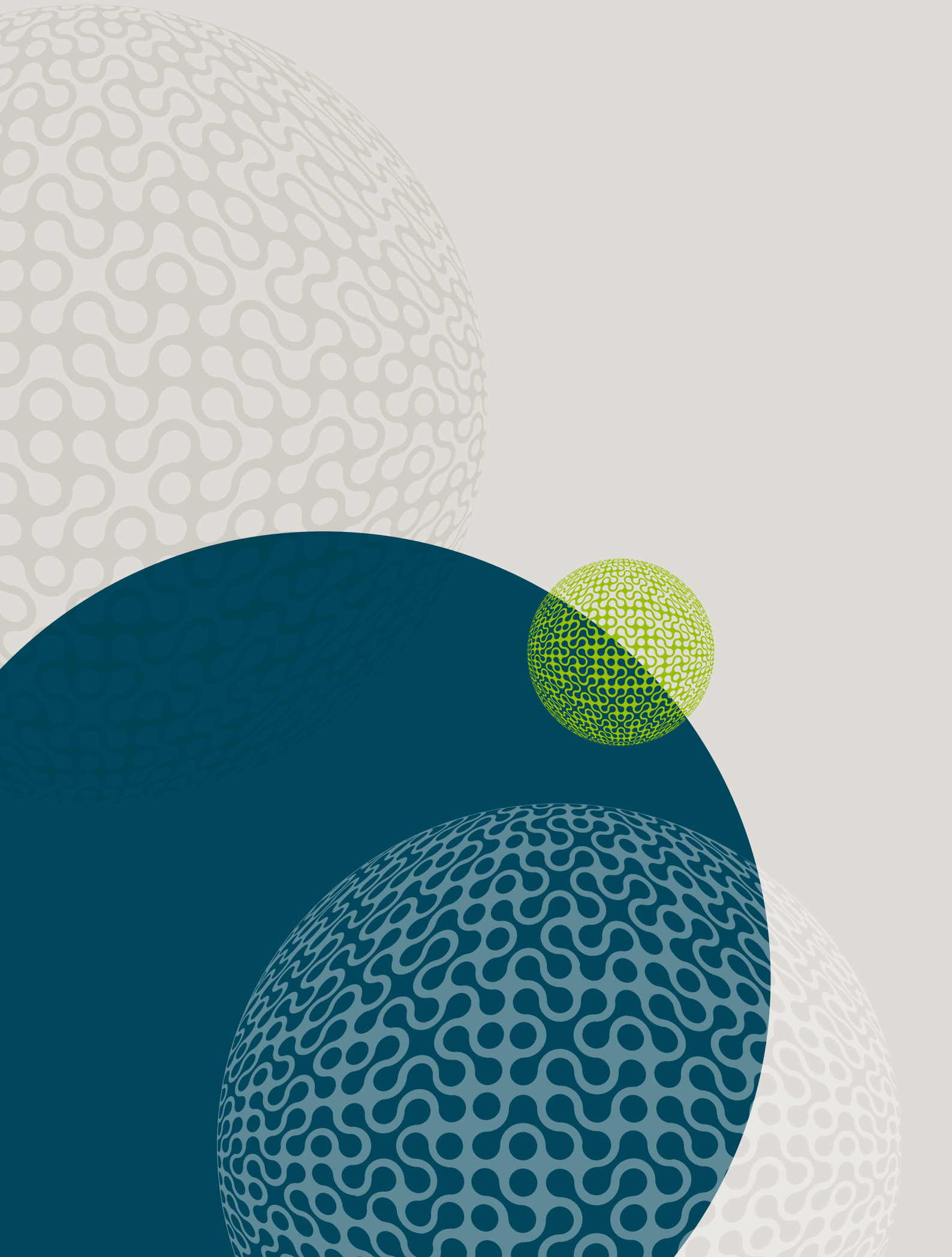
IMPACT REPORT

Impacts from the Global Food Security Programme

Global Food Security

Sustainable, healthy food for all



Foreword

The Global Food Security (GFS) programme was set up to facilitate multi- and interdisciplinary research and coordination across the whole food system. The global agri-food system can perhaps best be described as a system under pressure. Growth of the global population, coupled with the increase in per capita demand that goes with increased income, means that total demand is growing – the UN FAO has estimated that annually, some 60% more food will be demanded by 2050. Putting this in context, over the next 35 years the earth is being asked to produce more food than it has to date in human history. Based on current trajectories of demand and yield growth, a recent study suggests that by 2050 agriculture will need 120% more water, 42% more land and will emit enough carbon to account for 2 degrees of global warming[1]. These figures are unsustainable: either we find very clever ways of sustainably producing more per unit area or we need to demand less.

The challenges around food security are so diverse and extensive, it is impossible for any one research organisation, or even nation, to address each fully within an affordable research base.

This fundamental constraint then needs to drive two further considerations: how can different organisations and countries work together, through coordination and alignment, and therefore achieve the global outcomes we need? By coordinating strategy and research prioritisation, it is possible to identify common priorities which can be addressed through joint or aligned research efforts to maximise the value of any research investment irrespective of geographic, institutional and disciplinary boundaries. The added value of alignment can arise by sharing ideas, data or infrastructure.

Necessarily, GFS brings a systems' perspective to the overall agri-food system and a focus on how the different areas inter-relate. This helps avoid narrow disciplinary framing and the possibility that a solution based on one disciplinary view leads to unintended consequences elsewhere. A simple anecdote illustrates the need to think about the overall system: an animal vaccinologist recently told me he'd been in East Africa promoting the uptake of a new vaccine, and a farmer said to him "I don't have access to water to keep my cattle alive: solve that first then I'll think about your vaccine". From a system's perspective, reducing demand for food, if it alleviates pressure on the land, is as much part of sustainable intensification as increasing yields sustainably.

Research clearly plays a central role in providing the raw material for innovation leading to social and economic change. However the institutional infrastructure to connect the researchers to the societal challenges on one side, and research knowledge to users on the other, also really matters. Funders must fully coordinate along the innovation pathway to set the agenda and get research into use. This is something we are doing well in the UK, through the GFS programme, the Agri-Tech strategy and GFS partner Innovate UK, filling important roles connecting 'upstream research' and 'downstream use'.

GFS is held up internationally as an exemplar of within-country coordination and alignment; we bring diverse public institutions together to complement, coordinate and align at many levels. GFS systems analyses not only shape the thinking of the GFS partners, but are shaping the food security agenda more broadly, including at an international level.

We know from the feedback we have received – from royalty to school children, from chief executives to ministers, from vice-chancellors to students – that our work is appreciated for helping people think in new ways about the evolving challenges. This report demonstrates our impact to date, which we will build on in the years to come.

Professor Tim Benton

Champion for the Global Food Security Programme

Executive Summary

The major role for interdisciplinary research in addressing big societal challenges such as food security is becoming increasingly recognised. A joint approach is essential, across disciplines, funding agencies, government and business and internationally across countries. GFS has taken such an approach, bringing both an interdisciplinary and systems perspective to the issue of food security.

Food and soft drinks is the largest manufacturing sector in the UK (4th largest in the world) with the UK agri-food sector worth £96.9 billion and providing 3.6 million jobs.[2] It is imperative that this is underpinned by a strong interdisciplinary research base. GFS has taken a leading role in bringing together the major public sector funders of food security research alongside key stakeholders to increase coordination and collaboration. At its inception in 2011, we launched a joint strategy against which our investments are coordinated and we agreed a set of key research priorities that have been addressed in partnership.

> "This is the most exciting inter-disciplinary project I have seen. GFS has been instrumental in promoting an awareness of the risks of climate change to global food security, creating the vision for this project, and bringing together a diverse group of experts to implement it."
>
> Simon Sharpe, FCO

GFS has delivered impact and added value in a variety of ways. We have identified emerging challenges through our horizon scanning activities which have ultimately set the research agenda. For example the new £14 million research programme on 'Resilience of the UK food system in a global context' co-designed by BBSRC, ESRC, NERC, Defra and FSA, in partnership with stakeholders. Or the soils programme – soils are vital for food security and we brought together BBSRC, NERC, Defra and Scottish Govt to catalyse strategic investments worth over £13 million. There are many cross-funder initiatives described in this report with topics ranging from sustainable agriculture and aquaculture to food safety, nutrition and health.

However, co-funding of research is only part of the picture. We have sought to make better use of existing knowledge by making it available to policymakers and business in an easily accessible format. Our flagship GFS Insight 'practice and policy note' series has covered topics including soils, severe weather, food price spikes and the UK aquaculture industry. GFS is a trusted intermediary with government and industry and acts as a neutral broker in bringing those stakeholders together with academia to tackle key challenges. One example is the Agriculture Action Group, which provided the first really comprehensive exploration of the interaction between agriculture and water across industry, academia and policy and helped set the agenda for the future.

GFS has a growing international presence. We have led a UK-US project on resilience of the food system to extreme weather, bringing together academia, policymakers (including Defra and FCO) and industry (including food manufacturers and insurance companies) to understand the worst case scenarios for extreme weather impacting crop production, and optimal policy and business responses to minimise negative impacts. Earlier work on this topic has directly informed the IPCC report on climate change, and featured in a Nature publication. We also provided lead authorship of an EU discussion paper which has spearheaded discussions at Expo 2015 on the EU's food security research priorities.

GFS has led on a project for the G20 Meeting of Agricultural Chief Scientists to map out the top research priorities in sustainable agriculture across the G20 countries. This will ensure countries target global research efforts and investment more effectively. GFS has also launched a new international temperate agriculture network (TempAg), which aims to increase international collaboration and coordination across OECD countries, and synthesise knowledge to inform global policy and practice.

Food security raises many different and often inter-connected issues that are of high public interest in the UK and internationally, not least because it centres on that most emotive of issues: the food we eat. We have pioneered an innovative approach to public engagement through the establishment of a public panel to help us understand public views on topics such as new technologies and behaviour change, which will help shape research so it has the biggest societal impact.

Through our activities, thought leadership and profile-raising we have kept food security high on the agenda. We will continue to build on this momentum and the many relationships we have established to drive forward research and its translation to meet the food security challenge.

Introduction

The UK's main public sector funders of food-related research and training have joined forces to develop, design and implement a programme to coordinate research and associated activity on Global Food Security. It takes interdisciplinary and whole systems approaches to research on UK and global food supply systems. The programme is intended to help meet the global challenge of providing the world's growing population with access to environmentally, economically and socially sustainable, safe, affordable and nutritious diets, which will need to be produced and supplied from the same or less land and with lower inputs of finite resources.

> "By working together, the funders can bring a range of perspectives to bear on these issues, ensuring that excellent UK research is translated into tangible economic and societal benefits."
>
> Greg Clark
> Former minister for Universities,Science and Cities

Food and soft drinks is the largest manufacturing sector in the UK and 4th largest in the world. The UK food supply chain represents 7% of GVA (£96.9 billion) and 3.6 million jobs (13% of total UK workforce) with around 420,000 people in farming and 370,000 people in food manufacturing[3]. Translating research into innovative technologies, practices and information could enable countries worldwide to meet future food and environmental challenges while also contributing significantly to UK and global economic growth.

Meeting the challenges of our future food supply is not just an issue for government: it involves everyone across the food system. Therefore, GFS provides knowledge and evidence for policy development (nationally, regionally and locally) and to enable food producers and processors, retailers, consumers and civil society to respond to and manage the challenges facing the food system. Food security for the UK is inextricably linked to global production, demand and supply and must be considered in this broader context. This programme addresses these challenges and contributes to addressing related global issues, including the many challenges confronting the developing world in the face of environmental and demographic change.

Our mission is to integrate, coordinate and disseminate research that will be influential in informing policy and practice and will support food security goals. The programme is broad in scope: it integrates research in topics ranging from food production and processing to markets and distribution, consumption patterns, human nutrition and all aspects of sustainability including environmental impact. GFS has raised the profile of the food security challenge, providing leadership and coordinating our efforts in this area. We have been dynamic in identifying and responding to current and future challenges, leveraging existing funding, and co-designing new multidisciplinary research programmes. We have encouraged innovation, helped to translate existing knowledge and provided a focus for UK contributions to wider international efforts.

GFS activities are helping to address the food security challenge through: **agenda setting** and **focusing research priorities** around emerging food security challenges; greater **coordination and collaboration** to improve the design, delivery and translation (into policy, regulation and practice) of research across many disciplines; and **engagement and dialogue** to ensure that research delivers the maximum benefit for society.

Agenda setting

GFS has added value to food security research through agenda setting and horizon scanning to identify emerging food security issues. GFS activities with industry, academia and policy have set the strategic direction and encouraged a whole-systems approach to new research, as well as joining up funders' to maximise the impact of public funding in research.

New interdisciplinary programme of research on food system resilience

GFS has developed a new £14 million interdisciplinary programme of research co-designed by BBSRC, NERC, ESRC, Defra, and FSA, in partnership with our stakeholders, to address the challenge of 'Resilience of the UK food system in a global context.' This programme follows our '100 questions' activities and has been developed with policy, business and academia to ensure it delivers excellence with impact. Through interdisciplinary research calls, community building events and a suite of impact activities, this programme will build a portfolio of research that will deliver tangible outcomes for policy and practice.

Driving the research agenda with key stakeholders

GFS has brought together policymakers, academia, business and charities to identify the most important food security research questions for our key stakeholders. This has directly informed the strategic research priorities of both the GFS programme and its partners.

For example, the 'Priority research questions for the UK food system'[4] project fed into Defra's Future Evidence Programme and the Future Earth's Strategic Research Agenda (a 10-year international research initiative).

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Setting the EU's food security research agenda

GFS has played leading role in discussions around the EU's food security research priorities through Expo 2015: Feeding the Planet, Energy for life. GFS Champion Professor Benton, with input from GFS partners, led on the 'EU research and global food and nutrition security' discussion paper as part of an EU Scientific Steering Committee. This paper will serve as the basis for dialogue on food security research priorities with stakeholders at Expo 2015.[5]

The Director-General for Research and Innovation Robert-Jan Smits commented that the paper "very convincingly demonstrates why a global, coordinated and multi-disciplinary approach is needed to tackle the challenge. It is also a very valuable input for the future Work Programmes of the Horizon 2020."

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Ensuring future food security in the face of climate change

GFS, in partnership with the FCO and the Science and Innovation Network, is leading on an innovative project bringing together policy, business and academia, to understand worst case scenarios for extreme weather impacting on global crop production, and the market and policy responses that would lead to positive outcomes. The UK experienced severe drought events in 2011 and early 2012, followed by a wet summer in 2012 and Defra estimated that as a result farm profitability fell by 14% (£737m)[7].

GFS leveraged FCO funding for research on policy and business responses that might mitigate any detrimental impacts on the global food system. The full report will be launched this summer.

An earlier GFS and Food Research Partnership report on Severe Weather and UK Food Chain Resilience directly informed the IPCC Working Group II Fifth Assessment Report. Professor Andy Challinor, Leeds University Professor of Climate Impacts, used data from the report to demonstrate that a temperature increase of just 2°C would devastate crops in temperate and tropical countries in his *Nature* (2014)[8] study that fed directly into the IPCC's report.

The FCO's Simon Sharpe said: "This is the most exciting interdisciplinary project I have seen. GFS has been instrumental in promoting an awareness of the risks of climate change to global food security around Whitehall, creating the vision for this project, and bringing together a diverse group of experts from government, industry, science and the think tank community to implement it. I expect this to be enormously helpful to our international climate change influencing work." Aled Jones, Global Sustainability Institute Director, added "The impact of the taskforce should be significant and we are trying to extend this to support the work of the finance sector, including investors and insurance companies, to widen the impact and dialogue."

Multi-stakeholder approach to farming and water

GFS led the UKWRIP Agriculture Action Group, which aimed to stimulate a systems analysis of water use in agriculture and make recommendations for policy and industry. By 2025 some 2.8 billion people will face water stress or scarcity, rising to almost 7 billion by the middle of this century[6], and agriculture accounts for approximately 70% of the Earth's freshwater use.

A set of published reports outline the major challenges and priorities for water quantity, quality and embedded water in food production. One key finding was that 8 out of the top 10 countries that the UK imports food from is drought prone.

These are the first comprehensive explorations of the interaction between water and agriculture across industry, academia and policy.

Working with industry to tackle food waste

GFS has influenced retailers and manufacturers to engage with consumers on food waste, which costs UK households £12 billion every year.[9]

GFS Champion Professor Tim Benton talked with 30 business leaders, including Tesco, Sainsbury's, Asda, M&S, Nestle, Unilever, Coca Cola, Mars and NFU, at the IGD's CEO Forum and Technical Leadership Forum. Following this they took the decision to work together on the new Working on Waste campaign, in collaboration with WRAP, through which 90 companies are helping consumers to reduce household food waste.

Jon Woolven, IGD Strategy and Innovation Director, said "GFS involvement has been extremely valuable for clarifying the thinking of all these groups and influencing their direction. Professor Benton's assessment of the scale and pace of change required helped convince the group to start engaging with consumers together."

Focusing research priorities

With its over-arching perspective, GFS is able to scope key challenges and future areas of research with its stakeholders from the academic, policy and industrial communities and share the results with programme partners. This helps provide a focus in the development of new research programmes to tackle key priorities within the constraints of the overall funding available.

Influencing priorities on sustainable nutrition

GFS has championed the concept of sustainable nutrition and influenced the UNFAO forward strategy by presenting at their headquarters. Globally, there is a huge health imbalance across the population that needs to be addressed: some 925 million people suffer from hunger, while 2.1 billion people are considered overweight or obese.[10]

A GFS supported workshop with the Wellcome Trust and FCRN on food choice drivers and improving health and sustainability brought together the area's leading thinkers, business and policymakers to produce a set of recommendations in the *Changing What We Eat* publication. GFS also published a report on guidelines for a healthy sustainable diet, which followed from the Green Food project.

Our initial scoping work on nutrition has laid the groundwork for further investment from GFS partners in this area. The £8.5 million initiative Nutrition for Life, funded by Innovate UK, BBSRC, EPSRC, MRC, Defra and FSA, stimulated a multi-partner approach to business-led innovation in the food and drink sector. A cross-Council vision on food, nutrition and health has also been published.

Ensuring a resilient UK food supply in a global food system

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GFS facilitated a new £1.9 million initiative on "Understanding the challenges of the UK food system".[11] The UK imports around a third of its food and it is estimated that food fraud costs the UK food sector around £11 billion per year.[12,13]

This funding followed a GFS Public Policy Seminar on "Global Food Systems and UK Food Imports" examining factors affecting the stability and resilience of UK food supply chains. As a direct result of the seminar and subsequent report, ESRC and FSA came together under GFS to launch the new programme addressing the challenges facing UK food security in an increasingly complex, globalised system.

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Strategic approach to soil science

GFS has catalysed a strategic approach to soil science which has helped galvanise investment in research and training. UK soils are worth £5.3 billion to our economy – 2.2 million tonnes of topsoil is lost each year in the UK costing farmers £9 million.[17]

A £5 million initiative entitled "Soils and rhizosphere interactions for sustainable agri-ecosystems" (GFS-SARISA) was developed through GFS and funded by BBSRC and NERC, resulting in four multidisciplinary projects. Further investments were made by BBSRC, NERC, Defra and the Scottish Govt, including a £5 million initiative on soil security, a £2.3 million Centre for Doctoral Training in soil science, and a soils coordinator to bring together research and training investments to maximise impact.

Former Minister for Universities, Science and Cities, Greg Clark said: "Forging these strong partnerships between research councils...is vital in addressing major challenges facing our society like feeding a growing population."

Engaging industry in new research and development

GFS influenced Unilever's R&D strategic direction in discussions with Professor John Casey, former VP for Biological Sciences at Unilever. A resulting proposal with multiple collaborators to develop novel crops with superior health benefits to help deal with the global challenge of Type II diabetes has been funded by BBSRC, Innovate UK and DFID under the agritech catalyst, starting with research on millet varieties in 2015.[14]

In the UK, the treatment of diabetes and associated complications cost the NHS £14 billion per year.[15] It has been estimated that 50% of the Chinese population are pre-diabetic (roughly 0.5 billion people).[16]

> The GFS systems perspective sparked Unilever to address the question what should future foods look like and what sort of raw materials will we need to make them?

Guiding new research on agri-engineering

A GFS agri-engineering workshop helped inform a £13 million initiative co-funded by Innovate UK, Defra, BBSRC and the Scottish Govt on the potential for emerging technologies across the agri-food supply chain to meet food security challenges. The agri-engineering industry is worth £4 billion, employs 20,000 people in the UK[18] and will contribute £600 billion in GVA to European economies by 2030.[19]

Calum Murray, Lead Technologist for Sustainable Agriculture & Food at Innovate UK said: "The engineering workshop coordinated by GFS helped us secure agreement from both our Steering group and the Executive management team in Innovate UK to allocate funds to a dedicated Agricultural Engineering call. It also helped us with the overall scope of the call and the types of projects we wanted to see."

GFS has also led on addressing Action 1 of the UK's Strategy for Agricultural Technologies by providing agri-tech data mapping across the public sector.

Coodination and collaboration

GFS has become a focal point for food security research in the UK. National and international organisations see us as the main port of call for the UK's public funders of food security research.

Gilles Paire, Thinkstock

Protecting animal and human health in emerging livestock systems

GFS has helped facilitate an £18.5 million multidisciplinary research initiative to help protect animal and human health in the face of emerging livestock farming systems. Meat demand is predicted to rise by 40% in 2030[20] and there are significant risks to health associated with the rapidly changing nature of livestock farming systems to meet demand: 60% of human pathogens and 75% of emerging diseases are zoonotic. [21]

The initiative on 'Zoonoses and Emerging Livestock Systems' (ZELS) was funded by DFID, BBSRC, ESRC, MRC, NERC and DSTL and forged mutually-beneficial multi-disciplinary partnerships between researchers in the UK and developing countries.

Driving forward international food security research collaborations

GFS coordinated UK funding across BBSRC, ESRC, NERC as part of the €10.5 million Belmont forum and FACCE-JPI call on land use and food system dynamics. This resulted in three international projects in this area.

Working with the G20 and the OECD

GFS has launched a new international temperate agriculture network (TempAg), which aims to increase international collaboration and coordination across OECD countries, and to synthesise knowledge to inform global policy and practice.

GFS has also led on a project for the G20 Meeting of Agricultural Chief Scientists (MACS) to map the top research priorities in sustainable agriculture for a sub-set of the G20 countries. This aims to better coordinate global research efforts and investment to improve the various performances of agriculture.

GFS Champion Prof. Tim Benton is part of the G20 MACS working group on sustainability metrics and led on a white paper describing a set of indicators that could be used to inform these. This also aims to assess issues with the use of efficiency as a measure to optimise sustainable agricultural production.

Boosting the UK food economy

GFS worked in partnership with the National Centre for Universities and Business (NCUB) to publish a report encouraging world-class collaboration between businesses, universities and government to boost the UK's food economy.

Representatives from the NFU, Asda, Sainsbury's, Waitrose, IGD, Syngenta, Soil Association, academia, policy and many more came together to publish a set of reports to address the question: How can the UK integrate collaboration between business, higher education and other research institutions to develop a more competitive and sustainable UK agri-food sector?[28,29]

Out of this project, an environmental consultancy (3Keel at Oxford) set up a forum to develop some of the ideas with a range of projects emerging, all with industrial funding or co-funding, and all involving at least one GFS partner.

Leading the way on sustainable agriculture

GFS partners are working together to radically improve the sustainability of agriculture. Global agriculture currently emits 16% of the world's GHGs[23], uses 38% of the world's land[24] and 70% of its fresh water[25] and this will only worsen as demand increases.

Defra's £4.5 million sustainable intensification R&D platform (SIP) was coordinated under the GFS programme and acts as a hub for partner activities supporting multi-disciplinary and translational research aimed at improving productivity and environmental performance in UK agriculture.

Further GFS partner investments include BBSRC and NERC's Sustainable Agriculture Research and Innovation Club (SARIC) (£10 million over 5 years[26]) and the Sustainable Agriculture and Food Innovation Platform (SAF-IP) funded by Innovate UK, BBSRC, Defra and the Scottish Govt (£90 million over 5 years[27]) which has had five calls to date. They both aim to support collaborative research with industry to address key challenges on sustainable agriculture.

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Taking a systems approach to food safety

GFS has facilitated a cross-funder approach to tackling *Campylobacter* by emphasising the need for a systems approach and highlighting common research priorities. *Campylobacter* costs the UK economy £900 million and is the leading cause of food poisoning resulting in over 100 deaths per year. [22]

The major UK public funders of *Campylobacter* research (BBSRC, FSA, Defra, the Scottish Government and DARD) came together under a joint strategy to reduce both the level of the bacterium in farm-animal hosts and the potential for cross-contamination throughout the food chain. This was followed by a £4 million initiative to study *Campylobacter* from field to plate funded by BBSRC, Defra and the FSA in collaboration with industry.

Catalysing research on sustainable fish supplies

GFS has helped catalyse joint investments in aquaculture, an industry which produces 46% of the total food fish supply, is worth £71 million ($106 million)[30] and has the potential to relieve the strain on wild ocean fish stocks.

A GFS Insight policy and practice note summarised and translated the existing evidence on aquaculture and highlighted future research priorities, providing an accessible and very powerful tool for policy-makers and businesses. BBSRC and NERC (with additional funding from CEFAS, AFBI, Marine Scotland, FSA and FSA-Scotland) launched a £5 million initiative on sustainable aquaculture and also funded a Sustainable Aquatic Food Supply Knowledge Exchange Fellow based at M&S, who provides a vital link between research and industry, and ensures a holistic approach to the aquatic food supply network.

At an international level, an aquaculture sandpit was developed through the GRP Newton Fund with funding from BBSRC, DFID India and DBT India, resulting in a number of UK-India multi-disciplinary research proposals.

Ensuring evidence-based policy making

GFS and Cambridge University Science and Policy Exchange (CUSPE) brought together early career researchers (ECRs) and early career policy professionals (ECPs) to strengthen the links between evidence and policy making. A GFS-supported workshop facilitated discussion of current policy issues surrounding food security and sustainable fisheries.

Early career researchers and policy professionals are the leaders of tomorrow and building connections and awareness of food security issues now will ensure evidence-based policy making in the future.

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Engagement and dialogue

GFS has a very proactive approach to engagement with its stakeholders, through the GFS Champion, the website, blog, twitter feed, public dialogue and mobile exhibition. GFS has also published a wide variety of reports that bring the latest cutting-edge knowledge to different audiences.

Raising the profile of the Food Security challenge

GFS has played a key role in raising the profile of the food security challenge both through the GFS Champion and a strong digital presence as part of our communications and public engagement strategy. GFS Champion Professor Tim Benton has given over 250 talks at meetings and events involving a wide range of GFS stakeholders. GFS has been successfully positioned as an authoritative voice on food security, and specifically food security research issues in the media. A community of the communicators in food security research has also been established.

The Global Food Security Blog pages on the website have been consistently popular attracting over 80,000 unique page views since it began in 2011 – 27,000 in 2014 alone. The blog has developed into a useful tool for broad stakeholder engagement; all posts get shared via social media and around three quarters of the articles posted on the blog receive comments.

The blog posts examine a particular topical issue allowing GFS partners to submit articles on their activities, but also world leading experts such as Dr Robin Sanders (founder of FEEEDS Initiative and former Ambassador to Nigeria and the Republic of Congo), Andrew MacMillan (tropical agriculture economist, former Director of the FAO's Field Operations Division) and Paolo De Castro (MEP, Chairman of the Committee on Agriculture and Rural Development). Professor Benton's blog piece on the carbon emissions of cows vs. cars was even picked up and quoted by Richard Branson.[31]

Chris Evans referred to the GFS Food Waste report on his BBC Radio 2 breakfast show (9.8 million listeners); it was on the front page of the Telegraph (500,000 readers), Daily Mail (1.8 million readers) and was included in all editions of the Metro (770,000 in London plus regional).

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Galvanising action to address food waste

A GFS report on 'Food Waste within Global Systems' reached over 22 million people through radio, newsprint, social media, and TV. UK households throw away the equivalent of 24 meals a month, adding up to 4.2 million tonnes of food and drink every year that could have been consumed, at an annual cost of £720 per household.

The report was tremendously successful in galvanising action across much of the UK media. It even sparked an 'Ugly Veg' competition in the *Guardian* which led to this being the top online article that day. The Press Association produced a syndicated article about Red Cross food banks making reference to the GFS Food Waste report and its figures on food waste, which was reproduced in further national and regional newspaper websites.

Translating knowledge into policy and practice

The GFS programme's flagship publication series 'GFS Insight' provides access to the latest evidence on key food security issues for people working in policy, industry, charities and NGOs. Topics covered so far include soils, severe weather, food price spikes and aquaculture. The reports synthesise cutting-edge research in an engaging and accessible way, helping to maximise the potential for impact, and have consistently been the most popular news item visited on the GFS website since its launch.

Steve Jennings, Former Head of Programme Policy at Oxfam, said "I found the food price spikes paper extremely clear and concise. It explains things well even to a non-economist like me! I think this is a really good report and I will certainly use it."

Working with end users to generate new knowledge

GFS is working directly with farmers through the Duchy Originals Future Farming Programme, which is run by the Soil Association with the Organic Research Centre and Waitrose, to meet the emerging challenges of resource scarcity and environmental change.[33]

As part of this programme, GFS Champion Prof. Benton peer reviewed research grant applications and produced a practical guide to running effective farm trials, published to c.50,000 farmers as a supplement in the NFU magazine, the British Farmer and Grower.

Dr Tom Macmillan, Soil Association Director of Innovation said: "Tim has contributed actively to the independent steering group's discussions and thereby helped shape the programme's direction, including its approach to small-scale research funding.

Engaging the public at national events

GFS engages with civil society through our 'Field to Fork' exhibition which has visited a wide range of venues including country shows, research open days and museums. It supports and encourages public interaction with researchers and has been seen by over 682,000 people at 8 events in its first year and over 912,000 people at 9 events the following year – these included the Three Counties, Royal Highland and Royal Welsh shows.

GFS has also specifically targeted schools and young people through the development of educational resources, including a science debate kit on food security and an interactive web resource.

Engaging with the public on food security issues

Following the success of the first GFS public engagement exercise, which involved a survey of 1200 people and nearly 50 more in-depth discussions, a larger longer-term panel has been set up to understand public views on all aspects of food security. A 2014 poll stated that 69 % of the UK public think scientists should listen more to what ordinary people think and 75 % think that the Government should act in accordance with public concerns about science and technology.[32]

"This innovative approach to public engagement will enable discussion over a longer period on a variety of topics of interest to funders, researchers and members of the public. It is vital that research agendas are informed by wider public views."

Sir Roland Jackson
British Science Association CEO

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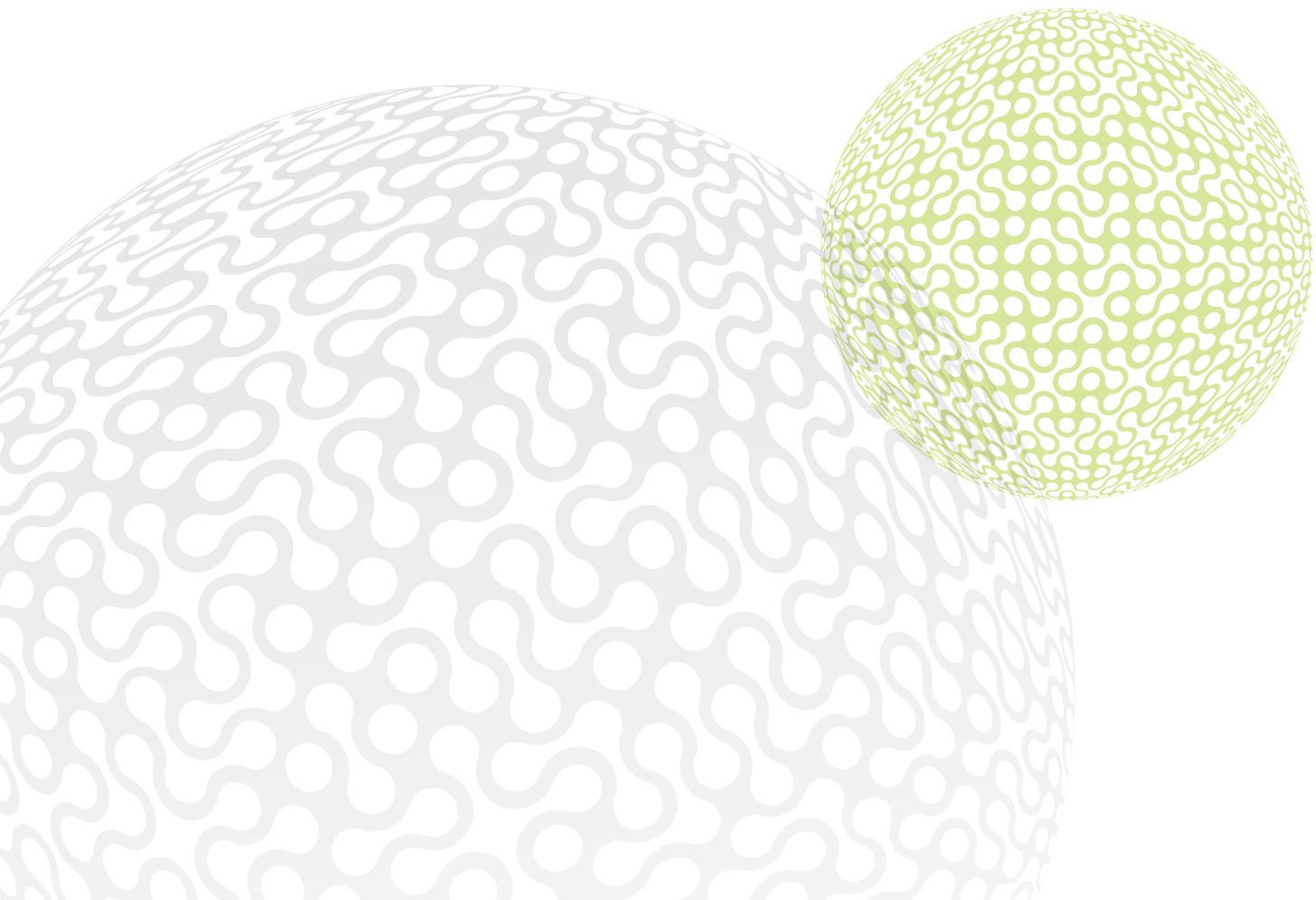

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