinson, J., Bradley, M., Busby, P., Connor, D., et al., 2006. Climate Change and Sustainable Development: Realizing the Opportunity. Ambio, 35(1), 2-8.

Rockström, R., Steffen, W., Noone, K., Persson, A., et al., 2009. A safe operating space for humanity. Nature, 461, 472-475.

Sen, A. 2001. Development as freedom. Oxford University Press, Oxford.

Turner, G.H., 2008. A comparison of The Limits to Growth with 30 years of reality. Global Environmental Change, 18, 397-411.

UNDP (United Nations Development Programme), 2011. Human Development Report 2011. Sustainability and Equity: A Better Future for All. Published for the United Nations Development Programme (UNDP).

UNEP (United Nations Environment Programme), 2007. GEO4 Global Environment Outlook: environment for development. Progress Press Ltd, Malta.

UNEP Mediterranean Strategy for Sustainable development: a framework for environmental sustainability and shared prosperity. Mediterranean Action Plan (MAP), Mediterranean Commission on Sustainable Development (MCSD), 2006

UNEP/MAP-Plan Bleu State of the Environment and Development in the Mediterranean, UNEP/MAP, Athens, October 2009.

UNEP/MAP-Plan Bleu , Benoit Guillaume (dir.), Comeau Aline (dir.) (2005). A sustainable future for the Mediterranean: the Blue Plan's environment and development outlook. Earthscan

U.S. National Oceanic & Atmospheric Administration, Global Monitoring Division and Etheridge et al, 1998, Historical CO2 record derived from a spline fit (20 year cutoff) of the Law Dome DE08 and DE08-2 ice, coreshttp://cdiac.ornl.gov/ftp/trends/co2/lawdome.smoothed.yr20

Wackernagel, M., B. Schulz, D. Deumling, A. Callejas Linares, M. Jenkins, V. Kapos, C. Monfreda, J. Loh, N. Myers, R. Norgaard and J. Randers. 2002. Tracking the ecological overshoot of the human economy. Proc. Natl. Acad. Sci., 99(14), 9266-9271.

Wackernagel, M., L. Onisto, P. Bello, Al. C. Linares, I. S. L. Falfán, J. M. García, A. I. S. Guerrero, Ma. G. S. Guerrero. 1999a. National natural capital accounting with the ecological footprint concept. Ecological Economics, 29, 375-390.

Wackernagel, M., Lewan, L., Hansson, C.B., 1999b. Evaluating the use of natural capital with the ecological footprint. Ambio, 28, 604–612.

World Bank, 2011. World Development Indicators & Global Development Finance (World Bank, Washington, DC, December 2011. Available at: http://databank.worldbank.org.

World Bank, 2012. Commodity Price Data (a.k.a. Pink Sheet). Available at http://data.worldbank.org/data-catalog/commodity-price-data [Accessed May 2012].

Hong Kong Ecological Footprint Report 2013

4.7 GHA/PERSON

The Ecological Footprint of the average Hong Kong resident.

18 MONTHS

Time it takes for the planet to renew what humanity consumes in 12 months.

2.6 PLANETS

The number of planets required if everybody in the world consumed resources at the same rate as Hong Kong.

26

If Hong Kong were a country, the size of its Ecological Footprint per person would make it the 26th largest country in the world.

WWF

Why we are here

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

wwf.org.hk

WWF-Hong Kong, 1 Tramway Path, Central, Hong Kong
Tel: (852) 2526 1011, Fax: (852) 2845 2734, Email:wwf@wwf.org.hk