



for a living planet

Ecological Footprints

Taking the first step



A 'how to' guide for
Local Authorities

Acknowledgements

This report is based on the publication, *Ecological Footprints – A Guide for Local Authorities*, by Stuart Bond, WWF-UK, which was published in 2002.

It updates the original report and adds new information on the footprint methodology, application to policy, and use in education. The revision was completed by Phil Matthews, CAG Consultants, with input from Elizabeth Leighton, WWF Scotland, John Barrett, Stockholm Environment Institute, Emma Whittlesea, SUSTAIN consultancy and the WWF-UK Footprint Programme team. WWF thanks everyone for their input to this report which provides up-to-date and practical advice for local authorities on one of the fastest growing concepts in sustainable development – the ecological footprint.

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Introduction

“The problem with land is that they stopped making it some time ago.” **Mark Twain**

Sustainable development has come a long way since the 1992 Earth Summit in Rio, and although many positive initiatives have come to fruition, we are still increasing our collective burden upon the planet. There are now six billion people but there is still only one earth.

The scale of the sustainable development challenge requires action at the local, national and international level. Within the UK, many individuals and communities are playing their part in helping move society along more sustainable lines.

Local authorities have a key role to play in reducing our over-consumption of the world's resources. The ability of local authorities to address the sustainability both of their organisation and of the area they serve has been strengthened in recent years. A range of new powers and responsibilities, such as Community Planning, can assist in integrating sustainability into local services.

One of the most important tools that local authorities have used to help address sustainable development is the ecological footprint. This is a means of quantifying the environmental impact of a region or community, and identifying how over-consumption can be reduced towards a sustainable level. By measuring consumption rather than pollution, footprint analysis brings sustainable development home to the individual and collective decisions we take.

This report explains the concept of ecological footprint and how it can be used as an effective tool by local authorities. It explains how footprinting can be integrated into Community Plans/Strategies and other mechanisms such

as Strategic Environmental Assessment (SEA). The report also provides case studies of local authorities who have undertaken effective footprint work, and highlights the benefits that have accrued from this.

WHAT IS SUSTAINABLE DEVELOPMENT?

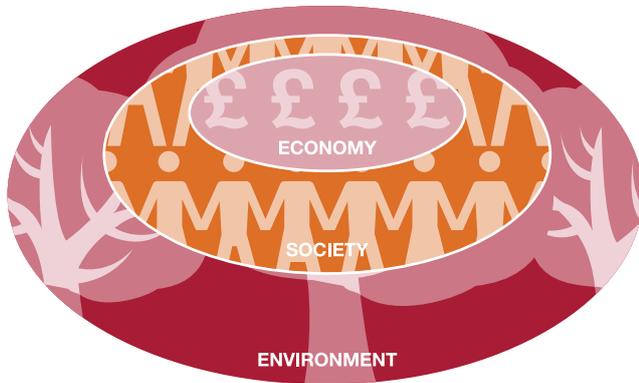
Before we explore the concept of the ecological footprint, it is important that we define what we mean by sustainable development. The most commonly used definition of sustainable development, and the one used by the UK Government, Scottish Parliament and Welsh Assembly Government, is that set out in the Brundtland Report of 1987:

“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

Gro Harlem Brundtland, 1987

At its core is the concept that the social and economic needs of people living across the planet have to be addressed, but that we must achieve this without over-exploiting the natural environment – including resources, habitats and species – upon which we depend. If we exceed the ‘carrying capacity’ of the earth's ecosystems and the ‘natural capital’ they provide us with, then we are threatening the ability of ourselves and future generations to survive, let alone maintain a decent quality of life. This definition has led to many interpretations of sustainable development.

Human demands on natural resources (natural capital) have increased by 70 per cent since 1970, while the state of the world's natural ecosystems has declined by 40 per cent in the same period.



The 'Russian Dolls' model of sustainability

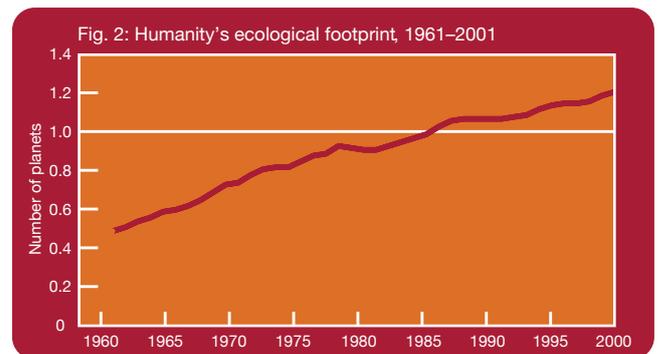
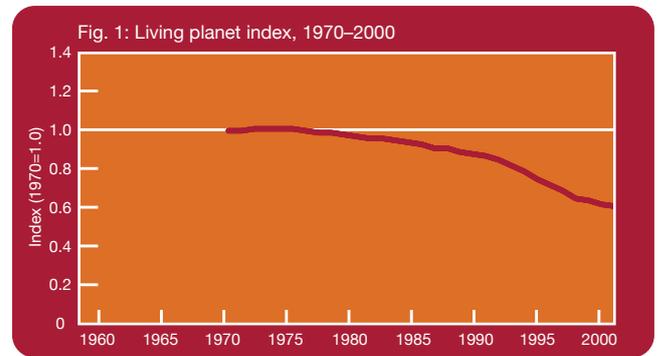
The 'Russian Dolls' model of sustainability¹ shows the economy as a subset of society, and society as a subset of the environment. It is a model with which many people would agree. However, the crucial challenge is how we translate this broad vision into a coherent and integrated set of strategies, plans and actions at the national, regional and local level, and in ensuring that our progress towards (or away from) sustainable development is monitored. Measuring our 'ecological bottom line' is the first link in the chain of defining and measuring sustainable development.

THE GLOBAL PERSPECTIVE: LIVING BEYOND OUR MEANS

Human demands on natural resources (natural capital) have increased by 70 per cent since 1970, while the state of the world's natural ecosystems has declined by 40 per cent in the same period. Humanity's footprint is now over 20 per cent larger than what the planet can regenerate: indeed, it now takes more than one year and two months for the earth to regenerate

"We no longer live within the sustainable limits of the planet. Ecosystems are suffering, the global climate is changing, and the further we continue down this path of unsustainable production and exploitation, the more difficult it will become to protect and restore the biodiversity that remains."

WWF International, *Living Planet Report*, 2004



what we use in a single year. We maintain this overshoot by liquidating the planet's ecological resources.² In other words, we are already living beyond our means with likely long-term and serious consequences for humanity.

Living Planet Report, WWF International

Figure 1 shows the decline in biodiversity over the last 30 years. Figure 2 shows our increasing global ecological footprint. If we are serious about reversing negative ecological trends, then we need to engage with the key drivers for those trends: the profligate consumption of resources, and the way society deals with 'waste'.

Ensuring that our natural capital is not destroyed demands that we utilise only the 'interest' on that capital. For example, we can manage forest ecosystems sustainably by harvesting only a small amount from the crop each year. Forestry is an example of what we may term 'renewable' natural capital, in that the stocks are not finite, and, given correct management procedures, can be sustained in perpetuity.

1 Proposed by Levett (1998) cited in *Sharing Nature's Interest*, 2000.
2 Global Footprint Network website, www.footprintnetwork.org



However, certain forms of natural capital are what we term as 'critical': the stocks are finite. Such stocks include coal, gas, oil and aggregates. These stocks are technically renewable, but human consumption is at a rate that is far greater than their slow creation in nature.

Another key element to our unsustainability is that resource use is not shared equally between nations or individuals. The developed nations consume far more global resources per person and also rely on the exploitation of ecosystems in other continents to sustain current lifestyles. In contrast, there is a failure to meet even basic needs for many people living in developing countries. The fundamental challenge facing human society over this century is therefore to enable everyone on the planet to live well within the planet's environmental limits.

THE RESPONSE TO THE SUSTAINABLE DEVELOPMENT CHALLENGE

Global sustainable development and sustainable consumption have been recognised as fundamental goals by the United Nations.

At the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg, governments built on earlier commitments to act on sustainable production and consumption. Clear targets were set through the Millennium Development Goals (MDGs) which represent a commitment to environmental sustainability and to addressing some of the root causes of environmental degradation and poverty. Indicators to monitor progress on the MDGs up to 2015 were also developed. In addition, world leaders adopted a plan significantly to reduce the loss of biodiversity by 2010.

“Each generation is entitled to the interest on the natural capital, but the principal should be handed on unimpaired.”

Canadian Conservation Commission, 1915

Global action is also being undertaken through other mechanisms, such as the Kyoto Protocol on cutting greenhouse gas (GHG) emissions. Welcome though Kyoto is, it does not come close to the 60-80 per cent cut in global GHGs that will be required to avoid dangerous levels of climate change: further negotiations are now underway. The European Union has recognised the need to act on climate change and, in their current *Sustainable Development Strategy*, to change our production and consumption patterns.

THE UK RESPONSE

The UK government's shared framework for sustainable development, *One future – different paths*, includes a set of guiding principles. The first, “living within environmental limits”, firmly recognises that, for a policy to be sustainable, it must respect the fact that we have only one planet. Sustainable production and consumption is identified as a priority area within the shared framework.

In the UK Sustainable Development Strategy, *Securing the Future*, the section “One Planet Economy” recognises that the global environmental impacts of our consumption and production patterns are severe. It also recognises that ecological footprinting represents a useful means of visualising the challenge facing us. The strategy notes that “developed country patterns of consumption and production could not be replicated world-wide” and cites the *Living Planet Report* estimate that if everyone lived like we do, we would require three planets to support us.³

The concept of footprinting also links in well with the Sustainable Communities agenda for England set out by the Office of the Deputy Prime Minister (ODPM). It also connects with the active work being taken forward on sustainable development and environmental justice by the Scottish Parliament and Welsh Assembly Government: indeed, the Welsh Assembly Government has adopted the ecological footprint as an indicator of progress.



What is the ecological footprint?

“Uniquely, we have adopted the ecological footprint as one of the indicators of resource use within Wales.”

Rhodri Morgan, First Minister, Welsh Assembly Government speaking at the ‘Wales in the World’ Conference, 17 April 2002

The most rigorous and useful way of measuring and interpreting our ‘ecological bottom line’ is through *ecological footprint analysis*. The ecological footprint is a measure of the mark that we leave behind upon the natural environment that sustains us.

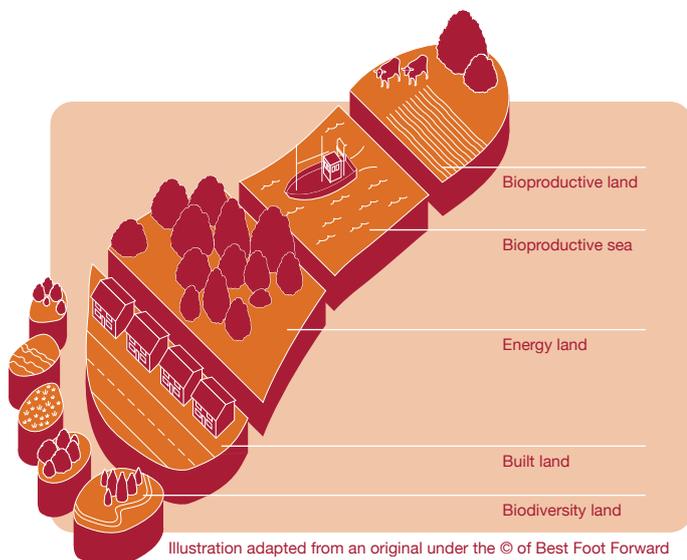
Governments, regional assemblies and local authorities are now engaging with the ecological footprint to help measure progress towards sustainable development and to inform policy. Using the footprint helps them integrate sustainability into policy-making in a way that has never before been possible.

Ecological footprint analysis measures the impact of human activity upon nature. The footprint expresses the land area that is required to feed us, provide resources, produce energy, assimilate

waste, and to re-absorb the greenhouse gases produced by our use of fossil fuels.

This approach uses land as its ‘currency’, and provides a notional figure – the global hectare⁴ – for the land area required to support an individual, a community or a nation’s population at its present standard of living. If all the biologically productive land and sea on the planet is divided by the number of people inhabiting it, our available footprint is 1.8 global hectares (gha) per person.⁵ If we choose to designate some of that productive land to wildlife, then our available footprint goes down.

Clearly, if the average footprint of every citizen of the planet is greater than 1.8 gha, then we are over-exploiting the earth’s resources and thus jeopardising the ability of future generations to



4 A global hectare is 1 hectare of biologically productive space. It could be anywhere on the planet, and assumes average levels of productivity.
5 *Living Planet Report 2004*, WWF International.

In 2001, our global footprint averaged 2.2 gha per person, meaning that we are already exceeding global carrying capacity by 21 per cent.



lead a decent quality of life. In 2001, our global footprint averaged 2.2 gha per person, meaning that we are already exceeding global carrying capacity by 21 per cent.

Developed nations are living in the most unsustainable manner, with some nations using up to nearly 10 gha per person. The UK has a total ecological footprint of 321,621,000 gha, equivalent to 5.4 gha per person.

This means that the UK's population is within the top 15 per cent of the global population in terms of our environmental impact. The biggest per person footprints can be found in the United Arab Emirates (9.9 gha), followed by the USA (9.5 gha).

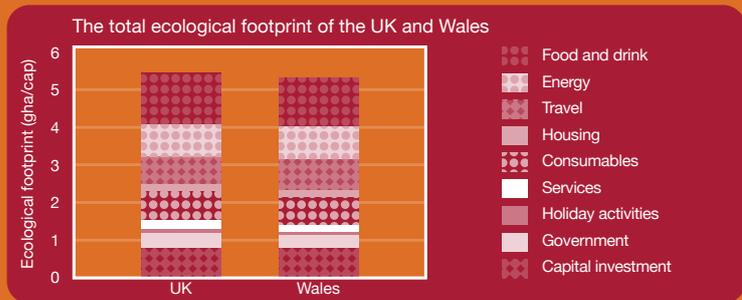
Our over-consumption can also be observed at the scale of a local authority area. The footprint of Liverpool is 5.07 gha per person, while the footprint of the Isle of Wight is 5.75 gha per person. The footprint of London – at 5.11 gha per person – is 125 times its geographical area; the size of the UK itself! If all the world's population had consumption patterns like us in the UK, we would need three planets to sustain ourselves.

Of the world's population, four-fifths has an ecological footprint smaller than 4 gha, equivalent in total to 38.3 per cent of the global footprint. The other fifth of the global population occupy 61.7 per cent of humanity's footprint, which in itself is already at least 20 per cent larger than the available capacity of the biosphere.

CALCULATING THE FOOTPRINT

The Welsh Assembly Government has a duty to promote sustainable development and has adopted the ecological footprint as an indicator of progress towards this aim.

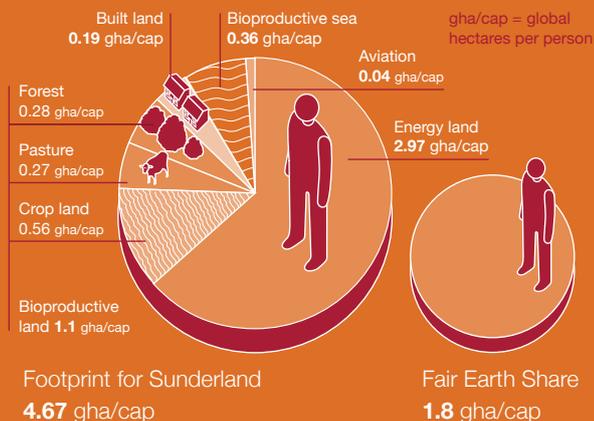
The project 'Reducing Wales' Footprint' established an ecological footprint for Wales and analysed material flows through the Welsh economy. Data on the impact of different activities was produced (see Diagram) and the wealth of information set out in the report of the project enables detailed analysis of where action to reduce the footprint is most urgently required. Based on the footprint data the impact of different policies and scenarios on the Welsh footprint was assessed.



Reducing Wales' Ecological Footprint, WWF Cymru

HOW IS AN ECOLOGICAL FOOTPRINT CAUSED?

The way we produce, manage and consume all types of resources impacts on our footprint. The North-East England Ecological Footprint project has calculated the footprint for Sunderland, which is 4.67 gha per person. This is low for the UK, but still almost three times the sustainable global average. From the diagram you can see that the greatest single proportion of the footprint (around two-thirds) is for energy. This represents not just the energy we consume directly in our homes and cars, but all the energy required to produce the goods and services we enjoy.





WHAT THE FOOTPRINT CAN DO...

Ecological footprinting:

- tells us about our impacts upon the natural world that sustains us;
- provides us with a 'time-bound' snapshot of our demand upon nature;
- allows us to compare footprints around the world;
- tells us about our available global biocapacity (productive land and sea area);
- tells us whether we are meeting the minimum requirements for sustainability.

AND WHAT THE FOOTPRINT CANNOT DO...

Ecological footprinting:

- cannot tell us what to do!
- tells us nothing about our quality of life – although it can indicate what our conditions may be like in the future if we continue on our 'business as usual' trajectory;
- does not account for pollutants;
- does not tell us whether land is managed in a sustainable way.

HOW FOOTPRINTING CAN SUPPORT THE WORK OF LOCAL GOVERNMENT

The report, *Step Change – an analysis of the policy and education applications of the ecological footprint*⁶ highlights six main purposes for undertaking footprinting projects, namely to:

- 1 provide baseline data to inform policies and projects;
- 2 analyse scenarios to determine targets and predict footprint reductions;
- 3 use as a means to integrate commitment to sustainable development within the Community Plan;
- 4 assist in sustainable development and environmental strategy formation;
- 5 adopt the ecological footprint as a key performance indicator;
- 6 provide powerful information for public awareness and education.

In the next section we consider the practical means by which we can develop a local authority area ecological footprint.



Footprint methodologies

Any local authority footprinting project has to be based on assembling the required data in an accurate and user-friendly way. There are two basic approaches to data collection, each of which has their own benefits and shortfalls.

1 THE 'TOP DOWN' APPROACH

The *top down* approach uses aggregate economic input-output and household expenditure data to derive footprints for large scale areas, such as the UK as a whole. The advantage of this approach is that it uses widely available national statistics and calculates accurate (albeit averaged) footprints for the areas or activities in question. The disadvantage of this approach is that it can overlook particular issues or variations around the average consumption pattern in a local area.

2 THE 'BOTTOM UP' APPROACH

The *bottom up* approach uses locally specific consumption data in order to generate a picture of consumption within a smaller area. The bottom up approach can provide some useful localised information, but one significant drawback is that in many instances data on local consumption patterns can be difficult to find. Using local data also does not take account of the resource requirements of the economy as a whole or of the indirect flows associated with consumption.

The most effective approach to preparing a footprint at a local authority area level is to combine both *top down* national data and *bottom up* local data: this way the strengths of each approach can be combined and the drawbacks minimised. It is this hybrid approach that has been developed by the Stockholm Environment Institute (SEI) for use in local authority area footprinting throughout the UK.

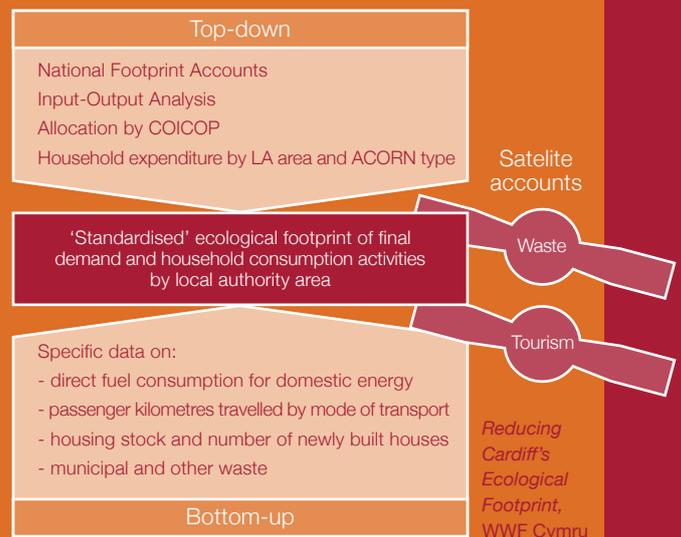
The National Footprint Accounts (NFA), developed by the Global Footprint Network, provide an ecological footprint for the UK. This data can be disaggregated down to regional and local authority level and combined with local data to form the basis of local footprint calculations.

The *Ecological Budget UK* project undertook a detailed resource flow analysis and ecological footprint of the UK by devolved nation and Regional Development Agency (RDA) area. This led to the production of footprint information for every local authority area in the UK, greatly simplifying the process of producing a local footprint.

There is a great deal of literature on the subject of ecological footprint methodologies. Helpful websites include:

www.ecologicalbudget.org.uk and www.footprintnetwork.org.

Outline of ecological footprint calculation methods



Global Footprint Network

Advancing the Science of Sustainability

The Global Footprint Network is committed to fostering a world where all people have the opportunity to live satisfying lives within the means of the earth's ecological capacity. It is dedicated to advancing the scientific rigour and practical application of the ecological footprint, a tool that quantifies human demand on nature, and nature's capacity to meet these demands.

In 2006, the Global Footprint Network will launch the first international standards for the ecological footprint, along with a certification process. This will ensure that all footprint studies are comparable, and comply with the most rigorous methodology and data sets agreed by the international community.

A crucial lesson from the experience of local authorities and LSPs in undertaking ecological footprint work is that it will only be effective in influencing policy and practice if it has the support of Elected Members, senior managers and key staff.

The steps on the footprint ladder

Undertaking a footprinting exercise requires the completion of a series of clear and distinct stages or ‘steps’, each of which will help ensure that the footprinting work is properly integrated with the wider work of the council or Community Planning framework.

A NOTE ABOUT THE DEVOLVED ADMINISTRATIONS

Since the creation of the Scottish Parliament, Welsh Assembly Government and Northern Ireland Assembly, many areas of policy, including Local Government, have been the responsibility of these bodies for their respective nations/regions. This has led to the use of different terms for similar structures such as Local Strategic Partnerships (LSPs) in England which are referred to as Community Planning Partnerships (CPPs) in Scotland and Community Strategy Partnerships (CSPs) in Wales. In order to make the text more readable the English terms are used throughout this report except when referring to specific examples in the other nations. For each of these terms the equivalents in Scotland, Wales and Northern Ireland are:

England	Scotland	Wales	N. Ireland
Local Strategic Partnerships	Community Planning Partnerships	Community Strategy Partnerships	n/a
Community Strategy	Community Plan	Community Strategy	n/a
Local Area Agreements	Policy Agreements	Local Outcome Agreements	n/a

GAINING SUPPORT

A crucial lesson from the experience of local authorities and LSPs in undertaking ecological footprint work (and indeed in promoting sustainable development in general) is that it will only be effective in influencing policy and practice if it has the support of Elected Members, senior managers and key staff.

As a general rule, time spent in building support before the footprinting project is underway can be invaluable in delivering successful outcomes. Cardiff County Council recognised the importance of ensuring high level support for the ecological footprint, and this has paid dividends as the process has been taken forward (see case study on pages 20 to 21).

Steps to consider include:

- ensuring that the footprinting project is discussed and agreed by the council cabinet or corporate management team (depending

on the decision-making process) or by the board of the LSP if the project is being taken forward through Community Planning;

- persuading the Chief Executive to make a personal commitment to the project and to pass this on to all relevant departmental heads;
- identifying any cross-departmental structures that could help support the footprinting process (for example, an officers’ sustainable development group) and meet with all key people involved to explain the project and the benefits for their work;
- identifying officers who are likely to hold the data that will be required to prepare the footprint report and meet with them to explain the process and outcomes.

The process of persuading senior management and Elected Members of the importance of footprinting is made easier by the commitments to sustainable development and sustainable procurement underpinning many of the

With its ability to create simple mental images from complex statistics, the footprint can also be used to help decision-makers to think about the big picture.

frameworks within which local government operates. These are discussed in the next chapter.

MAKING THE LINKS WITH CORPORATE, COMMUNITY AND DEPARTMENTAL STRATEGIES

Another key element of 'mainstreaming' the footprinting work is to ensure that it is integrated with key strategies such as the Corporate/Strategic Plan and Community Strategy, and that links are also made with other plans and strategies such as those on transport, climate change, sustainable development, housing and procurement. More information on the links that can be made with various strategies is set out in the following section.

USING FOOTPRINT AS A MONITORING TOOL

The footprint is useful as a one-off exercise but is perhaps more effective if viewed as an ongoing initiative, with the ecological footprint reviewed every few years. This allows trends to be measured over time (i.e. towards – or away from – sustainability) and comparisons made with other countries, regions, organisations and individuals. A commitment to a regular review of the footprint can help ensure it is embedded in council and Community Strategies as a tool to monitor progress, and that it is also used as part of the Strategic Environmental Assessment (SEA) of all relevant plans and strategies. (See the York case study on page 18, for example.) York has set a target of cutting the city's footprint within its Community Strategy.

UNDERTAKING FOOTPRINT ANALYSIS

The core element of the process is to generate the data and footprint analysis. This information is already freely available to all English, Scottish and Welsh local authorities as developed by the Stockholm Environment Institute (visit www.ecologicalbudget.org.uk). Results for Northern Ireland local authority areas are expected later in 2006.

The next step is to apply the analysis to policy. Already trialled with a number of footprinting projects, the REAP software (Resource and Energy Analysis Program) enables a

comprehensive accounting of how energy and resources are consumed, converted and produced in a given area/economy. It allows a range of alternative future scenarios regarding population, economic development, technology etc., to be considered, making it useful as a policy analysis tool.⁷

USING THE DATA: DEVISING AN ACTION PROGRAMME OR STRATEGY

As local authorities across the UK have shown, data provided by the ecological footprint is useful in a number of ways.

- At the most fundamental level it provides a clear picture of the extent to which a council or a local authority area is unsustainable. The range of data produced by the footprinting project can allow complex analysis of local environmental impacts with regard to individual issues such as energy use or food; in terms of how different communities or types of lifestyle impact on the overall footprint; or in terms of the resource use of different sectors of the local community.
- This data can inform a strategic response. It can be used to develop an Action Plan aimed at addressing impacts across the council or the community.
- It can be used as a basic tool to inform a revision of individual strategies with actions set out in the strategy analysed against their likely impact on the overall footprint. The data sets can be used to model different scenarios and examine their impact on the footprint, e.g. waste management, local food production, sustainable transport measures, renewable energy production, etc. Strategies that reduce the footprint can then be prioritised.
- The footprint can also be integrated with the Community Strategy and used to analyse or review actions or to monitor change.
- Finally, it is a valuable and effective visualising tool for educators, and can be used with children, young people and adults. With its ability to create simple mental images from complex statistics, it can also be used to help decision-makers to think about the 'big picture'.



Links between footprint and the wider local authority agenda

Footprinting has been shown to be an effective tool that can be integrated with a wide range of council and community plans and strategies. In particular, footprinting can be linked to the new powers of community leadership given to local authorities in recent years, helping underpin the need for all such plans to be based on sustainable development. The ecological footprint can also be used to assess the impact of individual policy decisions made by a local authority or Local Strategic Partnership.

THE DEVOLVED ADMINISTRATIONS AND REGIONAL GOVERNMENT

A significant amount of work on footprinting has been undertaken in Scotland, Wales, Northern Ireland and in the English Regions. Local authorities undertaking ecological footprint projects should be aware of the work underway in their nation/region and should consider how their footprint project can be linked with these initiatives.

In **Scotland**, a key objective of Scotland's Sustainable Development Strategy is to reduce the size of Scotland's ecological footprint. The Scottish Executive is also committed to conducting an independent ecological footprint analysis for Scotland in 2008, and to supporting the roll out of the footprint tool to local authorities and schools through *Scotland's Global Footprint Project*. This project is working with a number of councils to integrate the footprint into policy and to use it as an educational tool. The first footprint analysis of Scotland, *Scotland's Footprint*, was completed in 2004.

Wales has in many ways led the way on footprinting. A national footprint has been developed and is being used by the Welsh Assembly Government to monitor progress on sustainable development. Cardiff and Gwynedd Councils have used the analysis to

inform policies on transport, waste, food and other areas through the *Reducing Wales Ecological Footprint* project.

A footprint report for **Northern Ireland**, *Northern Limits*, has been prepared. A revised version of this report is now in preparation as is a new piece of work to assess the footprint of the Irish republic.

In **England** projects are underway in most regions:

- In 2002, a footprint for **London** was published, while in April 2004, the Mayor's Sustainable Development Commission adopted ecological footprint as a headline indicator. The concept has also been integrated with the London Plan (or spatial strategy), which acknowledges the impact of London's ecological footprint, especially in relation to energy and waste.
- In 2006, as part of the 'Ecological Budget UK' project, ecological footprint results became available for every English Region via the website .
- The Ecological Budget UK project also led to the development of two reports – both available in April 2006. For the **North-East**, there is a (local to regional) focus on Sunderland City, while for the **West Midlands** there is a (regional to local) focus on the footprint of a sustainable community.

A commitment to sustainable development underpins all Community Strategies and there is therefore significant potential to use the footprint to evaluate whether the plan is really helping to promote local sustainability.

There is also great potential to integrate footprints into a range of other regional work. For example, the South-East Integrated Regional Framework (IRF) has adopted ecological footprint as a headline indicator and it is also likely that there will be a commitment in the Regional Spatial Strategy (RSS) to stabilise the footprint and develop a reduction strategy.

ECOLOGICAL FOOTPRINT AND COMMUNITY PLANNING

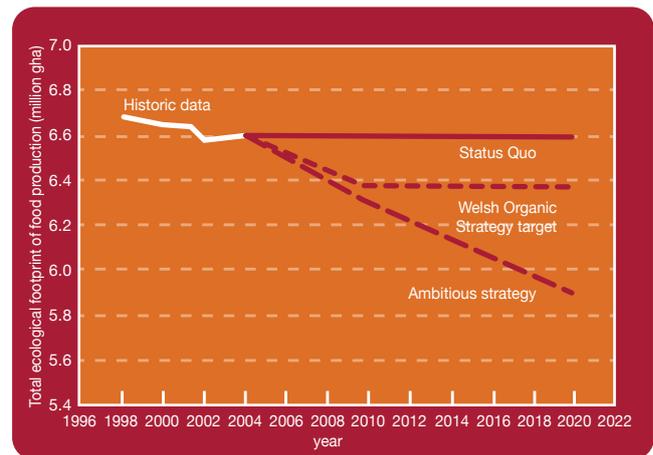
Community Strategies are now the central document driving much of the action at a local level. They are a statutory requirement and, given that they involve not just the local authority but also other public agencies, local businesses and the wider community, they offer the potential to develop integrated responses to local issues. A commitment to sustainable development underpins all Community Strategies and there is therefore significant potential to use the footprint to evaluate whether the plan is really helping to promote local sustainability.

The ecological footprint provides a way of linking the local to the global, while also providing a unique 'visioning tool' that can help both local people, and the authorities themselves, think about the challenges of sustainable development and the wider global impact of local actions. In Angus it was possible to link the footprint exercise to the Community Plan, using it as a tool to help those involved in preparing the Plan, particularly community groups, to make the connection between policy commitments and sustainable development.

The footprint project could also be linked to Local Area Agreements (LAAs). These represent an agreement reached between central and local government that is intended to improve performance in the delivery of local services. Ecological footprint could be adopted as an indicator of overall progress against the LAA.

Finally, the footprint can be integrated into the Public Service Agreement (PSA), with Essex Council being an example of where this has happened to date.

Footprint scenarios for organic food consumption and production, showing potential reductions. *Reducing Wales' Ecological Footprint*, WWF Cymru



	Baseline	Scenario a "slowing growth"	Scenario b "sustained growth"	Scenario c "high growth"
Year	2001	2020	2020	2020
Organic food market share	1.05%	2.2%	4.6%	16%
Individual food footprint a)	1.29 gha/cap	1.28 gha/cap	1.27 gha/cap	1.21 gha/cap
% change to baseline		-0.51%	-1.4%	-5.9%
Total amount of organic food consumed	29,900 t	69,000 t b)	135,400 t b)	470,500 t b)

- a) combined footprint of eating in and eating out
- b) takes into account the predicted growth in Welsh population

ECOLOGICAL FOOTPRINT AND PROCUREMENT/BEST VALUE

The Best Value regime governs the purchasing of all goods and services by local authorities. A key principle of Best Value across Britain is that it should promote sustainability. Indeed, sustainable public procurement is highlighted in the UK Sustainable Development Strategy, which also includes a commitment to developing related key performance indicators.

The ecological footprint links in well with procurement policies, helping local authorities to assess whether their purchasing decisions are contributing towards this sustainability goal and



providing quantified data that shows the real effect of procurement decisions. (See, for example, the Scotland's Global Footprint case study on page 19, which looks at how three Scottish councils are linking footprinting with Best Value.)

At a wider scale, the Ecological Budget UK project provides data that can be used as the basis for sustainable production and consumption strategies.

ECOLOGICAL FOOTPRINT AND STRATEGIC ENVIRONMENTAL ASSESSMENT

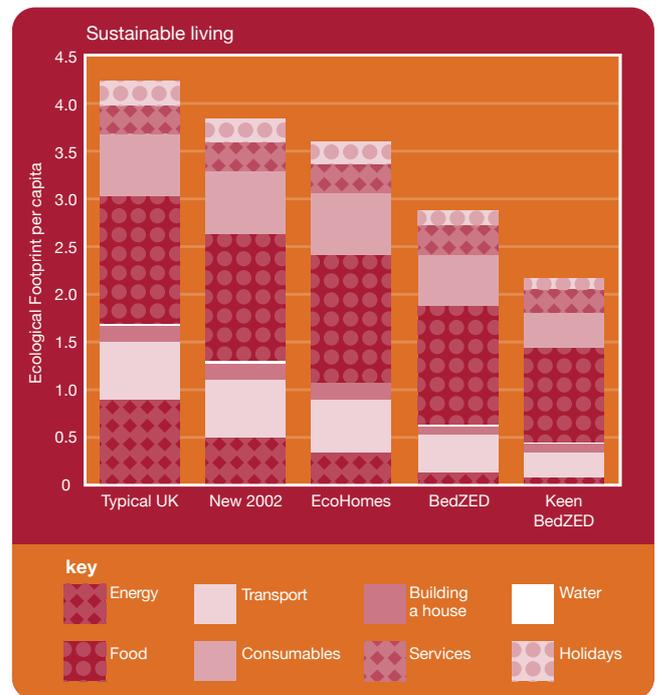
Since 2004 it has been a legal requirement that a Strategic Environmental Assessment (SEA) is undertaken on many local authority and LSP plans and strategies as they are being developed and reviewed.

SEA, and the associated process of Sustainability Appraisal, require the production of a baseline environmental assessment to highlight the key environmental challenges facing a community. SEA also requires the development of indicators and a monitoring process to assess whether the plan or strategy is having the impacts predicted by the Assessment or Appraisal. The information gathered to calculate the ecological footprint of an area can often be useful in providing baseline data for an SEA. The footprint is also useful as an indicator, particularly as – unlike other indicators – it can help assess the global environmental impacts of local policies. Finally, SEA requires that consideration be given to the impact of alternative scenarios/plans on the environment. Again, the footprinting exercise can assist with scenario modelling (See scenarios on organic food and sustainable linning on page 14).

The integration of the footprint and SEA is one of the objectives of the North-East Scotland footprinting project (see the case study on page 19). A considerable amount of work on the links between the two has also been undertaken as part of the Ecological Budget UK project.

ECOLOGICAL FOOTPRINT AND CLIMATE CHANGE STRATEGIES

Growing concern about climate change means that many councils across the UK are currently developing climate change strategies. As the footprint of a local authority includes data on carbon emissions per person, the ecological footprint can be used to provide the baseline data upon which to assess the impact of greenhouse gas mitigation policies on the overall emissions of a council or a local community. The footprint can also be used both to assess the relative impacts of different sectors of the economy on the overall emissions of an area, and to provide data on the embodied energy and greenhouse gas emissions provided by, for example, food production, consumption and disposal. Carbon dioxide (CO₂) accounts for all local authority areas in England, Scotland and Wales are available as part of the Ecological Budget UK project. Results for Northern Ireland local authority areas are expected later in 2006.



Footprint of different types of homes from current stock to zero energy developments. Stockholm Environment Institute.

Within Wales, the most effective strategy would be to introduce a waste minimisation and recycling scheme – especially for households. The embodied energy that is lost by throwing materials into landfill means that landfill waste accounts for nearly half of the footprint of Wales.

ECOLOGICAL FOOTPRINT AND SUSTAINABLE DEVELOPMENT/LOCAL AGENDA 21 STRATEGIES

Ecological footprint is a good way of integrating the various components of an overarching sustainable development or Local Agenda 21 strategy because it enables a direct comparison to be made between environmental options. Using the ecological footprint as part of the sustainable development strategy helps make the link between action on the ground and its likely wider impacts, thereby supporting a core principle of sustainable development.

The Welsh Assembly was the first administration in the world to use ecological footprinting as an indicator of 'real progress'. Local authorities such as Cardiff (see the case study on pages 20 to 21), Gwynedd and Liverpool have already made the links between footprinting and their wider sustainability work.

The footprint can also be used as a single indicator, and/or it can be broken down into its constituent parts (consumables and waste, energy and housing, travel, service demand, food and drink, and fixed capital government), with each one of these components being used as an individual indicator.

ECOLOGICAL FOOTPRINT AND INDICATORS

LSPs and local authorities have adopted a broad range of indicators to assess the effectiveness of their work. While effective indicators are very useful in helping to understand the extent of progress towards goals, many local authorities find some indicators problematic. This can be for a variety of reasons, including the following:

- indicators can be very narrow in their focus and fail to illustrate the bigger picture;
- the data required to assess progress against an indicator can be difficult to assemble and analyse;
- progress against one indicator can sometimes lead to a negative impact on another;
- the general public can find indicators difficult to comprehend.

The ecological footprint overcomes many of these problems as it offers a picture of overall progress towards sustainability that is easy to understand and explain. Essex County Council and North Lincolnshire Council are just two examples of administrations that have adopted the ecological footprint as one of their sustainable development indicators. York and North Lincolnshire Councils have also included the ecological footprint within their Community Strategies.

The Audit Commission's new *Quality of Life* report has noted the value of the ecological footprint as an aggregate indicator that can help provide the big picture on sustainable development. Although it is not part of the quality of life indicators set, the Commission recognise that there is increasing interest in this approach – see www.audit-commission.gov.uk/reports.

The report also notes that, through the Ecological Budget UK project, of which WWF is a key partner, ecological footprint results will be freely available for every local authority in England, Scotland and Wales including footprint data, information and support materials. Results for local authorities in Northern Ireland will be available later in 2006.

ECOLOGICAL FOOTPRINT AS A STRATEGIC MANAGEMENT TOOL

The footprint enables us to make comparisons between environmental policy options in a way that no other indicator can. Once the data has been collected we can then generate meaningful scenarios for strategies that seek to reduce the footprint.

Scenarios are a very effective way of deciding upon future policy and action. For example, within Wales, the most effective strategy would be to introduce a waste minimisation and recycling scheme – especially for households. The embodied energy that is lost by throwing materials into landfill means that landfill waste accounts for nearly half of the footprint of Wales. Not only can scenarios be used to help set targets, but they can also indicate by how much the footprint would be reduced if these targets were put in



place. For example, if the Welsh Assembly Government recycling and composting targets are met, the decrease in the waste footprint would be as much as 20 per cent.

Cardiff County Council, together with the ESRC BRASS Research Centre, is now in the process of applying the ecological footprint to significant events and developments because of their potential large environmental impact, but also because of their high-profile. The first large development that was examined was Cardiff's International Sports Village and the big event was the FA Cup Final.⁸

ECOLOGICAL FOOTPRINT AS AN EDUCATIONAL AND AWARENESS RAISING TOOL

The ecological footprint has great potential as an educational tool, enabling the complex concept of sustainable development to be presented in a clear visual form, and making connections to our everyday choices and life decisions as individuals. It also adds a global dimension, showing how environmental impacts are not just local but global, and highlighting inequality.

A number of the local footprinting projects have included an educational element. The current projects in North East Scotland and North Lanarkshire have placed a strong emphasis on working with schools to help them examine, measure and take action to reduce their impact on the environment locally and globally. Software and curriculum materials have been piloted in schools in these areas and will be available across Scotland in late 2006. It is intended that these materials should complement the Eco Schools programme, an international initiative designed to encourage whole school action for the environment. Materials are also available for other parts of the UK.

The Scotland's Global Footprint Project has also produced a popular fold-out footprint quiz and interactive display. More information on this work can be found at www.scotlandsfingerprint.org

Some councils have used the ecological footprint as a means of empowering the community. Angus Council carried out household surveys to determine the size of the average household's ecological footprint. This involved inviting people to complete a questionnaire regarding their lifestyles, e.g. questions on travel, energy use, water, shopping, waste, and the local environment. The questionnaire included an insert with 'footprint tips' with ideas on how to reduce footprint. The project was very successful in raising awareness throughout a single community, and Angus Council is considering repeating the exercise in other communities.

Mersey Travel used the ecological footprint as a communications and awareness raising tool in the transport sector to help induce change in people's travel behaviour. This involved a transport footprint calculator which provided information on the ecological footprint of different modes of transport. A version of this tool has been developed for schools.



8 Collins et al, 2005; Collins and Flynn, 2005; Collins et al, forthcoming

To help address these significant environmental challenges, a number of actions were set out in the Strategy. One of these was to “encourage local businesses and organisations to reduce their impact on the local and global environment and to assess their environmental performance.”

Case study 1

York

Introduction – The York Footprinting Project was one of the earliest in the UK. It began in 2001, when the Energy Saving Trust obtained funding from Norwich Union to undertake a footprint study, which was conducted by the Stockholm Environment Institute. The initial study was completed in August 2002 and calculated that the average footprint of each resident of York was 6.91 gha, well above the UK average. Over the last three years the City of York Council has used the data produced to help guide its overall policy framework, most especially with regard to Community Planning.

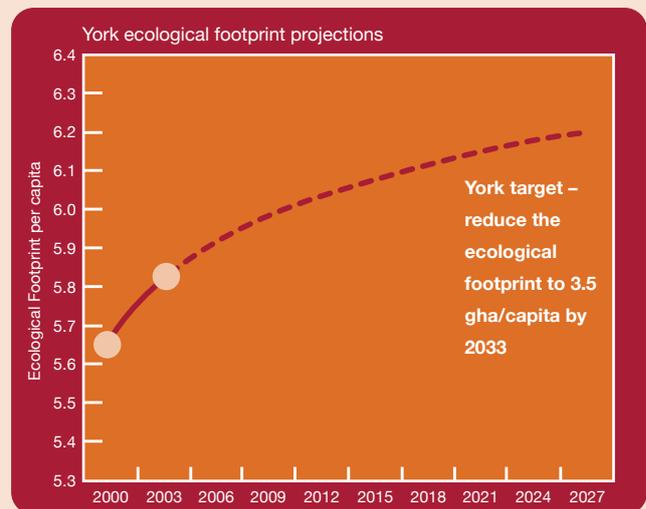
LINKAGES

In 2003, the York Local Strategic Partnership was established, with the City Council playing an important role. Through the LSP, the Community Strategy for York was produced in 2004, setting out a 20 year vision for the city. One of the core objectives for the Strategy was that York should become a sustainable city. However, based in part on the data generated through the footprinting exercise, it was recognised that the city faced a number of challenges in achieving this, including unsustainable consumption patterns, high volumes of traffic, increasing waste production and the threat of climate change.

To help address these significant environmental challenges, a number of actions were set out in the Strategy. One of these was to “encourage local businesses and organisations to reduce their impact on the local and global environment and to assess their environmental performance.” This objective is being actively supported by the Stockholm Environment Institute (SEI).

More crucially, the Community Strategy is being underpinned by a target to reduce the ecological footprint of the city to 3.5 gha per person by 2033. By using this as a target in the Community

Strategy, the Council can help ensure that this is a target that all in the community can contribute towards.



Now that this target is established, SEI is working with the City Council and Community Planning Partners to consider how best this ambitious target can be achieved.

Stockholm
Environment
Institute

MORE INFORMATION

Stockholm Environment Institute.

Visit www.regionalsustainability.org



Case study 2

Scotland's Global Footprint

Introduction – Scotland's footprinting project was launched in 2004 and will run for three years until June 2007. The aim of the project is for three Councils – Aberdeen City, Aberdeenshire and North Lanarkshire – to work with WWF Scotland and other partners to reduce their local and global environmental impact. Aberdeen City and Aberdeenshire Councils are running a joint project covering North East Scotland.

THE PROJECT

There are four stages to the project:

- measuring the footprint of each local authority area;
- using the REAP software tool to inform policy;
- developing a Footprint Reduction Plan and projects to reduce the footprint;
- producing educational materials for schools to measure the whole school footprint.

The work is intended to demonstrate the potential of integrating footprinting with two areas of important cross-departmental work within local authorities. Firstly, work is ongoing to connect the ecological footprint with work on Best Value. Secondly, it is being demonstrated how the footprint can help inform Strategic Environmental Assessments (SEA).

The project also places a strong emphasis on working with the education sector, and individual schools in the two areas have undertaken their own footprinting exercises as part of the project. These activities have been supported by an interactive software tool and materials to help support primary and secondary school children to calculate their ecological footprint.

LINKAGES

Both the North East and the North Lanarkshire project have linked their footprint work with their Community Planning Partnerships (CPPs).

THE FUTURE

The preliminary calculation of the footprint in each area has now been completed and this is feeding into an evaluation of policy options. These results and the educational materials will be rolled out to all Scottish local authorities in 2006.

MORE INFORMATION

www.scotlandsfingerprint.org



In 2001 (the baseline year), the ecological footprint of Cardiff was 5.59 gha per person. In land use terms this equated in total to 82 per cent of the land area of Wales. The researchers believe that in the intervening years up to 2005, Cardiff's footprint will have grown to equal the land area of Wales.

Case study 3

Cardiff's Ecological Footprint

Introduction – The Welsh Assembly Government has an established commitment to use the ecological footprint as a policy analysis tool. As part of the 'Reducing Wales' Ecological Footprint' project, the footprints of Cardiff and Gwynedd were calculated. The Cardiff project was based on a partnership between the Council, ESRC BRASS Research Centre at Cardiff University, the National Assembly, WWF Cymru, the Welsh Development Agency (WDA), the Stockholm Environment Institute and the Environment Agency, and funded with a £300,000 Biffaward.

THE PROCESS

Two years before beginning the project the Council included a commitment within the Sustainability Strategy to address the global impact of the city and to use the ecological footprint as a tool to assess this impact.

However, Cardiff County Council (CCC) was concerned that previous footprinting studies were not being linked to policy decisions and therefore not leading to real and quantifiable actions. It was felt that a key reason for this was that the footprint was not integrated with mainstream policy. Crucial to the success of Cardiff's work was ensuring that the footprint connected with the Community Strategy, providing as it does the overarching vision for the city. The footprint was also integrated with the Performance Plan and the Corporate Business Plan.

Another significant step was to ensure that the cabinet discussed and approved a commitment to the footprint project, with this ensuring high level political support.

Once this high level political and strategy commitment was in place, the footprint process was taken forward through the 'Sustainability Advocates' group. This consisted of senior managers in departments across the authority with the group being established to ensure that sustainable development was mainstreamed across the Council. Next the researchers worked with the Council on data collection and analysis, leading to the development of policy scenarios.

THE RESULTS

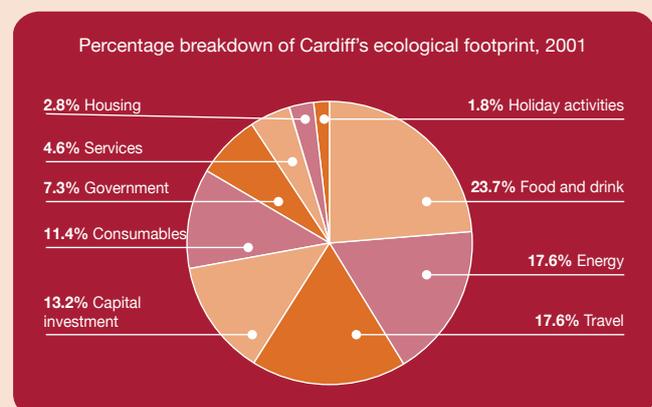
In 2001 (the baseline year), the ecological footprint of Cardiff was 5.59 gha per person. In land use terms this equated in total to 82

per cent of the land area of Wales. The researchers believe that in the intervening years up to 2005, Cardiff's footprint will have grown to equal the land area of Wales.

The most significant ecological impacts identified were:

- food eaten in the home;
- commercial infrastructure;
- passenger transport;
- municipal waste;
- domestic energy.

The research illustrated the huge impact of individuals and householders through their consumption patterns. By breaking the footprint down into its component parts, the impacts of different activities can be identified and possible policy responses considered.



Reducing Cardiff's Ecological Footprint, WWF Cymru



FOOD FOOTPRINT

Food is the biggest part of the ecological footprint and much of this impact is down to the production methods and the resources used in processing the food. Only 1 per cent of food consumed in Cardiff is organic, 32 per cent is imported and 16 per cent ends up going directly into the waste stream. The best way to slow the growth of the food footprint in Cardiff is to increase consumption of fresh, seasonal and organic foods rather than processed foods. School meals, events and public and private sector catering are key areas for action.

ENERGY FOOTPRINT

The study showed that there is an increasing growth in the energy footprint of Cardiff, and that rising disposable income and the proliferation of smaller numbers in households are adding to this increase. Only 6.8 per cent of domestic energy in Cardiff is sourced from renewable sources, and each citizen is responsible for 2.48 tonnes of CO₂ being released into the atmosphere. In order to reduce the growth of the footprint a radical shift towards renewable energy use across the city is required. In addition, providing new and existing housing with energy efficiency measures would have the most significant impact on the footprint.

WASTE FOOTPRINT

The study shows that 64 per cent of the domestic waste stream is recyclable. While Cardiff County Council recycling policies are beginning to tackle this problem, the study shows that radical minimisation of waste is required and that activities which minimise the introduction of packaging and food waste into the waste stream will have the most effect. Developing local markets for recyclables would also help to reduce the footprint.

TRANSPORT FOOTPRINT

Air and car travel are responsible for 95 per cent of the transport ecological footprint. Only 10 per cent of passenger km in 2001 were by public transport, cycling or on foot. The scenarios showed that the role of car and air travel in footprint growth over the next 15 years will be significant. This would be exacerbated by any further car centric development across Cardiff and increased numbers of people travelling by air. The study supports the Council's approach to providing access to more sustainable transport modes of rail and bus and city centre living, but shows that a more radical approach is needed. This evidence can help in the debate about congestion charging and similar demand management policies in the city.

The research suggests that the increased demand and economic benefits of air travel also have a significant ecological cost. An opportunity is identified for Cardiff to send out a clear message that the city is offsetting these impacts through carbon sequestration projects (tree planting, etc.) and green tourism initiatives.

INFRASTRUCTURE FOOTPRINT

Cardiff's capital city status and role in the city region means that Cardiff's citizens bear an ecological burden for the rest of Wales because of this shared infrastructure. Also clear is the need to start beginning to account for the lifetime ecological burden of developments, as well as their initial impacts in construction.

CONCLUSIONS

The Cardiff footprint study has helped to move footprinting out of the academic and into the policy arena and will help to inform the sustainable development debate in the city in a number of ways:

- it has identified the most significant areas of resource use and the ecological 'big hitters';
- it provides evidence to inform debate and challenge policy to reduce the ecological footprint;
- it will be used as an awareness raising tool to engage with partners and citizens into the future and be re-measured as a Community Strategy indicator at regular intervals.

MORE INFORMATION

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For copies of the technical report please see the pdf version at:
www.walesfootprint.org

Conclusions

The bottom line for sustainable development is that we live within the capacity of supporting ecosystems, both as individuals and communities. The ecological footprint helps translate the aspiration for local and global sustainable development into a tangible framework around which action can be taken.

At the local level, footprinting can be used as a strategic management tool, as an awareness raising and educational tool, as a cross-cutting thread running through a wide range of strategies and plans, and as a source of baseline information and indicators to underpin SEA and Best Value.

Many councils and community planning bodies across the UK have found that undertaking work on the ecological footprint has brought significant benefits. It is hoped that this guide, and the range of other support available from WWF and their partners, will assist other local authorities to become involved in this important work.

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Useful web addresses

Ecological Budget UK

www.ecologicalbudget.org.uk

WWF-UK and Ecological Footprint

www.wwf.org.uk/footprint

WWF Cymru and Wales' Ecological Footprint

www.walesfootprint.org

WWF Scotland and Scotland's Global Footprint

www.scotlandsfootprint.org

Stockholm Environment Institute

www.regionalsustainability.org

Global Footprint Network

www.footprintnetwork.org

Mass Balance UK

www.massbalance.org

The Sustainable Development Research Centre (SDRC)

www.massbalance.org

Best Foot Forward

www.bestfootforward.com

Appendix

Characteristics of indicators, and the performance of the ecological footprint

Measures what we want to know, or is an acceptable proxy for it	Ecological footprint measures human resource consumption against our stocks of natural capital – and answers the most basic question for sustainable development: ‘How much nature have we got, compared with how much we use?’
Scientifically valid	The ecological footprint concept has been in use since 1992. It is used to compare the ecological footprint of nations (see the <i>Living Planet Report</i>), and measure the ecological footprint of regions, communities and individuals.
Simple and easy to interpret	Ecological footprint is both a technical concept and a metaphor. Intuitively the human footprint should not exceed the area able to support it. It also supports an equity perspective by showing that in order to sustainably accommodate Northern large footprints, very little space remains for Southern footprints.
Shows trends over time	Ecological footprint can be used to compare against other countries, regions, organisations and individuals and against itself to show trends over time, i.e. has the footprint increased or decreased since the last measurement?
Sensitive to the changes it is meant to indicate	Ecological footprint is an aggregate of resource consumption flows and waste assimilation, converted into a land mass area that represents ecosystem categories. Changes in consumption patterns will produce changes in the demands of each ecosystem category, and a corresponding change in the overall footprint.

Reliable/stable/reproducible, i.e. comparable information is obtained when a measurement is repeated

Comparison between regions, countries and individuals is reliable/stable and reproducible. The Global Footprint Network will establish international standards and a certification protocol for ecological footprint reports in 2006.

Capable for extrapolation or use for prediction, because the processes it reflects are well enough understood

Ecological footprint analysis can be used to plan and model scenarios for the creation of a more sustainable future. Once the initial data has been collected, the data sets can be used to model differing scenarios and examine their impact on the footprint, e.g. waste management, food production, transport measures, renewable energy, etc.

Based on readily available data or data at a reasonable cost

The national footprint accounts are based on national statistics documenting resource use and consumption. The Ecological Budget UK report extends this approach and combines it with local consumption data to provide results for regional and local authority areas.

Based on data adequately documented and of known quality

Data sources include the Office of National Statistics (National Economic Accounts, National Environmental Accounts, Household Expenditure, National Food Survey), National Travel Survey (Department of Transport), household expenditure by ACORN group (CACI Ltd.).

Capable of being updated at regular intervals

National Footprint accounts are updated annually by the Global Footprint Network based on the latest complete data sets available, which usually entails a time lag of about three years. The Ecological Budget UK report will produce the first set of comparable footprint results by region and devolved country for the UK in 2006. It is hoped this report will be updated on a regular basis.

Have a target or guideline against which to compare it

The footprint is a snapshot in time. Comparing per capita use with global biocapacity offers a guideline for footprint reduction. Scenarios can help inform more specific targets for transport, energy and food for example.

The mission of WWF – the global environment network – is to stop the degradation of the planet's natural environment, and to build a future in which humans live in harmony with nature, by:

- conserving the world's biological diversity;
- ensuring that the use of renewable natural resources is sustainable; and
- reducing pollution and wasteful consumption.

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