The Social and Economic Value of a Biosphere for the Fens

Final Report · Cambridgeshire ACRE

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2.0	28/08/20	Draft Report	Paul Silcock, Esther Kieboom Matt Rayment, Charlotte Whiston	Paul Silcock
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Executive Summary

This report explains how a UNESCO Biosphere designation can bring social and economic value to the Fens, and enable the Fens to become a leader in sustainable growth and development. It shows how a Biosphere can help Local Authorities achieve their ambitions, by facilitating good, sustainable and inclusive growth. The report draws on evidence from other Biospheres, local authority strategies and plans, and socio-economic data.

It is recognised that there is a widening income and inequality gap between Cambridge and the Fens rural economy, and there are concerns that serious water stress and flood risk may limit housing development and economic growth. Biosphere status presents a unique opportunity to address these challenges, bringing people and organisations together to develop a shared vision for the future of the Fens. Over time, this will convince people that the Fens is a good place to live, work and relax, building on the Biosphere 'brand', and lead to a more balanced and resilient economy.

As a Biosphere, the Fens will:

- Grow and diversify the economy, by attracting new funding and investment, adding value to the agri-food economy and enhancing its sustainability and resilience, growing the green economy by investing in collaborative R&D in land-, water-, climate- and nature-management, and strengthening the Fens brand (driving growth in tourism and leisure, and adding value to local produce);
- Benefit local communities and reduce social inequalities, by enhancing economic opportunity, developing skills for the future, improving the living environment, strengthening identity, local pride and sense of place, and engaging local people in shaping a positive future;
- Protect and invest in the area's natural and cultural capital, for the benefit of people, the economy and the environment, building resilience and addressing the challenges of climate change and biodiversity loss.

Becoming a UNESCO Biosphere will generate a wide range of economic, social and environmental benefits for people and businesses across the region, supporting existing plans and initiatives and driving prosperity. It will demonstrate how nature can underpin and add great value to a forward-looking society and economy.

While the Biosphere proposal is still in development, it is possible to map out the likely pathway for a Fens Biosphere over time. In the short term, we might expect a new and more joined-up vision and strategy for the area, new partnerships and joint funding bids. In the medium term, by 2030, the Biosphere can be expected to attract greater funding, new investment, best practice to tackle climate challenges, develop the green economy and address community challenges, creating a sense of optimism about the area. In the longer term, before 2050, this translates into enhanced GVA, an improved natural environment, Net Zero carbon, sustainable soils and water management and stronger, more inclusive communities, aligning with the targets for the UN's Sustainable Development Goals and the 2050 target date for the UK to reach Net Zero.

1 A Biosphere for the Fens for a brighter, more sustainable future

There is a golden opportunity for the Fens to achieve global recognition as a leader in sustainable growth and development. Becoming a UNESCO Biosphere will generate a wide range of economic, social and environmental benefits for people and businesses across the region, supporting existing plans and initiatives and driving prosperity. It will demonstrate how nature can underpin and add great value to a forward-looking society and economy. If supported and approved, the Fens could become one of 700 Biospheres[1] around the world, including only 7 in the UK[2].

The Fens is a unique area with a strong natural and cultural heritage linked to its rich peat soils, waterways and wetlands, its network of historic cities, market towns and villages, and a diverse economy ranging from farming and food production through to science and technology.

The Fens also has its challenges. The region is experiencing peat loss, habitat fragmentation and increasing water scarcity. High growth areas are subject to increasing population and development pressure, while elsewhere deprived areas have relatively high unemployment and social issues. A Covid-19 related recession has hit the economy and climate change can be expected to exacerbate or introduce new challenges.

A Fens Biosphere provides an opportunity to bring people, nature and science together to promote innovative, sustainable solutions to help address these challenges and create a stronger, more resilient Fens. It can be the catalyst for achieving a sustainable living Fens landscape, supporting more and better spaces for nature and a better place for people to live, work and enjoy.

Crucially, rather than restricting or hindering ambitions for a better economy and society, a Fens Biosphere can open up new opportunities and accelerate positive economic, social and environmental change, including:

- Accelerating the transformation to sustainability in farming, adding value to agriculture and safeguarding Gross Value Added (GVA)
- Society-wide commitment to managing water and other natural resources responsibly
- Building a Biosphere brand that signifies sustainability, a high quality environment, and a place to visit and re-locate
- Diversification of the economy
- Leveraging in investment and achieving better returns on investment
- Building international profile and reputation, thereby generating additional investment.

[1] https://en.unesco.org/biosphere/wnbr
[2] https://unesco.org.uk/biospheres/

The key ways in which a Fens Biosphere can make a difference are summarised in **Table 1**.

Table 1: Biosphere – making a difference

Current issues	Current trajectory	Trajectory with Biosphere
Economy		
Vulnerable agri-food sector	GVA at risk	GVA sustained and growing, with higher value added built on a greater focus on R&D designed to raise value and address future challenges
Cambridge's 'super star hub' sucks in all talent	Risk that the Fens hinterland loses out to growth areas	The Fens is seen as a good place to live, work and invest – its role, competitive advantage and growth potential within the wider sub-regional economy are defined and enhanced
Lack of job and business opportunities in rural economy	Employment at risk	Employment and business opportunities in the 'green economy' at the frontier of land and water management, and in tourism and leisure; greater diversification of the economy overall
Society		
Inequality gap	Inequality continues	Inequality reduces. More inclusive growth linked to economic diversification and action to enhance the living environment
Sub-optimal quality of life in deprived rural areas	Slow improvement in quality of life	More rapid improvement in quality of life in deprived rural areas – education, skills, green space, health and well-being
Different quality of life issues in pressured, high growth areas	Steady or deteriorating quality of life	Better quality of life in growth areas

Current issues	Current trajectory	Trajectory with Biosphere
Environment		
Increasing awareness about the natural environment and climate change	Risk of increasing opposition to more economic activity and development	Businesses, local authorities and households buy into truly sustainable economic development
Lack of understanding of how to address environmental/climate challenges	Risk of paralysis as people feel overwhelmed and don't know what to do and where to start to address ecological and climate change challenges	Everyone understands and aspires to deliver 'best practice' in terms of carbon, water, biodiversity and climate change adaptation Natural capital is seen as an economic asset; protecting and investing in it helps to enhance prosperity and opportunity Climate-resilient communities empowered to make decisions and implement solutions
Ways of working		
Vision for cross-sectoral working	Risk that partners pursue separate and conflicting objectives	Vision for cross-sectoral working driven by shared understanding of how environmental, social and economic objectives can come together to deliver a better future for all
Knowledge exchange	Limited cross-sector knowledge exchange	Research and knowledge exchange supporting business and society to become more sustainable and resilient
Financial resources	Risk that funding used for disparate purposes and that synergies are missed	Identifying and pursuing synergies enhances effectiveness of resources, appeals to funders and increases success of funding bids. Strategic use of funding enhances long term return on investment. Biosphere brand is proven to attract financial resources

The key benefits of a Fens Biosphere – expanded on in this report – are:

- Understanding and strengthening the Fens' natural capital
- Helping address the climate change challenge
- Supporting quality of life and well-being for all
- Underpinning a balanced and resilient economy
- Creating a shared understanding and vision as part of a pathway for realising other Biosphere benefits and outcomes.

This report explores the benefits that a Fens Biosphere can bring to the economy, society and environment of the Fens, helping to achieve existing and emerging ambitions and plans for the region, before going onto consider the specific ways it can achieve this.

Before doing this, a brief introduction to the Fens Biosphere is provided below.

What is the Fens Biosphere?

'Biosphere' is a special status awarded by UNESCO to sites of excellence which explore and demonstrate approaches to conservation and sustainable development on a regional scale[3]. Biospheres test approaches that aim to reconcile biodiversity conservation with sustainable economic and community development and promotion of cultural values. Being a member of global network provides unique opportunities for exchanges of experience, collaborative research and other partnerships.

'Biosphere' is the world's only globally-recognised accolade for demonstrating excellence in sustainable development. It is not a "protected area" nor a "nature reserve".

A Biosphere is being proposed for the Fens given its strong identity, exceptional environment and biodiversity, significant cultural heritage and the commitment of a wide range of stakeholders working together towards a sustainable future[4]. The Biosphere proposals will only be presented to UNESCO for designation once all decision-makers and other key stakeholders in the area have endorsed the plans and understand the added value this would bring to their work and the area as a whole.

[3] https://en.unesco.org/biosphere
[4] https://www.fensbiosphere.org.uk/

A Fens Biosphere would cover a region of around 2,775 square kilometres across four counties, seven district councils, one City Council and one Unitary Authority, see **Figure 1**. The proposed area includes a Core Zone comprising sites of specific conservation value; a Buffer Zone which supports activities strongly focused on linking people, science and conservation to support the core zone; and a Transition Zone where activities focus on ensuring that resident needs are sustainable and if possible benefit wildlife and the environment[5].

In practical terms, local communities and all interested stakeholders would come together to plan and manage the Biosphere. The Biosphere would become a co-operative platform, an enabler for others to take action within an overarching long-term sustainability agenda. This would involve integrating three main "functions":

- Conservation of biodiversity and cultural diversity
- Economic development that is socio-culturally and environmentally sustainable
- Logistic support, underpinning development through research, monitoring, education and training.

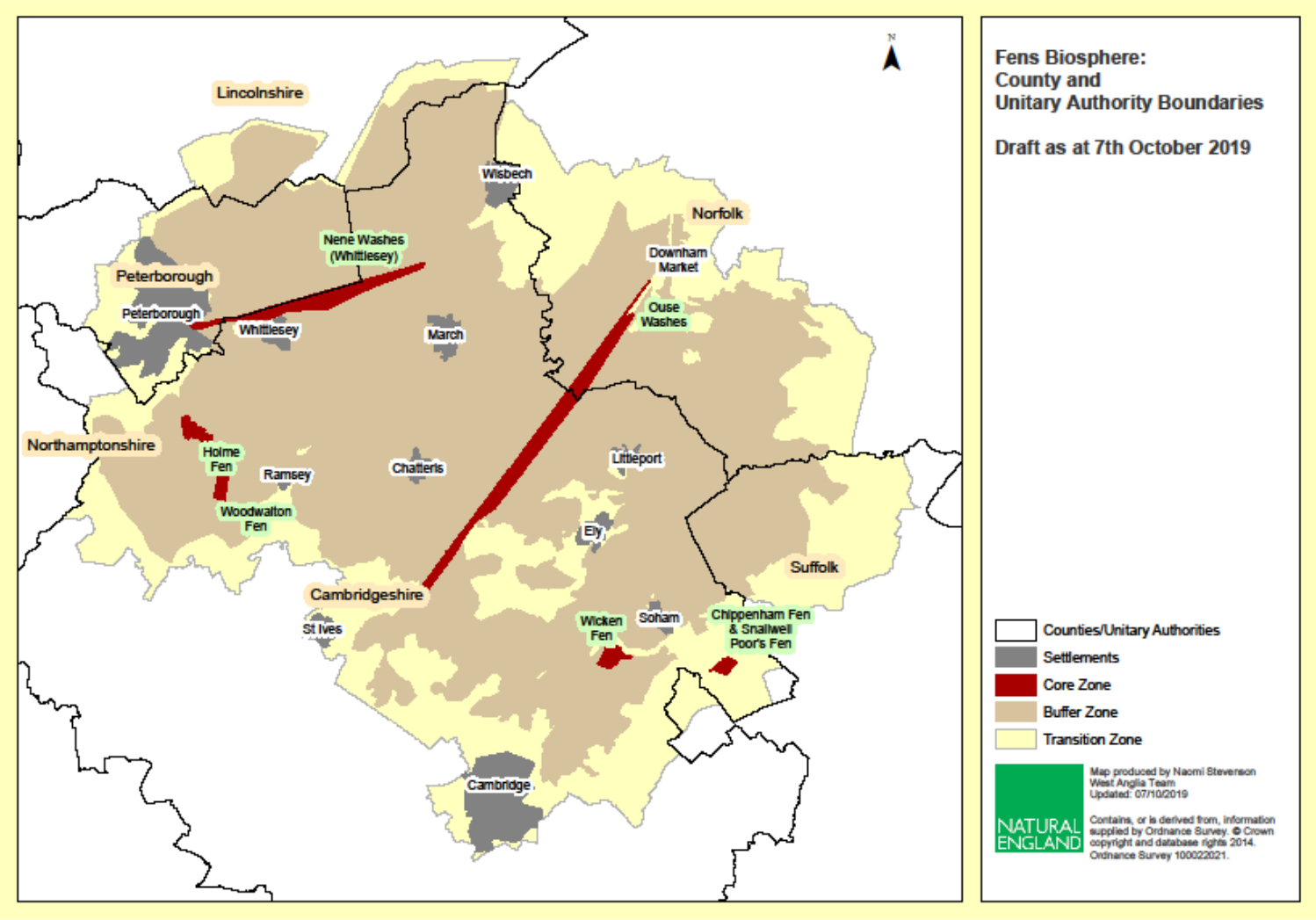
A growing number of organisations (24 at the time of writing) representing different land use and other interests are supporting the development of a UNESCO Fens Biosphere. It is the intention, in due course, to set up an independent Community Interest Organisation to manage and co-ordinate the partnership work in the future. This partnership and the planning, management and related activities will help deliver the UN's Sustainable Development Goals, see **Figure 2**.

A Fens Biosphere would fit with and complement international, national and local policies for sustainable development including:

- UN Sustainable Development Goals
- UK Net Zero Emissions by 2050
- Cambridgeshire and Peterborough Strategic Spatial Framework [Non Statutory] - Towards a Sustainable Growth Strategy to 2050
- Cambridgeshire and Peterborough Local Industrial Strategy
- Cambridgeshire County Council Climate Change and Environment Strategy
- 'Doubling Nature' Vision for Nature (Natural Cambridgeshire Local Nature Partnership) and emerging 'Doubling Nature' Natural Capital Investment Plan for Cambridgeshire and Peterborough
- Local Authorities' Local Plans, Green Infrastructure Strategies, Health and Well-being Plans, Climate Strategies and Action Plans, and Economic Development Plans.

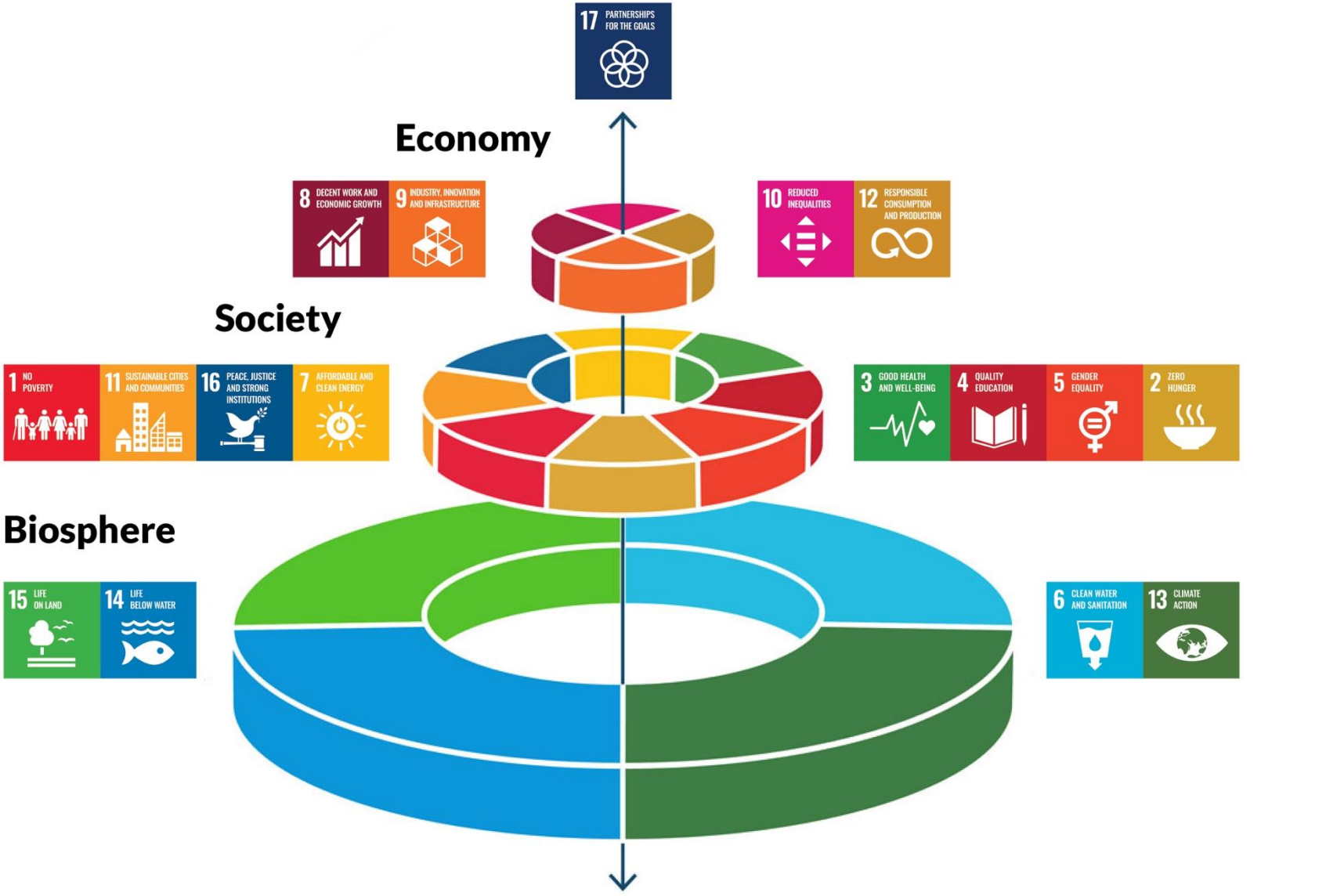
[5] https://www.fensbiosphere.org.uk/the-fens-biosphere/biosphere-area/

Figure 1: Fens Biosphere



Note, the Biosphere boundaries have not been decided upon. A geographical boundary consultation with decision-makers and all other stakeholders will take place in Autumn 2020.

Figure 2: Fens Biosphere and the Sustainable Development Goals (SDG)



2 A Biosphere for a shared understanding and strengthened natural capital

Agriculture accounts for the vast majority of land use, and the Fens are one of the most productive agricultural areas in the UK. Increased awareness of peat loss, greenhouse gas emissions and loss of biodiversity puts the spotlight on intensive agriculture in the Fens. Water resource management is also an issue of paramount importance, particularly in the East of England which is the driest region in the country. The Fens as a drained system presents unique challenges with regards to water management which require joined up thinking from all water users working together. Biosphere status provides a focus to develop a shared understanding of the issues related to the Fens' natural capital and how these issues can be addressed, through engagement and knowledge exchange between those who own and manage the land of the Fens and wider stakeholders (environmental, scientific, governmental), as well as the local communities and the public at large.

Natural capital provides the foundation for peoples' lives and businesses, including the soils to grow our food, the water resources to supply our drinking water, the biodiversity of our ecosystems, and the landscape we live in. Natural capital, combined with human capital (people, education and skills), social capital (communities, institutions and governance) and financial and manufactured capital, together form the foundation for our economy as well as our well-being and way of life. Economic benefits are generated through 'the market' (e.g. from the production of food crops) and include incomes and profits (GVA). There are additional 'non-market benefits' from so-called public goods, such as fresh air, clean water, climate, landscape which are to the benefit of us all. **Figure 2** illustrates how the 'Biosphere' (SDG15 Life on Land, SDG14 Life below Water and SDG 6 Clean Water) is the foundation for Society and the Economy. For example:

- The Fens natural assets (soil and water) underpin the food production and agri-food businesses that provide jobs, income and money to invest
- The Fens water resources are critical as the whole of society and economy is dependent on water
- Biodiversity is part of the whole ecosystem (the soil ecosystem produces healthy nutritious food, and absorbs/stores/releases water).

A Biosphere is committed to conserving, restoring and enhancing the landscape, genetic resources, ecosystems, species and biodiversity.[6] A Biosphere approach strengthens natural capital, which in turn makes society and the economy more resilient.

A Biosphere can make a difference to **current issues** and **future outcomes** for the natural environment, see **Table 2**.

[6] https://unesdoc.unesco.org/ark:/48223/pf0000103849 , p.4

Table 2: Natural environment issues and outcomes – Biosphere added value

Current issues	Business as Usual outcomes	Biosphere outcomes
Increasing awareness and concern in the community about environmental issues: • Soil erosion/loss of peat/organic matter/ soil carbon, Greenhous Gas (GHG) emissions and reduction in productivity • Water quality issues (phosphates / nitrogen / nutrients, salt ingress) • 'Serious' water stress[7] • Risk of flooding, sediments, dredging, pumping, sea level rise • Biodiversity loss • Climate change – see also Section 3	Risk of increasing opposition to an increase in economic activity and development out of concern for worsening of environmental issues Risks of restraints on development of housing and infrastructure	Businesses, local authorities and households buy into truly sustainable economic development, aspiring to 'be the best in sustainability', pursuing a strategy which protects and invests in natural capital alongside other forms of capital, for the benefit of all. This approach would deliver the highest economic, environmental, health and social benefits for society.
	Depletion of natural capital results in loss of ecosystem services, causing loss of economic activity and imposing additional costs on the economy. Examples could include crop failures, increased water scarcity and costs, increased impacts of floods and droughts, adverse effects on tourism	A plan to maintain and enhance natural capital – alongside other forms of capital – is defined and adopted, and the natural capital stock is enhanced over time, contributing to enhanced long term prosperity and well-being
Lack of understanding of how these issues can be addressed, and how progress can be made	Risk of entrenchment of positions between environmental and economic interests, rather than a coming together to work together towards sustainable solutions	Everyone understands and aspires to deliver 'best practice' – move to carbon neutrality, water efficiency, increase biodiversity and adapt to climate change Understanding of how nature, people and the economy can work together for the benefit of everyone

[7] The Environment Agency has classified Anglian Water supply regions as areas of "serious" water stress https://www.eastcambs.gov.uk/sites/default/files/2016s4082%20East%20Cambridgeshire%20Water%20Cycle%20Study%20%28Final%20Draft%29%20v2.0.pdf

A Biosphere would contribute to the **delivery of local strategies and plans** for the natural environment, see **Table 3** for examples.

Table 3: Natural environment strategies and plans – Biosphere contribution

Strategies and plans
Cambridgeshire County Council Climate Change and Environment Strategy 2020-2025
'Doubling Nature' Vision for Nature in Cambridgeshire and Peterborough, 2019 & emerging 'Doubling Nature' Natural Capital Investment Plan for Cambridgeshire & Peterborough
Peterborough City Council Biodiversity Strategy, 2018
Cambridgeshire Green Infrastructure Strategy, 2011 and the emerging Greater Cambridge Green Infrastructure Strategy
Greater Norwich Green Infrastructure Delivery Plan, 2009, currently being reviewed

A Biosphere would support a range of **activities** benefiting the natural environment, for example:

- Co-ordinate events that showcase best practice/regenerative/low carbon/wildlife friendly farming methods, including on Council Farms
- Facilitate new collaborations between academia, business and the land management sector
- Consider how the new Environmental Land Management (ELM) scheme fits with the area's plans for future water management and develop funding streams in order to contribute to the long term ambition of a sustainable Fenland.
- Consult on the introduction of a Fens Biosphere brand/standard for new 'peat-friendly' added value products and how this can add to the general public's understanding and appreciation of the Fens
- Collaborate with local authorities, land managers and other stakeholders to plan ecological networks (including a Nature Recovery Network for the Fens), biodiversity/environment net gain, nature improvement and natural capital investment.

Case Study 1: Accelerating and supporting sustainable farming practices

The Fens are a distinctive, historic and human-influenced wetland landscape. Much of the land is below sea level, relying on pumped drainage and the control of sluices at high and low tides to maintain its agricultural viability. The consequence of agricultural drainage and intensive agricultural production is peat wastage, with the loss of peat and associated emission of greenhouse gases. Peat soils are important for national food security, however, they are also susceptible to erosion and mineralisation, particularly in the face of climate change. The science has established the vulnerabilities of these soils, and mitigation strategies are required to preserve them for future generations.

Farmers and scientists are working together to establish best practice, including looking at control of water tables, based on local soil conditions and water availability. There is a range of farm businesses, of different scales, in the Fens moving towards more sustainable approaches which could be scaled up across the Biosphere. One example is G's, a family farming business producing a wide range of fresh crops including lettuce, spring and bulb onions, leafy salads, celery, radish, beetroot, organic salads and vegetables and potatoes. The business has grown over the years into a truly vertically integrated grower-to-marketing organisation with production facilities throughout the UK, Spain, Central Europe, USA and Senegal.

G's strategic aim is *"to leave our soils in a better condition for the next generation by transforming our farming practices to preserve our valuable soils."* G's has started to look at all operations piece by piece to see how they can adjust their actions to further support their aims and regenerative principles. *"We are here to farm. Our primary job is to produce crops and progressive farm management will be at the forefront of what we do. Our main aim is to become far less dependent on agro-chemicals and fertiliser."* G's is working together with scientists and they see that the implementation of these practical measures within G's production systems is already seeing benefits. Such measures include the use of cover crops (to avoid bare soil), minimum tillage (to minimise soil disturbance), crop rotations (to increase fertility and reduce the risk of pests and disease), incorporating grazing animals (to increase fertility) and incorporating pollinators (to increase biodiversity).

What is the added value of a Biosphere for the Fens?

UNESCO Biospheres and research are inseparably linked. They are by definition 'Science for Sustainability support sites', which means that they serve as a testing ground for interdisciplinary ways to better understand the relationship between social and ecological systems and to develop new approaches for dealing with change[8].

A Fens Biosphere would celebrate such best practice examples in sustainable farming, to increase understanding and awareness and further spread best practice. A Fens Biosphere would facilitate knowledge exchange between different groups of stakeholders to develop a shared understanding about sustainability in food production. A Fens Biosphere would make people proud of their cultural historic landscape and deepen their connection with the land and their understanding of where their food comes from. There may be opportunities of new value added crops for the Fens, and opportunities for Fens Biosphere branding. A Fens Biosphere could become an international showcase of truly sustainable food production.

[8] UNESCO, Biosphere Reserves – Learning Sites for Sustainable Development, 2019

3 A Biosphere for climate change resilience

Biodiversity loss and climate change may be the greatest threats to life on earth but engaging communities in the conversations necessary to begin to address these challenges is not easy, and can be overwhelming for many. Biosphere status will help the Fens to understand and define its relationship with the global climate, and to set out a strategy for the transition to Net Zero carbon emissions as well as adaptation to climate change. Through the development of a 'community programme for climate change' Biosphere status can help to increase ecological and climate literacy in ways that transcend institutional and geographic boundaries and begin to influence behaviour on the ground.

The UK Government's recently proposed Environment Bill aims to set targets for cleaner air, cleaner water, less waste and more biodiversity, with targets written into statute and local authorities held to account for their delivery. Target-setting in and of itself is insufficient to achieve environmental gains, and merit will lie in understanding the various motivations and capabilities that exist within communities and skilfully combine these with opportunities, such as the Biosphere presents, in order to influence desired outcomes. Taking water as an example, the water supply-demand balance is under significant pressure from population growth and climate change; there is also a need to increase resilience to severe drought and river and coastal flooding.

Biosphere status can provide the inspiration to help people feel more connected to their local environment, and help them understand what climate change means for their community. The development of a community programme for climate change also facilitates an opportunity for residents and visitors to deepen their understanding of the area's cultural heritage, including its contribution to food production, both historically and going forwards, and an exploration of the ways in which past extreme weather events have shaped local narratives. Biosphere status therefore provides a valuable opportunity to not only educate communities about climate change, but also to inspire them towards creating a vision towards a positive future. Using lessons learnt from behavioural science, the Biosphere can help 'nudge' people to make many small changes to help achieve resource efficiency (e.g. water, energy), zero-carbon (by 2050), reverse biodiversity loss and improve overall health and well-being.

A community-based climate change programme therefore encourages pro-environmental behaviours, supports the development of 'ecological literacy,' and connects them more deeply with the cultural heritage of the landscape. Communities that better understand and embody the issues are more likely to be motivated to adapt to change.

Such ecologically literate communities:

- Consume resources wisely (water, energy), reduce emissions, and live within resource boundaries
- Develop a closer relationship with nature and move towards biodiversity net gain
- Deepen their understanding of the cultural historic landscape and their role within it, and hence care more about it
- Acquire the skills and knowledge to meet the challenges of climate change and plan accordingly.

Inviting people to explore, reappraise and reinforce their sense of place within their geography can make them more invested in their communities and also advocates for communicating the uniqueness of the area to visitors and new residents. Building community resilience in this way, also directly links to health and well-being outcomes.

A Biosphere can make a difference to **current issues** and **future outcomes** relating to climate change**,** see **Table 4**.

Table 4: Climate change issues and outcomes – Biosphere added value

Current issues	Business as Usual outcomes	Biosphere outcomes
Increasing awareness in the community about climate change and biodiversity loss.	Risk of entrenchment between environmental and economic interests, rather than collaborating towards sustainable solutions	Climate resilient communities will have a closer relationship with their local landscape and a deeper understanding of the issues. They will be empowered to reduce GHG emissions and protect the Biosphere, alongside making improvements to health and well-being The Fens will be seen as a leader in understanding and addressing the challenges of climate change, including transition to Net Zero and adaptation, helping to enhance the area's brand and image, attracting investment and building competitive advantage
Lack of understanding of how these issues can be addressed, and how progress is being and can be made.	Risk of paralysis as people feel overwhelmed and don't know what to do and where to start to address ecological and climate change challenges.	Empowerment over appropriate actions to protect the Biosphere and improve biodiversity in a sustainable way. Communities have acquired skills to enable them to imagine, create and realise a more resilient future. Responsible use of water to protect the Fens Working together on connectivity in the wider landscape, working with landowner and managers, doubling nature Climate-resilient communities will be empowered to implement local energy solutions (e.g. community PV, community windfarms, community ground-source heat) Effective action to address and minimise the damage that climate change imposes on the Fens (e.g. through flooding and impacts on agriculture)

A Biosphere would contribute to the **delivery of local strategies and plans** which address climate change, see **Table 5** for examples.

Table 5: Climate Change Strategies and Plans – Biosphere contribution

Strategies and plans
Cambridgeshire County Council Climate Change and Environment Strategy 2020-2025
Cambridgeshire and Peterborough Combined Authority's Independent Climate Change Commission
Cambridgeshire Green Infrastructure Strategy, 2011 and the emerging Greater Cambridge Green Infrastructure Strategy
Local Authorities' Local Plans and Climate Change Action Plans, for example West Suffolk Climate Change Action Plan

A Biosphere would support a range of **activities** addressing climate change, for example:

- **Contribute to a Climate Change strategy** for Cambridgeshire and Peterborough to level up work already underway to reduce reliance on fossil fuels, protect and enhance its green spaces and help meet its commitment to become carbon neutral by 2050.
- **Engage with local communities** to enable them to make sense of how climate change will affect them, inspire them to problem solve, and support them to acquire the skills and capabilities that will enable their households and local parishes to adapt.
- **Promote R&D** related to climate change and opportunities for partnership between the research base, farming sector, environmental groups and communities to put the area at the forefront of the climate knowledge economy.
- **Showcase best practice** examples of energy efficiency, community renewable energy projects, natural flood management (SUDs, rain gardens), zero carbon and water-efficiency exemplars in the built environment.
- **Add value** to the work of partners to help communities become 'water savvy' (including pilot projects on irrigation and water storage), create biodiversity net gain and help them respond to the climate change challenge, including:
    - Partners in education and conservation, to educate the young
    - Partners in Water Resources East (WRE), Anglian Water and domestic and business water customers (including those with high water usage)

- Cambridgeshire and Peterborough Independent Climate Change Commission to provide a knowledge platform to help identify Net Zero carbon solutions to alleviate climate change, and help build resilience against climate change impacts.

Case Study 2: Creating water resilient communities

The ambitious Business Plan 2020-2023 for Water Resources East shows a collaborative approach to water resource management. Future Fenland is a radical and ambitious approach to tackle the combined challenges of population growth and climate change, delivering not just increased resilience but long-term growth in environmental and social prosperity for the East of England. It is hoped that it will act as a model to inspire others across the UK and beyond, as organisations seek to build a more sustainable future. This initiative, which is based on the principles of Integrated Water Resource Management, seeks to deliver a long-term solution to the drought, coastal inundation and flooding related risks which are posed in our fenland areas by climate change. By co-ordinating activity and funding in programmes which are traditionally considered to be separate, the overall level of investment which is required can be reduced, and delivery can be made more efficient and the benefits spread more widely[9].

What is the added value of a Biosphere for the Fens?

UNESCO Biospheres[10] are ideal spaces to set up and improve comprehensive learning processes in the context of climate change – a challenge for all of society. Biospheres form a unique global network contributing key practical experience for viable mitigation and adaptation strategies responding to the challenges of climate change. They have proven expertise in fields such as sustainable agriculture and forestry, regional marketing, tourism, spatial planning, participation of local communities and international partnerships.

Biospheres promote the use of participatory approaches (involving all stakeholders) for biodiversity conservation, climate change adaptation and mitigation. They can be areas for demonstrating adaptation measures for natural and human systems, assisting the development of resilience strategies and practices. Buffer zones and transition areas of Biospheres may also be used to test mitigation tactics and strategies.

A Biosphere for the Fens provides an exciting opportunity for local communities to come together, and for people to learn from each other about their local environment, and to see what their households and communities can do about climate change and biodiversity loss.

"A Biosphere can sprinkle the 'magic' necessary to get people excited and proud of their local area, connect them to their local environment in a way that enables us to solve the resource challenges for the South East of England."

Robin Price, Managing Director, Water Resources East, July 2020.

[9] Water Resources East (WRE), Collaborating to secure Eastern England's future water needs our initial water resource position statement, 2020

[10] UNESCO, For life, for the future. Biosphere reserves and climate change - A collection of good practice case studies, 2011

4 A Biosphere for improved quality of life and well-being for all

There is great diversity across the Fens in terms of quality of life and well-being, and a range of challenging social and socio-economic issues relating to education, skills, jobs, access to green space, health and well-being and connectivity (transport and digital). Biosphere status can bring people and partners from diverse sectors together and create synergies. This will increase understanding how people connect with and depend on their heritage and natural environment, and find solutions that build on these connections to enhance prosperity and quality of life. It will also generate new ideas and opportunities linked to the green economy. Fundamentally, a high quality environment supported by a Fens Biosphere will contribute to a high quality of life for all. It will improve local communities and peoples' lives, and help to level up society across the Fens.

There is significant inequality in the Fens between high growth areas and areas of deprivation. In deprived rural areas, quality of life is affected by a number of factors including: a narrow and relatively low economic base dominated by declining or slow growth sectors; low economic participation and lower than average incomes; an uncompetitive skills base; health and well-being issues; relatively poor transport and broadband infrastructure; and high housing costs[11]. In high growth areas, growing population and development is putting pressure on infrastructure and resources, affecting quality of life in different ways.

Local Authorities are well aware of these issues and addressing them through a range of initiatives including: improvements in education, skills and training; provision of good quality, affordable housing; provision of employment space and regeneration and growth opportunities; and connectivity through transport infrastructure, public transport services and high-speed broadband. Local authorities recognise that the quality of local environments, including green space, can have positive benefits for physical and mental health and well-being. They also recognise the importance of sustainable, inclusive growth.

A Fens Biosphere can contribute to the quality of life of people living in the Fens by raising awareness and understanding of the local environment, creating a sense of connectedness and ownership, and encouraging environmental enhancements which provide multiple benefits, including recreation and health and well-being. A Biosphere can also support education, training and job opportunities in the green economy, and contribute to better infrastructure through environmental design and planning, increasing the return on investment and levering in additional funding. A Biosphere can help bring people together through a shared pride in the Fens.

[11] Cambridgeshire and Peterborough Strategic Spatial Framework (Non Statutory) - Towards a Sustainable Growth Strategy to 2050, 2018

A Biosphere can make a difference to **current issues** and **future outcomes** for society, see **Table 6**.

Table 6: Social and socio-economic issues and outcomes – Biosphere added value

Current issues	Business as Usual outcomes	Biosphere outcomes
Inequality between growth areas and areas of deprivation	Inequality gap continues	Narrowing of inequality gap, more and greater levelling up and inclusive growth by focusing on local strengths and growth opportunities
Sub-optimal quality of life in deprived rural areas: • Low economic participation • Lower than average incomes • Low/uncompetitive skills base • More long term sick • Limited access to green space • Poor transport and broadband infrastructure • High housing costs	Slow improvement in quality of life in deprived rural areas	More rapid improvement in quality of life in deprived rural areas through: • Education, skills, training and jobs in the green economy • Better access to high quality green space and more recreation • Improved health and well-being • Well designed, sustainable development, including affordable and attractive housing • Increased investment in the economy and living environment
Different quality of life issues in growth areas: • Population/development/resource pressures • Limited access to green space / nature for recreation, health and well-being	Steady or potentially deteriorating quality of life in growth areas	Better quality of life in existing growth areas: • Better access to high quality green space/ nature • Improved health and well-being

A Biosphere would contribute to the **delivery of local strategies and plans** for society, see **Table 7** for examples.

Table 7: Social and socio-economic strategies and plans – Biosphere contribution

Strategies and plans
Cambridgeshire and Peterborough Strategic Spatial Framework (Non Statutory) - Towards a Sustainable Growth Strategy to 2050, 2018
Cambridgeshire and Peterborough Local Industrial Strategy, 2019
Health and Well-being Strategy for Cambridgeshire and Peterborough, 2020 (draft)
Local Plans including, for example, South East Lincolnshire Local Plan, King's Lynn & West Norfolk Borough Council Local Plan and the emerging West Suffolk Local Plan and Greater Cambridge Local Plan
Cambridgeshire County Council Green Infrastructure Strategy, 2011 and the emerging Greater Cambridge Green Infrastructure Strategy
Greater Norwich Green Infrastructure Delivery Plan, 2009, currently being reviewed
Fenland District Council Health & Well-being Strategy, 2018 and the emerging Health and Leisure Strategy
Huntingdonshire District Council Healthy Open Spaces Strategy, 2011, currently being reviewed

A Biosphere would support a range of **activities** benefiting society, for example:

- Working with partners in education to integrate sustainable land and natural resource management into the curriculum and raise the aspirations and skills essential for a future knowledge-based economy
- Identify and promote opportunities for training and business in the green economy
- Encouraging and informing more and better green spaces for recreation, relaxation, inspiration and health and well-being, linking to the Future Parks Accelerator for example.

- Promoting the best in environmental planning, design and construction for future residential and other development[12].
- Encouraging greater connectivity between urban and rural areas, with rural areas providing a wide range of public and private goods for the Fens region as a whole.

Case Study 3: Supporting and enhancing sustainable development

Wisbech Garden Town[13] is a bold and ambitious proposal to transform the fortunes of the market town of Wisbech. Forming part of the broader Wisbech 2020 Vision, it builds on the legacy of Garden City principles, but ensures connectivity between new development and existing to create transformational growth for the town as a whole. The scale of growth proposed aims to maximise economic and social benefits, drawing on the latest thinking on innovation and place creation. The main benefits, over a 40 year period, will include: 13,200 new homes; 11,000 new jobs; new schools, community and healthcare facilities; new skills and training facilities; an extended business park; and improved rail and road transport links (such as a Wisbech-Cambridge rail link and A47 improvements). The Garden Town will also help create a climate resilient town for the future, including the possibility of a barrage on the River Nene to combat uncertainty regarding sea-level rise and increase utilisation of the river as an asset. It will include a new country park in the heart of the town, designed as a multi-functional public space for surface water attenuation, leisure and woodland for all to enjoy.

What is the added value of a Biosphere for the Fens?

UNESCO Biospheres integrate three functions including economic development that is socio-culturally and environmentally sustainable. A Fens Biosphere would align well with the vision, principles and details of Wisbech Garden Town.

A Fens Biosphere has the potential to contribute to the Garden Town in a number of ways including:

- Enhancing the design and implementation with a focus on providing a high quality environment for all, benefiting quality of life, health and well-being and long term sustainability.
- Engaging the local community so everyone is involved in shaping and benefiting from the Garden Town.
- Developing the education and skills offer to include environmental planning, design, construction and management, thereby enhancing opportunities for professional and skilled employment.
- Raising the tourism image and profile of the town, with a particular focus on sustainable tourism, with the environmental enhancements complementing the area's rich cultural heritage.

[12] In line with the Government's 'Planning for the Future' White Paper, 2020 i.e. planning for beautiful and sustainable places
[13] Wisbech 2020 Vision, Our Collaborative vision for a Wisbech Garden Town…a place of great expectations, 2018

5 A Biosphere for a balanced and resilient economy

The economy of the Fens is a tale of two halves: the Fens rural economy contrasts starkly with the Cambridge 'super star hub'[14]. Biosphere status can bring people and organisations together to develop a shared vision for the future of the Fens that benefits both these communities; this will 'connect the dots' between the natural environment, cultural heritage and communities. Over time, a Biosphere can change the perception of the Fens into being a good place to live, work and relax, building on the Biosphere 'brand', and lead to a more balanced and resilient economy.

The agricultural sector is still dominating the Fens. Increasing automation and robotisation, combined with limits to immigration, will reduce opportunities for low skilled workers in the area. The demand for high skilled jobs is likely to increase, partly fuelled by the pull of the Cambridge centre for academia, life sciences and informatics.

Local Authorities are concerned about the widening income and equality gap between Cambridge and the Fens rural economy. They are also concerned about limitations to growth, as a direct result of serious water stress and flood risk in the Fens. These natural capital related issues have a direct impact on the Fens economy, and may worsen under a climate change scenario jeopardising the Fens economic future. For example, these issues can limit economic development in terms of the number of new houses that can be built and companies that can re-locate to the area. The flood risk of the Fens makes certain low-lying areas highly vulnerable to flooding, prohibiting future development.

This report has illustrated how a Biosphere can support better management of the Fens natural capital and make the Fens more resilient to climate change. WRE has a far-reaching vision for how water resources can be managed more holistically; this will require consultation and widespread community engagement. A Biosphere can help with this.

This report has also illustrated how the Biosphere can contribute to a better quality of life for the people living in the Fens, and create a sense of connectedness to their place. Such place making is also important for attracting visitors to the Fens as a destination for recreation, and provides the potential for growing the visitor economy. Such place making is also relevant to people who might want to re-locate from expensive and congested cities to a more rural location, where they can work from home or start up their own business. This would help the Fens rural hinterland to diversify and to become a more balanced economy.

A Biosphere 'brand' can provide the 'glue' to bring all these different parts of the economy together under one banner. A Biosphere would provide 'pride of place', showing that the Fens are special, not only for its natural and cultural heritage, but also in the way the area is managed in a sustainable manner.

A Biosphere can make a difference to **current issues** and **future outcomes** for the economy, see **Table 8**.

[14] McKInsey Global Institute, The future of work in Europe, 2020

Table 8: Economy issues and outcomes – Biosphere added value

Current issues	Business as Usual outcomes	Biosphere outcomes
The **agri-food sector dominates**, but is vulnerable: • Natural assets under stress: soil, water, climate change • Loss of income (e.g. loss of farm Basic Payments) • Increase in costs (increasing minimum wage, shortage of low paid seasonal/ migrant workers, technology) • Trade uncertainty (tariffs, barriers, imports)	GVA at risk	GVA sustained and growing Sustainable, environmentally friendly farming, circular economy The Fens land-based economy works with knowledge base to increase R&D, add value through agri-tech and find solutions to future challenges Increased resilience of agri-food sector against external shocks
Cambridge's 'super star hub' sucks in all talent (e.g. the biosciences and technology sectors)	Risk that the Fens hinterland loses out to growth areas	The Fens is seen as a good place to live, work and invest – its role, competitive advantage and growth potential within the wider sub-regional economy are defined and enhanced
Lack of job and business opportunities in the rural economy. The Fens have an 'image problem', their cultural heritage is undervalued, and they are not a visitor destination	Employment at risk Visitor economy opportunities not fully explored and taken advantage of	Work with others to change the perception of the Fens as an area rich in cultural and natural heritage, stark beauty, and a place for recreation for those living in cities The Fens become a good place to live and work and to invest, building sustainable houses, green infrastructure, and creating opportunities in the 'green economy'. Employment and business opportunities at the frontier of land and water management, and in tourism and leisure; greater diversification of the economy overall

A Biosphere would contribute to the **delivery of strategies and plans** for the economy, see **Table 9** for examples.

Table 9: Economic strategies and plans – Biosphere contribution

STRATEGIES AND PLANS
NFU, Delivering for Britain, Food and Farming in The Fens, 2019
Cambridgeshire and Peterborough Strategic Spatial Framework (Non Statutory) - Towards A Sustainable Growth Strategy To 2050, 2018
Cambridgeshire and Peterborough Local Industrial Strategy, 2019
National Infrastructure Commission, Partnering For Prosperity: A New Deal For The Cambridge – Milton Keynes – Oxford Arc, 2017
Local Plans including, for example, South East Lincolnshire Local Plan, King's Lynn & West Norfolk Borough Council Local Plan and the emerging West Suffolk Local Plan and Greater Cambridge Local Plan

A Biosphere would support a range of **activities** benefiting the economy, for example:

Farming and food production - see Section 2 on natural capital

Visitor/ Economy

- Work with partners towards a 'shared vision' of what the 'Fens visitor destination' could look like
- Bring people and organisations together to 'connect the dots' between places of cultural historic interest and local businesses, developing walking and cycle routes, promoting the Fens
- Engage with organisations and businesses to develop a joint programme of cultural events, farm visits, food events & guided walks (in person / apps)
- Be a helpful consultation partner for the local authorities (re signage, public transport links, parking)
- Link up with existing providers (such as the National Trust and the Wildlife Trusts) to create 'packages' and destination marketing, and a Fens Biosphere brand

General Economy

- Develop a positive, modern vision linked to investment in natural capital, agri-tech and climate solutions as well as a high quality living, working and visiting environment.

- Over time, a Biosphere designation would change perception of the Fens, raise the profile of the Fens and build the sustainability 'brand' for food production. In the long term, it could become a destination for recreation, and build a reputation as a healthy environment to live, work and play.
- A Fens Biosphere brand can be developed to market the area to visitors and potential residents, and to add value to local produce, generating new market opportunities and attracting new investment.

Case Study 4: Building and benefiting from the Biosphere brand

A key benefit of a UNESCO Biosphere designation is the identity and branding opportunities it brings to an area. A recent report highlighted the UNESCO brand as being a driver for tourism in the UK, providing international recognition for the global importance and significance of an area, thereby helping to leverage funding and investment[15].

A number of studies have also highlighted the value of Biosphere designation for the niche branding of products and services from an area. Rhön Biosphere's labelling scheme promotes products as diverse as lamb, crayfish, honey, brown trout and traditional apple varieties. Entlebuch Biosphere's product label Echt Entlebuch ('genuine Entlebuch')' is estimated to increase GVA by 2% for agricultural products and 19% for forestry products[16].

What is the added value of a UNESCO Biosphere for the Fens?

A Fens Biosphere would enable the development of a brand or standard for 'Fen-friendly' food and other products, providing opportunities for local farmers and growers to access new markets and add value.

The Biosphere designation would also contribute to the visitor economy, raising the profile and enhancing the image of the Fens area as a whole, complementing and strengthening existing local initiatives. A Biosphere would support sustainable and eco-tourism thereby growing the market and increasing the economic value of tourism based on the area's rich natural and cultural resources, including local food and drink.

Linked to this, the Fens Biosphere has the potential to raise understanding and awareness of the area's fantastic archaeological, historic and cultural heritage, as well as its diverse environmental assets, which would strengthen the area's identity for residents and visitors alike.

This could generate interest and leverage investment to develop sustainable cultural and visitor attractions, further enhancing the area's attractiveness.

[15] UNESCO, The National Value of UNESCO Designations to the United Kingdom, 2020
[16] Knaus et al.,The Economic Impact of Labelled Regional Products: The Experience of the UNESCO Biosphere Reserve Entlebuch, 2017

6 The pathway to achieve the Biosphere benefits and outcomes

A Biosphere will provide the focus to develop a shared vision and understanding of the Fens and formulate a strategy to co-ordinate activities and approaches. This will support the delivery of a range of economic, social and environmental outcomes over the medium to long term. Metrics will enable progress to be measured and guide future activity to realise the vision.

The previous sections have set out the different ways in which a Biosphere can make a difference to the Fens economically, socially and environmentally. This section focuses on the **pathway** from achieving Biosphere status through to the delivery of longer term outcomes and impacts, and how progress will be tracked.

While the Biosphere proposal is still in development, it is possible to map out likely key **actions, outputs, outcomes and impacts** of a Fens Biosphere, see **Table 10**. These will be delivered over time:

- In the short term, we might expect a new and more joined up vision and strategy for the area, new partnerships and joint funding bids.
- In the medium term, by 2030, the Biosphere can be expected to attract greater funding, new investment, examples of good practice, successful initiatives to tackle climate challenges, enhance nature, develop the green economy and address community challenges, with people expressing a greater sense of optimism and a better feeling about the area.
- In the longer term, before 2050, this translates into enhanced GVA, an improved natural environment, Net Zero carbon, sustainable soils and water management and stronger, more inclusive communities.

These medium and longer term targets align respectively with the 2030 target date for the UN's Sustainable Development Goals[17] and the 2050 target date for the UK to bring all greenhouse gas emissions to Net Zero[18].

[17] https://www.undp.org/content/undp/en/home/sustainable-development-goals.html#:~:text=The%20Sustainable%20Development%20Goals%20(SDGs,peace%20and%20prosperity%20by%202030.

[18] https://www.gov.uk/government/news/uk-becomes-first-major-economy-to-pass-net-zero-emissions-law

Actions	Outputs	Medium Term Outcomes by 2030	Longer Term Outcomes by 2050	Impacts by 2050
Biosphere status provides a focus to develop a shared vision and understanding of the Fens and how the area should be managed for the benefit of people and the environment. This includes: **Research** – to understand environmental, economic and social needs and opportunities, and how the natural environment, economy and communities of the Fens inter-relate and can work together for a better future **Engagement** – bringing people and organisations together to develop a shared vision for the future of the Fens that benefits communities, the environment and the economy **Collaboration** – including new or strengthened partnerships and joint funding bids.	**A strategy for the Fens Biosphere which combines:** **Vision** - A bold and modern vision for the future of the Fens, shared and owned by communities and organisations, which meets the needs of people and the environment **Knowledge** – An evidence base and plan for strengthening and managing the natural, social, cultural, human and man-made capital of the area **Connectedness** – in time, space and objectives - understanding of the connections between nature, people and the economy; the past, present and future; and the Fens and neighbouring conurbation **Identity** – A distinct identity for the Fens which is shared and promoted internally and externally	A strong Fenland brand, used in marketing for visitors, businesses, consumers and potential residents Cross-sectoral planning and decision making More funding More targeted and effective investment (in economic development, skills and nature) New ideas, research and innovation linked to local vision and identity Stronger and more committed partnerships and governance New collaborations between academia, business and the land management sector Greater public awareness of natural environment and cultural heritage	A better living and working environment Thriving visitor economy New green and culture-based businesses Enhanced skills More sustainable land management Enhanced and better-connected nature and cultural heritage Enhanced ecosystem services Demonstration and dissemination of learning, ideas and solutions for sustainable land and water management	A prosperous economy Thriving communities A healthy natural environment

Table 10: Fens Biosphere pathway

A number of **process and outcome metrics** are proposed to measure the progress and success of the Biosphere. The process metrics are relevant to the short-medium term. The outcome metrics relate to the longer term and where possible align with existing national and regional indicators. The Biosphere would be only one factor influencing these outcomes but they would encourage focus on the desired changes and provide an indication of success. The suggested metrics are indicative only at this stage.

Biosphere actions and outputs – process metrics

1. Fens Biosphere Strategy completed
2. Partnerships supporting the Biosphere (number of existing or new partnerships, and new joint initiatives/ activities/ collaborative projects)
3. Funding bids linked to Biosphere (£)
4. Public awareness of Biosphere (% of sample survey)
5. Projects undertaken under the Biosphere umbrella, and their outputs contributing to the outcomes listed below (e.g. water savings, reductions in GHG emissions, habitat restoration, flood mitigation, protection of cultural heritage, provision / improvement of green space, community plans, infrastructure investments, R&D investments)

Biosphere outcomes and impacts – outcome metrics

Healthy natural and cultural environment

6. Water usage (m^3 in total, m^3/household, m^3/tonne produced, m^3/£GVA)
7. GHG emissions (tCO2e in total, tCO2e/ tonne produced)
8. Habitats and species (area (ha) and condition, species richness and abundance)
9. Flood risk and costs (area of land at significant flood risk (ha), costs (£))
10. Cultural heritage assets (condition)

Thriving communities

11. Index of Multiple Deprivation (% of LSOAs within decile of multiple deprivation)
12. Access to / use of green space (Monitoring Engagement in the Natural Environment number of estimated visits)
13. Local population which is positive about the Fens and see it as a good place to live and work (% of survey sample)

A prosperous economy:

14. Investment in infrastructure to improve mobility (£)
15. Funding leveraged into the area (£)
16. GVA (£ total and by relevant specific sector e.g. agriculture)
17. Economic activity (% of population which is economically active)
18. Business births, deaths, and survival rates (number, percentage)
19. R&D investment (£, overall and related to agri-tech, land management and zero-carbon economy)

7 Conclusions

The Fens is an area rich in nature and cultural heritage, which faces challenges in modernising and diversifying its economy, building a better future for its communities, and addressing the challenges of climate change and nature loss.

Biosphere status presents a unique opportunity to address these challenges, bringing people and organisations together to define and pursue a vision for the area that strengthens and makes the most of its natural and cultural assets to meet the economic, social and environmental needs of the Fens.

As a Biosphere, the Fens will:

- Protect and invest in the area's natural and cultural capital, for the benefit of people, the economy and the environment, building resilience and addressing the challenges of climate change and biodiversity loss
- Grow and diversify the economy, by attracting new funding and investment, adding value to the agri-food economy and enhancing its sustainability and resilience, growing the green economy by investing in collaborative R&D in land-, water-, climate- and nature-management, and strengthening the Fens brand (driving growth in tourism and leisure, and adding value to local produce)
- Benefit local communities and reduce social inequalities, by enhancing economic opportunity, developing skills for the future, improving the living environment, strengthening identity, local pride and sense of place, and engaging local people in shaping a positive future.

While Biosphere status will provide a focus for action to address these challenges and opportunities, and an opportunity to strengthen the area's brand and identity nationally and internationally, a strong commitment will be needed by partners to work together in defining and pursuing this vision for the area and in addressing economic, social and environmental challenges together.

For further information and how you can help, please contact the Fens Biosphere team at https://www.Fensbiosphere.org.uk/