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THE UNHAPPY PLANET INDEX

An index of human well-being and environmental impact

nef is an independent think-and-do tank that inspires and demonstrates real economic well-being.

We aim to improve quality of life by promoting innovative solutions that challenge mainstream thinking on economic, environmental and social issues. We work in partnership and put people and the planet first.

economics
real wealth
means well-being

environment
lifestyles must
become sustainable

society
communities need
power and influence

nef (the new economics foundation) is a registered charity founded in 1986 by the leaders of The Other Economic Summit (TOES), which forced issues such as international debt onto the agenda of the G7/G8 summit meetings. It has taken a lead in helping establish new coalitions and organisations such as the Jubilee 2000 debt campaign; the Ethical Trading Initiative; the UK Social Investment Forum; and new ways to measure social and economic well-being.

We are accustomed to comparing countries in terms of crude riches or what they trade. Some countries earn, or are given, reputations for music, sporting excellence, food, or as holiday destinations. There are international league tables for performance on a range of issues from corruption to football. This report introduces a measure of something more fundamental. It addresses the relative success or failure of countries in supporting a good life for their citizens, whilst respecting the environmental resource limits upon which all our lives depend. The Happy Planet Index (HPI) is an innovative new measure that shows the ecological efficiency with which human well-being is delivered.

Contents

Executive summary

This report takes a very different look at the wealth and poverty of nations. It measures the ecological efficiency with which, country by country, people achieve long and happy lives. In doing so, it strips our view of the economy back to its absolute basics: what goes in (natural resources), and what comes out (human lives of differing length and happiness).

We are accustomed to comparing countries in terms of crude riches or what they trade. Some countries earn, or are given, reputations for music, sporting excellence, food, or as holiday destinations. There are international league tables for performance on a range of issues from corruption to football. This report introduces a measure of something more fundamental. It addresses the relative success or failure of countries in supporting a good life for their citizens, whilst respecting the environmental resource limits upon which all our lives depend.

The *Happy Planet Index* (HPI) is an innovative new measure that shows the ecological efficiency with which human well-being is delivered. It differs markedly from the central indicator of national income usually referred to by commentators, and relied on by governments to measure their success – Gross Domestic Product (GDP). And it also has a different rationale to the various alternative indicators that begin with GDP, and then subtract social and environmental costs to create a more accurate measure of economic success.

Some will view the report's findings with surprise, or even shock. The order of countries may seem counter-intuitive. But this is because, to a large degree, policy-makers have been led astray by abstract mathematical models of the economy that bear little relation to people's day-to-day realities. By returning to first principles and assessing the relationship between the fundamental inputs and the ultimate ends of society we are attempting to rectify this costly oversight.

No single country in our Index has everything right. We have to acknowledge from the start that while some countries are more efficient than others at delivering long, happy lives for their people, *every* country has its problems and no country performs as well as it could (hence this could be regarded as an *un*Happy Planet Index). Yet, fascinatingly, it is possible to see patterns emerging that point to how we might better achieve long and happy lives for all, whilst living within our environmental means.

Islands perform well. Perhaps a more acute awareness of environmental limits has sometimes helped their societies to bond better and to adapt to get more from less. Combined with the enhanced well-being that stems from close contact with nature, the world as a whole stands to learn much from the experience of islands.

The challenge will be whether we can learn the lessons of the HPI and apply them. The Index is built from three different indicators, two of which are objective: life expectancy and the ecological footprint – a measure of our use of environmental goods and services. The third indicator is people's subjective well-being, or 'life satisfaction'. (It should be noted that the way people report their life satisfaction corresponds to objective facts such as their mental and physical health.)

Any index is only as good as the data that feed it and no data set is perfect, even those relied on by governments, central banks and international financial institutions. Wherever possible we have used the best available official statistics – the same as those used by policy-makers – and we are confident that there is much to learn from what they show, however surprising it may be. Some of the most interesting findings concern the marked differences between nations. For example:

- **It is possible to live long, happy lives with a much smaller environmental impact.** Our Index reveals a striking comparison between the United States and Germany. People's sense of life satisfaction is almost identical in the two countries and life expectancy is broadly similar, although the average German can expect to live a little longer than the average American. But Germany's ecological footprint is only about half that of the US – Germany is around twice as efficient as the US at generating long, happy lives in terms of the resources that it consumes.

- **Countries with the same ecological footprint can produce lives of greatly differing length and well-being.** Russia and Japan show that the opposite is also possible. These two countries have an almost identical ecological footprint, but their respective average life expectancy and life satisfaction differ radically. Born in Japan you can expect to live nearly 17 years longer than if you are born in Russia, and you are likely to report a level of life satisfaction nearly 50 per cent higher than the average Russian. A similar picture emerges if Jamaica and Equatorial Guinea are compared. Virtually identical ecological footprints contrast with the fact that Jamaicans will live, on average, 27 years longer and be much happier.

- **Countries similar in other ways can differ enormously in life satisfaction.** Comparing another two countries reveals an even more complicated picture. Moldova and Honduras are ranked next to each other in the United Nations' well-regarded *Human Development Index* (HDI). They have similar life expectancy and similar ecological footprints. But, even allowing for variance in data, their life satisfaction levels are radically different. Hondurans report levels of life satisfaction over twice those reported by Moldovans. The latter are really quite unhappy.

- **Island nations score well above average in the Index.** They have higher life satisfaction, higher life expectancy and marginally lower ecological footprints than other states. Yet their incomes (in GDP per capita terms) are roughly equal to the world average. Even within regions, islands do well. Malta tops the Western world with Cyprus in seventh place (out of 24); the top five nations in Africa are *all* islands; as well as two of the top four in Asia. Even Bahrain, the island that scores lowest due to its high ecological footprint, ranks above all the other Gulf States.

On a scale of 0 to 100 for the HPI, we have set a reasonable target of 83.5. This is based on attainable levels of life expectancy and well-being and a reasonably sized ecological footprint. Today, however, the highest HPI is only 68.2, scored by the Pacific archipelago of Vanuatu. The lowest, and perhaps less surprising than some other results, is Zimbabwe's at 16.6. No country achieves an overall high score and no country does well on all three indicators. Vanuatu, for example, has only a moderate level of life expectancy at 69 years. The message, simply put, is that when we measure the efficiency with which countries enable the fundamental inputs of natural resources to be turned into the ultimate ends of long and happy lives, all can do better. This conclusion is less surprising in the light of our argument that governments have been concentrating on the wrong indicators for too long. If you have the wrong map, you are unlikely to reach your destination. Other headlines that emerge from the index are that:

- **Life satisfaction levels vary wildly country by country.** Questioned on how satisfied they were with their lives as a whole, on a scale of 1 to 10, 29 per cent of Zimbabweans rate themselves at 1, and only six per cent rate themselves at 10. Conversely, 28 per cent of Danes give themselves 10 out

of 10, with less than one per cent saying 1. (It should be remembered, again, that self-reported life satisfaction correlates well with a range of other objective data.)

- **Life expectancy also covers a wide range.** From birth in Japan you can expect to live 82 years, but only 33 if born in Swaziland.

- **As a species, we are over-burdening the Earth's currently available biocapacity.** By consuming 22 per cent more quickly than our ecosystems can regenerate, we are eating into and degrading the natural resources that our life-support systems depend on. In the process, we are depleting the environmental goods and services which future generations will depend on.

- **Countries classified by the United Nations as medium-human development fare better than both low- and high-development countries:**[1] When ranked by HPI, the top 25 per cent of nations include 35 medium development nations compared to only nine high development ones and only one low-development. It seems that countries with high development suffer from diminishing returns. Beyond a certain level, vastly increasing consumption fails to lead to greater well-being. In fact, greater materialism, diminished community, and destruction of natural capital are probably *reducing* our well-being.

- **Well-being does not rely on high levels of consuming.** High consumption does not necessarily guarantee high well-being, as in the case of Estonia, and *high well-being does not necessarily require high levels of consumption,* as in the case of the Dominican Republic.

- **Countries recently adopting market economies and those hit by HIV/AIDS do worst.** Beside low- and high-development countries, the other group to perform badly are the *backsliders* – countries whose human development indicators have decreased in recent years. These include many members of the Commonwealth of Independent States (CIS), including Russia and Ukraine, as well as those nations most heavily hit by HIV/AIDS, such as South Africa and Swaziland.

- **Central America is the region with the highest average score in the Index.** This is because the region combines relatively good life expectancy (a mean of 70 years) and high life satisfaction with an ecological footprint below its globally equitable share. Central America has had a notorious history of conflict and political instability, but the last 15 years have been relatively peaceful, which perhaps together with traditionally high levels of community engagement, explain its success.

- **The UK comes in 108th place in the Index.** The UK is just pipped by Libya, but beats Laos. Our heavy ecological footprint, the 18th biggest worldwide, is to blame, although it should be noted that our well-being is unspectacular for a Western nation and is bettered by countries such as Germany, the US, Costa Rica, Malta and, in top place, Switzerland.

- **Despite wide variation across the Western world, it performs poorly overall.** Malta (an island nation) tops the pile, achieving a respectable 40th place. Austria is next in 61st. Meanwhile the US brings up the rear in 150th place.

- **Social, cultural and political structures are strongly associated with life satisfaction across nations.** Higher levels of life satisfaction were found in countries where more people belong to community groups (for example, voluntary organisations, sports or religious groups); where they value concepts such as adventure, creativity and loyalty over material wealth and possessions; and where government is open and democratic.

- **G8 countries generally score badly in the Index.** As mentioned above the UK comes a disappointing 108th, with the other G8 members coming in at: 66th Italy, 81st Germany, 95th Japan, 111th Canada, 129th France, and 150th United States and finally, very nearly bottom of the whole Index, in 172nd place, is Russia.

Based on these findings, **nef** (the new economics foundation) proposes a global manifesto for a happier planet. We highlight the policy areas on which countries with low life expectancy, poor life satisfaction or high ecological footprints must focus, so that we can all live within our environmental limits and increase well-being for all. These include:

- Eradicating extreme poverty and hunger.
- Improving healthcare.
- Relieving debt.
- Shifting values away from individualism and material consumption, and towards social interaction.
- Supporting meaningful lives, by ensuring a healthy work-life balance, and recognising the value of social, cultural and civic life.
- Empowering citizens and promoting open governance.
- Working towards *one-planet living* by consuming within our environmental limits.
- Designing systems for sustainable consumption and production.
- Working to tackle climate change.

Finally, we call for political organisations to embrace and apply new measures of progress, such as the HPI and properly adjusted GDP measures. Only then will we be equipped to address the twin challenges of delivering a good quality of life for all whilst remaining within genuine environmental limits.

Introduction

Every year, the self-styled Group of Eight (G8)[2] most powerful nations meet to discuss the world's problems, including their own. Typically they exhort more action on poverty internationally and commit to promoting greater global economic growth.

The G8 value themselves (and everyone else) in terms of their national income, measured by Gross Domestic Product (GDP). It is a blunt indicator of economic power and success that sums up all the economic transactions taking place within a country.[3] But this orthodox way of seeing the world, repeated universally like a mantra at international summits, is failing.

Growth isn't working. It is not delivering global poverty reduction in line with the goals the international community set for itself, and it consistently fails to take account of real world environmental limits. Although flexible to a point (as, for example, energy technology improves), these limits inevitably kick-in sooner or later due to the awkward fact that we have only one habitable planet, bounded by the scientific laws of matter and energy. Unfortunately, we cannot conjure new resources out of nothing.

Powerful critiques now exist of growth and the economy's blindness to natural-resource limits. But these need to be supplemented with a dispassionate assessment both of *what* economies are actually delivering for people, and *how efficiently* they are delivering it. So instead of just creating indicators summing up activities that can be considered a *means* to some (unidentified) goal, we need to look closer at both the economy's fundamental *inputs* and its *ultimate ends*.

What is the ultimate aim of societies?

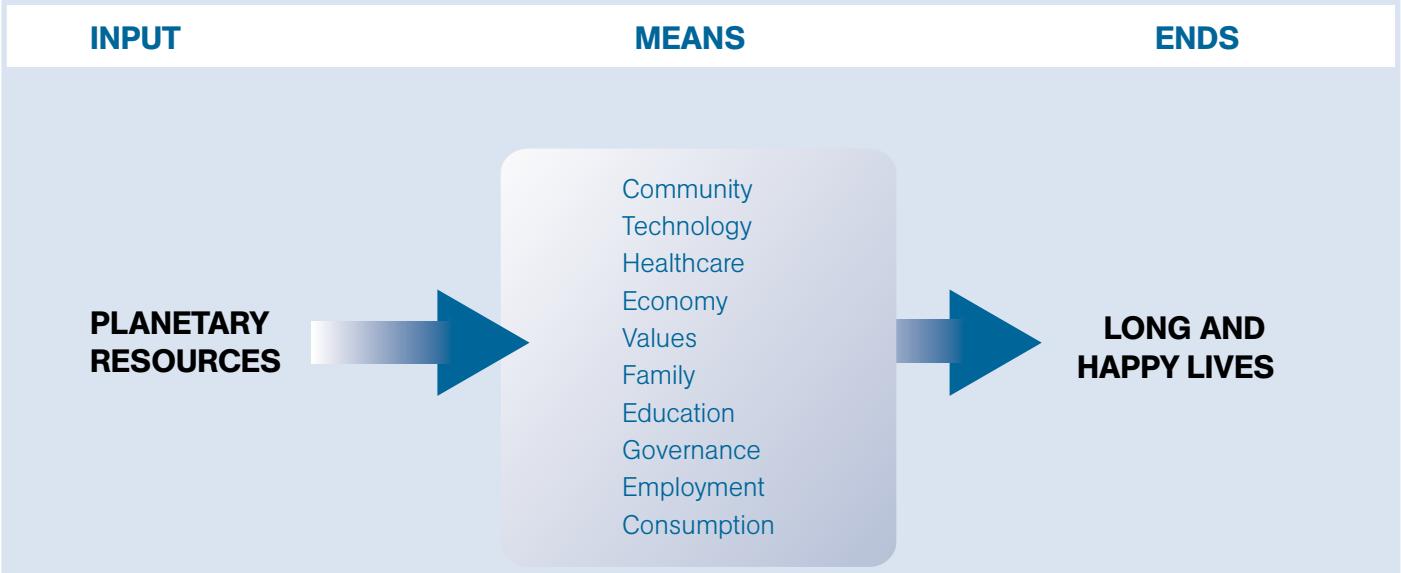
The question of a society's ultimate aim has, of course, been asked for millennia. Greek philosophers, such as Aristotle, thought of the ultimate end, or good, as something that should be strived for in its own right. Aristotle proposed that people's happiness was the highest good, and his understanding of happiness embraced living and doing well, not just feeling good.[4] Since then, the US Declaration of Independence entrenched the pursuit of happiness as a fundamental right for all citizens of the new country.

Several alternative indicators of development to GDP exist, such as the UN's *Human Development Index* (HDI). But these stop short of assessing a nation's success at delivering this ultimate aim. It is perfectly possible, for example, to be well-educated, free of illness and rich, but miserable and lonely.

And today, in the modern, ever more interconnected and interdependent world, it seems most people agree with Aristotle. When asked in surveys what they really value in life, they respond that the health and happiness of themselves and their families are most important.[5] But as well as considering the ultimate end of societies, it is important to account for the fundamental inputs our societies depend on. These are the resources provided by the planet that we all live on, and which will be necessary for future generations to sustain themselves.

This report marks the launch of the first *Happy Planet Index* (HPI). You will see some deliberate graffiti on the cover. This is to acknowledge that while some countries are more resource efficient than others at delivering long, happy lives

Figure 1: Fundamental inputs, means and ultimate ends



for their people, *every* country has its problems and no country performs as well as it could. Also, there is no escaping the fact that – as a whole – the sheer scale of humanity's use of farms, fisheries, forests and its dependence on fossil fuels is so great that we are eroding the ability of our ecosystems to support life. For this reason, it would be quite wrong for anyone, no matter where they live or how satisfied they may be with their lives, to think that their problems are resolved. In a world where we all depend, for example, on the global commons of an atmosphere whose future is already being irrevocably shaped by climate change, we cannot hide from collective problems.

The HPI estimates for the first time the ecological efficiency with which nations deliver happy and long lives for their populations. The results are startling – the wealthiest nations on the planet are grossly inefficient, and no nation on the planet scores well in every category. The findings suggest that, as we struggle to organise international affairs to tackle poverty and protect the environment, we have been using the wrong road map and are unlikely to arrive at our chosen destination. For the sake of both the planet, and our present and future well-being, we hope the *Happy Planet Index* will give our governments pause for thought and maybe even a better sense of meaningful direction.

Introducing the Happy Planet Index

The HPI is a completely new measure of human well-being and development. Like previous indices, it is multi-dimensional, composed of distinct variables, each reflecting different aspects of the human condition.

However, *unlike* previous indices, it…

- …makes no explicit use of income or income-adjusted measures.
- …utilises both objective and subjective data.
- …combines *fundamental inputs* and *ultimate ends*.

The HPI takes a radically different approach to defining progress. With well-being as the *ultimate end*, and planetary resource consumption as the *fundamental input*, we can restate the goal of development as *delivering high levels of well-being within the constraints of equitable and responsible resource consumption.* The HPI reflects the extent to which countries succeed in achieving this goal.

The HPI incorporates three separate indicators (each of which is discussed in more detail below): ecological footprint, self-reported life satisfaction, and life expectancy. Although the statistical calculations that underlie the HPI are quite complex, conceptually it is straightforward and intuitive:

$$\text{HPI} = \frac{\text{Life Satisfaction} \times \text{Life Expectancy}}{\text{Ecological Footprint}}$$

The HPI is a measure of the *ecological efficiency of delivering human well-being***.** It reflects the average years of happy life produced by a given society, nation or group of nations, per unit of planetary resources consumed. Put another way, it represents the efficiency with which countries convert the earth's finite resources into well-being experienced by their citizens.

Why is it an *un*Happy Index? Because, as our data clearly show, no countries perform as well as they could, and most fall far short of the mark.

What it will tell us – and what it won't

It is important to recognise from the outset that the HPI is not an indicator of the happiest country on the planet, or the best place to live. Nor does it indicate the most developed country in the traditional sense, or the most environmentally friendly. Instead, the HPI combines these notions, providing a method of comparing countries' progress towards the goal of providing long-term well-being for all without exceeding the limits of equitable resource consumption.

As is generally the case with composite indicators, it is possible for countries to achieve comparable scores on the HPI for quite different reasons. However, because the HPI consists of three separate components that are conceptually distinct from one another yet combined intuitively, interrogating the differences between such countries is both relatively straightforward and extremely informative from a policy perspective.

Why do we need a new index? Existing measures and their limitations

In the Western world, economics is at the heart of our thinking about most issues. When we talk of growth or development, we are typically thinking about the distribution and flow of money. A nation's progress is also most commonly measured in terms of GDP. Defined as the total value of a country's annual output of goods and services,[6] GDP is *the* standard measure of economic activity and is the key headline indicator for government policy in the vast majority of countries.

It is well known that GDP was never intended to function as an indicator of well-being. Even the economist Simon Küznets, a central figure in the development of GDP, urged the US Congress in 1934 to remember that "The welfare of a nation can scarcely be inferred from a measurement of national income."[7] However, until quite recently, it has routinely been assumed to be a reliable proxy for standard of living. The logic underlying this is easy to understand (if less easy to defend) – growth in GDP implies economic activity, which in turn implies that people are spending money and improving their quality of life.

But GDP turns out to be a poor indicator of welfare in several key respects. For a start, interpreting it as a standard-of-living measure means assuming that income is strongly correlated with well-being at the national level, such that – all else being equal – general well-being will increase as the economy grows. As has been repeatedly shown in recent years, this is simply not true in practice.[8] Undoubtedly, a relationship exists between income and well-being, but after a certain, surprisingly low level of GDP is reached, the strength of this relationship declines markedly.

GDP is insensitive to the distribution of income within countries. A country with high rates of poverty, a small but affluent elite, and high exports could have a similar GDP per capita to one with comparably little inequality and a thriving domestic economy. For example, Equatorial Guinea and Greece both have GDP per capita of around $20,000.[9] In Equatorial Guinea, however, this is driven almost entirely by the huge revenues collected from oil exports and delivered (Transparency International places the country in the top ten of its list of corrupt states) into the hands of a powerful few.[10] Meanwhile, poverty is endemic in the country and life expectancy is just 43 years – in Greece, it is over 78.[11]

GDP also fails to distinguish expenditure that is incurred in correcting or compensating for undesirable events. This can lead to some apparently perverse results. For instance, it has been estimated that the Enron accounting scandal may have contributed up to $1 billion to US GDP.[12] Even natural disasters – hurricanes, floods and so on – tend to boost GDP, because huge amounts of public money are typically spent in mitigating the resulting damage. From an environmental perspective this is a disastrous oversight – GDP counts resource consumption, but takes no account whatsoever of the extent to which it can be maintained.

Over the years, several alternative measures of progress have been proposed that attempt, in different ways, to correct for the problems of using GDP as a welfare measure. (Some of these are discussed in Box 1.) However, none make explicit use of *subjective* data. In other words, they do not include measures of how people actually feel about their lives.

This is a curious omission, because it is clear that people's *experience* of their quality of life is at least as important as their actual physical circumstances. It is no good, for example, arguing that someone with excellent health, lots of money and a high standard of education *must* be satisfied with their life if that is not how they actually feel. Similarly, it should not be assumed that people living in relative poverty or with chronic health conditions must necessarily be dissatisfied.

The HPI compares both experienced and material well-being with an absolute consumption measure, giving equal weight to each.

Box 1: Alternative indicators

In recognition of the limitations of GDP as a welfare measure, there have been a number of attempts to improve on it. Broadly speaking, these have taken two different approaches: adjusting and supplementing.

Adjusting GDP

The first approach has been to adjust GDP to take account of inequality, environmental costs and expenditure due to negative events, and the value of unpaid or voluntary work. The roots of this methodology can be found in the concept of *uneconomic growth*, popularised by US economist Herman Daly, which suggests that some forms of economic growth are actually detrimental to well-being.

Research in the US in the late 1980s and early 1990s led to a family of indices sharing this common conceptual approach.[13] A key element is the redefinition of defensive household expenditure (for example, repair bills, medical bills) and expenditure arising from crime and divorce as *costs*, and therefore as deductions rather than additions to GDP. In the UK, probably the best-known index is Herman Daly's and John Cobb's *Index of Sustainable Economic Welfare* (ISEW)[14] which has been jointly promoted by **nef** and the environmental campaign group Friends of the Earth.[15] Variants of the ISEW, such as the *Genuine Progress Indicator*[16] and several other country-specific indices,[17] differ slightly in the weight they give to individual variables; however, they typically achieve similar results.

The ISEW includes estimations of the economic cost of many environmental externalities, such as pollution and environmental degradation. Some economists have claimed that the ISEW makes questionable (or even arbitrary) estimates about these kinds of costs.[18] However, GDP itself is not assumption-free, and in effect it values the costs of environmental damage at zero. In response to criticisms of the original ISEW methodology, **nef** associate Professor Tim Jackson has proposed a new *Measure of Domestic Progress* (MDP),[19] which makes some adjustments to the methodologies used to account for climate change and resource depletion in previous indices.

Supplementing GDP

The second approach has been to use GDP data as is, but combine it with explicit welfare measures such as health, education and social inequality. The *Human Development Index* (HDI), created in 1990 by the Pakistani economist Mahbub ul Haq and based on the work of Nobel laureate Amartya Sen, is the most widely used example of this type. Structurally, it consists of three elements:

1. Standard of living (GDP per capita).
2. Life expectancy at birth.
3. Knowledge: a composite measure of education that includes data on literacy and school enrolment.

The HDI is one of the UN's key headline indicators, and is considered a useful and meaningful measure of a country's development. Norway has been top of the UN's HDI list since 2000, with the poorest African countries languishing at the bottom.

The *Human Poverty Index* is structurally similar to the HDI but uses indicators focused explicitly on poverty.

1. Longevity is replaced by the probability at birth of not reaching 40.
2. Knowledge is replaced by the percentage of adults lacking functional literary skills.
3. Standard of living is replaced by a weighted measure that incorporates percentage of children under-weight and percentage of population without access to safe water sources.

The *Human Poverty Index* is generally considered to be a better indicator of development than the HDI, when applied to poor countries.

Components of the HPI

Life satisfaction

Extensive research has been conducted in psychology and the social sciences to understand the factors influencing well-being.[20] Nevertheless, it is only relatively recently that subjective measures of well-being have begun to be taken seriously outside academia. In the UK there has been a groundswell of interest in the potential of subjective well-being measures both from within government[21] and from those – such as **nef** – seeking to inform and influence policy from outside.[22]

However, just as there is controversy over whether IQ tests really measure intelligence, there is considerable debate over whether self-reports of life satisfaction have anything to do with well-being as traditionally conceived. In social sciences parlance this is the question of *validity*. IQ tests are thought to be valid if they reliably predict a person's aptitude in performing tasks that are considered to require intelligence. Similarly, self-reports of life satisfaction are considered valid if they correlate reliably with predicted objective indicators that are thought to be associated with well-being.

Most academics working on well-being are satisfied that ratings of life satisfaction within a country or culture are acceptably valid. An individual's self-reported life satisfaction correlates with reports from loved ones, with how often they experience good moods, and even the likelihood they will commit suicide later on in their life.[23] People with positive self-perceptions also tend to live longer than those who regard themselves more negatively.[24] As well as being valid, self-reports of life satisfaction seem to be *reliable.* In other words, people tend to give the same patterns of response over time, and when slightly different question wordings are used.[25]

Another point of debate is whether life satisfaction and happiness should be regarded as equivalent. Some researchers – notably those from an economics background – tend to see happiness, life satisfaction and well-being as synonymous and interchangeable. Some even treat them as equivalent to the familiar economic concept of utility. Psychologists, on the other hand, often prefer a more fine-grained approach. American psychologist Ed Diener conceptualises well-being in terms of three dimensions:

1. Positive affect (i.e. the frequency with which a person experiences positive moods and emotions).

2. Negative affect (the frequency of negative moods and emotions).

3. Life satisfaction (reflecting an individual's overall evaluation of his or her life).

Positive and negative affect are *feelings*, and subject to momentary changes in response to daily events. Satisfaction with life overall, on the other hand, is generally more stable since it reflects a summary of "judgements about feelings".[26] Whilst on the individual level, day-to-day changes in happiness are of interest, at a policy level it is overall satisfaction that gives the best indication of how groups of people are faring. If a majority of people in a country report dissatisfaction with their lives, this seems to be a reasonable indication that something is awry, either with government policy, with society, or with both.

International surveys tend to consider life satisfaction by asking respondents a question such as: 'If you consider your life overall, how satisfied would you say you are nowadays?' Responses are given on a 0–10 scale, from *not at all satisfied* to *extremely satisfied*. Clearly this is not a perfect measure. Ideally, subjective well-being would be assessed by asking a series of questions, perhaps probing different aspects of life and framing the issue in different ways so as to gain a more complete picture. As a general indicator of the state of well-being in a country, however, this single question performs surprisingly well, showing good validity when compared with other national-level statistics.[27]

Life expectancy and happy life years

The second component of the HPI is national life expectancy at birth, i.e. the average number of years that a person born in that country can be expected to live.[28] This is an estimate based on the prevailing conditions in the country, and is calculated through large-scale data collection of mortality rates at different ages.

Life expectancy is often regarded as a gold-standard measure of well-being. This is not simply because a long life is necessarily a good thing (although most people would probably say that it is, all else being equal), but because rates of life expectancy depend on numerous factors that relate directly to material conditions in a country. For instance, life expectancy at birth is extremely sensitive to the rate of infant mortality, which is itself a robust proxy indicator of access to sanitation and the state

of healthcare. For these reasons, and undoubtedly thanks to its clarity and tangibility, life expectancy is widely used as a development indicator, and is one of the main components of the UN's HDI (see Box 1).

As the ultimate end of society, the HPI uses a model combining longevity and subjective life satisfaction devised by the Dutch sociologist Ruut Veenhoven and dubbed *happy life years* (HLY) – "the degree to which people live long and happily in a country at a certain time".[29] To calculate a nation's mean HLY, ratings of life satisfaction are multiplied by mean life expectancy at birth. Veenhoven describes this as an "ultimate output measure", because it incorporates both "apparent" and "assumed" quality of life.[30] HLY correlates with factors such as affluence, education, political freedom and gender equality – however, it is not completely explained by them. This suggests that the subjective component adds something distinctive that is not captured by purely objective measures of quality of life.

HLY is an imperfect measure to the extent that it assumes that all years of life are equally happy. One potential way around this is to adjust life expectancy with Disability Adjusted Life Years, the mean number of years lost through premature death plus the mean number of years spent in disability.[31] In one sense this provides a more complete statistic than pure longevity as it is more sensitive to changes in healthcare provision. However, in the present context, it is also less useful since it assumes, implicitly, that years spent in disability are less valuable that years spent in full health – something that many disabled people would disagree with strongly.[32]

A second, related caveat is that the life satisfaction data is invariably taken from populations of adults, whereas HLY, by definition, includes childhood. HLY therefore assumes that childhood is as happy, or unhappy, as adulthood. Previous work by **nef** suggests that children's and young people's well-being should ideally be assessed using purpose-designed questionnaires.[33]

Ecological footprint

The third component of the HPI is the *ecological footprint*. Nature can keep up with the demands of human economic activity, but only as long as this activity stays within the regenerative capacity of the biosphere: the living part of the planet. Ecological footprint accounting measures the extent to which the ecological demand of human economies stays within or exceeds the capacity of the biosphere to supply goods and services. These accounts help individuals, organisations, and governments to frame policies, to set targets, and to track progress towards sustainability.

The ecological footprint (henceforth: Footprint) measures how much land area is required to sustain a given population at present levels of consumption, technological development and resource efficiency, and is expressed in *global-average hectares* (gha). The largest component elements of Footprint are the land used to grow food, trees and biofuels, areas of ocean used for fishing, and – most importantly – the land required to support the plant life needed to absorb and sequester CO_2 emissions from fossil fuels.

Footprint takes account of the fact that in a global economy people consume resources and ecological services from all over the world. Therefore, a *Chiquita* plantation in Costa Rica will not count towards Costa Rica's Footprint, but rather towards the Footprint of those countries where the bananas are consumed. For this reason, a country's Footprint can be significantly larger than its actual biocapacity. The Footprint of a country is thus best understood as a measure of its *consumption*, and its worldwide environmental *impact*.

The same methodology can be used to calculate, in the same units, the Earth's biocapacity – its biologically productive area. Currently, the biocapacity of the Earth is around 11.2 billion hectares or 1.8 global hectares per person in 2001 (assuming that no capacity is set aside for non-human species). In 2001, humanity's demand on the biosphere – its global ecological footprint – was 13.7 billion global hectares, or 2.2 global hectares per person. At present, therefore, our Footprint exceeds our biocapacity by 0.4 global hectares per person, or 23 per cent. This means that the planet's living stocks are being depleted faster than nature can regenerate them.

Box 2: Bhutan and Gross National Happiness

The Himalayan kingdom of Bhutan has become famous for seeking to maximise Gross National Happiness (GNH) rather than GDP. The story of the origin of the phrase *Gross National Happiness*, is, like much of Bhutanese history, shrouded in mist. What is certain is that King Jigme Singye Wangchuck was sceptical of the Western approach to development early in his reign. In 1976, he was quoted as saying that "We have time to wait until our people are ready for the changes the outside world will bring." In a sense this encapsulates the concept of GNH – a patient reflection on what is actually best for Bhutan.

GNH captured the world's imagination and articles have been written in publications ranging from *The Times of India* to the *New York Times* – but with varying degrees of accuracy. In particular, there has been an assumption that the Bhutanese already measure GNH, whereas up until now it has been more of a working philosophy – almost a touchstone for good governance. Times are changing in Bhutan, however, and with the announcement of the first democratic elections to be held in 2008, the task of creating indicators of GNH has begun in earnest.

At the time of going to press, the Centre for Bhutan Studies in Thimpu, Bhutan, has indicated that it will create pilot GNH indicators in nine domains:

1. Living standard
2. Health
3. Education
4. Eco-system diversity and resilience
5. Cultural vitality and diversity
6. Time use and balance
7. Good governance
8. Community vitality
9. Psychological well-being

It is not yet clear how these domains will be operationalised; there may be a mix of both objective and subjective data used for each domain. Nor has it been decided whether the domains will be brought together into one meta-index of GNH. What is clear is that they are very ambitious, and go significantly beyond the scope of the *Human Development Index*. Currently, the timetable is to have the GNH indicators ready in time for the 2008 elections.

In the meantime, the Bhutanese will be encouraged by their country's position on the HPI. Bhutan ranks 13th in the world, and is the only Asian country to do well on two of the three main indicators (Footprint and life satisfaction), and not to do poorly on any. The biggest concern for Bhutan is average life expectancy, a relatively moderate 63. Although the Bhutanese live longer than people in some countries with similar GDP (for example Cambodia – 56 years), this is still below the world average. The geography of the country makes delivering health care particularly challenging, with 10 per cent of the population living over six hours walk from a road.

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However, both of these are snapshots in time – they can go up or down depending on how well we manage our ecosystems and how much we consume.

Footprint calculations become more accurate as the data on which they depend improves. For this reason, calculations of countries' Footprints are continually updated, and the methodology is subject to constant and rigorous review. Footprint can be applied to single products, or to households, organisations, cities, regions, nations, or human civilisation as a whole. It is now used widely by international institutions, governments, businesses, and individual organisations. It is a tool that helps to measure and manage progress towards real environmental sustainability. For example, using Footprint to assess the UK's ecological resource consumption, **nef** research recently produced some dramatic results.[34] We were able to show that, were the UK depending purely on its own resources, taking a typical calendar year, the nation would go into ecological debt as early as 16 April. More worryingly still, the world as a whole goes into ecological debt on 23 October, suggesting overall environmental degradation. If the whole world consumed at the level of a typical UK consumer, we would need the resources of 3.1 planets like Earth.

It should be noted that Footprint is not an all-encompassing indicator of total environmental use. Mineral resources are ignored, and fossil fuels are only counted for their polluting effects. Resource depletion is not considered. These facts lead to Footprint *underestimating* real impact, and to this extent it should be regarded as a conservative measure. It is also important to note that Footprint does not attempt to quantify how human impact erodes nature's capacity to regenerate. It says nothing of diminishing biodiversity, chlorofluorocarbons (CFCs) or soil degradation, and as such should not be interpreted as an indicator of ecological viability.

Calculating the HPI

Whilst conceptually straightforward and intuitive, calculating the HPI requires considerable care to ensure that the results are robust and meaningful.

Sources

The first issue is sourcing appropriate data. Life expectancy poses relatively little problem here – worldwide statistics are routinely estimated by various international bodies. In this report, we primarily use data from the UN *Human Development Report 2005*.[35]

The Global Footprint Network provides Footprint data for 144 countries.[36] For the remaining 34 countries we calculated estimates of Footprint based on carbon dioxide emissions and other variables (see Appendix 2 for a full explanation of this methodology).

The main source for life satisfaction is the *World Database of Happiness*,[37] which holds data from numerous national and international surveys, primarily the *World Values Survey* (WVS).[38] In some cases we deferred to region-specific surveys, particularly the *Latinobarometer* survey carried out in 2004.[39] In other cases we used related subjective data to estimate life satisfaction, notably from the *Afrobarometer* survey[40] and the recent *World Health Survey*. All of these surveys were conducted with samples of between 1,000 and 3,000 people in each country, with a representative distribution of income and region.

For the remaining countries, where no subjective data was available or where that available was judged to be unreliable, we estimated life satisfaction country by country with statistical regressions based on a range of objective indicators. Full details of statistical methods and sources are given in Appendix 2.

Calculation

The simplest approach to calculating HPI is to divide HLY by Footprint, which produces a number representing *number of happy years produced per global hectare.* Owing to differences in the distribution of the main variables, however, this straightforward division results in an unbalanced weighting towards Footprint in the HPI. In other words, small changes in Footprint lead to large changes in HPI whilst subtle but important changes in HLY are masked.

To avoid this problem, standard statistical transformations were used to match the variation in the two variables (see Appendix 3 for details). This results in an HPI that gives equal weight to proportional changes in Footprint and HLY. Table 1 shows some theoretical examples of how HPI varies with changes in life satisfaction, life expectancy and Footprint.

Table 1. Hypothetical HPI scores

	Life Satisfaction	Life Expectancy	Footprint	HPI
High Well-being / Acceptable Footprint	7.0	75.0	1.8	61.8
High Well-being / High Footprint	7.0	75.0	5.4	38.0
Low Well-being / Low Footprint	5.0	50.0	0.5	38.0
Reasonable ideal[41]	8.2	82.0	1.5	83.5

Interpreting the Happy Planet Index

For ease of interpretation we have devised a simple *Traffic Light* scheme of data coding. From the colour coded map of the world it is easy to see at a glance *how* each country performs on the HPI. By looking at the table of nations it is possible to see how the component indicators vary and their contribution to the overall score – in other words, *why* each country performs as it does.

The three component variables are coded according to a three-colour traffic light system (see Table 2; note that a fourth category is added for extreme Footprints). Life satisfaction categories represent the bottom-, middle- and top-third of the distribution. Life expectancy categories are based on the UN's own categorisation of low, medium and high HDI scores. Footprint categories are based on the calculation of an equitable global Footprint, with the world's resources shared equally amongst its population: 1.8 gha.[42] A Footprint of 1.8 thus represents one-planet living.

To provide finer-grained discrimination, a six-colour traffic light is used to code the HPI scores, both in the data tables and on the world map (Table 3). This combines the colours for the three main indicators. This categorisation offers an alternative representation of our findings to the absolute HPI score. Rather than combining all three indicators such that exceptional performance on one can make up for bad performance on another, this categorisation puts more emphasis on the individual components and makes it clear which countries are struggling in one or more areas. For example, despite excellent life expectancies and life satisfaction, most European countries are in amber, due to the fact they have very high Footprints in the red. Hungary, one exception, has medium life expectancy and life satisfaction, and a Footprint that is less than most other European nations. As a result, it is colour-coded as orange, despite having a lower absolute HPI than several European countries.

Table 2. Colour key for components

	Blood Red	Red	Yellow	Green
Life satisfaction		< 5.5 (dissatisfied)	5.5–6.7 (medium)	6.7 > (satisfied)
Life expectancy		< 60 (poor)	60–75 (average)	75 > (good)
Footprint	> 5 planets	> 2 planets	1–2 planets	< 1 planet

Table 3. Colour key for HPI score and world map

2 poor, or any with a 'Blood Red' Footprint

Any with 1 poor

3 medium

1 good and 2 medium

2 good and 1 medium

All 3 good

Table 4 gives full data for 178 countries. HPI scores for each country are also represented graphically on the colour-coded world map, on the centre-pages of this report. As can be seen from both the tables and the map of the world, no country scores a full green light (i.e. a green score in each category). Indeed, there are only 19 countries that score a light green light, illustrating how challenging it is to deliver high levels of well-being in an ecologically efficient manner. We have deliberately set aspirational targets for all of the categories, but it is important to recognise that there are many nations already achieving green lights in each of the individual components of the HPI – these targets are thus genuinely attainable. What is much more difficult is to do well on all three components simultaneously. Figure 2 clearly shows that most countries still have a long way to go.

This is the gauntlet that the HPI throws down not only to the G8 but to all world leaders: how can nations in the twenty-first century achieve *high levels of well-being within the constraints of equitable and responsible resource consumption?*

Figure 2: Missing the green target. Happy Life Years against Ecological Footprint for 178 countries

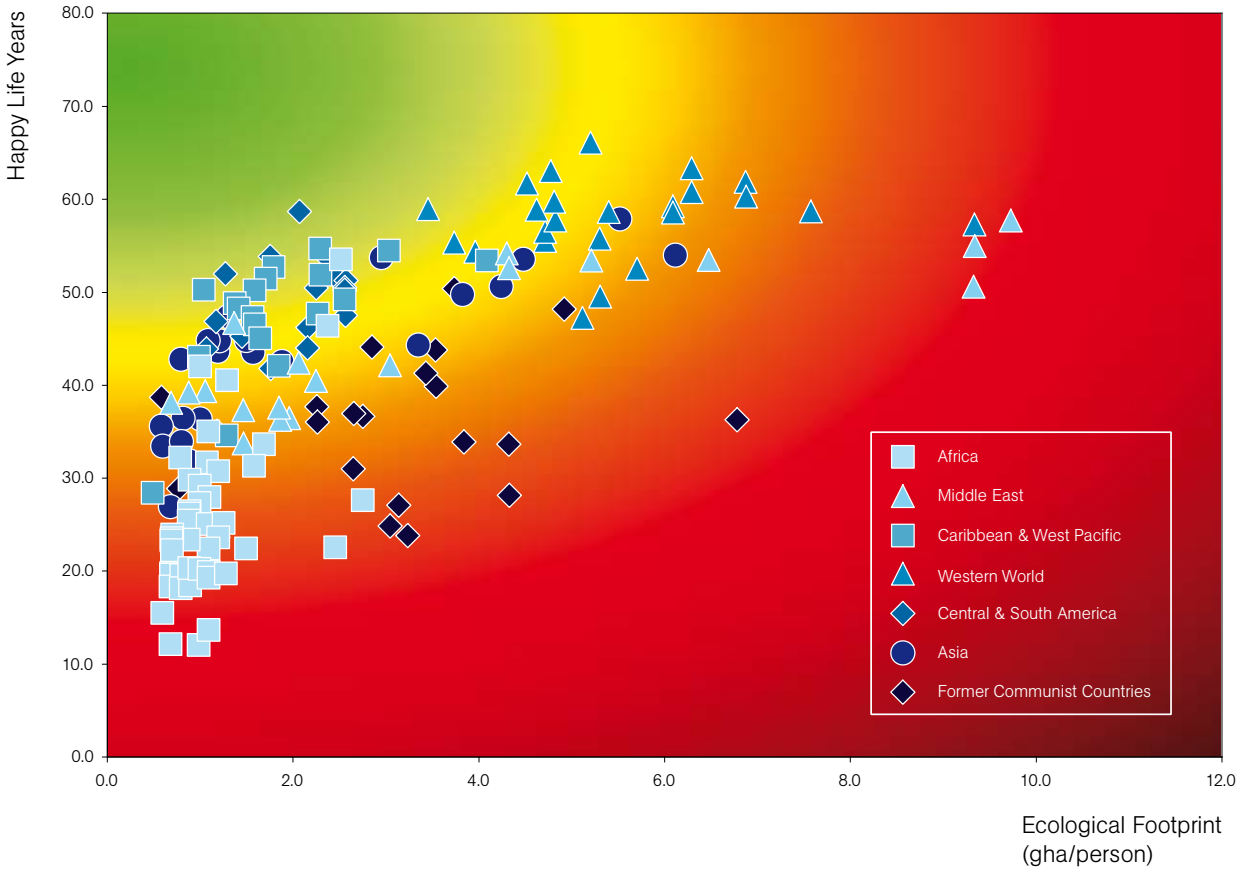


Table 4: Life satisfaction, Life expectancy, Footprint and HPI for 178 countries (ordered by HPI within region)

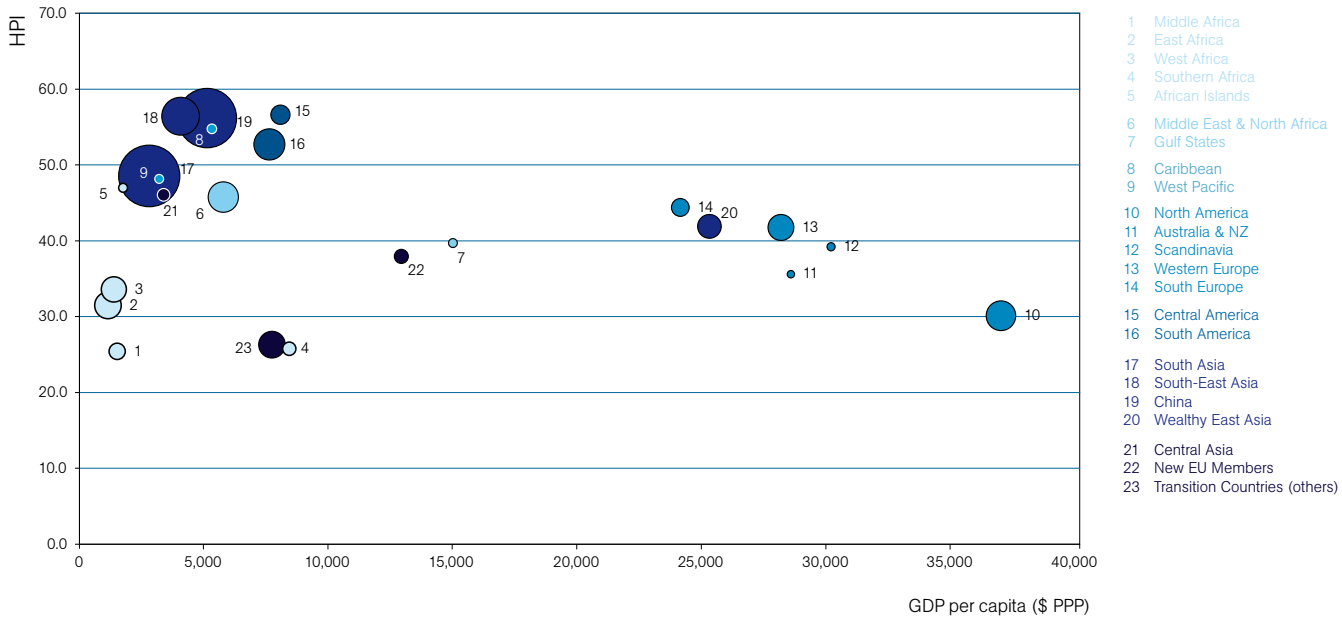
Countries	Life Sat	Life Exp	EF	=	HPI
WESTERN WORLD					
Malta	7.5	78.4	3.5	=	**53.3**
Austria	7.8	79.0	4.6	=	**48.8**
Iceland	7.8	80.7	4.9	=	**48.4**
Switzerland	8.2	80.5	5.3	=	**48.3**
Italy	6.9	80.1	3.8	=	**48.3**
Netherlands	7.5	78.4	4.7	=	**46.0**
Cyprus	6.9	78.6	4.0	=	**46.0**
Luxembourg	7.6	78.5	4.9	=	**45.6**
Belgium	7.3	78.9	4.9	=	**44.0**
Germany	7.2	78.7	4.8	=	**43.8**
Spain	7.0	79.5	4.8	=	**43.0**
New Zealand	7.4	79.1	5.5	=	**41.9**
Denmark	8.2	77.2	6.4	=	**41.4**
United Kingdom	7.1	78.4	5.4	=	**40.3**
Canada	7.6	80.0	6.4	=	**39.8**
Ireland	7.6	77.7	6.2	=	**39.4**
Norway	7.4	79.4	6.2	=	**39.2**
Sweden	7.7	80.2	7.0	=	**38.2**
Finland	7.7	78.5	7.0	=	**37.4**
France	6.6	79.5	5.8	=	**36.4**
Greece	6.3	78.3	5.4	=	**35.7**
Portugal	6.1	77.2	5.2	=	**34.8**
Australia	7.3	80.3	7.7	=	**34.1**
United States of America	7.4	77.4	9.5	=	**28.8**
MIDDLE EAST & NORTH AFRICA					
Tunisia	6.4	73.3	1.4	=	**58.9**
Yemen	6.2	60.6	0.7	=	**55.0**
Morocco	5.6	69.7	0.9	=	**54.4**
Palestine	5.4	72.5	1.1	=	**52.6**
Iran	6.0	70.4	2.1	=	**47.2**
Algeria	5.2	71.1	1.5	=	**45.9**
Oman	7.3	74.1	4.4	=	**43.9**
Lebanon	5.6	72.0	2.3	=	**43.6**
Syria	5.1	73.3	1.9	=	**43.2**
Saudi Arabia	7.3	71.8	4.4	=	**42.7**
Jordan	5.1	71.3	1.9	=	**42.1**
Egypt	4.8	69.8	1.5	=	**41.6**
Turkey	5.3	68.7	2.0	=	**41.4**
Libya	5.7	73.6	3.1	=	**40.3**
Israel	6.7	79.7	5.3	=	**39.1**
Bahrain	7.2	74.3	6.6	=	**34.4**
United Arab Emirates	7.4	78.0	9.9	=	**28.2**
Kuwait	7.2	76.9	9.5	=	**27.7**
Qatar	7.0	72.8	9.5	=	**25.5**

Countries	Life Sat	Life Exp	EF	=	HPI
AFRICA					
São Tomé and Principe	6.7	63.0	1.0	=	**57.9**
Seychelles	7.4	72.7	2.6	=	**56.1**
Comoros	5.9	63.2	0.8	=	**52.9**
Cape Verde	5.8	70.4	1.3	=	**52.4**
Mauritius	6.5	72.2	2.4	=	**49.6**
Ghana	6.2	56.8	1.1	=	**47.0**
Madagascar	5.8	55.4	0.8	=	**46.0**
Gambia	5.7	55.7	1.1	=	**42.5**
Congo	5.7	52.0	0.9	=	**41.6**
Senegal	5.6	55.7	1.2	=	**40.8**
Gabon	6.2	54.5	1.7	=	**40.5**
Benin	5.4	54.0	1.0	=	**40.1**
Namibia	6.5	48.3	1.6	=	**38.4**
Guinea	5.1	53.7	1.0	=	**37.4**
Mauritania	5.3	52.7	1.1	=	**37.3**
Togo	4.9	54.3	0.9	=	**36.9**
Kenya	5.6	47.2	0.9	=	**36.7**
Tanzania	5.5	46.0	0.9	=	**35.1**
Guinea-Bissau	5.4	44.7	0.7	=	**35.1**
Eritrea	4.4	53.8	0.7	=	**34.5**
Mali	5.3	47.9	1.1	=	**33.7**
Mozambique	5.4	41.9	0.7	=	**33.0**
Cameroon	5.1	45.8	0.9	=	**32.8**
Djibouti	4.8	52.8	1.3	=	**32.7**
Ethiopia	4.7	47.6	0.7	=	**32.5**
Nigeria	5.5	43.4	1.2	=	**31.1**
Burkina Faso	4.7	47.5	1.1	=	**30.1**
Côte d'Ivoire	4.5	45.9	0.9	=	**28.8**
Rwanda	4.4	43.9	0.7	=	**28.3**
Sierra Leone	5.0	40.8	0.9	=	**28.2**
Angola	4.8	40.8	0.8	=	**27.9**
South Africa	5.7	48.4	2.8	=	**27.8**
Sudan	3.6	56.4	1.0	=	**27.7**
Uganda	4.7	47.3	1.5	=	**27.7**
Niger	4.5	44.4	1.1	=	**26.8**
Malawi	4.6	39.7	0.7	=	**26.7**
Zambia	4.9	37.5	0.8	=	**25.9**
Central African Republic	4.9	39.3	1.1	=	**25.9**
Botswana	5.4	36.3	1.3	=	**25.4**
Chad	4.5	43.6	1.3	=	**25.4**
Equatorial Guinea	5.2	43.3	2.5	=	**23.8**
Lesotho	4.3	36.3	0.6	=	**23.1**
Congo, Dem. Rep. of the	3.3	43.1	0.7	=	**20.7**
Burundi	3.0	43.6	0.7	=	**19.0**
Swaziland	4.2	32.5	1.1	=	**18.4**
Zimbabwe	3.3	36.9	1.0	=	**16.6**

Countries	Life Sat	Life Exp	EF	=	HPI
ASIA					
Vietnam	6.1	70.5	0.8	=	**61.2**
Bhutan	7.6	62.9	1.3	=	**61.1**
Sri Lanka	6.1	74.0	1.1	=	**60.3**
Philippines	6.4	70.4	1.2	=	**59.2**
Indonesia	6.6	66.8	1.2	=	**57.9**
China	6.3	71.6	1.5	=	**56.0**
Thailand	6.5	70.0	1.6	=	**55.4**
Maldives	6.6	66.6	1.6	=	**53.5**
Bangladesh	5.7	62.8	0.6	=	**53.2**
Malaysia	7.4	73.2	3.0	=	**52.7**
Timor-Leste	6.6	55.5	0.8	=	**52.0**
Nepal	5.5	61.6	0.6	=	**50.0**
Mongolia	6.7	64.0	1.9	=	**49.6**
India	5.4	63.3	0.8	=	**48.7**
Burma	5.3	60.2	0.9	=	**44.6**
Taiwan	6.6	76.1	3.9	=	**43.4**
Hong Kong	6.6	81.6	4.6	=	**42.9**
Cambodia	5.6	56.2	1.1	=	**42.2**
Japan	6.2	82.0	4.3	=	**41.7**
Brunei Darussalam	7.6	76.4	5.6	=	**41.2**
Korea	5.8	77.0	3.4	=	**41.1**
Laos	5.4	54.7	1.0	=	**40.3**
Pakistan	4.3	63.0	0.7	=	**39.4**
Singapore	6.9	78.7	6.2	=	**36.1**
FORMER COMMUNIST COUNTRIES					
Kyrgyzstan	6.6	66.8	1.1	=	**59.1**
Tajikistan	6.1	63.6	0.6	=	**57.7**
Uzbekistan	6.4	66.5	1.9	=	**49.2**
Slovenia	6.6	76.4	3.8	=	**44.0**
Croatia	5.9	75.0	2.9	=	**43.7**
Albania	4.6	73.8	1.5	=	**42.1**
Georgia	4.1	70.5	0.8	=	**41.2**
Bosnia and Herzegovina	5.1	74.2	2.3	=	**41.0**
Azerbaijan	4.9	66.9	1.5	=	**40.7**
Poland	5.9	74.3	3.6	=	**39.3**
Macedonia	4.9	73.8	2.3	=	**39.1**
Romania	5.2	71.3	2.7	=	**37.7**
Hungary	5.7	72.7	3.5	=	**37.6**
Kazakhstan	5.8	63.2	2.8	=	**36.9**
Czech Republic	6.4	75.6	5.0	=	**36.6**
Armenia	3.7	71.5	1.0	=	**36.1**
Slovakia	5.4	74.0	3.6	=	**35.8**
Bulgaria	4.3	72.2	2.7	=	**31.6**
Moldova	3.5	67.7	1.2	=	**31.1**
Lithuania	4.7	72.3	3.9	=	**29.3**
Latvia	4.7	71.6	4.4	=	**27.3**
Belarus	4.0	68.1	3.2	=	**25.8**
Turkmenistan	4.0	62.4	3.1	=	**24.0**
Russia	4.3	65.3	4.4	=	**22.8**
Estonia	5.1	71.3	6.9	=	**22.7**
Ukraine	3.6	66.1	3.3	=	**22.2**

Countries	Life Sat	Life Exp	EF	=	HPI
CENTRAL & SOUTH AMERICA					
Colombia	7.2	72.4	1.3	=	**67.2**
Costa Rica	7.5	78.2	2.1	=	**66.0**
Panama	7.2	74.8	1.8	=	**63.5**
Honduras	7.2	67.8	1.4	=	**61.8**
Guatemala	7.0	67.3	1.2	=	**61.7**
El Salvador	6.6	70.9	1.2	=	**61.7**
Nicaragua	6.3	69.7	1.1	=	**59.1**
Venezuela	7.4	72.9	2.4	=	**57.5**
Guyana	7.2	63.1	1.5	=	**56.6**
Peru	5.6	70.0	0.9	=	**55.1**
Suriname	7.3	69.1	2.3	=	**55.0**
Mexico	6.9	75.1	2.5	=	**54.4**
Chile	6.5	77.9	2.6	=	**51.3**
Argentina	6.8	74.5	2.6	=	**52.2**
Belize	6.9	71.9	2.6	=	**52.0**
Paraguay	6.5	71.0	2.2	=	**51.1**
Uruguay	6.3	75.4	2.6	=	**49.3**
Ecuador	5.6	74.3	1.8	=	**49.3**
Brazil	6.3	70.5	2.2	=	**48.6**
Bolivia	5.5	64.1	1.2	=	**46.2**
CARIBBEAN & WEST PACIFIC					
Vanuatu	7.4	68.6	1.1	=	**68.2**
Dominica	7.3	75.6	1.8	=	**64.5**
Cuba	6.3	77.3	1.4	=	**61.9**
St. Vincent and the Grenadines	7.2	71.1	1.7	=	**61.4**
St. Lucia	7.0	72.4	1.6	=	**61.3**
Samoa (Western)	6.9	70.2	1.4	=	**61.0**
Antigua and Barbuda	7.4	73.9	2.3	=	**59.2**
Solomon Islands	6.9	62.3	1.0	=	**58.9**
Tonga	6.6	72.2	1.6	=	**57.9**
Dominican Republic	7.0	67.2	1.6	=	**57.1**
St. Kitts and Nevis	7.4	70.0	2.3	=	**56.1**
Fiji	6.7	67.8	1.7	=	**54.5**
Barbados	7.3	75.0	3.1	=	**52.7**
Trinidad and Tobago	6.9	69.9	2.3	=	**51.9**
Jamaica	7.0	70.8	2.6	=	**51.0**
Grenada	6.5	65.3	1.9	=	**49.0**
Bahamas	7.7	69.7	4.1	=	**44.9**
Papua New Guinea	6.3	55.3	1.3	=	**44.8**
Haiti	5.5	51.6	0.5	=	**43.3**

Figure 3. HPI vs. GDP per capita for sub-regions of the world (dot size indicates population)



Different types of progress: HPI vs. existing indicators

Comparing the HPI with GDP and HDI – two gold-standard development indicators – tells a fascinating story. First, Figure 3 shows HPI plotted against GDP per capita for a number of regions of the world (dot size represents population). With the exception of the ex-Soviet Transition countries yet to join the EU (dot 23) and Southern Africa (dot 4), a clear pattern emerges. Initially, the HPI rises sharply as GDP increases. However, this relationship peaks at around $5,000 (roughly equivalent to $14 per day) before declining further and further as GDP increases.

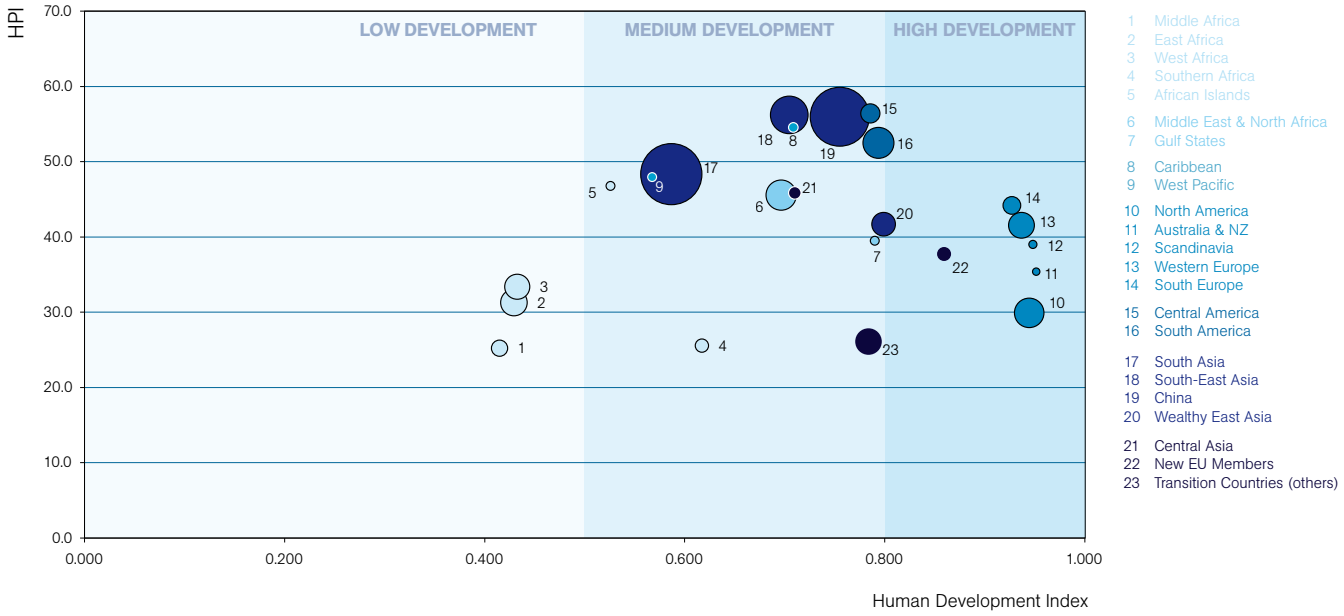
Even more striking is Figure 4, a graph of the same regions plotted against HDI. Shaded areas on the graph represent the UN's own low-, middle- and high-development categories. The relationship shows a very clear inverted-U trend – those countries that score highest on the HPI tend to be those classified by the UN as middle development (again with the exception of the Southern African and some post-communist countries). The tripartite structure of the HPI enables us to explore the main drivers of variation between countries, and analysing these global trends in more detail yields some interesting findings.

For countries classified as low-development, life satisfaction and longevity explain over 90 per cent of variation in the HPI.[43] This is unsurprising, and largely a reflection of the fact that many poor countries, especially those in sub-Saharan Africa, have high rates of infant mortality, poor healthcare and widespread poverty. Very small increases in GDP would lead to dramatic rises in life expectancy and life satisfaction.[44] At present, however, life for many in these countries is, in Hobbes' famous words, "poor, nasty, brutish and short".[45]

Conversely, for countries classified as high-development, Footprint increases significantly with GDP and accounts for over 50 per cent of the downwards trend in the HPI – meanwhile, longevity remains stable and life satisfaction increases only slightly.[46] For medium-development countries, however, life satisfaction is the main driver of changes in the HPI.[47] In practice, this means that – at a national level – the most significant gains in well-being seem to be made at low-to-moderate levels of income.

Countries that perform well on the HDI are often touted as the best places to live in the world. Invariably, these are countries with excellent healthcare, high GDP per capita, and good levels of education. According to the UN's most recent *Human Development Report*, the top three are Norway, Iceland and Australia. Hardly

Figure 4. HPI vs. HDI for sub-regions of the world (dot size indicates population)



surprising, one might think, that many of their citizens should generally report high levels of satisfaction with their lives. HDI takes no explicit account of the relationship between experienced well-being and the material circumstances in a country, however, assuming – in effect – that the former is completely predicted by the latter. As such, it fails to recognise that levels of well-being in many middle-income countries are comparable with those in the affluent West, and that some countries categorised as high development by the HDI have mediocre levels of reported well-being.

To illustrate this more clearly consider Moldova and Honduras. These two countries rank next to each other in 115th and 116th place on the most recent UN HDI, with scores of 0.667 (Honduras) and 0.671 (Moldova).[48] They have similar mean life expectancy of just under 68 years; by international standards this is unspectacular, falling only a little above the world average of 66, but it suggests a reasonable standard of basic need satisfaction in both countries – healthcare, diet, sanitation and so on. Moreover, both have a Footprint well within the limits of equitable resource consumption (1.2 and 1.4, respectively) and a roughly comparable population size, which indicates that reasonable levels of welfare are achieved at roughly the same environmental cost. From a traditional development perspective, then, the two countries look very similar. Yet Honduras and Moldova differ dramatically on the HPI; Honduras scoring 62.8 and Moldova an unimpressive 31.1. Why?

The difference is that *experienced* well-being in the two countries is completely different. Hondurans report mean life satisfaction of 7.2, well above the world average of 6.0. Moldovans, on the other hand, appear to be really quite unhappy – their mean life satisfaction score is just 3.5. Even accepting a degree of statistical error in the data, there can be little doubt that this is a large and meaningful difference. It seems, simply, that twenty-first century Honduran society is more efficient at converting fundamental inputs into ultimate ends.

The other issue that HDI makes no attempt to capture is the high price affluent countries pay for their well-being. The average Norwegian, for instance, consumes about three-and-a-half times their fair share of world resources, as measured by Footprint. A typical US citizen consumes over five times their share. And, if the nations of the UN are placed in rank order by HDI, the highest ranking country with a Footprint below the equitable maximum of 1.8 is Cuba – *in 52nd place*. This is the fundamental problem with development as the UN HDI depicts it. Because planetary resources are limited, it is simply not sustainable – or even possible – for

all countries in the world to buy their well-being at the same rate as the developed Western countries have become used to doing.

Fortunately, it may not be necessary. Consider two countries that share many cultural similarities: Singapore and Malaysia. HLY in both countries is comparable at just over 54 – Singaporeans live a few years longer on average, and report lower life satisfaction, but these are fairly small differences. Malaysia's HPI is 52.7, however, whereas Singapore's is just 36.1. The reason, of course, is that Singapore's Footprint is more than double that of Malaysia.

It seems that Malaysia is considerably more efficient at converting fundamental inputs into ultimate ends. Unlike the example of Honduras and Moldova, cultural differences do not provide an easy explanation here. Instead, this seems to be a clear example of diminishing returns in action. Increasing economic growth would almost inevitably increase Malaysia's Footprint. However, the experience of Singapore strongly suggests that overall differences in terms of well-being would be negligible. The difference in terms of environmental cost, on the other hand, would be dramatic.

From a policy perspective, then, should Malaysians be encouraged to become more like Singaporeans, or Singaporeans more like Malaysians? The answer given by the classic conception of growth is essentially the former – but the answer suggested by the HPI is unequivocally the latter.

These examples illustrate two related points:

1. high levels of resource consumption do not reliably produce high levels of well-being

and, crucially,

2. it *is* possible to produce high levels of well-being without excessive consumption.

The HPI provides strong evidence that there is a threshold to the economic model of development. In this model, once a certain level of per capita GDP has been achieved, further economic growth constitutes *bad* growth – causing more harm than good and effectively undermining the well-being of future generations with little or no benefit to the current generation. This threshold hypothesis has been previously proposed using adjusted economic measures like the *Index of Sustainable Economic Welfare* (see Box 1).[49]

This effect can be further seen by considering some (albeit limited) trend data for three Mediterranean countries: Greece, Portugal and Spain. All three nations were military dictatorships as recently as the 1970s and joined the EU in the 1980s. By most counts they would be considered to epitomise successful development. But Figure 5 clearly shows that whilst there have been gains in well-being, indicated by some increases in HLY, the pace of increase in Footprint far outstrips them.

The HPI shows clearly that there is another way, one that emphasises the need for development to remain within the limits of equitable resource consumption and takes seriously the subjective experience of those actually living in a country.

Development blues: the transition countries and Southern Africa

In the *Human Development Report 2004*, 20 countries are identified as backsliders, experiencing a falling HDI score between 1990 and 2002. These include five of the six countries in Southern Africa (no data was available in 1990 for the sixth of these, Namibia, but its HDI *has* fallen dramatically since 1995), as well as five members of the CIS, including Russia and Ukraine. As can be seen in Figures 3 and 4, these areas are also the only significant outliers from the general patterns of HPI observed across the world.

Box 3: Growth versus Equity

Conventional economics focuses on national income and economic growth, because money is seen as the source of well-being. There are two major problems with this. First, there is much more to well-being than money. In fact, differences in income account for only about 15 per cent of the variation in people's well-being. So, if we only look at total income, and ignore how much time people spend earning that income, the stability of their income, and so on, we risk throwing away our non-financial well-being to earn more income which won't make us any happier.

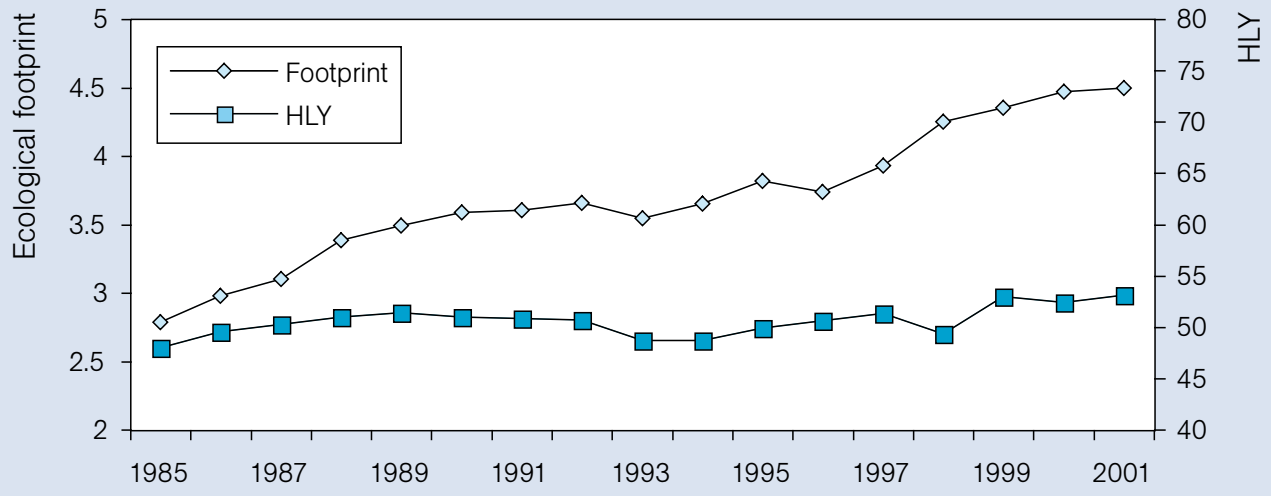
Secondly, not all income contributes equally to well-being. A landless labourer in a low-income country might have to work a long hard day for a dollar or less; but for Bill Gates, it would hardly be worth stooping to pick up a dollar bill from the pavement. In terms of its impact on well-being, it is at least as important who gets each extra dollar generated by economic growth as how many extra dollars are generated in total.

Because of its fixation with economic growth, conventional economics is very concerned with efficiency, in terms of how to maximise the income produced for a given quantity of inputs. Equity is seen as a separate social add-on to this central concern. The first (economic) concern is to produce as much as possible with the resources available. Only then is there a separate social decision to be made about how to modify the distribution of the benefits.

But, if we think of the purpose of the economy as being to produce well-being, rather than just ever greater quantities of goods and services, the relationship between the two becomes very different. Far from being a separate concern, equity becomes another dimension of efficiency – and arguably a more important one. If economic efficiency is about how inputs are translated into production, equity is about how efficiently that total production is translated into quality of life.

David Woodward is head of **nef**'s new global economy programme

Figure 5. Diminishing returns on the Mediterranean: Greece, Portugal & Spain



In the transition countries, especially those in Europe that have not so far acceded into the EU, levels of life satisfaction are well below what might be expected given their relatively high GDPs, whilst life expectancies are consistently lower than Western and Asian countries with similar Footprints. This combination makes for some of the lowest HPI scores across the world. Seven CIS countries fall amongst the 30 bottom nations on the HPI. Ukraine brings up the rear in 174th position (of 178), with Estonia and Russia just ahead. The few exceptions to this dismal trend are the less industrialised Central Asian states (for example, Uzbekistan – 59th place) and the Western Balkans (for example, Croatia – 82nd).

Three main factors lie behind this. First, as exemplified by the Chernobyl nuclear disaster in Ukraine and the destruction of Lake Aral in Kazakhstan, the rapid industrialisation under the Soviets was not without its costs.[50] The current mean Footprint of 3.6 (compared with Western Europe's 5.2) perhaps does not quite capture the damage caused by the reckless attempt to catch up economically with Western countries that, like the UK, had industrialised over a century earlier. Another indicator of past inefficiency is that former Communist states are amongst very few in the world to have actually *decreased* their Footprint recently. For example, Poland's Footprint dropped from 4.88 in 1989 to 3.34 in 2002, despite the fact that its economy expanded over the same period. The WWF (formerly known as the World Wildlife Fund) attributes this to the introduction of new technologies.[51]

However, wresting themselves free from communism has, if anything, made things worse for many CIS nations. Life satisfaction has fallen in Russia and Belarus since the early 1980s. A study in 1993 revealed that many Russians saw their life as better five years earlier.[52] This is not surprising; neighbouring Ukraine's transition to a market economy prompted the US Department of State to note that "After eight straight years of sharp economic decline from the early to late 1990s, the standard of living for most citizens declined more than 50 percent, leading to widespread poverty."[53] In a 1996 survey, almost two-thirds of respondents categorised themselves as being in poverty, whilst one-fifth expected life to get worse in the future. In global terms, the region is not poor, but a relative appraisal of an individual's situation (relative, for example, to the past) contributes heavily to subjective well-being.

The final factor is culture. Cultural differences play an important role in determining reported life satisfaction. The stereotype of Russian melancholy is only reinforced by data showing lower life satisfactions than in Western and Hispanic cultures, even after objective factors are controlled for. Robert Chandler's collection of Russian short stories provides an informative taster of the Eastern Slavic mind set.[54]

Another region which stands out is Southern Africa, where five of the six countries nestle amongst the bottom thirty in the HPI rankings (Zimbabwe and Swaziland taking bottom and second from bottom, respectively). This is even

more striking when we take into account their mean HDI (0.617) – classifying them as medium-development countries according to the UN, whilst the other three continental sub-Saharan African regions are classified as low-development countries.

Whilst political upheaval can be held responsible in countries such as Zimbabwe, the key factor must certainly be the prevalence of HIV. These six countries have the worst rates of HIV worldwide, with 22 per cent of those aged 15–49 infected in the year 2000,[55] rising up to 38 per cent in Swaziland and Botswana. The epidemic has had a devastating effect on life expectancy in the region, which has fallen from a mean of 62 years in 1992 to 45 in 2003. Also, no doubt, it has had a large effect on reported life satisfaction, which is now lower than in significantly less 'developed' West Africa.

These falls in HDI have coincided with falls in life expectancy, without major decreases in Footprint. They have also probably precipitated plummeting life satisfaction, leading to these countries falling off the inverted-U pattern of the HPI that has led to other middle-development countries faring relatively well.

Box 4: The G8 and HPI

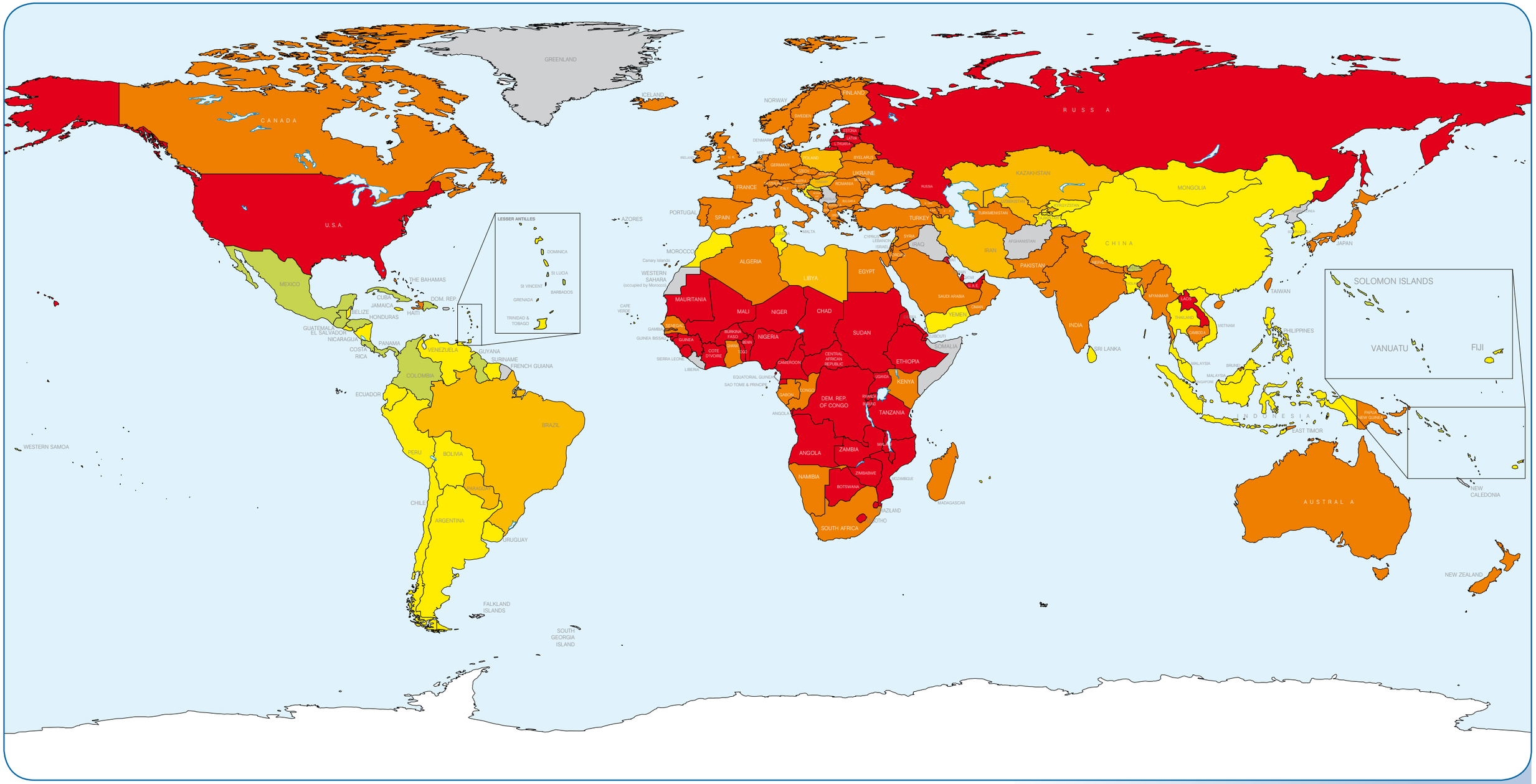
The states whose leaders will be shaping the global agenda in St Petersburg in July 2006 perform badly on the HPI. The host nation, Russia, is worst in 172nd place. The USA is not far ahead (150th), while the highest position is attained by Italy – a mediocre 66th. It is these countries, some of the least ecologically efficient in producing well-being, that lead the global community. Table 4 shows how they fare on the relevant indicators.

Table 4. HDI and HPI rankings for the G8 countries and other nations with high gross GDP.

	Gross GDP ranking	GDP per capita ranking	HDI ranking	**HPI ranking**
USA	1	4	10	**150**
China	2	97	84	**31**
Japan	3	13	11	**95**
India	4	119	125	**62**
Germany	5	14	20	**81**
UK	6	18	15	**108**
France	7	15	16	**129**
Italy	8	19	18	**66**
Brazil	9	66	62	**63**
Russia	10	61	61	**172**
Canada	11	7	4	**111**

Even according to the G8's definition of themselves as the "major industrialised democracies", the current G8 is not representative. India and Brazil both rank amongst the G8 members in terms of their gross GDP and have stable democracies. China comes second in the world in terms of gross GDP (although it is not a democracy). If HDI, which takes into consideration the health and education levels of citizens, determined G8 membership then only Canada would remain a member. If HPI, or even 'gross' HPI determined membership, none of the current members would remain. No doubt the agenda on the table in St Petersburg would look very different.

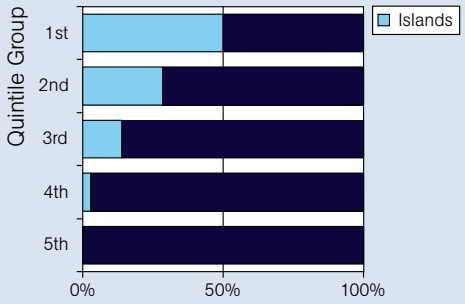
A map of the world colour-coded by HPI



Colour key:

All 3 good	
2 good and 1 medium	
1 good and 2 medium	
3 medium	
Any with 1 poor	
2 poor, or any with a ‘Blood Red’ Footprint	

Figure 9. Percentage of islands in each quintile HPI band



Island paradise

By contrast with the transition and Southern African countries, Island nations score particularly well on the HPI, with an average that is significantly higher than that for all nations (54.0 vs. 40.9).[56] On average, islands have higher life satisfaction (6.8 vs. 5.9), higher life expectancy (70.2 vs. 64.9) and marginally lower Footprints (2.2 vs. 2.6) than other states. In spite of this, their mean GDP is roughly equivalent to the world average ($8,813 vs. $9,405 per capita).

Even within regions, islands typically do well. Malta tops the Western world with Cyprus in seventh place (out of 24); the top five nations in Africa are *all* islands; as well as two of the top four in Asia. Even Bahrain, the island that scores lowest due to its high Footprint (6.6) ranks above the other Gulf States.

There may be a number of reasons why smaller island nations do well in the Index. In many cases, isolation and relative vulnerability have encouraged adaptive and supportive forms of economic and social organisation. Traditional Pacific agriculture, for example, has shown remarkable resilience to disasters, especially weather-related incidents like cyclones. During the 1990s, Samoa was hit by two '100-year' cyclones and lost its main crop, taro, to disease. Instead of famine, Samoa recovered thanks to the traditional food production system which uses a wide diversity of crops bred for their hardiness over generations and grown together in a robust mixed-crop pattern.

Island economies based on sharing and gift giving, such as that of Nanumaea (one of Tuvalu's islands), give rise to highly co-operative and mutually supportive communities. According to anthropologists Keith and Ann Chambers, "In a sharing system, maintaining supportive social relationships is so intrinsic to the exchange process that short-term tallies of material benefit are meaningless. As a result, sharing equalises access to resources across a community and serves as a socio-economic levelling mechanism." By comparison, profit-seeking enterprises promoted by aid projects "support the weakening of sharing obligations," that are central to coping when disaster strikes.[57]

Geographical isolation may insulate populations from mainland political turbulence and conflict, the presence of which is known to seriously undermine well-being. In addition, while living on islands – especially small islands – it is impossible to be removed from nature, as happens in large urban areas. This may lead societies to develop more culturally ingrained notions of environmental stewardship.[58] It is also possible that the high cost of importing goods to geographically remote islands has a restraining effect on personal consumption, thereby restricting the spread of materialist values.

Whilst some of this is speculative, we can conclude one thing with certainty: if it were possible for the rest of the world to emulate the higher-than-average life expectancy and life satisfaction of people living in island nations, and to follow the lead of their lower-than-average Footprint, the world would be a better place.

Factors influencing well-being

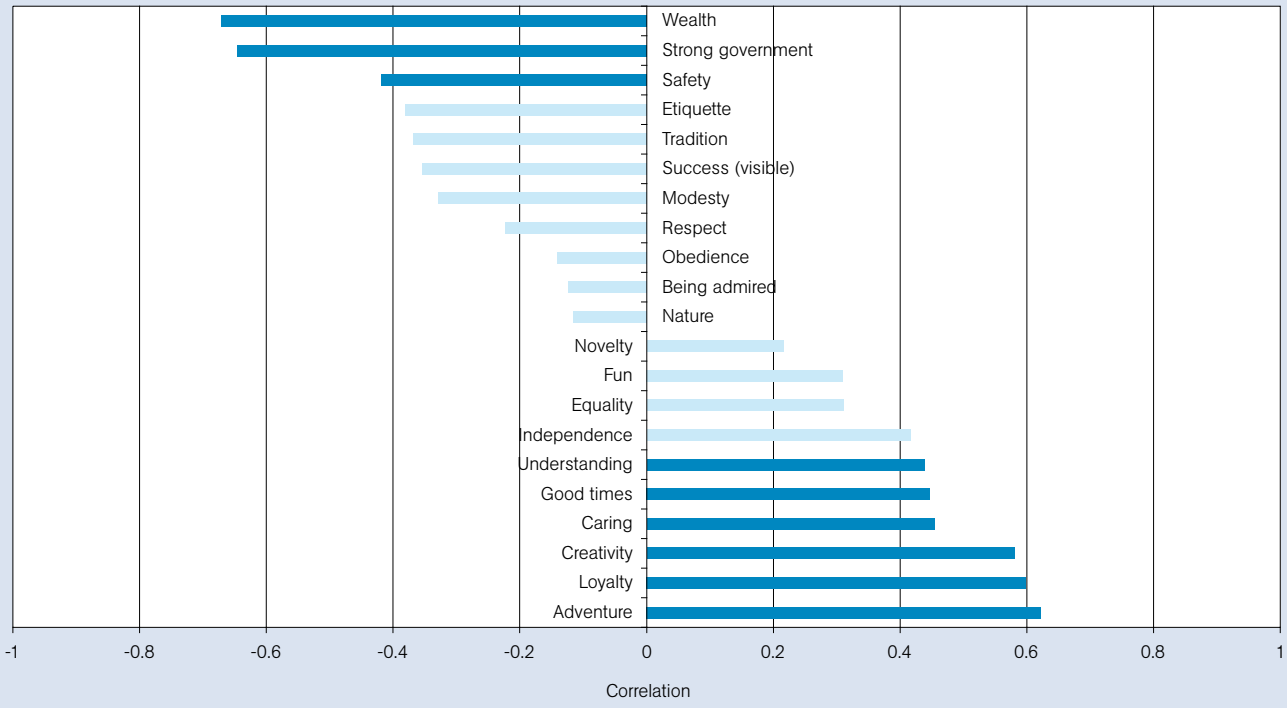
In this section, we review three major factors that could be responsible for mediating a country's input/output efficiency.

Cultural values

Recent research in psychology suggests that people who place high importance on material circumstances – money, looks, possessions, fame – typically report being less satisfied with their lives than people who regard these things as relatively less important.[59] This is not just because relatively poor people are less satisfied and worry more about their material situation than those who are affluent – the relationship holds even when income is taken into account. Psychologist Tim Kasser proposes that the desire for material possessions is an *extrinsic motivation* – in other words, a motivation that is not worthwhile for its own sake but arises from a need for external validation. Evidence suggests that intrinsic motivations are associated with feelings of autonomy and happiness, whilst extrinsic motivations are associated with dissatisfaction and anxiety.[60]

Is it possible that the negative effects of materialism on well-being can be seen in international data? The last *European Social Survey* (conducted in 2004) asked respondents from 24 European countries (including both Western and Eastern Europe) a series of 20 questions about the relative importance, to them, of different aspects of life.[61] We calculated correlations between the average responses to each question for each country and levels of life satisfaction, as assessed in the same survey. Figure 6 shows that mean life satisfaction correlates positively with the values placed on adventure, loyalty and creativity, but negatively with the values placed on strong government and wealth.[62] In other words, those who consider certain values such as loyalty and creativity to be most important are more satisfied with their lives than those who value things such as wealth and strong government more highly.

Figure 6. Correlations between life satisfaction and various values, as assessed in the *European Social Survey* (darker bands indicate statistically significant correlations)



Even stronger evidence comes from the *World Values Survey* (WVS). This includes a battery of questions allowing two scores describing value structure to be calculated for each person. One determines the individual's position on a scale of traditional-secular values, whilst the second defines a location on a scale of materialist-postmaterialist values. Materialist values emphasise economic and physical security, whilst postmaterialist values prioritise self-expression and the quality of life.[63] Our analyses suggest that across 63 countries worldwide (i.e. those that were included in the survey), location on the materialist-postmaterialist scale predicts 68 per cent of variance in countries' mean level of life satisfaction, even controlling for GDP.[64] Extraordinarily, postmaterialism – as measured using this questionnaire – is a better predictor of life satisfaction than GDP. This supports the argument that outlook on life is more important than material conditions in determining well-being. This may well account for why, for example, life satisfaction levels in Central American countries such as Honduras (7.2) are much higher than wealthier countries in North Africa such as Algeria (5.2).

Political conditions

It should come as no surprise that there is a clear association between political systems and life satisfaction. For example, countries rated as *free* by the American centre for democracy, Freedom House (2002)[65] score a full point higher on life satisfaction than those rated as *partly free* or *not free*, and over five points higher on average on the HPI (45.6 vs. 40.2). Also, there is a clear correlation with the World Bank's indicators of governance quality.[66] Most of these relationships remain even when GDP is statistically factored out.[67] For example, a country with a below-average score on the *Voice and Accountability Index* (VAI)– one of the World Bank indicators, and a measure of the level of democracy and rights within a country – is likely to score lower on life satisfaction than one with a relatively high score index.

Table 5. Poor governance diminishes well-being

	VAI	GDP per capita	Life sat.
Kazakhstan	-1.1	$6,700	5.8
Belize	+0.8	$7,000	7.2

Even amongst OECD countries there is considerable variation in governance, and this correlates more strongly with life satisfaction than does GDP,[68] as shown in Figure 7. (Mexico and Turkey have been excluded since they are atypical of OECD members.)

Likewise, a clear pattern exists amongst transition countries, with those closer to full democracy (for example, Slovenia) reporting higher life satisfaction than those with less democratic regimes (for example, Belarus).[69]

This evidence strongly suggests that macro-level factors, such as political system and governance quality, partially determine levels of life satisfaction and may account for intra-regional differences in the HPI.

Table 6. Democracy gradings and life satisfaction for the transition countries

Grade	Life satisfaction
A (Slovenia)	6.6
A- (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, and Slovakia)	5.4
B (Bulgaria, Croatia and Romania)	5.1
C (Albania, Macedonia, Moldova, Russia, and Ukraine)	4.2
D (Belarus, Bosnia and Herzegovina)	4.6

Figure 7. Scatterplot of VAI vs. life satisfaction in OECD countries

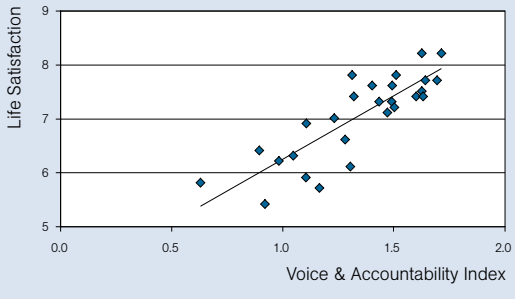


Table 7. Pairs of countries matched by GDP per capita, HDI and Footprint

High life satisfaction – group 1		Low life satisfaction – group 2	
Uganda		Moldova	
Vietnam		India	
Philippines		Turkey	
Peru		Ukraine	
Venezuela		Macedonia	
Mexico		Russia	
Chile		Latvia	
Argentina		Lithuania	
Malta		Portugal	
means		***means***	
Life satisfaction	6.6	Life satisfaction	4.7
Life expectancy	70.8	Life expectancy	69.6
Footprint	2.0	Footprint	3.1
GDP per cap	$7,514	GDP per cap	$8,087
HDI	0.77	HDI	0.77
HPI	**52.5**	**HPI**	**33.0**

Social capital

Many academics and policy-makers have highlighted the importance of social networks and community – known, broadly if imprecisely, as social capital – in contributing to individual well-being. For example, Haggerty *et al* consider participation and community as component domains of overall quality of life.[70] Various studies have proposed that people with many friends, and who are active in the community, are happier than those who are more solitary.[71]

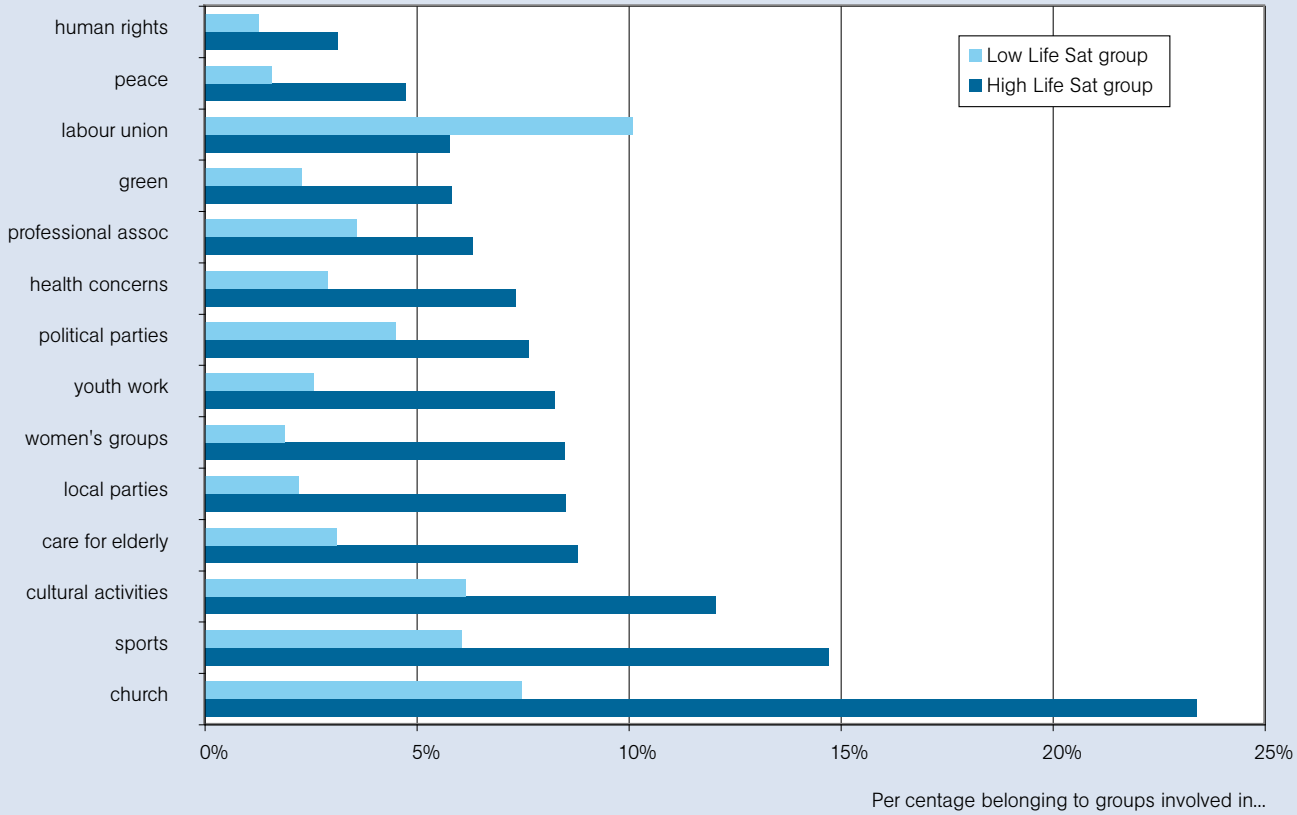
Differences in social capital seem a promising avenue for explaining some variation between countries. Cross-nationally, we can examine this by comparing subjective ratings of life satisfaction with a commonly used indicator of social capital – the percentage of people taking part in associational life.[72]

Table 7 shows nine pairs of countries that have been selected because they have differing levels of life satisfaction,[73] but similar GDP, HDI, life expectancy, and Footprint.[74] Figure 8 shows the numbers of respondents claiming to be involved in the following types of groups and associations, with the two groups of countries in different colours.

The pattern is striking. For all types of association, with the exception of labour unions, participation is much higher in the countries with higher life satisfaction. Despite the small number of countries compared, this difference is statistically significant for 11 types of association, and also significant when taking all types of association together. This is clear evidence that associational life, a well-recognised proxy for social capital, is related to higher levels of life satisfaction.

Moreover, it hardly escapes attention that Latin American countries – which, as a group, perform well in the HPI – dominate the high life satisfaction group, whilst the post-communist countries dominate the low life satisfaction group.

Figure 8. Higher social capital in countries with high life satisfaction



Box 5: Sustainable well-being? Country size, natural resources and export pressure

If the ultimate end – well-being – is to be sustainable over the long term, the fundamental input – planetary resources – must be managed carefully. Ecological footprint is a measure of consumption and not sustainability. Specifically, whilst a high Footprint almost always suggests a level of current resource consumption that is unsustainable over the long term, a low Footprint does not automatically imply that resource use *is* sustainable.

One reason is that Footprint takes little account of resource degradation. In a country with abundant natural resources, poor stewardship of natural capital, such as land, water, forest and fishing stocks, may be problematic in the long term but a less immediate problem in the short term. For instance, Russia and Japan both have a similar Footprint (4.4 and 4.3, respectively); but this is an estimate of per capita consumption, made without regard to locally available resources. Russia's vast stock of natural resources endows it with a biocapacity over 10 times that of Japan.[75] Whereas the Russians could self-sufficiently maintain relatively high levels of consumption for many years, Japanese consumption is already largely reliant on imports from the rest of the world.

Resource degradation is a serious problem for many small countries. Central American countries perform well on the HPI due, in part, to their low Footprint. However, many have suffered serious resource degradation as a result of both internal pressure from growing populations and external pressure from international agribusiness. Intensive methods of cash-crop production seek to increase production efficiency by using monoculture, fertiliser and pesticides. If not managed carefully, these can be a significant contributory to soil degradation. In some countries the extent of damage is extreme. For instance, human-induced land degradation in El Salvador is classified by the UN as *serious* for 94 per cent of available land – this is largely attributable to water erosion resulting from intensive agriculture.[76]

Of course, this kind of land degradation occurs in many countries, large and small. Such practices are always unsustainable in the long term, since the damage they cause is fundamentally irreversible. But the urgency of the problem is greater for small, relatively poor countries – especially those whose economies are largely export-driven.

Countries at the top of the HPI[77]

1st place: Vanuatu — Life sat: 7.4 — Life exp: 68.6 years — Footprint: 1.1 — HPI: 68.2

Vanuatu is an archipelago in the western Pacific, made up of over 80 islands, 65 of which are inhabited by a population approaching a quarter of a million. Vanuatu has over 2,500 km of exposed coastline, and no regular military. Despite its petite, per person ecological footprint (no higher than such pre-industrialised countries as Mali and Swaziland), it has a life expectancy matching Turkey and an estimated life satisfaction as high as nearby New Zealand. This estimate is based on three main national attributes: 1. reasonable longevity; 2. extremely rich natural capita, with unspoilt coastlines and unique rainforests; and 3. excellent levels of democracy.

According to the World Bank, Vanuatu has the highest levels of VAI in the region, even matching EU member Lithuania. This is not surprising. Gaining its independence in 1980, Vanuatu has been consistently democratic and peaceful, despite its immense cultural diversity. (There are over 100 local languages accounting for three-quarters of what is spoken.)

The economy is based largely on small-scale agriculture which provides livelihoods for 65 per cent of the population. The local market is also served by an indigenous light industry. It has few commodity exports and is remote from international markets. Government revenue comes largely from duties imposed on imports.

Vanuatu also typifies many of the characteristics of island economies that lead them to perform well on the HPI – although it shares with many islands a vulnerability to tropical cyclones and typhoons, a problem likely to be exacerbated by global warming.

Lastly, without claiming any causal link, we wonder if it is mere coincidence that the chorus of Vanuatu's national anthem (*Yumi, Yumi, Yumi* – "We, we, we") hails "We are happy to proclaim that we are the people of Vanuatu"!

2nd place: Colombia — Life sat: 7.2 — Life exp: 72.4 years — Footprint: 1.3 — HPI: 67.2

The fact that Colombia scores so well in the HPI will inevitably surprise, or even shock some people. Yet that is what the figures show, based on an entirely neutral methodology. It has high life expectancy (the same as Hungary) and high life satisfaction (the same as Germany), all for a quarter of Western Europe's per capita consumption of natural resources.

British writer Matt Rendell spends half the year in Columbia and is married to a Colombian. He offers some sociological insights, highlighting the strong social capital and digging beneath the movie-caricature of a country overrun by the drugs trade.

> "In some respects Colombia is similar to Italy (a country with particularly high levels of reported social capital). It has very strong regional identities, each with its own cuisine, use of language or dialect, its own music and dance. It has almost every climate in the world. And, as a result, one of the widest ranges of fresh fruit and vegetables on earth.
>
> It is also one of the most modern and economically stable countries in Latin America and has been so for 100 years. Colombia has never had the type of hyper inflation common to other countries in the region and its brief experience of military dictatorship was not of the malignant kind found elsewhere.
>
> One reason why people may be surprised about Colombia's position is because the Western media focuses on the country's problems but not its vibrant civil society. Colombians love music, sport, and beauty. They also have very high educational and healthcare standards.
>
> Urban life in Colombia is complex and rich in the way that it is in cities anywhere in the world. There is conflict in the countryside and, like in cities in most other countries including the UK, there are no-go areas. But on the whole such areas are localised.
>
> For historical reasons there is corruption and cocaine. And pressure from the insatiable appetite for drugs in Western economies makes it virtually impossible for Colombians to shed a trade that 40 million people regard with shame. But, people should also remember that 40 million Colombians have never seen cocaine, and live generous, law abiding and valuable lives. Rather like Britain in the 19th century, Colombia's oligarchy also has a profound tradition of philanthropy, if only to justify position in society
>
> Colombia has the trappings of modernity but with a profound spirituality. Its particular brand of Catholicism has blended over centuries with indigenous spiritualities and is manifested in its dance and music.
>
> Colombians are surrounded by natural splendours and haven't grown immured to beauty of their own country. In my experience they tend to be amazed on a daily basis by the beauty of their landscapes. In this sense it is a country of elevated spirits who look towards the sky."

3rd place: Costa Rica Life sat: 7.6 Life exp: 78.2 years Footprint: 2.1 HPI: 66.0

Costa Rica stands out as a haven of peace amongst the often troubled countries in Central America. Once dubbed the *Switzerland of Central America*, it abolished its army in 1948, which contributed to the consolidation of democratic institutions and freed up resources to invest in health and education. It has a free press, and civil and political rights have been protected since the 1950s.

Costa Rica's citizens enjoy the highest life expectancy in the Western hemisphere. Its social indicators are the best in Latin America and, in some cases, approach levels prevailing in advanced economies. Mandatory primary education was established as early as the beginning of the twentieth century, and it achieved almost universal adult literacy by the early 1990s.

With tropical forests hosting a wide range of flora and fauna, and coastlines along the Pacific Ocean and the Caribbean, Costa Rica is also a favoured tourist destination. Despite its small size, the country hosts an estimated half a million species and a significant range of habitats, making it one of the 20 countries in the world with the richest biodiversity. To preserve its environment, Costa Rica runs an ambitious conservation programme, which may be the most developed among tropical rainforest countries, protecting more than 10 per cent of the country. Since 1995, almost one-third of the country has been protected in national parks and privately owned preserves. Also, around two-thirds of its remaining rainforests are protected.

Countries at the bottom of the HPI

176th place: Burundi Life sat: 3.0 Life exp: 43.6 years Footprint: 0.7 HPI: 19.0

After over a decade of civil war, it seems that Burundi is finally taking the last steps on the road to peace. Tension between the dominant Tutsi minority and the Hutu majority, much of which is believed to have originated during colonial rule, has plagued the nation since independence in 1961. In 1993, this tension escalated as the first democratically elected president, a Hutu, was assassinated shortly after the election. This sparked years of Hutu-Tutsi violence, in which an estimated 300,000 people, mainly civilians, were killed.

The violence has left the country in turmoil. Approximately one-sixth of the population had been uprooted by the end of 2000. In addition, the conflict has left grave environmental scars. Large numbers of refugees and internally displaced people fleeing the war have cut down significant numbers of trees for firewood and to build shelters, and their cattle have overgrazed, stripping land of all vegetation.

Its troubled past makes it difficult for Burundi to move forward. Justice needs to be carefully balanced with reconciliation, to reassure the Tutsi minority that the Hutu Government will not seek retribution. But perhaps Burundi's biggest challenge lies with the next generation. Throughout the conflict, children have been forced to perpetrate and witness violence. They have been displaced from their homes and have been left as heads of households. They have become infected with HIV/AIDS and have been made victims of sexual violence. Many live in extreme poverty with little access to healthcare and education, in fear of abduction and forcible recruitment as soldiers. An estimated 7,000 children have been recruited into armed groups and 654,000 children are working on plantations, in construction and in mines.

Health is also a serious issue. Almost half of the children under five are chronically malnourished or stunted, and over half suffer from anaemia. Twenty per cent of the children die before the age of five, primarily from malaria, diarrhoea, pneumonia, HIV/AIDS and poor nutrition.

177th place: Swaziland Life sat: 4.2 Life exp: 32.5 years Footprint: 1.1 HPI: 18.4

Swaziland is a small mountainous country, almost completely surrounded by South Africa. It is one of the world's last remaining absolute monarchies and the King has only recently – and reluctantly – allowed political activity.

Persistent drought, population pressure on available land and water resources, and an overabundance of grazing cattle have accumulated into serious environmental and humanitarian problems in the kingdom. In 2004, after four years of drought and approximately one-quarter of the population in need of food aid, Swaziland was forced to declare a national emergency to secure humanitarian aid from foreign donors.

Two-thirds of the population live in chronic poverty and unemployment has been estimated as high as 45 per cent. The employment market has also proved highly vulnerable to fluctuations in international markets. In 2005, thousands of workers were laid off and several co-operatives failed after currency appreciation and cheaper Brazilian sugar made the local produce uncompetitive internationally. The price the EU pays for sugar is also expected to decline drastically from 2006, which could lead to even further lay-offs. In addition, clothing manufacturers have suffered from Chinese competition.

HIV/AIDS is a huge problem: Swaziland now has the highest prevalence rate in the world, and it is estimated to continue to increase. At the end of 2003 it was estimated that almost four in ten adults were living with HIV/AIDS. In addition, an estimated 16,000 children were living with HIV/AIDS, and the HIV prevalence in pregnant women has increased from 4 per cent in 1992 to 39 per cent in 2003.

178th place: Zimbabwe Life sat: 3.3 Life exp: 36.9 years Footprint: 1.0 HPI: 16.6

The stunning Victoria Falls, one of the natural wonders of the world, the stone enclosures of Great Zimbabwe, remnants of a past empire, and a diverse fauna, all put Zimbabwe high on a list of countries of both historical and environmental importance. But behind the beautiful setting, is a country in tatters. After many years as a colony and with a controversial constitution favouring whites in power, the country finally held free elections in 1979 and gained independence in 1980. The democracy, however, turned out to be frail and the nation's first prime minister has been the country's only ruler since, despite persistent claims of rigged elections.

A controversial land-reform programme has severely damaged the commercial farming sector, and involvement in the war in the Democratic Republic of Congo has drained the economy even further. Between 1998 and 2005 the official annual inflation rate rose from 32 per cent to a staggering 585 per cent. In addition, a failure in the 2005 crop meant that over three million people had to rely on international aid.

A drained economy leaves little resources to combat health and poverty levels, and the evidence is multiple. Eighty per cent of the population lives on less than US$2 a day. HIV/AIDS has hit the country particularly bad, and according to the UN over 3,200 people die each week from AIDS; 1.8 million Zimbabweans are living with HIV and AIDS; and there are an estimated 1.3 million orphans. Life expectancy has fallen dramatically, from 57 years in 1992 to 37 in 2003. This tragic decline in the country's health, economy, and political system no doubt contributes to its shockingly low levels of reported life satisfaction.

Conclusion: does happiness have to cost the Earth?

In short, no. As the HPI clearly demonstrates, there are different routes to achieving comparable levels of well-being. The model followed by the West can provide widespread longevity and good life satisfaction, but it does so only at a vast and ultimately counter-productive cost in terms of resource consumption.

The anthropologist Jared Diamond argues persuasively in his book *Collapse* that throughout history civilisations have failed because they did not recognise when their ways of life were exceeding environmental limits.[78] Brute common sense tells us that it will be impossible for every country in the world to live as we do in the West when this is driven by a level of resource consumption that exceeds the physical limits of the planet. However, the HPI shows that this is not the only path to development – similar levels of well-being can be achieved at far less ecological cost.

Moreover, recent research suggests that life in contemporary Western society is less idyllic than either GDP, HDI or any other of the standard measures of progress would suggest. Rates of depression seem to be rising across all age groups,[79] and there are upwards trends in drug abuse, suicidal behaviour, and crime amongst young people in countries across the Western world.[80]

The authors of one large-scale international review concluded that these psychosocial problems were less attributable to social and economic inequality and more to fundamental changes in value structures, in particular "the shift towards individualistic values".[81] And, as discussed above, much recent research in psychology suggests that the culture of consumerism is actively detrimental to psychological well-being. Reviewing a large amount of evidence on the relationship between society and health, epidemiologist Richard Eckersley has suggested that modern Western culture should itself be considered a "health hazard".[82]

If true, this is a conclusion that many in the West will find difficult to swallow. So endemic is the belief that a good life depends on having money and material possessions that it is almost inconceivable that people could be as happy as we are (or at least think we are) without those things. In the UK at least, and probably in other Western countries too, our view of many developing countries is strongly tainted by negative portrayals in the media. But as Matt Rendell notes in his writing about Columbia, the Western caricature of the country could hardly be more sharply divergent from the reality of life for an overwhelming majority of Columbians – this is probably the case for many other countries, too.

We might think that the vast number of immigrants coming to the West is itself evidence that our life is inherently better. The reality, however, is that these immigrants represent a tiny proportion of the overall populations of their countries of origin. Many are lured by false images of the luxurious Western lifestyle and their dreams are shattered by a reality which is bereft of luxury and, for many, of spiritual or community value.[83] It is a peculiarly Western arrogance which assumes that people with little in the way of material wealth cannot possibly have as high levels of well-being as the world's richest.

For all this, we should state again that the HPI is not intended to denote the best country in the world to live. It is doubtless possible to find people who are extremely satisfied with their lives in every country in the world, as well as people who are dissatisfied. A good score on the HPI does not

suggest that there are no problems in a country, that distribution of well-being or resource consumption is equitable, or indeed that current levels of well-being and consumption are sustainable.

It is also important to emphasise that the very poorest countries clearly benefit to some extent from economic growth, both at local and national levels. Recent research by **nef** suggests, however, that a model of development that focuses on global growth is seriously inefficient from the perspective of poverty reduction, and is getting worse.[84]

If well-being and not wealth is the ultimate aim of development, efforts must be made to ensure that countries do not develop economically *at the expense of* other aspects of life, such as social capital, which make an important contribution to well-being. As noted earlier in this report, one very plausible explanation for the exceptionally poor showing of the transition countries in the HPI is the significant breakdown in social networks that were set in train during the rapid industrial growth of the Soviet era.

A Global Manifesto for a happier planet

There is increasing consensus surrounding the idea that we need to harness the Earth's resources more efficiently. Changing this in practice is a hard task, as some countries' intransigence over the Kyoto Protocol demonstrates only too well.

Where do we go from here: the HPI and implications for policy

The orthodoxy of economic growth is so deeply ingrained that any policies which challenge its prime position as the measure of success are considered heretical. The HPI demonstrates clearly, however, that it is possible to combine high levels of well-being with less consumption.

In terms of improving longevity, there are ultimate limits that medical science will probably never transcend, at least in the sense that a long life is understood today. However, the key issue is arguably not years of life *per se*, but years of life spent happily. These issues are, in any case, systematically intertwined. Levels of life satisfaction and longevity are strongly related between countries at the population level.[85] At the individual level it is known that happy people live longer than unhappy people.[86] Good health is probably both a cause and an effect of high levels of well-being. Once the physical needs for shelter, secure food supplies, clean water, and basic access to healthcare are met – and for the majority of the world's population this is far from guaranteed – then health and well-being policies are likely to be broadly aligned.

Most recent research into happiness and well-being has been based on analyses of people's life satisfaction. Some researchers argue that up to 50 per cent of variation in ratings of life satisfaction can be attributed to trait factors; in other words, a predisposition to be happy – probably the result of both genetic and early environment factors.[87] Inevitably, material circumstances, such as income and possessions, as well as environmental factors, such as neighbourhood, also play a role in happiness. Once basic needs have been met, however, people tend to adapt quickly to material changes. When you receive a pay rise, or buy a new car, you may be happier for a while but the novelty and psychological benefit soon wear off.[88] In fact, material circumstances account for only around ten per cent of the overall variation in happiness in Western countries.

Much more significant are *intentional activities*, which are estimated to explain around 40 per cent of variation in reported happiness.[89] These include things such as socialising, exercising, and participating in cultural life, as well as activities in which you have to think and to use your mind, like working towards goals, taking an interest in others, and being engaged by meaningful work. Adaptation rarely occurs for these kinds of activities – the effect doesn't wear off in the same way as when you acquire more things – and it is clear that this is the area where there is the most scope for making a positive difference to well-being.

Arguably, the biggest challenge to policy in the whole body of well-being research is that we devote too much time to increasing our material standard of living and not enough time to fostering our relationships and engaging in personally meaningful and engaging pursuits. There is no reason why working life cannot play a part in providing both of these.

So, what actions do we need to take? In 2004 **nef** published a *Well-being Manifesto* in which we outlined eight broad areas of UK policy where a well-being focus would have a significant impact. Whilst many of these policy areas have a resonance beyond the UK, the international data on which the HPI is

Table 8. Summary of each country's position in terms of Happy Life Years (HLY) and Footprint

HLY \ Footprint	< 1 planet	1–2 planets	> 2 planets
Good	**47 million people (0.8%)** Colombia, Panama, Saint Lucia, Saint Vincent and the Grenadines, Vanuatu	**209 million people (3.4%)** Antigua and Barbuda, Argentina, Barbados, Chile, Costa Rica, Dominica, Malaysia, Malta, Mexico, Saint Kitts and Nevis, Seychelles, Suriname, Venezuela	**895 million people (14.6%)** Australia, Austria, Bahamas, Bahrain, Belgium, Brunei Darussalam, Canada, Cyprus, Denmark, Finland, France, Germany, Hong Kong, Iceland, Ireland, Israel, Italy, Japan, Kuwait, Luxembourg, Netherlands, New Zealand, Norway, Oman, Qatar, Saudi Arabia, Singapore, Slovenia, Spain, Sweden, Switzerland, United Arab Emirates, United Kingdom, United States of America
Medium	**2,065 million people (33.8%)** Algeria, Bangladesh, Bhutan, Cape Verde, China, Comoros, Cuba, Dominican Republic, Ecuador, El Salvador, Fiji, Guatemala, Guyana, Honduras, Indonesia, Kyrgyzstan, Maldives, Morocco, Nicaragua, Palestine, Peru, Philippines, Samoa (Western), São Tomé and Principe, Solomon Islands, Sri Lanka, Tajikistan, Thailand, Timor-Leste, Tonga, Tunisia, Vietnam, Yemen	**537 million people (8.8%)** Belize, Bosnia and Herzegovina, Brazil, Croatia, Grenada, Hungary, Iran, Jamaica, Jordan, Kazakhstan, Korea, Lebanon, Libya, Macedonia, Mauritius, Mongolia, Paraguay, Poland, Romania, Slovakia, Syria, Trinidad and Tobago, Turkey, Uruguay, Uzbekistan	**56 million people (0.9%)** Czech Republic, Estonia, Greece, Portugal, Taiwan,
Poor	**2,039 million people (33.3%)** Albania, Angola, Armenia, Azerbaijan, Benin, Bolivia, Botswana, Burkina Faso, Burma, Burundi, Cambodia, Cameroon, Central African Republic, Chad, Congo, Côte d'Ivoire, Dem Rep of the Congo, Djibouti, Egypt, Eritrea, Ethiopia, Gabon, Gambia, Georgia, Ghana, Guinea, Guinea-Bissau, Haiti, India, Kenya, Laos, Lesotho, Madagascar, Malawi, Mali, Mauritania, Moldova, Mozambique, Namibia, Nepal, Niger, Nigeria, Pakistan, Papua New Guinea, Rwanda, Senegal, Sierra Leone, Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia, Zimbabwe	**117 million people (1.9%)** Belarus, Bulgaria, Equatorial Guinea, South Africa, Turkmenistan, Ukraine,	**151 million people (2.5%)** Latvia, Lithuania, Russia

built brings new insights. For example, it is clear that differences in well-being do occur between regions with similar levels of per capita GDP, such as Latin America and former Communist Eastern Europe. From our analysis we can argue that these differences are associated with social and natural capital, health, value structures, and levels of democracy.[90] We need to think about how our global system is designed, and about the issues which we most value. We need a shift in focus to ensure we increase our well-being in a way which is environmentally sustainable and socially just. Our *Global Manifesto for a happier planet* makes recommendations for each component of the HPI. Table 7 shows how each country fares on HLY and Footprint, providing an indication of which component policy-makers need to prioritise.

Life expectancy

1. ***Eradicate extreme poverty and hunger.*** Recognise that increasing material wealth in (so-called) developed countries does not lead to greater happiness, and that extreme poverty systematically undermines people's opportunities to build good lives for themselves and their families. We urgently need to re-design our global systems to more equitably distribute the things people rely on for their day-to-day livelihoods, for example: income, and access to land, food and other resources.

2. ***Improve healthcare.*** High life expectancy in a country reflects good healthcare and living conditions, and has a positive relationship to people's sense of well-being. Globally we need to increase access to clean water, halt the rise in diseases such as HIV/AIDS and malaria, and reduce child and maternal mortality. The World Health Organization estimates that everyone in the world could be provided with a good level of basic healthcare for just $43 per person, per year.

3. ***Relieve debt.*** Many developing countries are forced to prioritise the service of crippling financial debt over providing a basic standard of living. Debt sustainability calculations should be based on the amount of revenue that a government can be expected to raise *without increasing poverty* or compromising future development.[91]

Life satisfaction

4. ***Shifting values.*** Value systems that emphasise individualism and material consumption are detrimental to well-being, whereas those that promote social interaction and a sense of relatedness are profoundly positive. Government should provide more support for local community initiatives, sports teams, arts projects and so on, whilst acting to discourage the development of materialist values where possible (for example, by banning advertising directed at children).

5. ***Support meaningful lives.*** Governments should recognise the contribution of individuals to economic, social, cultural, and civic life and value unpaid activity. Employers should be encouraged to enable their employees to work flexibly, allowing them to develop full lives outside of the workplace and make time to undertake voluntary work. They should also strive to provide challenges and opportunities for personal development at work.

6. ***Empower people and promote good governance.*** A sense of autonomy is important at all levels for people to thrive, and there is growing evidence that engaging citizens in democratic processes[92] leads to both a more vibrant society and happier citizens.[93] Promoting open and effective governance nationally and internationally, including the peaceful resolution of conflicts and elimination of systematic corruption, is important for all of us achieving greater well-being in the long term.

Ecological footprint

7. ***Identify environmental limits and design economic policy to work within them.*** The ecological footprint gives us a measure of the earth's biocapacity that, if over-stretched, leads to long-term environmental degradation. Globally we need to live within our environmental means. One-planet living should become an official target of government policy with a pathway and timetable to achieve it. (The UK currently consumes at just over three times this level. If everyone in the world consumed as we do in the UK, we would need 3.1 planets like Earth to support us.)

8. ***Design systems for sustainable consumption and production.*** We need to reverse the loss of environmental resources, conserve our ecosystems and integrate a sustainable development approach throughout the global community. Ecological taxation can be used to make the price of goods include their full environmental cost, and to encourage behaviour change. Clear consistent labelling that warns of the consequences of consumption, as with tobacco, would also help, as well as giving manufacturers full life-cycle responsibility for what they produce.

9. ***Work to tackle climate change.*** For the UK to play its part in preventing catastrophic and irreversible global warming it is estimated that we will need to cut our greenhouse gas emissions by at least three per cent every year. More broadly, rich countries need to meet and exceed their targets for reducing greenhouse gas emissions set under the Kyoto Protocol, cutting emissions to a level commensurate with halting global warming so that temperature rise is kept well below 2°C. After 2012, and in subsequent commitment periods of the Kyoto Protocol, emissions cuts should put industrialised countries on track to savings of up to 80 per cent by 2050.

And finally,

10. ***Measure what matters.*** People all over the world want to lead happy and complete lives, but we all share just one planet to live on. We urgently need our political organisations to embrace and apply new measures of progress, such as the HPI and adjusted GDP indicators.[94] Only then will we be equipped to address the twin challenges of delivering well-being for all whilst remaining within genuine environmental limits.

Appendix 1: Data limitations

As with any index constructed from multiple data sets, the HPI is subject to limitations. Our intention is that development of the HPI methodology will be ongoing and in particular that the quality of available data will improve over time. The major issues are summarised briefly below.

1. Need for more and better data

The first reservation is simply that existing data is not comprehensive. In compiling the Index we were forced to estimate data on Footprint and life satisfaction for several countries (full details of this are given in Appendix 2). These estimates were validated statistically, and we are confident that they are as robust as possible. In particular, our life satisfaction data set is arguably the most complete and accurate available in the current literature. Nevertheless, there is plenty of room for more and better primary data. Ideally, more countries would follow the example of Bhutan and start to produce national well-being accounts. Failing this, more large-sample surveys should be conducted, along the lines of the WVS.

Calculating a country's ecological footprint is a complex process, requiring numerous different data sets. The Global Footprint Network is constantly revising and improving its methodology and data sources. However, there are obvious problems with the data from some countries, especially when it is collected and distributed by the country's government.

2. Limitations of self-report data

Whilst they are quite common in the research literature, comparisons of self-reported life satisfaction between different cultures are somewhat controversial and a number of specific concerns have been raised. These provide important caveats for interpreting the HPI and it is worth considering them in some detail.

Translation

Can we be sure that questions mean exactly the same thing in different languages? Basic emotions, such as happiness, have relatively unambiguous equivalents in most languages, and studies suggest that bilingual people give the same answers when asked in both languages. More subtle concepts such as satisfaction, however, may have no direct analogue in some languages. Using a battery of different questions that ask the same thing in slightly different ways is a standard means of ensuring that differences across countries are not attributable to anomalous translation. However, most international surveys have – for reasons of economy – used only one question, increasing the chances of error.

Reference group effects

A 5' 9" man might describe himself as short if he were Dutch, but tall if he were Japanese. Similarly an averagely happy woman might say she were happy if she were surrounded by miserable people but quite sad if everyone around her was ecstatic. A strong reference group effect would have an attenuating effect on differences between countries – if everyone rates their life satisfaction relative to their compatriots, then all countries will tend to average around five out of ten. The fact that clear differences exist between countries suggests that the reference group effect is not as pervasive as one might fear. It may be, for instance, that people compare themselves to the levels of happiness they perceive exist in other nations. Nevertheless, some non-intuitive cross-cultural comparison findings have been blamed on this effect.[95]

Motivational differences and social norms

One issue which has preoccupied many researchers is the possibility that people answer questions on life satisfaction based on how they feel they *should* present themselves, not on how they genuinely feel. In some cultures, social norms dictate modesty and discourage people from drawing attention to themselves, whilst in others there may be a pressure to demonstrate success or to avoid being seen to complain. This difference is particularly acute between so-called individualistic cultures, exemplified by the US, and collectivistic ones such as Japan and China. Compared with Westerners the Chinese and Japanese are known to underrate local facilities that are excellent by objective standards.[96] Differences also exist between cultures that are less obviously contrasting. For instance, Americans have lower life expectancies on average than the French, yet rate their health better than most people in France do.[97]

Response bias

Typically, respondents are asked to report their life satisfaction on a scale of 0 to10. As the midpoint is 5, one might reasonably expect the mean score across a large population to be around 5. In fact, this is rarely the case; in most countries, the average is well above 5 (in Western societies, someone responding with a 5 is likely to suffer from depressive symptoms). If this positive bias were universal and unvarying across cultures, it would not be a cause for concern. It is possible, however, that some cultures picture the centre point to be at a different position than others – further research needs to be done to explore this issue.

A second, related issue is 'central tendency bias', which is the tendency of some respondents to avoid extreme responses. One cross-cultural study posed a series of statements to which respondents had to agree or disagree. Japanese and Taiwanese students were less likely to express either strong agreement or disagreement, whilst Americans, and to some extent Canadians, went for extreme answers more often.[98] In this particular case these biases did not affect the cross-national comparisons because the tendency to strongly rather than mildly agree cancelled out the tendency to strongly rather than mildly disagree. Generally, however, this only happens when the distribution of respondents is split evenly between satisfied and dissatisfied – in most real-world surveys this is unlikely.

A third kind of response bias is caused by variation in how the verbal descriptions anchoring the scale are interpreted. For instance, 'extremely satisfied' is potentially ambiguous: if it is read to mean 'as satisfied as I can possibly imagine' then few, if any respondents will give a 10, but if it is interpreted as, say, 'more satisfied than most people' then many may do so. Differences of this kind may be cultural, but as yet there is little empirical evidence.

In summary

With the exception of the first, it is fair to say that none of these debates has been satisfactorily resolved. Nevertheless, there is broad agreement that subjective life satisfaction data is a useful means of making international comparisons, especially when based on data that uses a battery of questions to probe different dimensions of life satisfaction. Future research on life satisfaction (and thus future incarnations of the HPI) will benefit greatly from the use of more sophisticated surveys, including a range of questions that probe different aspects of life satisfaction. This work is already beginning: **nef** is a partner in the forthcoming *European Social Survey*, which will be the first large cross-national survey to employ a truly multi-dimensional model of well-being, with an associated battery of questions.[99]

3. Limitations of the ecological footprint

From the point of view of the HPI, the ecological footprint has two weaknesses. First, it is extremely anthropocentric. The threshold at which it is currently most usually set is based on supporting the needs of human life, and does not include the biocapacity needed for wild species. The reason for this is partly to reflect the actual human-centred approach to natural resource management, but also to show that, even using this extremely conservative baseline, we are already in ecological overshoot. A less anthropocentric approach paints an even more worrying picture of our collective predicament. And, none but the most hard-headed anti-environmentalist would argue that a future with severely limited plant and animal diversity is an acceptable outcome of human development, let alone sustainable. Recalibrating to account for wild species' need for biocapacity, the 'one-planet living' limit would be considerably lower than the 1.8 used in interpreting the HPI, and all countries would perform worse as a result.

Secondly, as noted early in the report, available biocapacity can change depending on the economic model and the manner of our natural resource management. In this sense, the Footprint is a snapshot in time. It is also primarily a measure of consumption and says little about the quality of environmental management in any particular country.

Appendix 2: Data sources and estimation procedures

Our data set includes the 177 countries and entities detailed in the latest UN *Human Development Reports* (2004 and 2005),[100] plus Taiwan. As such, several countries which the HDR did not assess are not included here (including Iraq, Afghanistan, Liberia, and Somalia).

Life expectancy

We used life expectancy at birth in 2003, taken from the UN *Human Development Report.*[101]

Ecological footprint

For 144 countries Footprint was taken directly from the WWF and Global Footprint Networks' *Living Planet Report 2004.*[102] For the remaining 34 nations, we estimated Footprint using statistical regression models based on other relevant data. For the majority (23), we used a model which included data on GDP per capita, CO_2 emissions,[103] levels of urbanisation[104] and latitude. For eight other countries, further data was available in the form of energy consumption,[105] which provided a better-fitting model. For the three remaining regions (Palestine, Taiwan and Timor-Leste), no consumption or emission data was available, meaning we had to resort simply to GDP per capita, latitude and land area. All of these models provided a statistically significant and acceptably strong fit to the data – even the worst performing model explained 86 per cent of variance in Footprint.[106]

Life satisfaction

The life satisfaction scores used to calculate the HPI were mostly drawn from four sources (as indicated in Table 4). The sources are described in detail here:

1. Ruut Veenhoven's *World Database of Happiness.*[107] This, our main data set, is primarily based on results from the WVS,[108] from 1995 to 2005. Respondents were asked the following question:

   "All things considered, how satisfied are you with your life as a whole these days?"

   A score of 1 was anchored with the word 'dissatisfied', whilst a score of 10 was anchored with 'satisfied'. Veenhoven transformed the scale so that it ranges from 0 to10, and produced a weighted average based on the results from up to 13 surveys, including several waves of the WVS, for any given country. This data was used directly for 64 countries.

   Also included in Veenhoven's database was data from a different question:

   "Suppose the top of the ladder represents the best possible life for you and the bottom of the ladder the worst possible life. Where on this ladder do you feel you personally stand at the present time?"

   Responses on this question were scored from 0 to10, but a transformation was required so that the results would be comparable with those from the *World Values Survey*. In the end, most of the scores derived from this source were excluded, as they appeared to underestimate life satisfaction relative to the other data. Only four were included, due to lack of the availability of any other data.

2. The WHO's *World Health Survey* (2002).[109] This contained no specific question on life satisfaction. Theoretical assumptions, however, suggested that the responses to three other questions within the survey might be used to estimate life satisfaction. The questions were as follows:

   "How often have you felt that you were unable to control the important things in your life?"

"How often have you found that you could not cope with all the things that you had to do?"

"How satisfied are you with your health?"

Performing a linear regression on the 24 countries for which data was available from both the *World Database of Happiness* and the *World Health Survey*, we found a model predicting life satisfaction from the former using data from questions 2 and 3 from the latter,[110] with $R^2 = 0.56$. This model was used to predict life satisfaction values for 21 further countries, although these figures were only incorporated into the data set when they appeared to be roughly corroborated by those predicted by our main regression analysis (see point 5, below). As a result, this source was only used for 11 countries. An example of rejection is Laos, whose life satisfaction was estimated from objective data to be 5.4 (see point 5). Had we used the *World Health Survey* data, we would have had to assign it a life satisfaction of 8 – well above that of neighbouring countries such as Cambodia and Vietnam.

3. The *Latinobarometer*.[111] Exploration of the sample distributions of *World Values Survey* data suggested that the data for Latin America may be subject to sample biases. In particular, whilst the income distribution of these countries seemed well represented in the samples, there appeared to be a slight bias towards the urbanised and well-educated. Whilst there is no reason to assume urban populations would report higher life satisfaction than rural (if anything, one might expect the opposite when income is controlled for), we decided to use an alternative source, the *Latinobarometer* survey, which we believe to be better suited to the regional context. Life satisfaction data was based on a single question:

   "In general, would you say that you are satisfied with your life? Would you say that you are:

   1. very satisfied

   2. fairly satisfied

   3. not very satisfied

   4. not satisfied at all?"

   The use of a different scale meant a transformation algorithm was required to compare this set with the worldwide data. The solution was found in the form of a very similar question in the *Eurobarometer*[112] survey. We developed an algorithm that translated response distributions on this question to national means similar to those found in the *World Values Survey*[113] – this algorithm could then be used on the *Latinobarometer*, giving us a new ranking of Latin American countries, with Costa Rica coming top, Venezuela second, and Panama third.

4. The *Afrobarometer*,[114] a similar regional survey, did not specifically ask about overall life satisfaction, but did ask respondents for their opinions on the national economic and political situation, their own living conditions and future conditions, as well as their mental and physical health, their fear of crime, and their domestic environment. Using a theoretical model of how satisfaction with these constituent domains can drive overall life satisfaction,[115] we were able to estimate scores for 15 countries, all of which were used with the exception of that for Ghana, for which we already had data which we considered to be reliable.[116]

5. For the vast majority (62) of the remaining countries, no subjective data was available whatsoever. We therefore estimated life satisfaction on the basis of two regression models using national level data. Aware of the importance of cultural differences and wide differences in living standards across the world, the main regression equation was only based on the 30 countries in Africa and Asia (excluding those countries in the OECD) for which we had previously estimated life satisfaction. Only three independent variables made a statistically significant contribution to the model: life expectancy, the VAI (as measured by the World Bank's *Governance Matters* report[117]) and the Ecosystem Services Product (ESP), a measure of natural capital developed by Sutton and Costanza[118] and shown

to predict life satisfaction through regression.[119] We also included the *Human Well-Being Index* (HWI)[120] in the model, which is a combination of indicators encompassing the quality of life in various domains (health, wealth, knowledge, community and equity). Whilst this did not predict much variance once the other three variables had been included, we felt that, given its theoretical relevance, its minor effect on the estimates could only be beneficial.

Below is the final equation we used:

LS = Life Exp x 0.045 + ln(capped ESP) x 0.45 + VIA x 0.35 + HWI x 0.01 – 0.021

Model fit $R^2 = 0.87$.

Life satisfaction scores for 48 countries in Africa, Asia, the Caribbean and Western Pacific were estimated directly from this equation.

6. For nine of the remaining few countries, particularly in the Middle East, the main regression produced results that seemed excessively conservative. For example, the UAE, which scores 7.4 from the *World Health Survey*, would have been estimated at 6.0. Our suspicion was that these countries' low scores from *Governance Matters* might be responsible: the VAI indicator used in the main regression shows almost no correlation with life satisfaction for the nine Middle Eastern nations for which we have subjective data ($r = 0.1$, in comparison with $r = 0.5$ for the 14 countries for which we used *Afrobarometer* data). The reason for this difference is unclear – it may be a cultural artefact, or a reflection of inadequacies in the data.

   Instead, we used a best-fit model based on all the life satisfaction data derived from the WVS, the WHS and the *Latinobarometer* (109 countries, $R = 0.78$). This model included four predictors: GDP per capita, life expectancy, the dependent population (which has a positive impact on life satisfaction, all other things being equal), and whether the country is located in the tropics (these countries score higher life satisfactions than those in temperate or arctic environments, all other things being equal).[121] Various other variables, for example, the education indicator from the HDI, were tested. However, none of these were significant, and they did little to improve its predictive power. We also considered a logarithmic model, but this model was marginally less successful at predicting life satisfaction.

   Scores predicted by the model seemed reasonable for the missing Arab countries, as well as for Brunei, which shares many features with the oil-rich Gulf States. We also used this model for Belize, whose life satisfaction was perhaps overestimated by the main regression equation (7.6 compared with Mexico's 6.9 and Guatemala's 7.0).

   The fact that Syria was predicted approximately the same life satisfaction as neighbouring Jordan in this model gave us the confidence to simply use Jordan's score for Syria.

7. A few countries' scores come from elsewhere. The figures for Cuba,[122] Palestine,[123] Hong Kong[124] and Bhutan[125] all come from surveys within these countries/territories. Timor-Leste was given the same score as Indonesia, which seemed appropriate given that it was almost certainly still part of Indonesia when the *World Values Survey* was carried out here (Timor-Leste gained independence in 2002, and most of the surveys were carried out around 1997–1999). Lastly, scores for the central Asian republics of Mongolia, Kyrgyzstan, Turkmenistan, and Tajikistan were estimated based on those for Kazakhstan and Uzbekistan, considering differences in economic and political conditions.

Appendix 3: Calculating the HPI (details)

Appendix 3 describes how to calculate the HPI. This operation can be performed on any appropriate data, but here we use the example of our complete data set of 178 countries.

As mentioned in the main text, differences in the distributions of Footprint and HLY (i.e. life satisfaction x life expectancy at birth) prohibit a straightforward division, because variation in Footprint is much greater than the variation in HLY. Footprint can be as large as 9.9 gha in the UAE, or as little 0.5 gha in Haiti (a factor of 20). Meanwhile, whilst there is a large difference in HLY (from the 12 of Congo, to the 66 of Switzerland), this difference is only a factor of 5.5.

As a result, equivalent percentile increments in the two variables would have substantively different results. The relative substantive significance of doubling the Footprint of a country such as Haiti (bearing in mind that a Footprint of 1 gha is still well below the world average) is not as great as that of doubling its HLY (28.5 would become 57, putting it amongst the top countries). Directly dividing HLY by Footprint would treat both these changes as being of equal importance. Considering again cross-national comparison, this would lead to the HPI being predominantly driven by Footprint, whilst the more subtle but equally important differences in HLY are masked. Our transformation deals with this problem, ensuring HPI reflects roughly equally changes in life satisfaction, life expectancy and Footprint, as shown by the correlations in Table 9:

Table 9. Correlations of HPI with component indicators

	Life satisfaction	Life expectancy	Footprint
Basic HPI Algorithm	-0.069	-0.264	-0.717
Our HPI Algorithm	0.617	0.473	-0.234

With the basic calculation, the effect of Footprint becomes so overwhelming that countries with higher life expectancies actually have *lower* HPIs – clearly this is counter-intuitive.

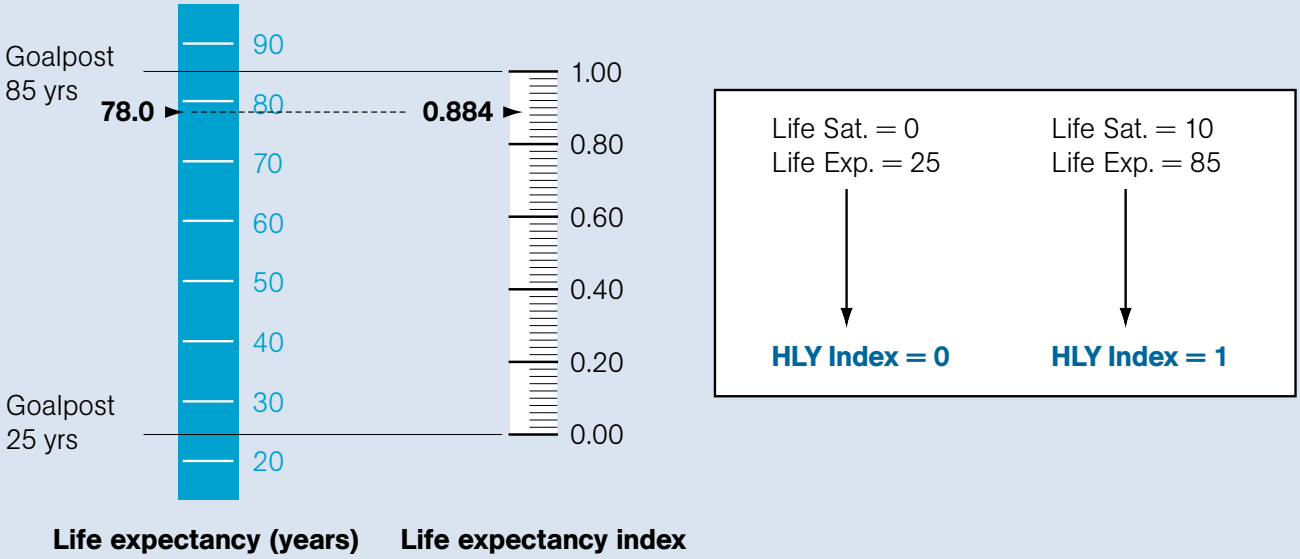
The algorithm used is described below:

1) $\text{HLY} = \dfrac{\text{Life Satisfaction x Life Expectancy}}{10}$

2) Indices (from 0 to 1) calculated for Footprint and for HLY. This process is modelled on that used to calculate the UN HDI. A minimum and maximum 'goalpost' is set for each statistic. Scoring a minimum on, for example, Footprint, would lead to being assigned a 0 on the Footprint index, whilst scoring a maximum would lead to being assigned a 1. This is shown in more detail in Figure 10:

   The minimum and maximum life satisfactions are simply the minimum and maximum scores in the questionnaire. The minimum and maximum life expectancies are taken from the HDI. The minimum Footprint is taken to be 0, the maximum is set at 15 – well above the highest current Footprint (9.9 gha – UAE), but not so high as to imply that the current scores are low in absolute terms. In any case, the impact of this maximum value comes out in the wash – it has no effect on the overall rank order of countries, only on the absolute scores.

Figure 10. How indices are derived from component indicators



3) The indices created both have standard deviations of approximately 0.14, and range within the theoretical bounds of 0–1. However, their means are different (mean HLY index = 0.48, mean Footprint index = 0.17). As discussed, this is problematic because it masks the difference in substantive significance for equal percentile increments of the two indices. It requires a much smaller proportionate increase in the HLY index to move well beyond the main distribution of values, whilst relatively larger proportionate increases in the Footprint index are of less importance. To adjust for this, we add a small constant to the Footprint index, thereby matching its coefficient of variation (CV – the standard deviation divided by the mean) with that of the HLY index.[126] The value of this constant was set to ensure the CVs for the HLY index and the Footprint index matched for the data set including the 103 countries for which we had direct data. When the remaining 75 countries (i.e. those for which some data was estimated) were added, the constant required to *exactly* match the two CVs changed slightly – however, we decided to use the previously calculated constant since it was calculated from pure data. In any case, there was very little difference between the two (0.252 vs. 0.264), and hence very little difference in resulting rank order and absolute values of the countries (average difference in HPI scores for the two algorithms – 0.6 per cent; correlation between the two sets $r = 0.9997$).

4) The HLY index is divided by the adjusted Footprint index. With the complete dataset, this produced numbers ranging between approximately 0.4 and 1.8, with a mean score of 1.13. Such figures are not very appealing to work with, but they do highlight the fact that there is a reasonable correlation between the HLY and the Footprint index ($r = 0.64$): countries with larger footprints tend to score higher on HLY.

5) This number is then multiplied up by a constant to produce a final HPI ranging from 0 to 100. The constant is set so that a country scoring 10 on life satisfaction, 85 on life expectancy and 1.8 gha on Footprint would achieve an HPI of 100. One problem with such a multiplication is that index scores of above 100 are theoretically possible (for example, with a life satisfaction of 9, life expectancy of 85 and Footprint of 1.2). However, when calculating the HPI for nations or regions such scores seem highly unlikely – the highest HPI observed in the present data is 68.2, and even our theoretical 'reasonable ideal' is only 83.5.

Endnotes

1 Classifications from the United Nations Development Programme (2003) *Human Development Report 2003* (New York: Oxford University Press).

2 The G8 are: United States of America, United Kingdom, France, Italy, Canada, Germany, Japan and Russia.

3 The G8 defines itself as the eight "major industrial democracies" of the world (www.g7.utoronto.ca). Technically speaking, however, this is incorrect. If membership were granted purely on terms of total GDP then China and India would be in the G8, supplanting Russia and Canada.

4 The Greek word for the ultimate end is 'telos' and the word that is usually translated as happiness is 'eudaimonia'. The translation issues are not trivial, with many arguing that a closer translation of eudaimonia would be well-being (a word we favour at the centre for well-being at **nef**). However, in English this would mean a serious compromise of linguistic elegance – a well-being-ed planet index would not make grammatical sense, nor would it sound very attractive. For an excellent discussion of these issues, see Sumner L W (2002) 'Happiness now and then' in Jost L J & Shiner R A, *Eudaimonia and Well-being* (Kelowna, B.C.: Academic Printing & Publishing).

5 In importance rankings on a range of 1 to 9, happiness comes out top with a global average score of 8.0 followed by health (7.9), love (7.9), meaning (7.3), wealth (6.8) and attractiveness (6.3). Diener E & Scollon C (2003) 'Subjective well-being is desirable, but not the summum bonum' *Paper presented at the University of Minnesota Interdisciplinary Workshop on Well-Being*.

6 Specifically, it is the sum of four separate values: consumer expenditure, business investment, government expenditure, and net exports (i.e. gross exports minus gross imports). Note that we use GDP rather than GNP here, since this has been most common in the development literature. GNP is the total value of final goods and services produced per year by a country's nationals, even if based abroad; GDP is the total value of final goods and services produced within a country's borders.

7 Cobb C, Halstead T, and Rowe J (1995) 'If the GDP is up, why is America down?' *The Atlantic Monthly* (October), pp. 59–78.

8 Layard R (2005) *Happiness: lessons from a new science* (London: Allen Lane).

9 UNDP (2003) op. cit.

10 Global Witness (2004) *Time for transparency: coming clean on oil, mining and gas revenues* (Washington DC: Global Witness Publishing Inc.).

11 UNDP (2003) op. cit.

12 Venetoulis J (2004) Are Accounting Scandals Good for the Economy? http://www.americanprogress.org/site/pp.asp?c=biJRJ8OVF&b=37091

13 Daly H and Cobb J B (1989) *For the common good: redirecting the economy toward community, the environment, and a sustainable future* (Boston: Beacon Press); Cobb, C W and Cobb J B (1994) *The Green National Product: a proposed index of sustainable economic welfare* (Lanham: University Press of America).

14 Daly and Cobb (1989) op. cit.

15 Jackson T, Laing F, MacGillivray A, Marks N, Ralls J, and Stymne S (1997) *An index of sustainable economic welfare for the UK 1950–1996* (Guildford, UK: University of Surrey Centre for Environmental Strategy).

16 Anielski M and Rowe J (1999) *The Genuine Progress Indicator: 1998 update* (San Francisco: Redefining Progress).

17 For example: Rosenberg D, Oegema P and Bovy M (1995) *ISEW for the Netherlands: preliminary results and some proposals for further research* (Amsterdam: IMSA); Jackson *et al* (1997) op. cit.; Hamilton C (1999) 'The genuine progress indicator: methodological developments and results from Australia' *Ecological Economics* 30, pp. 13–28.

18 See, for instance, Neumayer, E (2000) 'The ISEW: Not an indicator of sustainable economic welfare' *Social Indicators Research* 48, pp. 77–101.

19 Jackson T (2004) *Chasing progress: Beyond measuring economic growth* (London: **nef**).

20 For reviews, see Diener E, Suh E M, Lucas R E and Smith H E (1999) 'Subjective well-being: three decades of progress' *Psychological Bulletin* 125, pp. 276–302; Layard (2005) op. cit.

21 See, for instance, Donovan N and Halpern D (2002) *Life satisfaction: The state of knowledge and the implications for government* (London: Prime Minister's Strategy Unit); HM Government (2005) *Securing the Future: Delivering UK Sustainable Development Strategy* (Norwich: The Stationary Office).

22 Layard (2005) op. cit.; Shah H and Marks N (2004) *A Well-being manifesto for a flourishing society.* (London: **nef**).

23 Diener *et al* (1999) op. cit.

24 Levy B R, Slade M D, Kunkel S R and Kasl S V (2002) 'Longevity increased by positive self-perceptions of aging', *Journal of Personality and Social Psychology* 83, pp, 261–70.

25 Diener *et al* (1999) op. cit.

26 Nettle D (2005) *Happiness: the science behind your smile* (Oxford: Oxford University Press).

27 Some limitations of life satisfaction surveys are discussed in Appendix 1.

28 Note that the index uses mean life expectancy across gender. In the large majority of countries women outlive men. However, in most instances the difference is relatively small and tends to narrow as countries become richer.

29 Veenhoven R (1996) 'Happy life expectancy: a comprehensive measure of quality-of-life in nations' *Social Indicators Research* 39, pp. 1–58.

30 Ibid.

31 Murray C J L, Salomon J A, Mathers C D, Lopez A D (eds) (2002) *Summary measures of population health: concepts, ethics, measurement and applications* (Geneva: World Health Organization).

32 Evidence for adaptation to disability it given in Riis J, Loewenstein G, Baron J, Jepson C, Fagerlin A and Ubel P (2005) 'Ignorance of hedonic adaptation to hemodialysis: a study using ecological momentary assessment' *Journal of Experimental Psychology: General* 34, pp. 3–9.

33 Marks N, Shah H & Westall A (2004) *The power and potential of well-being indicators* (London: **nef**).

34 Simms A, Moran D and Chowla P (2006) *The UK interdependence report: how the world sustains the nation's lifestyle and the price it pays* (London: **nef**).

35 United Nations Development Programme (2005) *Human Development Report 2005* (New York: Oxford University Press). See Appendix 2 for full information on sources used.

36 See www.footprintnetwork.org

37 Veenhoven R (2005) Average happiness in 91 nations 1995–2005: world database of happiness (www.worlddatabaseofhappiness.eur.nl).

38 Inglehart R, Basáñez M, Díez-Medrano J, Halman L and Luijkx R (2004) *Human beliefs and values: a cross-cultural sourcebook based on the 1999–2002 values surveys* (Mexico: Siglo XXI Editores).

39 Cited in Graham C and Felton A (2005) 'Does inequality matter to individual welfare? An initial exploration based on happiness surveys in Latin America' *CSED Working Paper No. 38* (Washington, DC: The Brookings Institution).

40 Bratton M, Logan C, Cho W and Bauer P (2004) 'Afrobarometer round 2: compendium of comparative results from a 15-country survey' Working Paper No. 34, (The Afrobarometer Network).

41 Based on the highest national life satisfaction score (Denmark), the highest life expectancy (Japan) and a Footprint similar to many middle-income countries (for example, China).

42 Wackernagel M, Moran D, Goldfinger S, Monfreda C, Welch A, Murray M, Burns S, Königel C, Peck J, King P and Ballesteros M (2005) *Europe 2005: the ecological footprint* (Brussels: WWF European Policy Office).

43 Correlations with HPI for low development counties: Life Sat. $r = .85$; Life Exp. $r = .86$; Footprint $r = -.04$).

44 These are both well-known findings. For reviews that discuss them see, respectively, Mandel S (2006) *Debt relief as if people mattered: a rights-based approach to debt sustainability* (London: **nef**) and Diener *et al* (1999) op. cit.

45 Hobbes T (1651) Leviathan (from Chapter XIII).

46 Correlations with the HPI for high development counties: Life Sat. $r = .36$; Life Exp. $r = .02$; Footprint $r = -.75$).

47 Correlations with the HPI for middle development counties: Life Sat. $r = .80$; Life Exp. $r = .54$; Footprint $r = -.35$).

48 UNDP (2005) op. cit.

49 Max-Neef M (1995) 'Economic growth and quality of life: a threshold hypothesis' *Ecological Economics* 15, pp. 115–118.

50 US Energy Information Administration (2000) *Ukraine: environmental issues*. http://www.eia.doe.gov/emeu/cabs/ukrenv.htm

51 Wackernagel *et al* (2005) op. cit.

52 Veenhoven R (2001) 'Are the Russians as unhappy as they say they are?' *Journal of Happiness Studies* 2, pp. 111–136.

53 US Department of State, Bureau of European and Eurasian Affairs (2006).

54 Chandler R (ed.) (2005) *Russian short stories from Pushkin to Buida* (Penguin Classics).

55 World Bank World Development Indicators (http://devdata.worldbank.org/data-query/), downloaded 13 June 2006.

56 Included are island and archipelago states that contain no islands with a land area of over 100,000km^2. The borderline case of the Philippines is also included: over half the population lives on islands smaller than 100,000km^2, and the remainder live on Luzon (whose area is 104,000km^2).

57 Chambers K and Chambers A (2001) *Unity of heart: culture and change in a Polynesian atoll society* (Long Grove, IL: Waveland Press).

58 Concern for nature and the environment has been shown to correlate directly with life satisfaction. See Ferrer-i-Carbonella A and Gowdy J M (in press) 'Environmental degradation and happiness' *Ecological Economics*.

59 For recent reviews, see Kasser T (2002) *The high price of materialism* (Cambridge, MA: MIT Press); Kasser T (2006) 'Materialism and its alternatives' in Csikszentmihalyi M and Csikszentmihalyi I S (eds) *A life worth living: contributions to positive psychology* (Oxford: Oxford University Press); Hnilica K (2005) 'The influences of materialistic value orientation on life satisfaction' *Ceskoslovenska Psychologie* 49, pp. 385–98; Nickerson C, Schwarz N, Diener E and Kahneman D (2003) 'Zeroing in on the dark side of the American dream: a closer look at the negative consequences of the goal for financial success' *Psychological Science* 14 pp. 531–6.

60 Kasser (2002) op. cit.

61 These questions were based on the Schwarz Value Inventory. See Schwartz S H (1992) 'Universals in the content and structure of values: theoretical advances and empirical tests in 20 countries' in Zanna M P (ed.) *Advances in experimental social psychology* (San Diego, CA: Academic Press); Schwartz S H (1994) 'Beyond individualism and collectivism: new dimensions of values' in Kim U, Triandis H C, Kagitcibasi C, Choi S-C and Yoon G (eds) *Individualism and collectivism: theory, method and application* (Newbury Park, CA: Sage).

62 These correlations are diminished when GDP per capita or the logarithm of GDP per capita is controlled for, but a few remain significant (notably the negative correlation with strong government and the positive correlation with the importance of adventure). However, the small sample size must be borne in mind – statistically, it would be unusual to find strong correlations with only 24 cases. When the values are separated into two groups (extrinsic and intrinsic), the differences in scores for the groups correlate with life satisfaction, even when GDP per capita is controlled for.

63 Inglehart R (1997) *Modernization and postmodernization* (Princeton, NJ: Princeton University Press).

64 Simple correlation: $r = 0.875$. Partial correlation controlling for the logarithm of GDP per capita: $r = 0.823$.

65 Freedom House website (http://www.freedomhouse.org/template.cfm?page=212&year=2002, downloaded June 2006)

66 r values above 0.5 for all the World Bank indicators (Voice & Accountability, Rule of Law, Control of Corruption, Regulatory Quality, Government Effectiveness and Political Stability).

67 Correlations remain significant for all the indicators except Political Stability.

68 $r = 0.83$ vs. $r = 0.79$, excluding Mexico and Turkey.

69 Democracy ratings taken from Berg-Schlosser, D (2004) 'The quality of democracies in Europe as measured by current indicators of democratization and good governance' *Journal of Communist Studies & Transition Politics* 20, pp. 28–55.

70 Haggerty M R, Cummins R A, Ferriss A L, Land K, Michalos A C, Peterson M, Sharpe A, Sirgy J and Vogel J (2001) 'Quality of life indexes for national policy: review and agenda for research' *Social Indicators Research* 55, pp. 1–96.

71 See, for example, Helliwell J and Putnam R (2006) 'The social context of well-being' in Huppert F, Baylis N and Keverne B (eds) *The science of well-being (*Oxford: Oxford University Press); Shah and Marks (2004) op. cit.

72 Putnam R (1993) *Making democracy work* (Princeton, NJ: Princeton University Press).

73 To ensure absolute consistency between life satisfaction measures, we chose only countries that were included in the World Values Survey.

74 Statistical tests showed that, overall, members of each pair were significantly different only in terms of life satisfaction.

75 Estimated using data from the Global Footprint Network.

76 Food and Agriculture Organization of the United Nations (2000) *World soil resources report 90* (Rome: UN).

77 Sources for this section include: www.IRINnews.org; UNAIDS; WHO; Women's Commission for Refugee Women and Children; UN Office for the Coordination of Humanitarian Affairs; UNICEF; BBC News; CIA: The World Fact Book; Mail & Guardian Online; BBC News; The Henry J Kaiser Family Foundation; DFID; One World UK; www.Mongabay.com; IMF.

78 Diamond J (2005) *Collapse: how societies choose to fail or succeed* (New York: Viking Penguin).

79 Diener E and Seligman M (2004) 'Beyond money: toward an economy of well-being' *Psychological Science in the Public Interest* 5, pp. 1–31.

80 Rutter M and Smith D J (eds) (1995) *Psychosocial disorders in young people: time trends and their causes* (Chichester: John Wiley and Sons, Ltd).

81 Ibid.

82 Eckersley R (2006) 'Is modern Western culture a health hazard?' *International Journal of Epidemiology* 35, pp. 252–258.

83 For example, see Nicholson B (2002) 'The wrong end of the telescope: economic migrants, immigration policy, and how it looks from Albania' *Political Quarterly* 73, pp. 436–444.

84 Woodward D and Simms A (2006) *Growth isn't working: the unbalanced distribution of benefits and costs from economic growth* (London: **nef**).

85 Using all our life satisfaction data (including that predicted from other subjective surveys but not those estimated using regression analysis) the correlation is 0.57.

86 Lyubomirsky S, King L and Diener E (2005) 'The benefits of frequent positive affect: does happiness lead to success?' *Psychological Bulletin* 131, pp. 803–855.

87 Lyubomirsky S, Sheldon K M and Schkade D (2005) 'Pursuing happiness: the architecture of sustainable change' *Review of General Psychology* 9, pp. 111–131.

88 Easterlin R A (2003) 'Explaining happiness' *Proceedings of National Academy of Science* 100, pp. 11176–11183.

89 Lyubomirsky *et al* (2005) op. cit.

90 This was shown in the sub-analyses discussed under factors affecting well-being, and in the regression analysis used to estimate life satisfaction in nations for which there was no extant data. The model included three main factors: Health, Natural Capital and Level of Democracy ($R^2 = 0.75$).

91 Mandel S (2006) op.cit.

92 The Power Inquiry (2006) *Power to the people* (York: York Publishing). For example, citizens in Harrow have been empowered by a trial 'open budget' scheme - see http://www.harrowopenbudget.org/. This is modelled on similar schemes developed in Brazil.

93 Frey B and Stutzer A (2005) 'Beyond outcomes: measuring procedural utility' *Oxford Economic Papers* 57, pp. 90–111.

94 Such as those discussed in Box 1.

95 Heine S J, Lehman D R, Peng K and Greenholtz J (2002) 'What's wrong with cross-cultural comparisons of subjective Likert scales: the reference-group problem' *Journal of Personality and Social Psychology* 82, pp. 903–918.

96 Triandis H C (2002) 'Cultural syndromes and subjective well-being' In Diener E and Suh E M (eds) *Culture and subjective well-being* (Cambridge MA: Massachusetts Institute of Technology Press).

97 Riis J, Schwarz N and Kahneman D (2005). 'Some international differences in health are reality free: implications for happiness' (manuscript in preparation). Indeed, this study finds no correlation between satisfaction with health and objective health measures.

98 Chen C, Lee S and Stevenson H (1995) 'Response styles and cross–cultural comparisons of rating scales among East Asian and North American students' *Psychological Science* 6, pp. 170–75.

99 See www.europeansocialsurvey.org for more details of the Round Three module on personal and social well-being.

100 UNDP (2003) op. cit.; UNDP (2005) op. cit.

101 Ibid.

102 Loh J and Wackemagel M (eds) (2004) *Living planet report 2004* (Gland, Switzerland: WWF).

103 For 2002. Taken from World Bank: World Development Indicators database (http://devdata.worldbank.org/data-query/), downloaded 13 June 2006.

104 Urban population as a percentage of total in 2000. Taken from World Resources Institute: Earthtrends database (http://earthtrends.wri.org) on 12 May 2006. Original source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat (2004) *World urbanization prospects: the 2003 revision* (New York: United Nations).

105 From the World Bank World Development Indicators database (2002 data) (http://devdata.worldbank.org/data-query/)

106 More information on the regression models used is available from Sam Thompson and Saamah Abdallah.

107 Veenhoven (2005) op. cit.

108 Inglehart *et al* (2004) op. cit.

109 From the World Health Organisation website: http://www3.who.int/whs/S/ReportsAnalyses

110 For the regression equation, please contact the authors.

111 Cited in Graham C and Felton A (2005) *Does inequality matter to individual welfare? An initial exploration based on happiness surveys in Latin America. CSED Working Paper No. 38* (Washington, DC: The Brookings Institution).

112 The precise question used was: "On the whole, are you very satisfied, fairly satisfied, not very satisfied, or not at all satisfied with the life you lead?" Eurobarometer 56.2 (Nov 2001) – data available on the EU website: http://ec.europa.eu/public_opinion/index_en.htm

113 For the transformation scores used, please contact the authors. The resulting mean across Europe was 7.237, compared to the mean of 7.240 from the WVS.

114 Bratton M, Logan C, Cho W and Bauer P (2004) *Afrobarometer Round 2: compendium of comparative results from a 15-country survey. Working Paper No. 34* (The Afrobarometer Network).

115 Haggerty *et al* (2001) op. cit.

116 For more details, please contact Sam Thompson and Saamah Abdallah. One score we were undecided about was that for Nigeria. We have included the estimated value from the Afrobarometer (5.5), but it could be argued that this is unnecessarily sceptical of the reported figure from the WVS (6.5), given the oft-reported high spirits of West Africans. However, comparison with Ghana (6.2), with its more stable political environment and even greater reputation for happiness in the face of adversity, suggested that a conservative estimate was more appropriate. Also Nigeria's four neighbours had an average score of 4.9. Had we used the higher figure, Nigeria would have scored a HPI of 37.1, climbing from 146th position to 125th.

117 Kaufmann D, Kraay A and Mastruzzi M (2003) *Governance matters III: Governance indicators for 1996–2002* (World Bank Policy Research Working Paper 3106)

118 Sutton P C and Costanza R (2002) 'Global estimates of market and non-market values derived from night time satellite imagery, land cover and ecosystem service valuation' *Ecological Economics* 41, pp. 509–527.

119 Vemuri A & Costanza R (in press) 'The role of human, social, built and natural capital in explaining life satisfaction at the country level: Toward a national well-being index' *Ecological Economics*.

120 Prescott-Allen R (2001) *The wellbeing of nations* (Washington, DC: Island Press).

121 For the regression equation, please contact Sam Thompson and Saamah Abdallah.

122 From Joar Vitterso (personal communications). Based on a rather small sample (N=209) using an overall life satisfaction question on a scale of 0 to 10. No transformation was required, and the score was the same as that predicted by our regression model (6.3).

123 Derived from a survey carried out by the Fafo Institute for Applied International Studies, Norway. The survey, in December 2005, asked a representative sample of 1845 in the West Bank and Gaza Strip about their satisfaction with life these days, on a five-point scale. An algorithm, available from the authors, was used to transform the distribution of answers into a mean on a 0–10 scale. (raw data available at http://www.fafo.no/ais/middeast/opt/opinionpolls/index.htm. Our thanks to Gro Hasselknippe for providing us with the data.

124 Lau A, Cummins R A and McPherson W (2005) 'An investigation into the cross-cultural equivalence of the personal well-being index' *Social Indicators Research* 72, pp. 403–430. Two slight concerns with this data are the small sample (N=180) and the fact that the score for the other country included in this study (Australia) is slightly higher than that we have from the World Values Survey. As such, the figure for Hong Kong may also be slightly inflated. Our thanks to Anna Lau for alerting us to this study.

125 Derived from a survey of most households in Bhutan conducted by the Centre for Bhutanese Studies (2005). Life satisfaction was reported using only a three-point scale, suggesting that caution should be exercised about the accuracy of this data. Our thanks to Tashi Choden for making this data available.

126 This procedure was suggested by Dr Johannes Forkman, of the Centre for Biostochastics, Swedish University of Agricultural Sciences, Uppsala.

Countries of the World in rank HPI order

Interpretation warning: A country's absolute position on the HPI is broadly illustrative of its performance relative to current global standards. However, because of uncontrollable variation in source data, caution should be exercised in drawing comparisons between countries that are less than 20 places apart, particularly where they have very different socio-cultural characteristics. It is clear that all countries could do better: an HPI score of 100 is attainable based on standards already achieved by some countries on constituent parts of the Index. In the current global context, we have set a reasonable ideal of 83.5.

	Countries in HPI rank order	Life Sat	Life Exp	EF	HPI
	Reasonable ideal	8.2	82.0	1.5	83.5
1.	Vanuatu	7.4	68.6	1.1	68.2
2.	Colombia	7.2	72.4	1.3	67.2
3.	Costa Rica	7.5	78.2	2.1	66.0
4.	Dominica	7.3	75.6	1.8	64.5
5.	Panama	7.2	74.8	1.8	63.5
6.	Cuba	6.3	77.3	1.4	61.9
7.	Honduras	7.2	67.8	1.4	61.8
8.	Guatemala	7.0	67.3	1.2	61.7
9.	El Salvador	6.6	70.9	1.2	61.7
10.	St. Vincent and the Grenadines	7.2	71.1	1.7	61.4
11.	St. Lucia	7.0	72.4	1.6	61.3
12.	Vietnam	6.1	70.5	0.8	61.2
13.	Bhutan	7.6	62.9	1.3	61.1
14.	Samoa (Western)	6.9	70.2	1.4	61.0
15.	Sri Lanka	6.1	74.0	1.1	60.3
16.	Antigua and Barbuda	7.4	73.9	2.3	59.2
17.	Philippines	6.4	70.4	1.2	59.2
18.	Nicaragua	6.3	69.7	1.1	59.1
19.	Kyrgyzstan	6.6	66.8	1.1	59.1
20.	Solomon Islands	6.9	62.3	1.0	58.9
21.	Tunisia	6.4	73.3	1.4	58.9
22.	São Tomé and Principe	6.7	63.0	1.0	57.9
23.	Indonesia	6.6	66.8	1.2	57.9
24.	Tonga	6.6	72.2	1.6	57.9
25.	Tajikistan	6.1	63.6	0.6	57.7
26.	Venezuela	7.4	72.9	2.4	57.5
27.	Dominican Republic	7.0	67.2	1.6	57.1
28.	Guyana	7.2	63.1	1.5	56.6
29.	St. Kitts and Nevis	7.4	70.0	2.3	56.1
30.	Seychelles	7.4	72.7	2.6	56.1
31.	China	6.3	71.6	1.5	56.0
32.	Thailand	6.5	70.0	1.6	55.4
33.	Peru	5.6	70.0	0.9	55.1
34.	Suriname	7.3	69.1	2.3	55.0
35.	Yemen	6.2	60.6	0.7	55.0
36.	Fiji	6.7	67.8	1.7	54.5
37.	Morocco	5.6	69.7	0.9	54.4
38.	Mexico	6.9	75.1	2.5	54.4
39.	Maldives	6.6	66.6	1.6	53.5
40.	Malta	7.5	78.4	3.5	53.3
41.	Bangladesh	5.7	62.8	0.6	53.2
42.	Comoros	5.9	63.2	0.8	52.9
43.	Barbados	7.3	75.0	3.1	52.7
44.	Malaysia	7.4	73.2	3.0	52.7
45.	Palestine	5.4	72.5	1.1	52.6
46.	Cape Verde	5.8	70.4	1.3	52.4
47.	Argentina	6.8	74.5	2.6	52.2
48.	Timor-Leste	6.6	55.5	0.8	52.0
49.	Belize	6.9	71.9	2.6	52.0
50.	Trinidad and Tobago	6.9	69.9	2.3	51.9
51.	Chile	6.5	77.9	2.6	51.3
52.	Paraguay	6.5	71.0	2.2	51.1
53.	Jamaica	7.0	70.8	2.6	51.0
54.	Nepal	5.5	61.6	0.6	50.0
55.	Mauritius	6.5	72.2	2.4	49.6
56.	Mongolia	6.7	64.0	1.9	49.6
57.	Uruguay	6.3	75.4	2.6	49.3
58.	Ecuador	5.6	74.3	1.8	49.3
59.	Uzbekistan	6.4	66.5	1.9	49.2
60.	Grenada	6.5	65.3	1.9	49.0
61.	Austria	7.8	79.0	4.6	48.8
62.	India	5.4	63.3	0.8	48.7
63.	Brazil	6.3	70.5	2.2	48.6
64.	Iceland	7.8	80.7	4.9	48.4
65.	Switzerland	8.2	80.5	5.3	48.3
66.	Italy	6.9	80.1	3.8	48.3
67.	Iran	6.0	70.4	2.1	47.2
68.	Ghana	6.2	56.8	1.1	47.0
69.	Bolivia	5.5	64.1	1.2	46.2
70.	Netherlands	7.5	78.4	4.7	46.0
71.	Madagascar	5.8	55.4	0.8	46.0
72.	Cyprus	6.9	78.6	4.0	46.0
73.	Algeria	5.2	71.1	1.5	45.9
74.	Luxembourg	7.6	78.5	4.9	45.6
75.	Bahamas	7.7	69.7	4.1	44.9
76.	Papua New Guinea	6.3	55.3	1.3	44.8
77.	Burma	5.3	60.2	0.9	44.6
78.	Belgium	7.3	78.9	4.9	44.0
79.	Slovenia	6.6	76.4	3.8	44.0
80.	Oman	7.3	74.1	4.4	43.9
81.	Germany	7.2	78.7	4.8	43.8
82.	Croatia	5.9	75.0	2.9	43.7
83.	Lebanon	5.6	72.0	2.3	43.6
84.	Taiwan	6.6	76.1	3.9	43.4
85.	Haiti	5.5	51.6	0.5	43.3
86.	Syria	5.1	73.3	1.9	43.2
87.	Spain	7.0	79.5	4.8	43.0
88.	Hong Kong	6.6	81.6	4.6	42.9
89.	Saudi Arabia	7.3	71.8	4.4	42.7

	Countries in HPI rank order	Life Sat	Life Exp	EF	HPI
	Reasonable ideal	8.2	82.0	1.5	83.5
90.	Gambia	5.7	55.7	1.1	42.5
91.	Cambodia	5.6	56.2	1.1	42.2
92.	Albania	4.6	73.8	1.5	42.1
93.	Jordan	5.1	71.3	1.9	42.1
94.	New Zealand	7.4	79.1	5.5	41.9
95.	Japan	6.2	82.0	4.3	41.7
96.	Congo	5.7	52.0	0.9	41.6
97.	Egypt	4.8	69.8	1.5	41.6
98.	Turkey	5.3	68.7	2.0	41.4
99.	Denmark	8.2	77.2	6.4	41.4
100.	Brunei Darussalam	7.6	76.4	5.6	41.2
101.	Georgia	4.1	70.5	0.8	41.2
102.	Korea	5.8	77.0	3.4	41.1
103.	Bosnia and Herzegovina	5.1	74.2	2.3	41.0
104.	Senegal	5.6	55.7	1.2	40.8
105.	Azerbaijan	4.9	66.9	1.5	40.7
106.	Gabon	6.2	54.5	1.7	40.5
107.	Libya	5.7	73.6	3.1	40.3
108.	United Kingdom	7.1	78.4	5.4	40.3
109.	Laos	5.4	54.7	1.0	40.3
110.	Benin	5.4	54.0	1.0	40.1
111.	Canada	7.6	80.0	6.4	39.8
112.	Pakistan	4.3	63.0	0.7	39.4
113.	Ireland	7.6	77.7	6.2	39.4
114.	Poland	5.9	74.3	3.6	39.3
115.	Norway	7.4	79.4	6.2	39.2
116.	Macedonia	4.9	73.8	2.3	39.1
117.	Israel	6.7	79.7	5.3	39.1
118.	Namibia	6.5	48.3	1.6	38.4
119.	Sweden	7.7	80.2	7.0	38.2
120.	Romania	5.2	71.3	2.7vv	37.7
121.	Hungary	5.7	72.7	3.5	37.6
122.	Guinea	5.1	53.7	1.0	37.4
123.	Finland	7.7	78.5	7.0	37.4
124.	Mauritania	5.3	52.7	1.1	37.3
125.	Kazakhstan	5.8	63.2	2.8	36.9
126.	Togo	4.9	54.3	0.9	36.9
127.	Kenya	5.6	47.2	0.9	36.7
128.	Czech Republic	6.4	75.6	5.0	36.6
129.	France	6.6	79.5	5.8	36.4
130.	Armenia	3.7	71.5	1.0	36.1
131.	Singapore	6.9	78.7	6.2	36.1
132.	Slovakia	5.4	74.0	3.6	35.8
133.	Greece	6.3	78.3	5.4	35.7
134.	Tanzania	5.5	46.0	0.9	35.1
135.	Guinea-Bissau	5.4	44.7	0.7	35.1
136.	Portugal	6.1	77.2	5.2	34.8
137.	Eritrea	4.4	53.8	0.7	34.5
138.	Bahrain	7.2	74.3	6.6	34.4
139.	Australia	7.3	80.3	7.7	34.1
140.	Mali	5.3	47.9	1.1	33.7
141.	Mozambique	5.4	41.9	0.7	33.0
142.	Cameroon	5.1	45.8	0.9	32.8
143.	Djibouti	4.8	52.8	1.3	32.7
144.	Ethiopia	4.7	47.6	0.7	32.5
145.	Bulgaria	4.3	72.2	2.7	31.6
146.	Nigeria	5.5	43.4	1.2	31.1
147.	Moldova	3.5	67.7	1.2	31.1
148.	Burkina Faso	4.7	47.5	1.1	30.1
149.	Lithuania	4.7	72.3	3.9	29.3
150.	United States of America	7.4	77.4	9.5	28.8
151.	Côte d'Ivoire	4.5	45.9	0.9	28.8
152.	Rwanda	4.4	43.9	0.7	28.3
153.	Sierra Leone	5.0	40.8	0.9	28.2
154.	United Arab Emirates	7.4	78.0	9.9	28.2
155.	Angola	4.8	40.8	0.8	27.9
156.	South Africa	5.7	48.4	2.8	27.8
157.	Sudan	3.6	56.4	1.0	27.7
158.	Uganda	4.7	47.3	1.5	27.7
159.	Kuwait	7.2	76.9	9.5	27.7
160.	Latvia	4.7	71.6	4.4	27.3
161.	Niger	4.5	44.4	1.1	26.8
162.	Malawi	4.6	39.7	0.7	26.7
163.	Zambia	4.9	37.5	0.8	25.9
164.	Central African Republic	4.9	39.3	1.1	25.9
165.	Belarus	4.0	68.1	3.2	25.8
166.	Qatar	7.0	72.8	9.5	25.5
167.	Botswana	5.4	36.3	1.3	25.4
168.	Chad	4.5	43.6	1.3	25.4
169.	Turkmenistan	4.0	62.4	3.1	24.0
170.	Equatorial Guinea	5.2	43.3	2.5	23.8
171.	Lesotho	4.3	36.3	0.6	23.1
172.	Russia	4.3	65.3	4.4	22.8
173.	Estonia	5.1	71.3	6.9	22.7
174.	Ukraine	3.6	66.1	3.3	22.2
175.	Congo, Dem. Rep. of the	3.3	43.1	0.7	20.7
176.	Burundi	3.0	43.6	0.7	19.0
177.	Swaziland	4.2	32.5	1.1	18.4
178.	Zimbabwe	3.3	36.9	1.0	16.6

* See page 15 of the full report for an explanation of the HPI colour code.

environment
lifestyles must
become sustainable

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