

Opportunities and threats to the local economy from environmental dependencies

*LEED Toolkit Level 2 Report for GFirst Local Enterprise
Partnership*

12 May2014

Report produced for: GFirst Local Enterprise Partnership

Report funded by: Natural England (on behalf of the Defra network)

Report prepared by: Paul Silcock
Esther Kieboom
Matt Rayment, ICF-GHK
Dr Ilya Maclean, ESI

Report reviewed by: Paul Silcock

Cumulus Consultants Ltd
The Palmers
Wormington Grange
Wormington
Broadway
Worcestershire
WR12 7NJ

Telephone: +44 (0) 1386 584950
Email: info@cumulus-consultants.co.uk
Internet: <http://www.cumulus-consultants.co.uk>

Contents

1.	Executive Summary	4
2.	Introduction	6
3.	Brief description of the economy of the area	7
4.	Overview of opportunities and threats	9
5.	Opportunities summary	12
6.	Threats summary	14
7.	Opportunities in detail	16
8.	Threats in detail	31
9.	Summary and next steps	45

Appendices

1.	List of people interviewed	46
2.	Cross reference LEED Level1 and Level2	47

1. Executive Summary

The prosperity of Gloucestershire is underpinned by a high quality natural environment. It is essential that, as the economy is developed, the county's natural environment is not overlooked or damaged but instead maintained and, where possible, enhanced. This will sustain future economic growth. GFirst Local Enterprise Partnership (LEP) and Gloucestershire Local Nature Partnership (LNP) recognise this interdependency and have worked hard together in the period leading up to the submission of the EU Structural and Investment Funds Strategy (EUSIF) and the Strategic Economic Plan (SEP). The Local Environment and Economic Development (LEED) Toolkit seeks to add value to this work. Potential opportunities and threats to the county's economic growth plans stemming from the economy's dependency on the environment are identified and expanded on in this LEED Level 2 Report. Three key points stand out for the consideration of the LEP and LNP.

Quality of life is high on the list when competing for talent and business. Highly skilled people expect to live and work in a high quality environment, and aspire to a high quality of life; this also attracts high value businesses (Opportunity 2 or O2). Well-designed buildings, well planned developments and attractive landscapes are appreciated. Sense of place is also important, and future development along the M5 should not turn Gloucestershire into 'just another motorway intersection' (Threat 4 or T4). Connectivity and transport are key, and future improvements such as the 'missing link'¹ need to be developed in a way that minimises the impact on the environment and tourism (T5). Alongside road and rail connections, Green Integrated Transport Schemes are also important; 'active travel' (walking and cycling) should be part of the 'quality of life offer' and planned into new developments and green infrastructure (O4). The GREEN Skills Centre provides an example of the type of high value skills the county wants to build and could help the development of the renewables sector (O1); alongside, the drive for energy efficiency should not be overlooked (T7).

'Resilience' is a pre-condition for economic growth. The threat of flooding (T1) needs to be addressed, through careful spatial planning and design of new development (T6). As land is developed the natural functions of soil in terms of water absorption and water cycling are lost (T3). The inclusion of green/blue infrastructure² (O3) and sustainable urban drainage systems³ in new development is vital. In addition, new market mechanisms such as Payment for Ecosystem Services schemes⁴ (O8) could be used, where land managers are paid to provide flood alleviation that benefits urban populations downstream. Such a 'catchment management approach' can also address other land management and water quality issues. Despite recent flooding, water resources are under pressure from an increase in population and the impacts of climate change. Water availability is therefore a risk to the whole economy, and in particular agriculture (T2). A joined-up approach to increase water security and resilience is therefore required.

¹ The Missing Link is the 5km section of single carriageway at the Gloucester-Cheltenham end of the A417/A419 route between the M4 and M5. A dual carriageway is proposed to improve the road in this location.

² Green infrastructure can be defined as a network of multi-functional green space, urban and rural, which is capable of delivering a wide range of environmental and quality of life benefits for local communities. Blue infrastructure refers to a similar water-based network (rivers, canals, lakes, ponds).

³ Sustainable urban drainage system (SUDS) is a natural approach to managing drainage in and around properties and other developments; it operates by slowing and holding back the water that runs off from a site, allowing natural processes to break down pollutants.

⁴ Payment for Ecosystem Services (PES) schemes are market-based mechanisms to increase the supply of ecosystem services.

The strength and importance of the rural economy must not be overlooked (T8). The growth in creative and knowledge intensive industries (O5) is not limited to urban areas, as many entrepreneurs and high skilled workers are attracted by the beautiful rural environment, provided there is fast broadband available. The rural economy already supports a thriving visitor economy, and there are opportunities to develop sustainable tourism further (O6). The production of high quality local food and drink would benefit from a stronger local supply chain and showcasing Gloucestershire food & drink to a wider audience (O7). A thriving rural economy not only provides an attractive backdrop, but supports the wider economy in the region.

2. Introduction

2.1 Background

The Local Environment and Economic Development (LEED) toolkit is designed to support Local Enterprise Partnerships (LEPs) to identify key *opportunities and threats to local economic plans* which stem from the *economy's dependence on the environment*. These are significant, but normally given insufficient consideration in economic development planning, partly because the complexity of the evidence base makes them hard to assess. LEED was developed by Natural England, the Environment Agency, the Forestry Commission and Defra in conjunction with four LEPs. More information on LEED can be found [here](#).

LEED was rolled out by GFirst LEP as follows:

- A LEED Level 1 Workshop was held in Gloucestershire on 20th January 2014.
- A short report was then produced setting out an interim list of opportunities and threats.
- GFirst LEP decided to progress to Level 2 of the LEED toolkit, in association with the Gloucestershire LNP, with financial and technical support from Natural England and its consultants.

This report forms the output from the LEED Level 2 process; it describes the approach taken and summarises the findings.

2.2 Aim

LEED Level 2 builds on the work undertaken at Level 1. The aim of LEED Level 2 is to verify the opportunities and threats to the Strategic Economic Plan based on the economy's dependence on the environment, and to consider these environmental relationships in more detail. LEED Level 2 involved a review of existing evidence and meetings with key experts.

2.3 Approach

LEED Level 2 consisted of eight tasks:

1. Setting up a consortium of key local partners/experts, with whom key environmental relationships could be explored.
2. Setting up meetings with key local experts – to cover the full range of ecosystem services including: water supply/water quality/flooding; food supply; fibre and fuel; land and soil quality/erosion; tourism/ recreation/ cultural heritage/ landscape value; health; clean air/air pollution; wildlife/pollination/pests/diseases/genetic resources; and climate mitigation/adaptation.
3. Producing a summary of the socio-economic background based on existing documents.
4. Preparing interview questions specific to each environmental relationship.
5. Interviewing key experts. In total, 7 face-to-face interviews and 4 telephone interviews were completed, involving 13 experts; see Appendix 1.
6. Analysing and synthesising the findings, to produce a draft Level 2 report.
7. Holding a Level 2 Workshop on 9 April 2014. This involved senior representatives from GFirst, Gloucestershire LNP, local authorities and other partners. It included a presentation and discussion on the draft findings and suggested actions.
8. Producing a final report, incorporating feedback from the Level 2 workshop and comments on the draft report.

3. Brief description of the economy of Gloucestershire

Gloucestershire has high employment and self-employment rates, and low unemployment rates

Economic participation rates are relatively high compared to the rest of the country, with 80.2% of the work aged population economically active (national 77.4%), with higher rates of employment and self-employment than the national average. Unemployment rates are lower (5.7%) than the national average (7.7%).⁵

Gloucestershire has a strong economy, which is highly diversified

There is a diverse range of industrial and commercial activities in the county with a relatively highly skilled workforce and good infrastructure that has attracted international and innovative businesses. There are 26,000 enterprises, with a high proportion of the population working in high and medium technology, the knowledge economy, export intensive and 'home grown' industries. Gloucestershire has a high success rate for business survival. During 2012, over 5,000 start-ups were established in the county, with a similar trend to follow for 2013. Gloucestershire is also ranked second in the country (behind Cumbria) for having the highest survival rate of businesses over a three year period.⁶

Gloucestershire remains strong in manufacturing

Manufacturing accounts for a larger proportion of the Gloucestershire economy than the regional and national averages, accounting for nearly 15% of all jobs (compared to 10% nationally). Particular specialisms are: nuclear energy; aerospace; and precision engineering and medical instruments. These are relatively high skilled, high value manufacturing jobs. Other important employment sectors include the Professional, Scientific & Technical sector, the Finance & Insurance sector and the Media sector, in particular digital media. In 2009, manufacturing represented 21.7% of local economic output (£2.5bn) and remains a very important sector, although it has only grown by 13% in 10 years. Since 2000 the financial & insurance GVA grew by 162%. Of particular note is the significant decline in the output for the real estate sector, declining by 18% between 2008 and 2009. This highlights the adjustment that has taken place as a consequence of the housing market downturn since 2008⁷.

Gloucestershire has an excellent transport infrastructure

Gloucestershire is served by good rail and road transportation links such as the M5 and the M4 with easy access to other motorway networks and major routes, linking it to the urban hubs of Bristol, Birmingham, Cardiff and London. Gloucestershire also has its own Gloucestershire Airport, with Bristol and Birmingham international airports being only an hour away.

Gloucestershire has a skilled workforce

Gloucestershire has relatively high skilled work force, with 20.8% working in professional occupations, 14.7% in associate professional and technical positions, and 12.6% in skilled trade occupations. This reflects the highly skilled nature of the area.⁸

⁵ Nomis (2014) 2013 Labour Market Statistics

⁶ GFirst (2014) Strategic Economic Plan for Gloucestershire

⁷ South West Observatory, Gloucestershire LEP (Economic Profile)
<http://economy.swo.org.uk/leps/gloucestershire/>

⁸ Business West Policy Team November 2012

Gloucestershire has a growing population

In 2012, Gloucestershire counted a population of 602,200. Local projections suggest that the Gloucestershire population will increase to 674,000 in 2033.⁹ 62.7% of the population were of working age (aged 16-64), compared to the national average of 64.2%¹⁰, due to a larger than average proportion of people of pensionable age in the county¹¹.

Gloucestershire has a rich countryside and cultural heritage

Gloucestershire has a rich countryside and cultural heritage and positions itself as an attractive place to live, work and visit. Examples are: the Cotswolds Area of Outstanding National Beauty (AONB), the ancient woodland of the Forest of Dean, and towns such as Cheltenham and Gloucester, Tewkesbury, Stroud and Cirencester, as well as attractive historic villages.

Gloucestershire has ambitions to grow GVA

The Local Enterprise Partnership has the ambition to grow Gross Valued Added (GVA) at 4.8% per annum between 2014 and 2022. Its plan will be focused on knowledge-intensive sectors. It aims to do this by supporting businesses and developing skills in high growth sectors, including helping start-ups to grow, and by maximising the connections and opportunities of the motorway corridor.¹²

LEP's economic growth priorities

The Strategic Economic Plan sets out ambitious plans to accelerate economic growth by focusing on key drivers of productivity and supporting growth in high value sectors, including:

- Knowledge intensive business sectors;
- Medium/high-tech manufacturing;
- Businesses with high potential for export growth;
- Low carbon energy including nuclear and renewables.

Priorities for the LEP are:

- Supporting high growth potential businesses to move on to the next stage;
- Improvements to transport connectivity;
- Opening up employment land, particularly around the motorway corridor;
- Ensuring an effective business support and skills offer.

⁹ Gloucestershire local projection 2010

¹⁰ Nomis (2014), Local Authority Profile for Gloucestershire

¹¹ Strategic Housing Market Update, Final Draft 2013

¹² GFirst (2014) Strategic Economic Plan for Gloucestershire

4. Overview of Opportunities and Threats

During the Level 1 Workshop, seven opportunities and six threats were identified. The Level 2 interviews and research provided further evidence to build and refine these, and also added some additional opportunities and threats. This resulted in eight opportunities and eight threats, see below:

The top ten opportunities identified (not ranked):

- O1: Centre of Excellence for renewables
- O2: Gloucestershire's attractive landscape to attract high value businesses
- O3: Green/Blue Infrastructure in new developments
- O4: Green Integrated Transport Schemes
- O5: Grow creative and knowledge intensive industries
- O6: Sustainable tourism
- O7: Supply chain for local food and drink
- O8: Payment for ecosystem services

The top ten threats identified (not ranked)

- T1: Flooding
- T2: Water availability
- T3: Changes in land use threaten soils
- T4: 'Just another motorway intersection'
- T5: 'Missing Link' impacts on environment and tourism
- T6: Lack of strong spatial planning
- T7: Economic growth increases demand for energy
- T8: Overlooking the importance and potential of agriculture and forestry

Appendix 2 cross-references the numbering of these opportunities/threats with the numbering in the Level 1 report.

As part of the analysis, the opportunities and threats were categorised into logical groupings. These groupings align, broadly, with the ecosystem services framework of Provisioning Services (PS), Regulating Services (RS) and Cultural/aesthetic services (CS), as follows:

Opportunities:

- A) opportunities that the environment provides for the economy (PS);
- B) opportunities to take action for the environment in order to protect the economy (RS);
- C) opportunities to use the quality of the environment for economic gain (CS); and
- D) opportunities to use existing strengths to develop exportable environmental goods and services.

Threats:

- E) threats from environmental change that can damage the economy (RS);
- F) risks that some of the economic opportunities related to the environment are missed (PS); and
- G) threats from inappropriate development patterns that can damage both the environment and the economy (PS,RS,CS).

Tables 1 and 2 below show the categorisation of the eight opportunities and eight threats. This categorisation is indicative and simplified. In practice, individual opportunities and threats may fall into a number of categories and reflect a number of ecosystem services in different groups.

Opportunities	A opportunities that the environment <u>provides for the economy</u>	B opportunities to take action for the environment in order to <u>protect the economy</u>	C opportunities to use the <u>quality of the environment for economic gain</u>	D opportunities to develop <u>exportable environmental goods and services</u>
	PS	RS	CS	
O1: Centre of Excellence for renewables	✓			✓
O2: Gloucestershire's attractive landscape to attract high value businesses			✓	
O3: Green/Blue Infrastructure in new developments		✓	✓	
O4: Green Integrated Transport Schemes		✓	✓	
O5: Grow creative and knowledge intensive industries			✓	
O6: Sustainable tourism	✓		✓	
O7: Supply chain for local food and drink	✓			✓
O8: Payment for ecosystem services		✓		

Table 1: Opportunities by category

Threats	E threats from environmental change that <u>can damage the economy</u>	F risks that some economic <u>opportunities related to the environment are missed</u>	G threats from inappropriate development that <u>can damage both the environment and the economy</u>
	RS	PS	PS,RS,CS
T1: Flooding	✓		
T2: Water availability	✓		
T3: Changes in land-use threaten soils	✓		✓
T4: 'Just another motorway intersection'			✓
T5: 'Missing Link' impacts on environment and tourism	✓		✓
T6: Lack of strong spatial planning			✓
T7: Economic growth increases demand for energy		✓	
T8: Overlooking the importance and potential of agriculture and forestry		✓	

Table 2: Threats by category

It is important to note that the opportunities and threats do not stand alone and are closely related. Several examples are set out below:

- The potential for growing the renewables sector (O1) is closely linked to energy demand and the need for energy efficiency (T7).
- Opportunities for growing the supply chain for local food and drink (O6), payments for ecosystem services (O8) and sustainable tourism (O7) can be developed provided the importance and potential of agriculture and forestry is not overlooked (T8).
- Good spatial planning (T6), providing green/blue infrastructure (O3) and developing market mechanisms such as payments for ecosystem services (O8) can make the economy more resilient to threats from flooding (T1), water availability (T2) and soils (T3).
- Green/blue infrastructure (O3), green integrated transport schemes (O4), the missing link (T5) and flooding (T1) are inter-related. Even with improvements in transport infrastructure in strategic locations such as the missing link, if other parts of the network are inaccessible, then the message of the county being 'closed for business' every time it floods could easily gain traction. This could be overcome by building flood resilience into existing and new infrastructure.
- Finally, but very importantly, people and business will be attracted to Gloucestershire by a high quality of life and a high quality environment. Maintaining Gloucestershire's attractive landscape to attract people and business (O2)(O5) is dependent on good planning (T6) and will be enhanced by the provision of green/blue infrastructure (O3) and green integrated transport schemes (O4). Conversely, poor quality development should be avoided (T4) and environmental impacts minimised and mitigated as far as possible (T5).

Specific interrelationships are highlighted in each opportunity and threat section below. Although the listed opportunities and threats are diverse and stem from a range of different types of interlinkages between the environment and the economy, addressing them together will help to fulfil Gloucestershire's vision for a sustainable economy that benefits people and the environment. The LEED toolkit recognises the range of links between the economy and the environment and the need to address these collectively to ensure that the opportunities that natural capital provides for economic growth are maximised and sustained over time.

What's in the rest of the report

This report now continues as follows:

- A two page spread expanding on the opportunities identified above (pages 12-13)
- A two page spread expanding on the threats identified above (pages 14-15)
- A section on each opportunity and threat, offering more evidence, links with other opportunities and threats and potential solutions (pages 16-44)
- A summary and next steps, including information on Level 3 of the LEED Toolkit (page 45)

5. Opportunities Summary

The opportunities in this section are the top eight identified by the research, but are not ranked.



O1: Centre of Excellence for renewables

Renewables are a central part of the solution to the low carbon energy challenge, and skills for renewables are highlighted in the Strategic Economic Plan. The GREEN Skills Centre can help drive the development of the renewables sector in the county and promote energy efficiency.



O2: Gloucestershire's attractive landscape

Gloucestershire's attractive landscape and quality of life are major draws for high value added businesses, attracting and retaining skilled workers, and a pull for visitors. This will deliver economic benefits, as well as recreational and health & well-being benefits



O3: Green (& blue) Infrastructure in new developments

Green Infrastructure is a planned approach to the delivery of nature and the benefits it brings. Examples include flood control, reductions in air pollution and opportunities for recreation. Green Infrastructure must be planned strategically at landscape scale for the fullest benefit.



O4: Green Integrated Transport Schemes

Green integrated transport schemes offer opportunities in terms of low carbon transport, reduced air pollution, reduced noise and increased accessibility for those without cars. They also help to protect the attractive character of the area.



O5: Grow creative and knowledge intensive industries

There is an opportunity to position the county as a live-work destination, particularly for businesses in the creative and knowledge intensive industries. This could link to brands such as 'Cool Cotswolds' and local festivals. Broadband delivery will be an essential element of this.



06: Sustainable tourism

Growth in tourism is an opportunity in terms of increased employment, particularly in rural areas. This needs managing in order not to damage what makes the area attractive. Developing sustainable tourism will benefit the economy and the environment.



07: Supply chain for local food and drink

There is an opportunity to supply more local food and drink to local markets; there is increased demand in the UK for high-quality foods with a specific local provenance and tradition. There is no reason why more could not be supplied to local organisations, as well as local venues and events. There is also potential for export of local food and drink.



08: Payment for ecosystem services

Payments for ecosystem services (PES) are market-based mechanisms to increase the supply of ecosystem services. For example, in order to increase flood protection, landowners upstream could be paid to provide additional flood alleviation, which would benefit urban populations downstream.

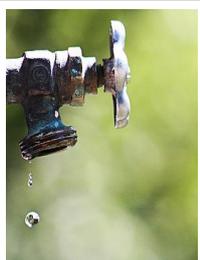
6. Threats Summary

The threats on this page are the top eight identified by the research, but are not ranked compared to each other.



T1: Flooding

The development zone in the growth plan is at risk of flooding. Changes to land use and management, both in the Cotswolds and further upstream could have a significant mitigatory impact. Advocacy for these changes is required, as is joint working with Local Authorities and the Environment Agency.



T2: Water availability

Although flooding has been the dominant issue in recent years, the climate change projections are for increased variability and extreme weather. Water shortages and drought are therefore a risk to the whole economy, but particularly agriculture. Changes to land use and management which mitigate flooding also prepare for water shortages.



T3: Changes in land use threaten soils

Gloucestershire is seeing much agricultural land being taken up by new developments. Once sealed, soils are lost for agricultural production, the function of nutrient and water cycling is lost and the risk of flooding increases. Furthermore, changes in agricultural practices have seen a loss of organic content, reducing resilience against flooding, as well as drought.



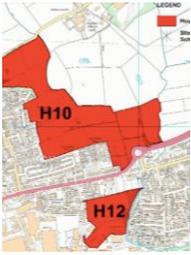
T4: 'Just another motorway intersection'

Gloucestershire's unique and attractive landscape is not as well showcased from the main road networks as it could be. There is a danger that further development could make this worse and the sense of place around that area is further eroded. A vision for high-quality development is therefore required.



T5: 'Missing Link' impacts on environment and tourism

Improvements to the A417/419 are a key element of the Strategic Economic Plan. These improvements could have negative impacts on the environment and tourism. These impacts need to be mitigated as far as possible during the planning process. A long run-in time will be required to determine these impacts ahead of the formal EIA process.



T6: Lack of strong spatial planning

Lack of strong spatial planning could result in Gloucestershire becoming a less attractive place to invest, work, live and visit. New developments need to be designed to enhance its character and its resilience.



T7: Economic growth increases demand for energy

All things being equal, economic growth will increase demand for energy, which will make meeting Climate Change Act targets significantly harder. There are roles for planning, design, energy efficiency technologies and changes to consumer demand to meet this threat.



T8: Overlooking the importance and potential of agriculture and forestry

Agriculture and forestry are important to the economy and to the character of the area. It is important that the economic potential of this sector is not overlooked, together with its wider contribution in terms of local food supply, tourism and ecosystem services.

7. Opportunities in Detail

This section describes each opportunity in more detail, suggests actions to seize the opportunity, highlights the importance and urgency, and identifies the associated costs and risks.

01: Centre of Excellence for renewables

The opportunity

Renewables are a central part of the solution to the low carbon energy challenge, and skills for renewables are highlighted in the Strategic Economic Plan. The Gloucestershire Renewable Energy, Engineering and Nuclear (GREEN) Skills Centre can help drive the development of the renewables sector in the county; it can also promote energy efficiency opportunities.

The GREEN Skills Centre is a key element of the Strategic Economic Plan¹³. Located at the decommissioned Berkeley power station, it will be a centre of excellence delivering STEM (Science, Technology, Engineering & Maths) skills in partnership with Stroud and South Gloucestershire College and major suppliers in the engineering and nuclear sectors.

There is an opportunity for the GREEN Skills Centre to encompass the full range of renewable energy technologies currently operating and potentially applicable in the county including wind, biomass, hydro, tidal, waste, ground source and solar, thus helping to ensure that benefits provided by the environment are fully realised. This will encourage young people into the renewable sector and contribute to the growth of the renewables sector in the county. Renewable energy will be a key part of the solution to the low carbon energy challenge.

Nationally, the renewable energy industry is expected to grow significantly in the next 20 years; the government has set a target for 15% of energy to be produced renewably by 2020¹⁴. The county's natural assets and current mix of energy infrastructure puts it a good position for this market. The total renewable energy resource available in Gloucestershire is significant – equivalent to over three times current electricity consumption and 40% of current gas consumption in terms of heat demand¹⁵. It could also generate reductions in CO2 emissions three times greater than the county's current emissions, through the export of renewable energy¹⁵. Large scale wind provides the greatest technical potential for renewable energy in the county, followed by biomass from forestry arisings, animal waste and energy crops¹⁵. Small scale wind, hydro and waste have potential but their relative contribution is low¹⁵. The Severn Estuary has the potential for sustainable tidal energy generation; via schemes that do not have the significant impacts on valuable estuarine habitats which would arise with the Severn barrage. The Severn Estuary could act as a test bed for a whole range of sustainable tidal technologies¹⁶. It is important to note, that although this level of renewable energy production is feasible, the assessment does not account of current or future planning policy nor whether this level of uptake would be desirable in practice¹⁵.

¹³ GFirst (2014) Strategic Economic Plan for Gloucestershire, including Appendix 2

¹⁴ DECC (2011) UK Renewable Energy Roadmap

¹⁵ ENTEC (2011) Renewable Energy Study Phase 2 Resource Assessment, Report for Gloucestershire County Council

¹⁶ RSPB (2014) Sustainable Severn – making the most of the estuary

It is important not to overlook the economic and environmental opportunities presented through energy efficiency (see T7), and the GREEN skills centre has a potential role in this sector too.

Suggested actions to seize this opportunity include:

- Continue working with Ecotricity, NIBE Energy and Severn Wye Energy Agency and develop links with other renewable energy partners, to explore the potential of the GREEN Skills Centre to support training for the renewables sector and the energy efficiency sector.
- Link GREEN Skills Centre discussions to recent renewable energy studies^{15 17} to develop a renewable energy strategy for the county. This could include opportunities for incorporating renewable and low carbon technologies into new developments and infrastructure and encouraging community renewables projects. Funding opportunities may exist through 'Allowable Solutions', off-site carbon reductions relating to the delivery of zero-carbon homes from 2016¹⁸.

Importance and urgency

Renewable energy could be a significant part of the economy in twenty years' time. The Renewable Energy Agency (REA) predicts that by 2020 the renewables industry could employ more than 400,000 people in the UK¹⁹. It is also predicted that capital investment in UK renewables will grow by around £65 billion between 2014 and 2020 in order to achieve the Government's projects for renewable electricity and heat, on the back of £30 billion already invested over the period between 2010 and 2013²⁰. The sector is developing quickly so engagement is urgent. It is worth noting that the county is already home to 64 companies involved with renewable energy, 33 involved with energy saving products and services, and 14 involved with the marine energy supply chain²¹.

Associated costs and risks

Renewable energy and carbon sequestration makes a significant contribution to reducing greenhouse gases in the atmosphere, which is essential to protect many essential environmental benefits, from flood control to food production. However there are local environmental impacts which need to be considered and managed, and any negative impact on the attractiveness of the area also needs to be considered. Each renewable energy option has its challenges including visual and landscape impact (e.g. wind), competing uses of land/resource (e.g. biomass) and environmental sensitivity (e.g. hydro, tidal).

¹⁷ ENTEC (2010) Renewable Energy Study, Report for Gloucestershire County Council

¹⁸ House of Commons Library (2013), Zero Carbon Homes, SN/SC/06678

¹⁹ REA (2012): Renewable Energy: Made in Britain, Renewable Energy Association

²⁰ REA (2014) <http://www.r-e-a.net/news/renewable-energy-industry-supports-over-100000-jobs-set-for-64-billion-of-investment-by-2020>

²¹ <http://www.regensw.co.uk/directory/>, accessed 12.5.14

02: Gloucestershire's attractive landscape

The opportunity

Gloucestershire's attractive landscape and quality of life are major draws for high value added businesses. It is important that economic development maintains and, where possible, enhances this attractiveness. Particularly important are the health and wellbeing benefits of landscape quality and recreational opportunities.

Gloucestershire has a relatively highly skilled workforce and good infrastructure which has attracted international and innovative businesses. A high proportion of the population works in high and medium technology, and in the 'knowledge economy'²². Such skilled people are in high demand, and Gloucestershire competes with other business centres, such as London and Bristol.

The great advantage that Gloucestershire offers is its attractive environment and high quality of life^{23,24}. Its environment includes nationally and internationally important landscapes, such as the Cotswolds AONB and Forest of Dean Forest Park, which are highly valued by local people and visitors. There is a range of (outdoor) recreational opportunities, which provide important health and wellbeing benefits. Agriculture and forestry play a critical role, maintaining and enhancing the county's natural environment and recreational opportunities, and underpinning its attractiveness.

The following actions have been identified to seize this opportunity:

- Promote the high quality natural environment of Gloucestershire in the implementation of the Strategic Economic Plan.
- Promote the high quality natural environment through the LEP for attracting talent for existing and potential future businesses to Gloucestershire.
- Ensure strong spatial planning protects and where possible enhances the attractiveness of Gloucestershire for the future.

Importance and urgency

The Strategic Economic Plan (SEP) already recognises the value of a high quality natural environment, as this is a key factor in high value businesses and skilled people locating here. The LEP has to ensure that the projects within the SEP and any site-based developments are designed and implemented in a way that maintains and enhances the environment. It is essential that economic development does not damage or destroy this asset, and that the landscape quality and attractiveness of Gloucestershire is maintained. Gloucestershire must not become 'Just another motorway junction' (see T3).

Associated costs and risks

This approach requires effective land use planning, and the support of developers for high quality design of buildings and the (natural) environment surrounding such new developments. This may involve higher development costs, and also some opportunity cost in terms of land not being developed. However, such investment will retain and enhance the attractiveness of the county, and is of benefit to all who live, work, visit and invest in it.

²²GFirst (2014) Strategic Economic Plan for Gloucestershire

²³ <http://www.gloucestershire.gov.uk/CHttpHandler.ashx?id=1511&p=0>

²⁴ Gloucestershire health and wellbeing strategy, 2012 -2032, Fit for the future

03: Green / Blue Infrastructure in new developments

The opportunity

A planned approach to green spaces and corridors in and around new developments can greatly reduce flood risk to properties, reducing insurance premiums and increasing the attractiveness of the area. This approach offers important benefits in terms of managing flood risk, by reducing surface run-off and providing somewhere to hold, or divert water away from valuable assets and easing the pressure on hard flood defences. SUDs (Sustainable Drainage Systems) should be incorporated into new developments to reduce flood risk. This approach is cheaper and more resilient than 'grey' infrastructure.²⁵ More broadly, WSUD (Water Sensitive Urban Design) could be implemented; this entails all aspects of the water cycle being taken into account when planning and designing the built environment²⁶.

Green infrastructure also keeps areas cool, and soaks up pollutant impact. Green infrastructure reduces air pollution and provides opportunities for active travel (walking, cycling) and recreation, by providing people space to relax and connect with nature and their community. Access to green space has a significant impact on health and well-being.²⁷ Green infrastructure delivers economic benefits, as it improves physical and mental health outcomes²⁸. Mental health is a significant problem in England with strong negative impact on the economy.²⁹ Time 'in nature' promotes recovery from stress and attention fatigue, and has positive effects on mood, concentration and self-discipline.³⁰ Working with nature in this way can provide much more resilient settlements and commercial accommodation.

Green infrastructure includes 'blue infrastructure' (rivers, canals, lakes, ponds). For example, Cotswold Water Park, with its continuing mineral extraction, will create more 'blue' infrastructure. Gloucestershire LNP has already developed a strategic framework for Green infrastructure in Gloucestershire³¹. Its vision is that "Gloucestershire's green infrastructure is enhanced, promoted and managed, so that it can continue to contribute to our high quality natural and historic environment, our health and well-being, our economy, our resilience to climate change and to a better quality of life for all" and "that sustainable economic growth in the county is strengthened by giving green infrastructure the same consideration as other key county-wide infrastructure issues." Natural England's website contains further information, guidance and case studies relating to Green Infrastructure.³²

The following actions have been identified to seize this opportunity:

²⁵ Duffy, A, Jefferies, C, Waddell, G, Shanks, G, Blackwood, D & Watkins, A (2008) A cost comparison of traditional drainage and SUDs in Scotland, *Water Science & Technology*, 57, 1451-1459

²⁶ CIRIA et al. (2013) Water sensitive urban design in the UK, ideas for built environment practitioners.

²⁷ Gloucestershire health and wellbeing strategy, 2012 -2032, Fit for the future

²⁸ Sunderland, T. (2012) Microeconomic Evidence for the Benefits of Investment in the Environment - review. *Natural England Research Reports, Number 033, 2012*

²⁹ LAYARD, R. (2006) The depression report: a new deal for depression and anxiety disorders. London School of Economics - Political Science - Centre for Economic Performance

³⁰ Health Council Of The Netherlands (2004), Nature And Health. Nature And Food Quality Agriculture. The Hague

³¹ Gloucestershire Local Nature Partnership (2014) A strategic framework for Green infrastructure in Gloucestershire, Draft 2, 29th January 2014

³² <http://www.naturalengland.org.uk/ourwork/planningdevelopment/greeninfrastructure/>

- Develop a county-wide Green Infrastructure Strategy which all partners can utilise when formulating their plans and projects (this includes the LEP, local authorities, the Health and Wellbeing Board, developers and others).
- Ensure that high quality Green Infrastructure is planned strategically at landscape scale for the fullest benefit. There are opportunities to work together on a more strategic level (rather than just site specific), e.g. the M5 corridor. Economic growth can go hand in hand with enhancing Green Infrastructure and the services it provides, i.e. flood resilience/ flood risk reduction.
- Support for a co-ordinator of Green Infrastructure across the LEP area to ensure a joined-up approach to the design and inclusion of Green Infrastructure in new developments which aims at a more strategic approach (working with Gloucestershire County Council and Gloucestershire LNP).
- The Council is Lead Authority on SUDs, and should ensure all new developments include appropriate SUDs. Consideration should also be given to the introduction/implementation of WSUD.
- The Local Planning Authority can use the CIL (Community Infrastructure Levy) as a source of funding for Green Infrastructure to connect communities.
- Good quality green spaces should be developed in consultation *with* local people, and should be within walking distance of where people live (66% of all visits to green space are taken within two miles of home, highlighting the importance of accessible local green space³³). This green infrastructure should cater for different types of people (e.g. skate park, walkers, biodiversity, etc.). The Health and Wellbeing Board has a role to play in promoting the use of green space for a more active and healthy life style.

Importance and urgency

One of the key functions that natural green spaces and Green Infrastructure are expected to fulfil is managing flood risk (T1). There are approximately 20,000 properties at risk of river flooding in Gloucestershire, 8,000 of those are businesses. There are approximately 60,000 properties at risk of surface water flooding in Gloucestershire, 15,000 of those are businesses³⁴. Furthermore, there are infrastructure assets (for example, roads, sewage treatment works and electricity installations)³⁵ in the Gloucestershire region at risk of flooding. Climate change is expected to increase flood risk through rising sea-levels and increased frequency of high-intensity rain events. If new development is not carefully planned it can suffer from flood risk and increase the risks to other properties downstream. This would damage Gloucestershire's reputation as an attractive area to invest. In addition, there are important economic and social benefits related to health and well-being.

Associated costs and risks

This approach requires effective land use planning, and the support of developers for the on-site elements of Green Infrastructure. This may involve some opportunity cost in terms of land not being developed, and some landscape costs, but will increase the attractiveness and resilience of the development.

³³ Natural England (2013) Monitor of Engagement with the Natural Environment: The national survey on people and the natural environment, NECR122

³⁴ Environment Agency

³⁵ Environment Agency (2009) River Severn Catchment Flood Management Plan 2009

04: Green Integrated Transport Schemes

The opportunity

Green integrated transport schemes cover opportunities in terms of low carbon transport, such as public transport, walking and cycling routes, and should be part of an integrated Transport Strategy for Gloucestershire. Green modes of transport provide an alternative to the use of the motor car, and reduce air pollution³⁶, reduce noise and increase accessibility for those without cars. Such schemes also help to protect the attractive character of the area. Active travel (walking and cycling) offers important health benefits³⁷.

Gloucestershire's Strategic Economic Plan considers transport infrastructure as essential to attract and retain high value-added businesses.³⁸ The car is the dominant transport mode, and the quality of road network is clearly important. It has identified as high priority the "missing link" on the A417/A419 (which is considered as the number one transport priority), the proposal for the Growth Zone at Junction 10 of the M5 to create an all-ways junction (number one growth priority - cost £30m), and the development of Junction 9 (Ashchurch). In addition, it proposes to develop a Gloucestershire Gateway service station between Junctions 11a and 12 of the M5.

However, the Strategic Economic Plan is currently not considering how Green Integrated Transport Schemes could connect places of work with where people live and shop.

Convenient and pleasant travel options are essential to the economic functioning of Gloucestershire, its attractiveness for in-migration and inward investment, and its attractiveness as a tourist destination. New development and transport planning allow the opportunity to take a strategic approach to plan and develop the infrastructure for public transport and routes for active travel (walking and cycling). This will reduce pressure on the road network, reduce the cost of traffic congestion, reduce carbon emissions, and reduce the damage to the attractiveness of tourist sites. It will help to maintain a healthy workforce and form part of the Gloucestershire's 'lifestyle offer' offer to potential investors. Data on travel to work is available from the Office for National Statistics (ONS)³⁹ to inform transport planning.

Suggested actions to seize this opportunity are:

- Green Integrated Transport Schemes should be included in a transport strategy and investment should be put towards them, as part of the delivery of the Strategic Economic Plan.
- Walking and cycling routes should be included in plans for green infrastructure in Gloucestershire. Such walking and cycling routes should link to the countryside and rivers/canals.
- Ensure new developments plan in public transport and walking and cycling from the outset.
- Green infrastructure should be included in any new road or rail development to help improve air and water quality, decrease the risk of flooding, decrease noise pollution and help prevent erosion (see O3 on Green Infrastructure)

³⁶ Krzyanowski, M, Kuna-Dibbert, B & Schneider, J. (2005) Health Effects Of Transport-Related Air Pollution, World Health Organization

³⁷ National Institute of Clinical Excellence (2012) Walking and cycling: local measures to promote walking and cycling as forms of travel or recreation, NICE Public Health Guidance PH41,

³⁸ GFirst (2014) Strategic Economic Plan for Gloucestershire

³⁹ <http://www.ons.gov.uk/ons/guide-method/census/analysis/travel-to-work-and-other-geographic-analysis/index.html>, accessed 12.5.14

Importance and urgency

A strategic approach to development over the next 20 years is required to deliver on this opportunity and therefore consideration is urgent. This consideration can build on already existing plans. Meeting climate change targets and the health burden caused by a largely sedentary population are major strategic drivers.

Associated costs and risks

Walk/cycle routes require planning and developing, but are relatively cheap compared to other forms of transport infrastructure, to build, use and maintain. Improvements in public transport vary in cost according to scale, but the cost-benefit analysis should include climate and health impacts. There are no significant risks in seizing this opportunity.

05: Grow creative and knowledge intensive industries

The opportunity

There is an opportunity to position the county as a live-work destination using brands such as 'Cool Cotswolds'. This could apply particularly to businesses in the creative and knowledge intensive industries which have high growth potential⁴⁰, add significant value and are attracted by, and have a positive relationship with, a high quality landscape and environment⁴¹. Creative sectors include design, publishing, digital media, computer games, film and music; these link to local festivals and events. Knowledge intensive sectors include high tech /scientific services such as R&D, ICT and engineering as well as more traditional professional services such as legal, accountancy, marketing, and consultancy. The opportunity would involve encouraging start-up businesses – including those which are home-based - as well as growing established businesses across the county, including rural areas.

Economic benefits include income generation, value added and job creation in the sectors concerned, as well as expenditure and activity in the wider local economy. Environmental benefits include less commuting, car usage and traffic leading to reduced carbon emissions and improved air quality, as well as a well-managed and cared for landscape and environment supported by business. There are social benefits too, particularly in terms of bringing activity and vitality to rural areas.

Broadband delivery will be essential⁴¹. Broadband speed and availability is currently variable across the county and the roll out of high-speed broadband will have benefits for the economy and knock-on potential benefits for the environment. Faster broadband is currently being rolled out by the Fastershire project⁴², which aims to bring fibre broadband to around 90% of homes and businesses in Gloucestershire and Herefordshire by the end of 2016. The proportion of premises which currently receive less than 2Mbps will go down from 20% to virtually zero as a result of the project.

The following actions have been identified to seize this opportunity:

- Promote the county as a live-work destination, particularly for creative and knowledge-intensive sector businesses, based on the area's high quality natural environment and other assets.
- Develop stronger linkages with creative and knowledge-intensive sectors to understand needs and issues and support growth.
- Support the roll out of high-speed broadband speed through the Fastershire project and similar initiatives.

Importance and urgency

Connection to high-speed broadband can overcome many of the economic disadvantages of rurality, allowing high-value added creative and knowledge economy businesses to start in, or move to, attractive rural areas such as those in Gloucestershire. The economic urgency is driven by the desire not to be left behind as digital communications speed up.

⁴⁰ GFirst (2014) Strategic Economic Plan for Gloucestershire

⁴¹ Cumulus Consultants (2013), Assessment of the economic value of the Cotswolds AONB, Report for the Cotswolds Conservation Board

⁴² <http://www.fastershire.com/homepage>

High speed broadband also has other economic benefits. It makes tele-commuting viable which can reduce congestion, increase the attractiveness of the area as somewhere to live and reduce carbon emissions. It should therefore be viewed as urgent from this perspective as well.

Associated costs and risks

There is a cost associated with rolling out high-speed broadband, and costs are higher per unit in rural settings. In terms of risks there is the potential that new infrastructure could impact negatively on perception of the landscape. Increasing broadband speed may also encourage more people to relocate to the countryside, putting added pressure on the rural environment and the rural transport network; this underlines the desirability of developing green transport opportunities (O4).

06: Sustainable Tourism

The opportunity

Growth in tourism is an opportunity in terms of increased employment, particularly in rural areas. This growth needs managing in order to avoid damaging what makes the area attractive; tourists are attracted to Gloucestershire by the beautiful countryside. Developing sustainable tourism will benefit the economy and the environment.

Tourism is an important sector in Gloucestershire in economic, export and employment terms. Each year the county welcomes in excess of 16 million visitors contributing over £1billion to the local economy⁴³. The county's high quality environment is an important draw for visitors and local people alike; its food culture, which has obvious links to farming, is also significant. The Cotswolds and Forest of Dean are particularly important tourism destinations and there are many locations that cater for more local visitors and the resident Gloucestershire population. The Cotswolds is one of the top performing destinations in England, according to VisitEngland⁴⁴.

There is an opportunity to grow tourism, particularly in rural areas, however it will be important to do this in ways which do not detract from what makes the area attractive. This is about developing sustainable tourism i.e. maintaining the quality of the environment and special features in the area and maintaining quality of life for local people, while growing the sector. Local community enterprises/shops have a role to play in its delivery alongside private businesses. VisitEngland recognise that 'unspoilt countryside' is a 'high level strength' which needs to be maintained to retain current visitor satisfaction levels⁴⁴.

Growing tourism will generate economic benefits in terms of GVA and job creation, and these benefits will be enhanced with more staying visitors given additional visitor expenditure associated with short break and longer stays. Environmental benefits from sustainable tourism include a landscape and environment which is maintained and enhanced by visitor expenditure. A sustainable tourism approach will also help manage, mitigate and avoid potentially adverse impacts associated with a growth in tourism such as congestion, erosion in 'hot spots', and pressure on resources such as water and transport infrastructure.

The following actions have been identified to develop this opportunity:

- Support tourism sector businesses with high growth potential through the Growth Hub, collaborative working with the Wye Valley and Forest of Dean DMO (Destination Management Organisation) and Cotswolds DMO⁴⁵, and a strengthened partnership with VisitEngland and Visit Britain. Funding should be available through the EU Structural and Investment Funds⁴⁶.
- Support sustainable tourism through the Cotswolds Sustainable Tourism Partnership and similar initiatives⁴⁷.

⁴³ GFirst (2014) Strategic Economic Plan for Gloucestershire

⁴⁴ TNS (2013), Understanding Visitor Satisfaction 2012-13, VisitEngland

⁴⁵ Cotswolds Conservation Board (2014) Draft Destination Management Plan for the Cotswolds. This plan includes a number of opportunities for growing tourism in the Cotswolds.

⁴⁶ GFirst (2014), EU Structural and Investment Fund Strategy 2014-2020 Gloucestershire

⁴⁷ Cotswolds Conservation Board (2010) A Strategy and Action Plan for Sustainable Tourism in the Cotswolds AONB 2011 - 2016

- Support related activity such as: sustainable transport initiatives; tourism and recreational infrastructure; initiatives promoting local food and drink to visitors; education and awareness raising activities; and visitor giving schemes.

Importance and urgency

Tourism is a vital sector in Gloucestershire, particularly in rural areas. There is however a need to enhance productivity and GVA, for example by improving the offer and increasing visitor expenditure by encouraging staying visitors and extending the tourist season. Encouraging expenditure on the maintenance of the natural environment and cultural heritage, and rolling out high-speed broadband speed, are also important.

Associated costs and risks

There will be costs associated with supporting the work of DMOs, however these will be matched by contributions from tourism businesses and will deliver increased returns. Risks include not taking a broad view i.e. not working with adjoining LEPs/authorities and not embracing areas outside those covered by the two DMOs, inappropriate development affecting top tourist destinations and a lack of public transport (especially for overseas visitors).

Opportunity 7: Supply chain for local food and drink

The opportunity

There is an opportunity to supply more local food and drink to local markets; there is increased demand in the UK for high-quality foods with a specific local provenance and tradition. There is no reason why more could not be supplied to local organisations, as well as local venues and events. There is also potential for the export of local food and drink.

Gloucestershire has a strong agricultural and food base (and heritage). Agriculture is the primary land use in the county; arable, dairying, beef and sheep enterprises dominate in different areas; and traditional cider and perry orchards are an important feature in certain places. There is also a well-established food and drink processing sector which allows the sale of local food and drink to consumers through outlets such as local dairies, butchers, farmers markets, farm shops and local/community shops. In addition, there are many aspects to food and drink produced in Gloucestershire that can be regarded as locally distinctive, adding to the cultural identity of the county (e.g. Cotswold Sheep, Gloucester Cattle, Gloucester Old Spot pig, Gloucester Cheese and farmhouse cider and perry)⁴⁸.

There is an opportunity to supply more food and drink to local markets; there is evidence of increased demand in the UK for high-quality food and drink with a specific local provenance and tradition^{49 50}. Presently much of the county's agricultural production is exported in commodity or processed form to other parts of the country or abroad. There is no reason why more could not be supplied to local pubs, restaurants, businesses, schools, colleges, hospitals and other organisations, as well as iconic local venues and events such as Cheltenham Racecourse, Gloucester Rugby Club and the Cheltenham Festivals, where there could be benefits to both supplier and venue/event. There could also be greater supply to the tourist industry. Catering to the local market could capture more of the value added in the agriculture to food production chain and increase the local density of commercial relationships. There is also potential for more exports of food and drink of Gloucestershire provenance across the country and beyond. This opportunity applies as much to mainstream agricultural products as it does to organic, environmentally-friendly or similar products.

There would be economic benefits in terms of employment and GVA in the agriculture, food and drink sectors, but in addition it would support farm diversification and the agriculture supply chain including engineers, builders, merchants, professionals etc., thereby contributing to the county's rural economy. Environmental benefits would include a well-managed countryside supported by more prosperous farming businesses, reduced carbon footprint due to lower food miles, and genetic conservation associated with local breeds. It could also contribute to improved access to good quality food from a health perspective. This is reflected in the Government's Food 2030 Strategy⁵¹. There would also be indirect benefits through image and cultural identity, reinforcing the links between place, land and economy.

The following actions have been identified to develop this opportunity:

⁴⁸ Land Use Consultants (2012) Gloucestershire Local Nature Partnership Issues Report.

⁴⁹ FT (2013) Demand rises for locally produced food. Andrea Felsted, 20 November 2013;

⁵⁰ Experiencing Scotland (2013) Experiencing Scotland Driving business through provenance.

⁵¹ HM Government (2010) Food 2030

- Support producers and suppliers of local produce by facilitating links with supermarkets and other retailers, as well as schools, colleges, hospitals, local businesses and high profile venues/events.
- Support food and drink producers wishing to start up new businesses with a view to supplying the local market; link with existing initiatives such as Stroud District Food Grants⁵².
- Develop a Gloucestershire agri-tech /agri-food strategy to complement the Government's UK agricultural technologies strategy^{53 54}.
- Support agri-food businesses through Growth Hub proposals.

Importance and urgency

According to the Food and Agriculture Organisation (FAO), global population growth estimates suggest that 70% more food will need to be produced globally by 2050 in order to sustain current consumption patterns (based on 34% increase in population)⁵⁵. This is likely to increase the price of food, which will have a significant impact on UK agriculture.

Associated costs and risks

There will be some limited costs associated with encouraging the supply of local food and drink, however this should be outweighed by the benefits to both suppliers and purchasers and the wider local economy. There are no significant risks attached to this opportunity.

⁵² http://www.stroud.gov.uk/docs/food_grants.asp

⁵³ GFirst (2014), EU Structural and Investment Fund Strategy 2014-2020 Gloucestershire

⁵⁴ See also, by way of example, Herefordshire Food Partnership (2011) From Food to Table - A Sustainable Food and Drink Strategy for Herefordshire

⁵⁵ FAO (2009): How to Feed the World in 2050, Food and Agriculture Organisation

08: Payment for ecosystem services

The opportunity

Ecosystem services are the outputs of ecosystems from which people derive benefits.⁵⁶ Examples of these services include the supply of food, water and timber (provisioning services); the regulation of air quality, climate and flood risk (regulating services); opportunities for recreation, tourism and education (cultural services); and essential underlying functions such as soil formation and nutrient cycling (supporting services).⁵⁷

Payments for ecosystem services (PES) are market-based mechanisms to increase the supply of ecosystem services. It is a voluntary transaction where a well-defined environmental service (or a land use that is likely to secure that service) is being 'bought' by one or more buyers, from one or more services providers, on the condition that this service is delivered.⁵⁸ For example, in order to increase flood protection, landowners upstream could be paid to provide additional flood alleviation, which would benefit urban populations downstream.

The UK's Ecosystem Markets Task Force⁵⁹ highlighted 'managing natural resource security' and 'using nature to enhance resilience' as their key themes. The government is committed to promoting the emergence of PES schemes. The 2011 Natural Environment White Paper, *The Natural Choice: securing the value of nature*, proposes various measures to mainstream the value of nature across society. In particular, the White Paper emphasises the "...real opportunities for land managers to gain by protecting nature's services, and trading nature's benefits with businesses, civil society and the wider public sector".⁶⁰

There is an opportunity for Gloucestershire to facilitate and pilot PES schemes. PES schemes could be used for a range of purposes, for example:

- To enhance resilience, e.g. against flooding; where landowners are paid to hold back water on their land, in order to avoid downstream populations from flooding and decrease the amount of soil carried from fields into water courses. Such schemes could be paid for by insurance companies or downstream populations at risk of flooding.
- To manage natural resource scarcity, e.g. water trading; where permits for abstraction are auctioned, resulting in a more efficient allocation of water, and protection of water resources in rivers and streams.
- To reduce costs by taking a catchment management approach. For example, peat bog restoration in the upland catchment of the Severn in Wales, delivers multiple benefits, as it reduces run-off sediments that discolour the water (reducing water treatment costs).

⁵⁶ MA (Millennium Ecosystem Assessment) (2005) *Ecosystems and Human Well-being: Synthesis*. Island Press, Washington D.C.

⁵⁷ Smith, S., Rowcroft, P., Everard, M., Couldrick, L., Reed, M., Rogers, H., Quick, T., Eves, C. and White, C. (2013) *Payments for Ecosystem Services: A Best Practice Guide*. Defra, London

⁵⁸ Wunder, S. (2005) *Payments for Environmental Services: Some Nuts and Bolts*. Occasional Paper No. 42. CIFOR, Bogor,

⁵⁹ Ecosystem Markets Task Force (2013) *Realising nature's value*, the Final Report of the Ecosystem Markets Task Force

⁶⁰ HM Government (2011) *The Natural Choice: securing the value of nature* [online] available at: <http://www.official-documents.gov.uk/document/cm80/8082/8082.asp>

- To increase a ‘bundle’ of ecosystem services, e.g. by creating new woodland which provides a wide variety of benefits including flood control, recreation and wildlife habitat. It also makes a contribution to Climate Change Act targets (albeit small compared to the volume of UK emissions), and provides an opportunity for carbon offsetting.

The following actions have been identified to seize this opportunity:

- The LEP and LNP to lead a co-ordinated approach for PES, learning from existing pilot schemes. Examples of PES pilot schemes can be found on the following website: <http://ecosystemsknowledge.net/resources/programmes/pes-pilots>.
- Identify opportunities for pilot PES schemes in the Gloucestershire, where additional ecosystem services are required (e.g. flood mitigation), focused around particular river catchments.
- Involve stakeholders (e.g. landowners, Environment Agency, LNP, etc.) to sketch out schemes, including objectives, scope, scale, deliverables and possible risks.

Importance and urgency

PES schemes potentially provide a cost-effective tool to increase Gloucestershire’s resilience, for example, against flooding, which is a threat to the economy (see section on Threats).

Associated costs and risks

Each PES scheme needs to be assessed for its viability and risks. For a PES scheme to be viable, the cost of setting up and running a PES scheme should be lower than the cost of alternative means of securing an ecosystem service. For example, a change in land use can be less costly than building concrete flood defences. The risks of a PES scheme need to be understood, for example, are there any ‘unintended consequences’, or what happens if the land managers fails to deliver the agreed services?

8. Threats in Detail

This section describes each threat in more detail, suggests actions to address the threat, highlights the importance and urgency, and identifies spin-off benefits.

T1: Flooding

The threat

There are approximately 20,000 properties at risk of river flooding in Gloucestershire, 8,000 of those are businesses. Around 60,000 properties at risk of surface water flooding in the county, including 15,000 of businesses.⁶¹ Essential infrastructure at risk includes Mythe Water Treatment Works, two emergency response centres, seven electricity and gas installations, one telephone exchange and sections of roads including the A40, A438, A4019, A46, A38 and the M5.⁶²

Man-made trends in land management and land-use have increased flood risk over time.⁶³ Greater pressure from new developments and ageing flood defence infrastructure are likely to increase the severity of flood events. Climate change is expected to increase flood risk through rising sea-levels and increased frequency of high-intensity rain events.⁶⁴

Significant development is planned and it is important that future sites are adequately protected from flood risk. It will be the developers' responsibility to resolve this with the local planning authority. If new development is not carefully planned it can suffer from flood risks and increase the risks to other properties in the area of the development and downstream.

The following actions are suggested for dealing with this threat:

- Strong spatial planning of where best to locate new developments. Ensure floodplains are not inappropriately developed. Follow the 'sequential approach' of Planning Policy Statement (PPS) 25 and consider land swapping opportunities.
- Incorporate a Green Infrastructure strategy⁶⁵ into the Core Strategy (planning), to increase resilience against flooding (O3). Development/redevelopment needs to be managed to minimise flood risks to both existing and new properties. Methods must be sustainable over the long-term. For example, making more space for rivers through urban areas via 'blue corridors' (i.e. restoring access for floodwater on to key strips of floodplain). This requires redevelopment to be limited to flood-compatible land-uses e.g. parkland). The Community Infrastructure Levy (CIL) and EU SIF can assist with financing these.
- Local planning authorities must stipulate that developments have flood compatible layouts, contribute to the delivery of the any local Green Infrastructure strategy and SuDS (Sustainable Urban Drainage Systems). Consideration should also be given to the introduction/implementation of WSUD (Water Sensitive Urban Design).

⁶¹ Environment Agency

⁶² Environment Agency, River Severn Catchment Flood Management Plan 2009

⁶³ Sunderland, T. (2012) Microeconomic Evidence for the Benefits of Investment in the Environment - review. *Natural England Research Reports, Number 033*.

⁶⁴ Defra (2009) Adapting to Climate Change: UK Climate Projections. DEFRA. London

⁶⁵ Gloucestershire Local Nature Partnership (2014) A strategic framework for Green infrastructure in Gloucestershire, Draft 2, 29th of January, 2014

- Use Green Infrastructure to build flood resilience into new transport infrastructure and existing transport networks to minimise damage to the economy during periods of flooding.
- Restore sustainable natural storage of floodwater on undeveloped floodplains, in order to reduce dependence on raised flood defences (which are not sustainable in the long term) and offset increasing flood risk from trends including climate change (see also O8 on PES).
- Encourage rural and urban best practices in land-use and land management to restore more sustainable natural floodplains and to reduce run-off (see also O8 on PES).
- Work with upstream catchments outside the county to alleviate flood risk in the future (e.g. restoring peat bogs in Wales)
- Consider other measures, such as promoting flood resilience measures amongst businesses and households at risk, and other ways to reduce flood risk.

Importance and urgency

Flooded communities are likely to suffer substantial economic losses in terms of material assets and livelihood disruptions as well as psychological trauma.⁶⁶ It is likely that an increase in the volume of surface water runoff and rainwater will take place as a consequence of the replacement of vegetation (and its services) by impervious built surfaces.⁶⁷ An increased frequency of high-intensity rain events in recent years has shown the urgency to address this threat.

Spin off benefits

The approaches outlined here would increase resilience and flooding, reduce the maintenance cost for the public sewer system and make urban areas greener, more natural and attractive. For example, local attenuation pools would also be attractive to people and for wildlife.

⁶⁶ Reacher, M, Mckenzie, K, Lane, C, Nichols, T, Kedge, I, Iversen, A, Hepple, P, Walter, T, Laxton, C & Simpson, J. (2004) Health impacts of flooding in Lewes: a comparison of reported gastrointestinal and other illness and mental health in flooded and non-flooded households. *Communicable Disease and Public Health*, 7, 39-46.

⁶⁷ Parliamentary Office Of Science And Technology (2007) Urban Flooding

T2: Water availability

The threat

Although flooding has been the dominant issue in recent years, the climate change projections are for increased variability and extreme weather.⁶⁸ Water availability is therefore a risk to the whole economy, but particularly agriculture. Changes to land use and management which mitigate flooding can also help prepare for water shortages and drought.

The Severn is a highly regulated river and provides most of the drinking water for Gloucestershire. In 2012, the county was on the verge of drought, but then the rains started (and did not stop) resulting in flooding in November 2012.

The two main pressures on water resources over the next 40 years are future demand for water and climate change. An increase in population and the number of houses will affect the demand for water. Climate change may affect both the demand for water and the natural resource in rivers and groundwater in future.⁶⁹ If abstraction continues at current rates (or increases) and natural water resources become depleted due to climate change, then existing impacts of abstraction on rivers, lakes, wetlands and estuaries will be magnified.

Land use maps from 1973 and 2009 show a trend of agricultural land being converted from grassland (for livestock farming) to arable (for crop production).^{70 71} There is the possibility of a further increase in arable production in Gloucestershire, if water-intensive agriculture is no longer sustainable in the east of the country and moves west. Soils in the Cotswolds tend to be thin, and more prone to drought, potentially affecting agricultural production in the future. If the number and lengths of periods of drought increase, then this could increase the risk of wildfires, for example, on common land and in woodlands.

Suggested actions to deal with this threat are:

- Continue the Environment Agency's work with farmers on water security, identifying options for rainwater harvesting and water storage, trickle irrigation and drought resistance cropping.
- Promote water efficiency in businesses and homes.
- Adopt a more joined-up approach to water management between planners, developers, water companies, environmental groups and councils to encourage knowledge transfer and increase the likelihood of measures being successful.
- Increase support for the uptake of water saving devices in new developments; WSUD has a role to play here. Examples include water butts, low flow tap attachments, and ponds which hold water near where it falls to filter it and reduce flash-flooding.

⁶⁸ DEFRA (2009) Adapting to Climate Change: UK Climate Projections. DEFRA. London

⁶⁹ Environment Agency (2013) Water for life and livelihoods, Severn River Basin District: Challenges and choices,

⁷⁰ Gloucestershire Wildlife Trust (2011) The State of the Natural Environment in Gloucestershire 2011,

⁷¹ Environment Agency (2013) Water for life and livelihoods, Managing water for people, business, agriculture and the environment

Importance and urgency

Water is a scarce resource under increasing pressure in the region, and business as usual can be expected to lead to poorer quality water and higher water tariffs. Climate change is expected to reduce the capacity of the environment to purify water through an increase in low-flow events, which affect water quality due to reduced dilution of pollutants.

Spin off benefits

Water efficient businesses and homes will be resilient to future shocks. Additionally water and energy are closely connected, and there will therefore be energy and material efficiency savings as well. Restoring natural systems to their full capacity, in terms of water filtration, will have spin-off benefits in terms of increased resilience in other areas (flood risk for example) and in terms of recreation.

T3: Changes in land use threaten soils

The threat

Gloucestershire is seeing much agricultural land being taken up by new developments. Once sealed, land is lost for agricultural production, but also the function of nutrient and water cycling is decreased and can be lost. This increases the risk of flooding⁷², which is already a threat to the economy. Furthermore, changes in agricultural practices have seen a loss of organic content, reducing resilience against flooding and water shortages.

The construction of houses, business parks and roads covers and compacts soil, preventing good drainage and increasing the risk of flooding, creates heat islands and, where traffic is congested, causes pollution to air, soils and water.⁷³ In Gloucestershire, soil sealing is the main threat to soils. These trends have an impact on the ecosystem services functions that soils provide, including nutrient cycling, and water purification, and water cycling. Soils that have been sealed cannot absorb any rainwater, potentially exacerbating the risk of flooding. Loss of organic content in soil reduces resilience.

Once agricultural land has been taken up by development, it is lost for agricultural production. High quality agricultural land in particular needs to be conserved where possible.

Gloucestershire has some of the most resilient soils in the country, i.e. they do not get washed away or blown away (although data on this is limited). There has been a loss of organic content of soils, partly due to the disappearance of mixed farms and increased specialisation, as well as agricultural land being converted from grassland (for livestock farming) to arable for crop production.⁷⁴ The new CAP may lead to an increase in arable land, as financial incentives for 'arable conversion' to grasslands are being lost. Arable production in Gloucestershire could further increase, if water-intensive agriculture is no longer sustainable in the east of the country and moves west. In order to increase organic content in soils, farmers have started to use (treated) sewage sludge to fertilise the land. Soils with less organic content are more prone to water shortages and drought, and are less resilient in terms of holding water⁷⁵ (linked with T2 Water availability).

Suggested actions to deal with this threat are:

- Effective land use planning. The loss of high grade land/soil should be given due attention in the planning process and by the LEP. New developments need very careful planning, so that they in the right place and at the right scale (see also T6 to address the need for strong spatial planning).
- Continue to work with farmers and land managers, to ensure appropriate land and soil management (nutrient management, run-off, compaction), particularly in the light of climate change.

⁷² Parliamentary Office Of Science And Technology (2007) Urban Flooding

⁷³ UK National Ecosystem Services Assessment (2011) Understanding nature's value to society, Synthesis of Findings

⁷⁴ Gloucestershire Wildlife Trust (2011) The State of the Natural Environment in Gloucestershire 2011,

⁷⁵ The Environment Agency (2009) Using science to create a better place – Land use and environmental services

Importance and urgency

Soils perform important ecosystem functions in terms of providing 'Provisioning Services' (i.e. food production) and Regulating Services (i.e. flood protection, water purification). Soil is a scarce resource and must be valued as such.

Spin off benefits

Conserving soil can have other spin-offs such as improved water quality and biodiversity of water courses.

T4: 'Just another motorway intersection'

The threat

Gloucestershire has a unique and attractive landscape and a high quality of life, which are important for attracting talent and high value businesses.⁷⁶ Gloucestershire's unique and attractive landscape is not as well showcased from the main road networks as it could be. There is a danger that further development could make this worse and the sense of place around these areas could be eroded.

In addition to local impacts, there could be an impact on adjoining landscapes. For example, new developments in the Vale could have a negative impact on views from the Cotswold scarp, potentially with an adverse impact on tourism. Account should be taken of the Cotswolds' AONB designation and the European Landscape Convention⁷⁷.

A vision for high-quality development is therefore required. This threat is closely linked with O2 'Gloucestershire's attractive landscape'.

Possible actions for the LEP and Planning Authorities to deal with this threat are:

- Highlighting, promoting, and signposting the attractiveness of Gloucestershire along the motorway, and its appeal as a visitor destination.
- Taking into account, during the planning process, the broader impacts of development, for example the impacts on the wider environment, landscape and tourism economy.
- Encouraging good design linked to sense of place; there might be a role for a design panel and a design statement and/or design standards for the county, in addition to strong spatial planning (see T6). This could incorporate green infrastructure, aiding both developers and planners (see O3).

Importance and urgency

Significant development is expected in the next twenty years to accommodate inward investment and a growth in population. The Strategic Economic Plan could provide, in its delivery, a stronger emphasis on how to maintain and enhance the attractiveness of the county, as this is a key factor in high value businesses and skilled people locating here. It is essential that economic development does not damage or destroy this asset, and that the landscape quality and attractiveness of Gloucestershire is maintained. (see O2). The Green Infrastructure approach, which consciously builds nature and its benefits into development needs to be considered from the outset: some retrofitting of green infrastructure is possible, but the outcomes are considerably better if considered at the beginning.

Spin off benefits

Getting this approach right could lead to new developments which are attractive and do not detract from landscape quality. Well-designed Green Infrastructure also provides habitats and habitat connections for wildlife. This increases its value to residents but also contributes to the region's wildlife targets – possibly helping to displace losses of habitat elsewhere.

⁷⁶ GFirst (2014) Strategic Economic Plan for Gloucestershire

⁷⁷ Natural England (2007) European Landscape Convention – A Framework for Implementation,

T5: 'Missing Link' impacts on environment and tourism

The threat

Improvements to the A417/419 are a key element of the Strategic Economic Plan. The improvements could have negative impacts on the environment and tourism. These need to be mitigated as far as possible during the planning process. A long run-in time will be required to determine these impacts ahead of the formal EIA process.

The Strategic Economic Plan includes proposals to address the 'Missing Link', the 5km section of single carriageway at the Gloucester/Cheltenham end of the A417/A419 route between the M4 and M5. The proposed 'Brown Route' scheme provides a dual carriageway for the whole section of the 'Missing Link', from the Cowley roundabout to the Brockworth bypass, effectively removing both congestion and accident hotspots⁷⁸.

A number of important strategic and economic benefits are set out in the main Plan and its Appendix 4A. There are concerns however about the potential negative impacts of the scheme on the area's environment and tourism economy. Potential environmental impacts relate to landscape (given the scheme's location on the prominent Cotswolds scarp), ecology (land take and severed ecological connections) and tranquillity (as a result of increased traffic noise). These, together with potential impacts on recreational routes, could adversely affect tourists and tourism businesses, as well as local communities.

It will be critical that these impacts and costs are fully taken into account during the option appraisal and planning process, particularly in light of the area's AONB status, other site-based designations in the locality and the value of the Cotswold's tourism economy. This will help ensure that the adverse impacts associated with the scheme, or any variant of it, are minimised and mitigated as much as possible.

Possible actions to deal with this threat are:

- Set out at an early stage the potential impacts on the environment and the tourism economy of the Cotswolds, and options for minimising and mitigating these. This could involve updating the 2003 appraisal.
- Involve statutory and other environmental bodies, and tourism organisations in helping to assess the impacts and bring forward options for mitigation including green infrastructure based solutions or, if appropriate, alternatives.

Importance and urgency

The project timetable for the Missing Link with planning and consultation over the next four to five years requires that potential negative environmental and other impacts be scoped and assessed in the near future. This would run ahead of the formal EIA process due to take place in 2016/17.

⁷⁸ GFirst (2014) Strategic Economic Plan for Gloucestershire including Appendix 4A

Spin off benefits

A well designed scheme, with appropriate mitigation, would bring about not only strategic and economic benefits, as set out in the Strategic Economic Plan, but should also seek to enhance the existing arrangement in terms of accessibility, connectivity and environmental contribution. The scheme should aim to add value across the board in these different areas.

T6: Lack of strong spatial planning

The threat

There is a risk that, without strong spatial planning, Gloucestershire could become a less attractive place to invest, work, live and visit. New developments need to be designed to enhance its character and its resilience.

Strong spatial planning is essential for Gloucestershire to remain an attractive place to invest, work, live and visit. There is a need to ensure that future residential and commercial development, and infrastructure provision, is located in the right places (taking account of natural assets and hazards), with the right design (in tune with the surrounding landscape), and with good provision (in terms of green infrastructure and SUDS to provide multiple benefits, such as flood alleviation and sustainable transport routes).

There is however a concern that strong spatial planning is not possible presently, following the abandonment of Regional Spatial Strategies, the introduction of the National Planning Policy Framework (NPPF)⁷⁹ and time delays associated with getting local plans adopted⁸⁰. This is an issue across the country but relevant to the county. That said, local authorities have a “duty to co-operate”⁸¹ and are collaborating on a number of fronts including strategic policies and joint approaches. The Gloucester Cheltenham Tewkesbury Joint Core Strategy provides one important example of this. A separate issue is that local authorities now have more limited powers to apply and design renewable energy standards to developments in their areas following the introduction of the NPPF.

The Strategic Economic Plan recognises the key role of the planning process in supporting economic growth and much collaborative work is being undertaken⁸²; improving the effectiveness and consistency of the planning system is highlighted in Section 5.3 of the Strategic Economic Plan. There is a risk of tension however between the LEP’s aspirations and the statutory planning process required of local authorities.

The risk arising from these points is that inappropriate development could go ahead with potentially adverse economic and environmental impacts. This links to the opportunities identified previously, such as the value of Gloucestershire’s natural environment to a number of sectors (O2, 5 and 6) and potential threats such as flooding, water availability and the loss of valuable natural assets such as soils (T1, 2 and 3).

Possible actions to deal with this threat are:

- Continued close working between the LEP and local authorities at a strategic level to ensure that proposed developments contribute positively to the economy and the environment, and that the dependencies of the economy on the natural environment and the value of the county’s natural capital is recognised at a strategic level. This would include incorporating a Green Infrastructure policy and adopted GI strategy in the Core Strategy.

⁷⁹ DCLG (2012) National Planning Policy Framework

⁸⁰ Core Strategies and Local Plans in Gloucestershire are at various stages of the local plan process. Pers.Comm. Barry Wyatt, 22.4.14

⁸¹ Section 110 of the 2011 Localism Act inserts the Duty to Co-operate as a new Section 33A into the Planning and Compulsory Purchase Act 2004. Section 33A came into effect 15 November 2011.

⁸² GFirst (2014) Strategic Economic Plan for Gloucestershire

- Ensure that local planning policies and processes take account of these dependencies and linkages at site level. If appropriate this might include the production of guidance reflecting strategic priorities.

Importance and urgency

Planning decisions which potentially affect the attractiveness and resilience of the county are being made now. There is a need to provide direction and guidance for both planners and developers, as well as local businesses and people, at the earliest opportunity.

Spin off benefits

A strong spatial planning framework alongside the Strategic Economic Plan will provide certainty to all parties concerned. This will build the confidence required for future investment decisions and confidence in the sustainability of the proposed developments.

T7: Economic growth increases demand for energy

The threat

All things being equal, economic growth will increase demand for energy, which will make meeting Climate Change Act targets significantly harder. There are roles for planning, design, energy efficiency technologies and changes to consumer demand to meet this threat.

Manufacturers across all sectors are concerned about energy costs, which are seen as a risk to growth.⁸³ Energy efficiency is a key priority in supporting household and business energy consumers with rising costs. But it is also at the heart of action to decarbonise the UK in a cost-effective way, maintain secure energy supplies, and increase business productivity.⁸⁴

Prime Minister David Cameron stated at the launch of the energy efficiency programme in 2013: *"Make no mistake, we are in a global race and the countries that succeed in that race, the economies in Europe that will prosper, are those that are the greenest and the most energy-efficient. Energy consumption is set to grow by a third over the next two decades alone. And in a race for limited resources it is the energy-efficient that will win that race,"* he said.⁸⁵

Although the Strategic Economic Plan has identified renewable energy and low carbon economy as an important growth priority (GREEN Skills Centre), it has not highlighted the importance of energy efficiency. Energy costs are high, and after labour cost, a substantial input cost for businesses. Energy efficiency will be key for businesses and consumers in order to keep energy costs down.

Possible actions to deal with this threat are:

- The LEP and Local Planning Authorities should encourage energy efficiency in the design of new developments as far as possible⁸⁶ and through retro-fitting existing properties.
- In their package of business advice, the LEP should include advice to businesses in how to reduce their energy costs. This could include signposting to the wide range of energy efficiency advice and guidance available⁸⁷.

Importance and urgency

Significant development is expected in the next twenty years to accommodate inward investment and a growth in population. Any new developments should be attractively designed, energy efficient, resilient to flooding and heat extremes.

Spin off benefits

Reduced levels of energy reduces the costs to businesses and to consumers. Lower levels of energy consumption reduces reliance on fossil fuels, and reduces greenhouse gas emissions.

⁸³EEF, the Manufacturers' Organisation (2014) Executive Survey 2014 – Manufacturers' views on the economy and their own prospects in 2014

⁸⁴ Department of Energy and Climate Change (2013) Energy Efficiency Strategy, 2013 Update

⁸⁵ <http://www.ukace.org/2013/02/david-camerons-speech-at-the-launch-of-deccs-energy-efficiency-mission/>

⁸⁶ It is acknowledged however that local authorities are limited in applying design standards following the introduction of the NPPF.

⁸⁷ For example, via local authorities, Severn Wye Energy Agency, Centre for Sustainable Energy and the Energy Saving Trust

T8: Overlooking the importance and potential of agriculture and forestry

The threat

Agriculture and forestry are important to the economy and to the character of the area. It is important that the economic potential of this sector is not overlooked, together with its wider contribution in terms of local food supply, tourism and ecosystem services.

Agriculture is important to the economy and character of Gloucestershire. While the agriculture sector (which includes forestry and fishing) is comparatively small in terms of its contribution to total GVA and employment in the county (1% and 2.6% respectively in 2013⁸⁸), it is over-represented in Gloucestershire relative to the rest of the UK and has experienced growth in employment over the period from 2002 to 2012⁸⁹. Furthermore, the sector makes a significant contribution to the food processing sector and indirectly supports the county's important tourism industry. Agriculture and forestry also provide a range of important ecosystem services to people and businesses in Gloucestershire (e.g. water quality, water availability, flood risk management, landscape character, biodiversity, carbon storage and recreation)⁹⁰. Additionally, agriculture and forestry are a vital component of the economy of the county's rural areas, supporting a wide range of businesses in the supply chain.

While the draft Strategic Economic Plan acknowledged the importance of sectors such as tourism and food processing, it did not recognise the direct and indirect importance of agriculture and forestry. This has been rectified to an extent in the final Strategic Economic Plan, with references to existing expertise and facilities in agri-technology and its economic potential. This is important to improve productivity and efficiency in the sector and the wider food supply chain. However, in the delivery of the Strategic Economic Plan, it will also be important to recognise the wider contribution of agriculture and forestry, for example in relation to local food supply (O8), tourism (O6), the provision of ecosystem services (O9), maintaining soils (T3) and maintaining an attractive landscape (O2).

Possible actions to deal with this threat are:

- Progress the opportunities relating to local food supply, sustainable tourism and ecosystem services.
- Recognise the wider role of agriculture and forestry - economically, environmentally and socially - and ensure it is not overlooked in economic and spatial planning.
- Integrate agriculture and forestry with other sectors of the economy and develop cross-sectoral relations. They have an important contribution to make and benefits will flow both ways.
- Ensure agriculture and forestry businesses are supported through the Growth Hub and via other channels in the same way as other businesses.

⁸⁸ GFirst (2014) Strategic Economic Plan for Gloucestershire

⁸⁹ Gfirst (2014), EU Structural and Investment Fund Strategy 2014-2020 Gloucestershire

⁹⁰ Cumulus Consultants (2009) The Future of Farming and Forestry in the Cotswolds AONB, Report for the Cotswolds Conservation Board

Importance and urgency

The importance of agriculture, forestry and land management is growing. This is a result of growing demand for food globally, increasing pressure on and demands from land, and climate change which is affecting productivity and influencing the value of ecosystem services from land, including for example, flood risk management. Taking a strategic approach now will enable the sector to fulfil its economic potential and play its wider role in society.

Spin off benefits

A more prosperous, integrated, agricultural and forestry sector will help to reduce dependency on public support payments and benefit the wider rural economy and rural communities.

9. Summary and next steps

This report has explored a number of potential opportunities and threats to Gloucestershire's economic growth plans arising from the economy's dependency on the environment. A number of actions have been suggested to help address the threats and realise the opportunities. These will need to be considered by GFirst LEP in the context of the refinement and implementation of the Strategic Economic Plan, the delivery of the EU Structural and Investment Fund Strategy, as well as other collaborative work being taken forward by the LEP, LNP, Local Authorities and other partners.

One option, for the consideration of the LEP, is to progress to Level 3 of the LEED toolkit. Level 3 focuses on the development of a robust evidence base for the opportunities and threats, building on the work undertaken in Levels 1 and 2. It would involve:

- Evidence and data analysis. Going back to the primary evidence sources in order to provide a stronger, more objective evidence base for the opportunities and threats identified. It will include detailed consideration and detailed data collection and analysis of the environmental relationships relating to the opportunities and threats. It will support or challenge the opportunities and threats already identified, and also potentially find new ones.
- Ranking of opportunities and threats. This will involve giving the opportunities and threats two scores, one for importance and one for urgency. Multiplying these together will provide a single score which will enable the opportunities and threats to be ranked.
- Final workshops. A final workshop with experts will reality check the findings; this will involve local people who are expert in the local environment, economy and its relationship. Following further analysis and the production of a draft report, a final workshop will be held with key audiences including senior people representing the LEP, local authorities and other local consortium members. This will provide an opportunity for feedback and discussion.
- Final report. The final report will set out the top opportunities and threats. This will include detailed justification, major uncertainties and suggestions regarding possible responses. The report will be accompanied by the evidence base.

For more information on the LEED toolkit, including progressing to Level 3, please contact Tom Butterworth, Natural England at:

Email: Tom.Butterworth@NaturalEngland.org.uk

Mobile: 07500 608458

Appendix 1: Level 2 interviews - Matrix of ecosystem services and experts

Ecosystem service / topic	Expert
Water supply, water quality, flooding	Ian Jones, EA
Food supply	John Tingey, NFU Russell Marchant, Hartpury
Fibre & fuel	Kevin Stannard, FC
Land & soil quality/erosion	Ian Jones, EA John Conway, RAU
Tourism/recreation/cultural heritage/landscape value	Martin Lane, Nicola Greaves, Malcolm Watt, Mark Connelly, CCB
Health	Sarah Scott, GCC Health
Clean air/air pollution (if an issue)	Nigel Riglar, GCC
Wildlife/pollination/pests/diseases/genetic resources	Colin Studholme, GWT
Climate mitigation/adaptation	Ian Jones, EA Nigel Riglar, GCC John Conway, RAU
Strategic planning and development	Barry Wyatt, SDC

Appendix 2: Cross reference between LEED Level 1 and Level 2 opportunities and threats

The top ten opportunities identified (not ranked):

The top ten opportunities identified were:

- O1: Centre of Excellence for renewables (was O2)
- O2: Gloucestershire's attractive landscape to attract high value businesses (was O4)
- O3: Green/Blue Infrastructure in new developments (was O1)
- O4: Green Integrated Transport Schemes (was O7)
- O5: Grow creative and knowledge intensive industries (was O3)
- O6: Sustainable Tourism (was O6 Tourism)
- O7: Supply chain for local food (new)
- O8: Payment for ecosystem services (was O5 Offsetting carbon with woodland)

The top ten threats identified (not ranked)

The top ten threats identified were:

- T1: Flooding (was T1)
- T2: Water availability (was T8)
- T3: Changes in land-use threaten soils (new)
- T4: 'Just another motorway intersection' (was T3)
- T5: 'Missing Link' impacts environment and tourism (T7)
- T6: Lack of strong spatial planning (new)
- T7: Economic growth increases demand for energy (was T5)
- T8: Overlooking the importance and potential of agriculture and forestry (was T2 Overlooking agriculture quality and diversity)