

Institution: Coventry University
Unit of Assessment: UoA14: Geography and Environmental Studies
1. Unit context and structure, research and impact strategy

1.1. Context and Structure

Research in Geography and Environmental Studies has undergone significant change since REF 2014. At that time, Coventry University (CU) submitted physical geographers and environmental scientists to UoA7 Earth Systems and Environmental Science (10.4 FTE), whilst human geographers/social scientists were included in submissions to UoA21 Politics and International Studies (18.7 FTE) and UoA19 Business and Management Studies (17 FTE). In 2014 CU launched its 'Excellence with Impact' strategy, marking a major new investment in research and establishing several new challenge-led research centres. One of these is the Centre for Agroecology, Water and Resilience (CAWR), launched in 2014, whose staff form the largest part of our submission to UoA14 Geography and Environmental Studies (Table 1.1). CAWR aims to combine natural science, social science and lay knowledge to deliver high-impact research for the understanding and development of resilient food and water systems throughout the world.

Our submission to UoA14 has been made possible through significant investment in staff and infrastructure at CAWR, which enabled us to build on existing strengths in hydrology, geomorphology, local/community food systems and agroecology. New staff have been appointed to extend our specialisms to fulfil CAWR's objectives (Section 1.2). This means we are now able to submit researchers whose work falls into a range of areas as outlined in the UoA14 Panel Descriptor for Geography (including: biogeography and ecosystem science; environmental and climate change; geomorphology; hydrology and water science; Quaternary science; environmental geography; cultural, development, health, historical, political, rural, social, urban geographies; geographical information sciences; socio-ecological systems; natural resource governance) and Environmental Studies (including: ecosystem services, governance, sustainable development, conservation, ecology, environmental pollution, resource management, environmental assessment). Ranging from science-based to humanistic approaches, our work features numerical, theoretical, experimental, model-based and field-based strategies as well as a strong emphasis on participatory methods.

Included in our submission are ten associate members of CAWR. These are based in the Faculty of Engineering, Environment and Computing (EEC) and seconded to the Research Centre for a minimum of three years with protected time for research and access to the same resources as Centre staff. Also included are three FTEs at the University Research Centre for Peace, Trust and Social Relations (CTPSR), plus one FTE from the Faculty Research Centre for Fluid and Complex Systems (CFCS), whose research complements that of CAWR and sits within the scope of UoA14.

Table 1.1: Composition of CU submission to UoA14

	FTE
CAWR	40.2
EEC (Associate Members of CAWR)	10.0
CTPSR	3.0
CFCS	1.0
Total	54.2

Unit-level environment template (REF5b)

As 93% of staff in our submission are members of CAWR, this statement describes the research environment at CAWR. Research is organised into four complementary themes which together facilitate the development of interdisciplinary and transdisciplinary approaches to understanding and improving the resilience of food and water systems. By interdisciplinarity, we refer to the combination of two or more disciplines to achieve outcomes not achievable by a single discipline. We use the term transdisciplinarity to refer to the co-construction of knowledge involving scientific and non-scientific sources or practices (including lay and traditional knowledge, for example). Each of the themes is convened by a professor or senior academic and staff align themselves with themes most appropriate to their interests. Theme membership is fluid; staff can move freely between them and participate in more than one theme.

The **Fundamental Processes and Resilience** theme (Leader **Van De Wiel**) advances knowledge on the underlying processes that promote resilience in food and water systems. **Resilient Food and Water Systems in Practice** (Leaders **Charlesworth and Schmutz**) focuses on the development of practical techniques and technologies for resilience, as well as the resilience potential of whole food and water systems and their communities in rural and urban settings. **Community Self-Organisation for Resilience** (Leaders **Kneafsey and Franklin**) develops insights into the complex and contested ways in which communities self-organise to manage the food and water resources they depend on and seeks to progress critical understanding of the concept of community resilience. **Policies and Institutions for Resilient Food and Water Systems** (Leader **Pimbert**) critically explores the progressive thinking and action needed to challenge and transform unsustainable structures and hold powerful actors and networks to account.

Our research environment is dynamic and evolving, aiming to create an adaptive culture which is responsive to our internal needs as well as those of our partners, collaborators and the externally changing environment. An example of this is the unique **People's Knowledge and Transdisciplinary Working Group**, initiated in 2015, which aims to build a community of practice of transdisciplinary scholars within CAWR and externally.

CAWR is housed in a grass-roofed eco-building at Ryton Gardens, a semi-rural location south-east of Coventry. The facility has the rare and distinctive advantage of being set in nine hectares of organic certified agricultural land with access to growing space, greenhouses, polytunnels and a range of bespoke laboratories (Figure 1.1).



Figure 1.1: CAWR's research buildings, outdoor space and greenhouses

1.2 Research Objectives

CAWR was launched with the ambition of 'becoming an uncontested world leader known for its innovative transdisciplinary research on agroecology and water, as well as for its contributions to understanding and developing equitable and resilient food and water systems'. We define agroecology as an approach to agriculture and food systems based on ecological principles, which recognises the importance of local knowledge and the agency of food producers and citizens. Table 1.2 sets out the broad objectives achieved by CAWR during the current assessment period, which correspond closely to the plans laid out in our UoA7 submission in 2014:

Table 1.2: Objectives achieved 2014–20, with selected illustrative outputs

<p>1. Enriched resilience science: Our research has contributed to the understanding of hydroclimatic and hydrological systems, particularly on rainfall variability over multiple timescales (Dieppo et al., <i>Jnl of Geophys Res – Atmospheres</i>, 2016; <i>Intl Jnl Climatology</i>, 2016), attribution of extreme rainfall events (Eden, in Christiansen et al., <i>Jnl of Climate</i>, 2018) and teleconnections in hydroclimate systems (Eden et al., <i>Jnl of Geophys Res – Atmospheres</i>, 2014; Dieppo et al., <i>Climate Dynamics</i>, 2015). It has also improved understanding of biodiversity responses to natural and anthropogenic environmental change, especially for invertebrates (Wilkes et al., <i>Global Change Biology</i>, 2020), macrophytes (Kennedy et al., 2015; Murphy et al., 2019), pollinators (Smith et al., <i>Front. Sustain. Food Syst</i>, 2020; Smith in Holland et al., <i>Biological Conservation</i>, 2015) and invasive plants (Dehnen-Schmutz in Touza et al., <i>Ecological Economics</i>, 2014). Warne et al. have assessed water quality and endocrine activity in Australian rivers and implications for the Great Barrier Reef (<i>Environmental Pollution</i>, 2020). Our research also contributed to understanding resilience in catchment geomorphology, notably in relation to riverbank erosion (Van De Wiel, in Rousseau et al., <i>Geomorphology</i>, 2017) and catchment sediment connectivity (Coulthard and Van De Wiel, <i>Geomorphology</i>, 2017).</p>
<p>2. Developed practical techniques and practices for resilient food and water systems: Significant achievements here can be found in our internationally recognised work on sustainable drainage systems (SuDS). Charlesworth and Coupe (<i>Renewable and Sust. Energy Reviews</i>, 2017), Lashford et al. (<i>Water</i>, 2020) and Rubinato et al. (<i>Hydroinformatics</i>, 2018) have published on the role of SuDS in minimising flood risk and water pollution. Dehnen-Schmutz and Bennett have developed new insights on weed management, biodiversity and yields (in Maclaren et al., <i>Weed Research</i> 2019; <i>Jnl Applied Ecology</i>, 2018).</p>
<p>3. Extended research into how community self-organisation contributes to the resilience of socio-ecological systems: A body of work has been developed around alternative food networks (Owen and Bos, <i>Jnl of Rural Studies</i>, 2016), local food systems (Anderson in Laforge et al., <i>Agric. Hum. Values</i>, 2015), urban agriculture and short food supply chains (Kneafsey and Schmutz in Zasada et al., <i>City, Culture and Society</i>, 2019; Chang and Morel, <i>Agron. Sustain. Dev</i>, 2018; Tornaghi, <i>Antipode</i>, 2016), gardening activism and food justice (Kneafsey et al., <i>Local Environment</i>, 2017; Tornaghi and van Dyck, <i>Local Environment</i>, 2014). We have also developed socio-ecological perspectives on food security, biodiversity conservation and community resilience in India (Saxena, <i>Sustainability</i>, 2020) and Brazil, including Chappell's (2018) critically acclaimed interdisciplinary analysis of food security policies in Belo Horizonte – <i>Beginning to End Hunger</i>. Other work has focused on natural resource management, sustainable livelihoods and</p>

access to healthcare in South Africa (**Lemke** and van Rensburg, *Dvlpmt S. Africa*, 2014; **Fried** et al., *Qual. Health Care Res.*, 2015).

4. Delivered insights into policies and institutions for resilience: Key achievements include **Brem-Wilson's** unique insights into non-elite participation in food and agricultural policy processes in the United Nations (UN) Committee on World Food Security (*Jnl of Peasant Studies*, 2015; *Rev Intl Studies*, 2016) and **Tilzey's** critical theoretical perspectives on food sovereignty (*Jnl Rur Studies*, 2017; *Pols & Governance*, 2019), including his ground-breaking monograph *Political Ecology, Food Regimes and Food Sovereignty*, 2018. **Anderson, Maughan, Pimbert** developed a new theory of transformative agroecology learning (*Agric. Hum. Values*, 2018). With others, they co-edited special issues on Learning for Transformation in Food Movements (*Agric. Hum. Values*, 2019) and Agroecology Transformations (*Agroecol & Sust. Food Syst*, 2020). **MacKinnon** published original analysis of legacies of internal colonialism in Scotland and imperialism in India, tracing their impacts on local populations and environmental resource management (*Northern Scotland*, 2017; *Intl Jnl of the Commons*, 2018; *Scottish Hist. Rev.*, 2019; *Env. & Planning E*, 2020).

Of cross-cutting relevance to these objectives, staff have also made methodological contributions notably in the field of participatory and collaborative research methods and scholar activism – **Brem-Wilson** (*Socialist Studies*, 2014), **Brown** (with Brady, *Methodological Innovations*, 2020), **Denning** (*Social & Cultural Geography*, 2019), **van Dyck** et al. (*Agroecologia*, 2018).

This suggests CAWR is developing into a world leader in the fields of agroecology and resilient food and water systems. In addition to these outputs, evidence of this can be seen in the external income we have generated. During 2014-20 staff have been awarded funded projects (as principal investigator or collaborator) worth a combined total value of £33.5m. Evidence of our strong international reputation is also provided by Scival data (10.03.21) showing that 53% of CU affiliated papers between 2014-20 were internationally co-authored; 42.6% were published in the top 10% of journals (using Source Normalised Impact Per Paper, SNIP), and our outputs have been cited 54% more than the world average for their field. Using topics in SciVal to analyse our contributions, we stand out as a world leader in agroecology, permaculture and peasant movements. We are also a top contributor on concrete pavements, stormwater and asphalt mixtures which forms part of our work on SuDS.

1.2.1 Research objectives 2020–25

As food and water security, climate change and biodiversity move to centre stage of local and global policy discourse, CAWR is exceptionally well positioned to continue its trajectory and also contribute to achieving the Sustainable Development Goals. Discussions with partners (academics, farmers, educators, policy makers and social movements) in the Americas, Africa, Asia and Europe have also enabled us to prioritise research going forward. Our high-level research objectives 2020–25 are:

1. Respond to socio-environmental crises: research will focus on reducing carbon and ecological footprints through food system transformation, including the development of low external input circular systems that link food and energy production with water and waste management along the rural-urban continuum in diverse contexts. We will deepen understanding of the relationship between agroecology and ecosystem services, notably soil regeneration and biodiversity restoration, and develop practices and technologies to support climate resilient food and farming systems, including processing and value chains. We will build on our strengths in water science to deliver cutting-edge

Unit-level environment template (REF5b)

research on new and emerging pollutants such as micro-plastics and expand our research on climate and hydro-ecological modelling.

2. Enhance socio-economic sustainability: research will examine how, and under what conditions, community self-organising processes can support sustainable livelihoods, health and wellbeing, dignity and cultural diversity as well as economic organisations that can re-localise food and water systems. This will include further work responding to the Covid-19 crisis, which has highlighted the problems of industrialised agriculture, environmental destruction and increased vulnerabilities to global pandemics.

3. Boost political sustainability and good governance: We will continue and extend our research on methodological and institutional innovations that can expand citizen participation, social inclusion, subsidiarity and democracy in the co-production of knowledge, policies and institutional choices for food and farming systems, land, seeds, energy and water. We will explore forms of adaptive governance and institutional arrangements that best support transitions/transformations to sustainable and just food and water systems. The mutual constitution of political, economic and social power will be critically analysed in different settings to identify the changes in power relations needed to secure the right to food and other human rights as well as enable community and socio-ecological resilience in the face of rapid and uncertain change.

We will build on our strengths to deliver high quality applied research which delivers impacts locally and globally. Several projects have already been secured which will ensure progress towards our objectives (see Figure 3.2). Additionally, demonstrating the long-term vision and expectations for CAWR, CU in 2019 invested £2.4 million to purchase the 9-hectare site at Ryton. This signalled an exciting new step to enhance research capacity over the next ten years. The vision is to develop a multifunctional living laboratory and hub for high-impact, transdisciplinary research, education and enterprise, around a decarbonised, circular economy based on the ethos of One Planet Living. The acquisition of the site has already supported successful bids for several H2020 projects. *UNDERTREES* (€1.2m, 2020–23), *AGROMIX* (€7m, 2020–24) and *AE4EU* (€2m, 2021–23) have the Ryton site written into their grant agreements and provide the foundations for achieving our objectives into 2025. The *AE4EU* project, for example, will position the Ryton site as the UK node of a European living lab network of agroecology.

1.3 Impact Strategy

CAWR's impact strategy aims to generate benefits for communities, institutions and businesses operating from local to global scales, as illustrated in our submitted case studies (Table 1.3).

Table 1.3: Impact Case Studies

ICS1	Developing Sustainable Drainage Systems for Better Water Management, Pollution Reduction and Ecological Water Treatment
ICS2	Participatory Policy-Making on Global Food Insecurity
ICS3	Effective Prison and Community-Based Interventions: Building Humanising Rehabilitative Environments
ICS4	Supporting Rural Development through Short Food Chains and Local Food Systems
ICS5	Supporting Native Biodiversity Through Garden-based Citizen Science

We have created an impact-supporting environment through four inter-linked activities:

Unit-level environment template (REF5b)

1. Developing strong collaborations, partnerships and participatory approaches: engagement with partners nationally and internationally ensures our research adaptively evolves in the light of new knowledge, constraints and opportunities. Moreover, our participatory research approach, with its emphasis on co-production and reflexive learning, often delivers disproportionately high impacts. For example, ICS1 illustrates how long-term partnerships with industry have delivered practical innovations which have reduced flooding and water pollution. ICS2 shows how our researchers successfully collaborated with the Civil Society and Indigenous People's Mechanism of the UN Committee on World Food Security to reinforce the participation of rural youth and under-represented regions in policy making on global food security. ICS5 illustrates how peoples' gardening knowledge and skills can be combined and enhanced through citizen science to support native biodiversity.

2. Building on diverse funding sources: a wide portfolio of small, medium and large-scale projects is important because it enables interaction with a range of different partners and includes those likely to benefit most from the research. A proportion of research is funded at CU's institutional charitable rates. This reinforces CU's Corporate Social Responsibility agenda, but crucially it helps to amplify the voices of smaller-scale, often locally based initiatives that would otherwise be unable to afford evaluations or have the capacity to undertake research and collaborations. ICS3 illustrates how several smaller projects generated cumulative and significant impacts for the commissioning, design and delivery of land-based and faith-based rehabilitative programmes in prisons, contributing to health and wellbeing benefits for criminalised men and women. A key benefit of this work was that it enabled smaller charities to acquire independent evidence of the impacts of their work, which then strengthened their capacity to access further funding. ICS3 again highlights how our participatory approach encourages reflexive learning and growth in the organisations involved, leading to improved practices.

3. Undertaking policy relevant research: conducting policy relevant research is embedded in the overall aims of CAWR. The significance of this is underlined by having an entire research theme devoted to policies and institutions, plus a 'knowledge mobilisation strategy' (Section 1.5). ICS2, 4 and 5 illustrate how policy and strategy-relevant research leads to impacts, highlighting the importance of active dissemination and outreach and reinforcing the role of collaborative networks.

4. Developing impact skills and capabilities: Events organised by the Peoples' Knowledge Working Group, as well as external trainers, provide regular opportunities for researchers to critically reflect on the concept of impact in relation to CAWR's agenda for 'transformative' research. In practical terms, they are encouraged to develop processes to track and evidence impact through training and support provided by a dedicated Research Impact Officer affiliated to CAWR (staff in CTPSR and CFCS have equivalent support).

Researchers can also access internal funding to undertake necessary travel and engagement to build effective pathways to impact. In the next REF period, we will continue to implement these activities, with the following new initiatives planned:

1. Documenting the impacts of new site developments at Ryton Gardens: the plans have impact at their heart, including measures for fully integrated monitoring processes using relevant social, economic and environmental performance indicators.

Unit-level environment template (REF5b)

2. Launching a new series of policy briefings: aimed at government policy makers and other social actors, each policy brief presents key policy recommendations or implications from our research. The first set of policy briefs will aim to influence discussions at the UN Food Systems Summit and the COP on Climate Change, 2021.

3. Enhancing the accessibility of our research: we will increase the proportion of our research that is open access and improve accessibility to a wider range of publics through a variety of languages, formats and multi-media communications.

Staff will continue to be supported by CU's research impact team. We will continue to generate impacts locally and globally; for example, CAWR has developed a strong agenda for locally based participatory research, with three fully funded PhD studentships (starting from September 2020) focusing on aspects of community food resilience and urban agroecology in Coventry, plus a PhD investigating the use of Nature Based Solutions to address environmental degradation by New and Emerging Pollutants which will provide small-scale demonstrator test beds open to the public, students, stakeholders and for use in teaching and CPD.

1.4 Interdisciplinary Research

Interdisciplinarity was built into the fabric of CAWR from its outset and is a defining quality that has underpinned our success. Indeed, CU's research centres were set up to address societal issues, rather than disciplinary ones, and thus their objectives are addressed using interdisciplinary perspectives. Our aim is not only to support interdisciplinarity but also to develop trans-disciplinarity and our themes and cross-cutting working group provide the practical platforms for organising this. Several mutually reinforcing actions support our approach to interdisciplinary and transdisciplinary research:

- recruiting a mix of researchers from the natural sciences, social sciences, arts and humanities;
- recruiting researchers with a strong track record and commitment to inter- and transdisciplinary scholarship to act as catalysts and role models;
- prioritising problem-focused research rather than pure disciplinary-based research – CAWR encourages undertaking fundamental research in an applied way;
- supporting the co-construction of knowledge by collectives of natural and social scientists, artists and citizens (including farmers and indigenous peoples).

The combined effects of these actions have enhanced the vitality and sustainability of our research environment. Many of CAWR's major projects exemplify our inter- and/or transdisciplinary approach. *Urbanising in Place*, for example (Sustainable Urbanisation Global Initiative – Belmont Forum and Joint Programming Initiative Urban Europe, €1.5m, Co-I: **Tornaghi**, 2018–21), brings together academics from geography, rural and urban sociology, architecture, planning, design, agronomy, hydrology, engineering and physics. Together they work with 'communities of practice' – each with specific and valuable knowledge – in Rosario, Riga, Brussels and London to identify the building blocks of an 'agroecological urbanism'.

1.5 Open Research

CAWR creates an open research environment in three key ways. First, our emphasis on participatory methods means research agendas, projects and outputs are co-developed through trust in which the needs and aspirations of partners, beneficiaries and users are foregrounded and built into research design.

Second, we are committed to participation in open data initiatives and comply with CU's Policy on Research Data Management and Sharing, which states that data (that underpin/validate research findings) should always be made available unless there are ethical or legal reasons why they cannot.

Third, we make our research outputs as openly available as possible. Since 2016, CU has developed a comprehensive Open Access (OA) strategy with a minimum standard of green OA being a baseline for all our outputs. Going further than this, 39% of all our published outputs are available via gold OA, funded from a variety of sources, including CAWR, collaborating institutions and project funds. We have several OA books, such as *Everyday Experts*, edited by the Peoples' Knowledge Collective and part of CAWR's own series, 'Reclaiming Diversity and Citizenship' (edited by **Pimbert**), including authors from both CAWR and our wider networks.

Our OA strategy is intertwined with our approach to impact; we have invested in a 'knowledge mobilisation strategy' that translates our research into a range of different media so it can be mobilised for public good. Our work on agroecology transformations, for example, is communicated using videos, research briefs, journal articles and a monograph (*Agroecology Now! Transformations to More Just and Sustainable Food Systems*, available online December 2020). All of the outcomes are cross-linked and presented dynamically on the *Agroecology Now!* website. The platform links to a body of 75 freely downloadable OA publications from CAWR.

1.6 Research Integrity

Research is governed by the principles of research ethics and integrity which are set out in CU's Group Research Ethics and Conduct Policy. In common with the Concordat to Support Research Integrity (Universities UK), the underpinning principles of research ethics and integrity include: culture, honesty, rigour, integrity, co-operation, accountability, transparency, training and development, and care, respect and safety. In addition to these principles, and in keeping with our impact agenda, we pay special attention to how we work with marginalised communities and individuals (for example, migrants and refugees, criminalised men and women, Indigenous people, small-scale peasant farmers). At the heart of our interactions with all our collaborators is continual learning about how to build research relationships which are non-extractive, equitable, respectful and mutually beneficial.

Ethics requests are handled using the university's online ethics approval system. Senior academics undertake the role of Ethics and Governance Lead. They attend the University Group Ethics Committee and hold the position on a two-year rotating basis, with two co-leads in support, at least one of whom is a mid-career researcher. The rotation of staff in this role strengthens capacity. It means levels of understanding of CU's ethics procedures are high and continually refreshed across the research community, as well as ensuring that the administrative burden associated with ethics reviews and decision making is shared. It also provides an opportunity for mid-career researchers to take on a role of leadership and responsibility with the support of more experienced peers. The ethics team includes at least one social scientist and one natural scientist. They have responsibility for ensuring that staff and postgraduate researchers (PGRs) are trained in the principles of ethics and integrity so that research projects comply with the highest standards.

2. People

2.1 Staffing Strategy

In total, 50 new academics have been appointed to CAWR during the assessment period (this refers to all staff, including Early Career Researchers (ECRs) not eligible for REF). Two of the staff from CTPSR were also new appointments (**Harris, Denning**). The research opportunities identified via internal discussions at the end of REF2014 ensured that staff were recruited to 1) fill gaps in our expertise, 2) create an inter and transdisciplinary team capable of addressing ‘wicked’ problems associated with water, agroecology and resilience and 3) ensure all the research themes have grown at a roughly even pace (Table 2.1).

Table 2.1: Development of research specialisms, 2014–20

	Specialisms present in 2014	New specialisms developed since 2014
Fundamental processes and resilience	Urban hydrology, fluvial dynamics and geomorphology, Charlesworth, Lawler (retired) ; Environmental GIS and remote sensing, Anifowose, Blackett	Fluid mechanics, coastal geomorphology, Dale, Rubinato ; Fluvial geomorphology and computational modelling, Van de Wiel ; Modelling of hydrological and climate systems, Dieppois, Eden ; Human-environment relationships during the Holocene, Farrell ; Behaviour of pollutants in aquatic and terrestrial ecosystems, Bogush, Hart, Kourtchev, Warne ; Applied freshwater ecology and hydroecology, Kennedy, Wilkes
Resilient food and water systems in practice	Agroecology, organic horticulture, stabilisation agriculture, Wright, Schmutz ; Citizen science and stakeholder engagement in the management of invasive species, Dehnen-Schmutz, Bennett, Trenchard ; Sustainable drainage systems, environmental remediation, Charlesworth, Coupe, Ifelebuegu	Agroforestry, stabilisation agriculture and peace building, McAllister, Felix ; urban and vegan horticulture, Rayns, Lennartsson-Turner ; Participatory approaches to plant breeding, biodiversity restoration, and climate change mitigation, Labrada, Smith, Burbi, Rayns ; Cost-effective technologies for environmental remediation, Bogush, Lashford

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Community self-organisation for resilience	Short food supply chains, local and community food systems, food poverty, food justice, Kneafsey ; Urban agriculture, social farming, gardening and micro-farming, Schmutz, Kneafsey	Short food supply chains and community food enterprises, Owen ; Health benefits of gardening, Lennartson-Turner ; Urban agroecology, Tornaghi, Chang ; Community organising, environmental activism, Anderson (left), Maughan, Tornaghi, Chang ; Socio-ecological perspectives on food security, biodiversity conservation and community resilience, Chappell (left), Saxena ; Land and community-based rehabilitation, Brown ; Sustainable livelihoods and place making, Lemke, Franklin ; Gender, nutrition and rights to food and healthcare, Lemke, Fried ; Ethics and sustainability of consumption, Evans, Martin-Woodhead ; Human-animal relations, Abell, Evans, Franklin
Policies and institutions for resilient food and water systems	Food sovereignty, agroecological transitions, democratisation of agricultural knowledge, Pimbert ; Governance of natural resources, Bennett	The politics of land and knowledge and natural resource management, including legacies of colonialism, MacKinnon, Singh, Milgroom, Lemke ; The funding, financing and politics of agroecological transition, Anderson, Moeller, Hilmi ; Social movement and non-elite participation in formal agricultural policy processes, Brem-Wilson ; International political economy and ecology of food systems and food sovereignty, Tilzey, Chappell ; Socio-technical transitions, van Dyck

Note: Table represents staff whose outputs are included in our submission; a small number of staff who were appointed and left within the assessment period are not represented. New specialisms have been developed as a result of 34 new appointments in CAWR and six in EEC, plus staff transferring into CAWR from elsewhere in CU during the assessment period (**Abell, Brown**). Also illustrates where staff are active in more than one research theme.

Our submission is boosted by the inclusion of **Shariatipour's** research from the Centre for Fluid and Complex Systems, developing numerical simulation of CO₂ storage in deep saline formations and depleted hydrocarbon reservoirs. Additionally, the research from CTPSR synergises with that of CAWR. **Denning's** work on faith-based responses to food poverty and **Harris's** critical scholarship on structural inequality and encounters with difference add new dimensions to CAWR's work on food justice and community responses to food insecurity (**Kneafsey, Tornaghi, Saxena**). **Neulai's** interdisciplinary monograph on *Urban Space and Late 20th C New York Literature* complements

Unit-level environment template (REF5b)

Maughan's work on environmental change in science fiction literature/culture and **Tornaghi's** agenda-setting research on agroecological urbanism.

Recruitment has been driven by a strategic decision to recruit international talent from multiple career stages. As a result, approximately 45% of staff are international, strengthening the diversity of our team and the global reach of our research and collaborations. Crucially, and in keeping with CU's overall recruitment approach, CAWR has appointed several practitioners from community development, advocacy and business sectors who have transitioned into academia (for example, **Singh** is an experienced youth worker and advocate for environmental and social justice in the UK and internationally; **McAllister** worked in international non-governmental organisations (NGOs) and **Hilmi** held several roles at the United Nations Food and Agriculture Organisation; **Schmutz, Rayns and Lennartsson-Turner** worked for national horticultural charity Garden Organic). This strategy has brought a wealth of applied knowledge, professional networks and expertise to enhance the ability of CAWR to achieve real-world impact and develop transdisciplinary research approaches.

We recruited rapidly during 2014–16, with 22 appointments, and subsequently averaged six per year. Between 2017–20, CAWR doubled the number of ECRs compared to 2014–16, largely due to success in attracting larger externally funded projects. More experienced researchers have been appointed on Fellowships funded by the H2020 MSCA scheme (Table 2.2).

Table 2.2: Externally funded posts

ECRs	Project title	Dates	Funding
Marandure	<i>TOCASA</i> : Trade-offs in communal areas in South Africa	2019–21	Biotechnology and Biological Sciences Research Council (BBSRC)/Global Challenges Research Fund (GCRF): £789,256
Conroy, van Kesteren, Touliatos	<i>Organic Plus</i> : phasing out contentious inputs from organic agriculture	2018–22	H2020: €4.1m
Ruiz Cayuela, De La Rosa, Abbas	<i>RECOMS</i> : resourceful and resilient communities	2018–22	Marie Curie International Training Network: €3.9m
Green	<i>HOMED</i> : holistic management of emerging forest pests and diseases	2018–22	H2020: €5m
Fathollahi	<i>SAFERUP</i> : Sustainable, Accessible, Safe, Resilient and Smart Urban Pavements	2018–22	H2020: €3.9m
Maughan	<i>Growing and Spreading Innovation in Community Economies</i> :	2018–21	British Academy Postdoctoral Fellowship: £258k

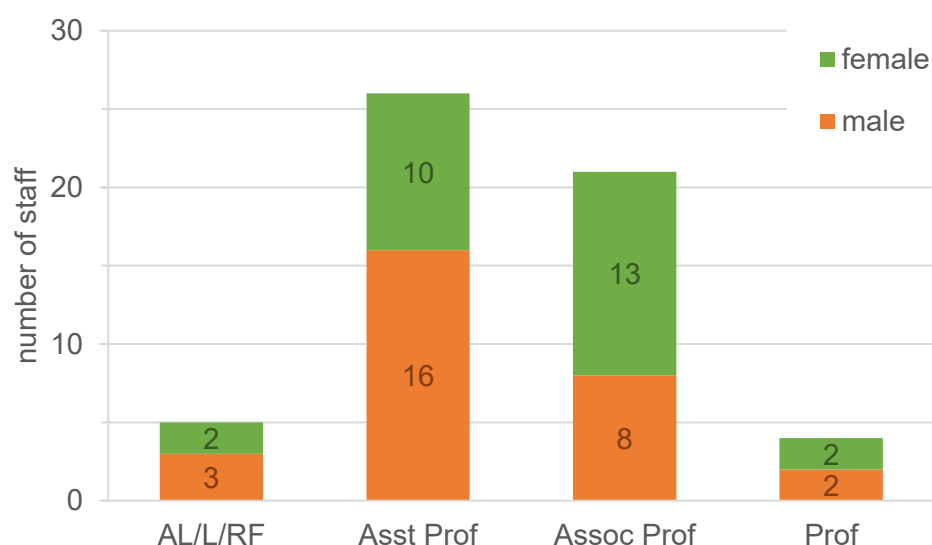
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	Agroecology and Sustainable Food Systems		
Mid-career staff funded on fellowships			
Milgroom	WILDRICE International Fellowship	2020–23	H2020, MSCA: €337k
Labrada	ECO-BROKER International Fellowship	2019–21	H2020, MSCA: €225k

The split of staff at different career stages is evidence of a sustainable research environment. Figure 2.1 shows there is a concentration of mid-career researchers who will have opportunities to progress to more senior levels during the next REF phase, which should also support an increase in the number of professors over the next five-ten years. It is anticipated the ECR pool will grow as we continue to increase the number of postdoctoral researchers employed by large grants. Our policy of establishing a core team of researchers with permanent employment contracts, supplemented by a smaller number of project-funded and fellowship staff on fixed term contracts, promotes stability and long-term thinking which will ensure the sustainability and vitality of the research environment.

Figure 2.1: Gender distribution of UoA14 REF eligible staff at each career stage

Note: AL = Assistant lecturer; L = Lecturer; RF = Research Fellow.



Source: Coventry University UoA14 data, Coventry University People Team, 31st July 2020.

2.2 Staff Development

We develop talent by creating a research culture which encourages disruptive thinking, creative dissent, reflexivity, as well as thinking and working outside established paradigms. A culture of ‘accountable autonomy’ creates conditions of relative freedom in which researchers can thrive and generate impacts. It enables self-organising dynamics, a culture of trust and a safe space for researchers to push the boundaries of existing knowledge.

Unit-level environment template (REF5b)

Regular theme meetings provide an important opportunity for staff at different career stages to develop their leadership skills and capabilities and to benefit from informal mentoring and peer group support. Themes are convened by an academic lead and co-lead(s) on a rotational basis and include opportunities to share news about current or new projects and publications, discuss mental health and wellbeing, celebrate achievements and practically support colleagues with research ideas and ‘papers in progress’. Meetings also provide a valuable opportunity for social interaction, thus helping individuals to keep connected with each other – a function which has proved especially important during the COVID-19 pandemic and the increase in remote working.

We have been building the skills and capacities of researchers by creating different opportunities for them to gain experience, for example in academic leadership and project management. Regular training opportunities are provided on research ethics, grant writing and impact. All staff have an annual Personal Development Fund ranging from £500–£1,000, which can be used for conference attendance, training, networking and relevant purchases.

Additionally, staff can access QR funding to support their development in a variety of ways (distributed via internal competitive process at CU). Collectively, staff at CAWR acquired over £300k to fund a range of activities to support skills, develop networks and pilot projects (Table 2.3).

Table 2.3: Funded staff development

QR funding scheme	Value (GBP)	Illustrative examples of contribution to staff development
<ul style="list-style-type: none"> ▪ Pump Prime funding ▪ International and Interdisciplinary Pilot Projects 	110,795	This funding has enabled staff to: 1) make links with stakeholders for the development of new collaborations; 2) conduct pilot tests. For example, funding enabled preliminary trials by Rayns and Smith to evaluate the potential of heritage bean varieties for human and beneficial insect nutrition. This contributed to the development of the <i>TRUE</i> project (led by James Hutton Institute).
<ul style="list-style-type: none"> ▪ Impact accelerator funding ▪ Networking and skills development ▪ Enterprise and engagement activities 	49,039	Dehnen-Schmutz et al. created a web-based citizen science platform (<i>Plant Alert</i>) to report potentially invasive ornamental garden plants. Since its launch in 2019, the platform, hosted by the Botanical Society of Britain and Ireland, has received 480 records; results have been used in Defra horizon scanning and risk assessments for future invasive species.
<ul style="list-style-type: none"> ▪ Research equipment and infrastructure 	151,521	Lashford received funding for the installation of a long-term monitoring system at the Heart of England Sperial Site to enable a better understanding of the role of tree-planting on reducing runoff by increasing interception and infiltration rates.
Total	311,355	

Unit-level environment template (REF5b)**2.3 Research Students**

CAWR is developing its reputation as a high-quality provider and has grown its PGR community during the current assessment period, with 54 students currently enrolled and 37 having successfully completed (Table 2.4), an average of two completions per Director of Studies.

Table 2.4: PhD completions August 2013 to July 2020

2013–14	2014–15	2015–16	2016–17	2017–18	2018–19	2019–20	Total
9	1	2	2	7	5	11	37

CU supports engagement with external partners by providing matched funding opportunities for studentships. CAWR has secured a number of these, enabling six students to start PhDs during the current REF period, supported by funding from the Welsh Government, Severn Rivers Trust, the Waste FEW-Ull project funded by the Sustainable Urbanisation Global Initiative, Lobs Charity, Ruskin Mill and Warwickshire County Council. Two members of staff are engaged in part-time PhD study with their fees paid by CAWR. Additional smaller sums have been provided in sponsorship by the Zimbabwe Institute of Permaculture, the Ghana Education Trust, the Niger Delta Development Commission and Kogi State University, Nigeria.

CAWR also supports co-tutelle arrangements with the Universities of Zimbabwe, Cantabria in Spain, Stellenbosch, South Africa, and Santa Catarina, Brazil. We are working to develop further co-tutelles with the University of Concepcion, Chile, and University of Indonesia.

CAWR runs a Doctoral Training Programme which is versatile and flexible, allowing PGRs to choose credible development activities that fit with their academic needs, skills requirements and research schedules. Activities are wide-ranging and include seminars and workshops, annual summer schools, peer-to-peer presentations and discussions, as well as various social activities to foster internal and external networking opportunities (Box 2.1). We encourage and facilitate PGR-led activities to complement this programme.

Box 2.1: PGR Events organised in CAWR and CU

- **CAWR Annual Summer School:** a week-long series of workshops, seminars and panel discussions culminating in a social/networking event. PGRs design the programme so that it reflects their needs and interests, and are assisted by staff to develop and resource it.
- **Weekly Research Seminar Series:** internal and external speakers on a wide range of topics.
- **Cross-centre Student Seminar series self-organised by PGRs:** facilitates networking and knowledge exchange across Centres.
- **Doctoral college poster symposia with a competitive element:** our students took first and second prize in 2016 and 2017 respectively.
- **Three Minute Thesis (3MT®):** CAWR's PGR **Udall** won this competition in 2016 and went on to represent CU nationally, where she placed within the top 5. In 2019 **Sidibe** was selected for the final round of this competition and in 2020 **Giambartolomei** placed third in the Three Minute thesis competition, won the People's Choice Award and received a Special Commendation in the PGR of the Year competition.
- **CU Doctoral College, Research Hootenanny:** in 2018/19 **McKenzie** won the 'Research Student of the Year' award and in 2019/20 **Emeana** was shortlisted for the same award.
- **The inaugural 'Outstanding Supervisory Team of the Year' competition:** organised by CU Doctoral College and judged by an external panel of experts, was won by CAWR supervisors **Bennett** and **Burbi** in 2019. Another supervisory team from CAWR (**Franklin, Fried**) was shortlisted in 2020.

PGRs can access all the facilities described in Section 3 plus their own dedicated working area with a mix of PCs and iMacs. The physical layout of the offices, which are largely open plan, is conducive to students having easy access to staff and contributes to the collegiate atmosphere. PGRs participate in theme meetings, seminars and general staff meetings, thereby having access to research expertise and mentoring beyond their immediate supervisory team. PGRs have opportunities to participate in projects and are encouraged to co-publish papers where appropriate. Examples include **Maclaren** et al.'s paper published in *Crop Science*, which was selected as one of the inaugural 2020 Outstanding Papers in Crop Ecology, Management and Quality.

CAWR provides the following dedicated services for its PGRs:

- **Administrative support:** includes a Postgraduate Programmes Co-ordinator and a Senior Administrative Officer providing support throughout the student lifecycle from application, induction, to graduation and alumni relations.
- **PGR Student Support Group:** includes student and staff representatives and meets bi-monthly to consider all student needs from academic support, training and development to practical and personal needs.
- **Pastoral care:** provided by two experienced academics; a monthly hour-long surgery is also held by the PGR Director, Pastoral Representatives and PGR Programmes Coordinator.
- **Student allowance:** an annual development allowance of £500 each in their first two years of study, and £750 in their final year. Further needs such as additional conference travel, specialist training or software requirements are considered on a case-by-case basis. An internal budget/hardship fund has been used to support students as needed.
- **Development activities:** offered across CU, such as academic writing workshops (at the Centre for Academic Writing) and careers advice and guidance (offered by the Talent Team). CAWR

Unit-level environment template (REF5b)

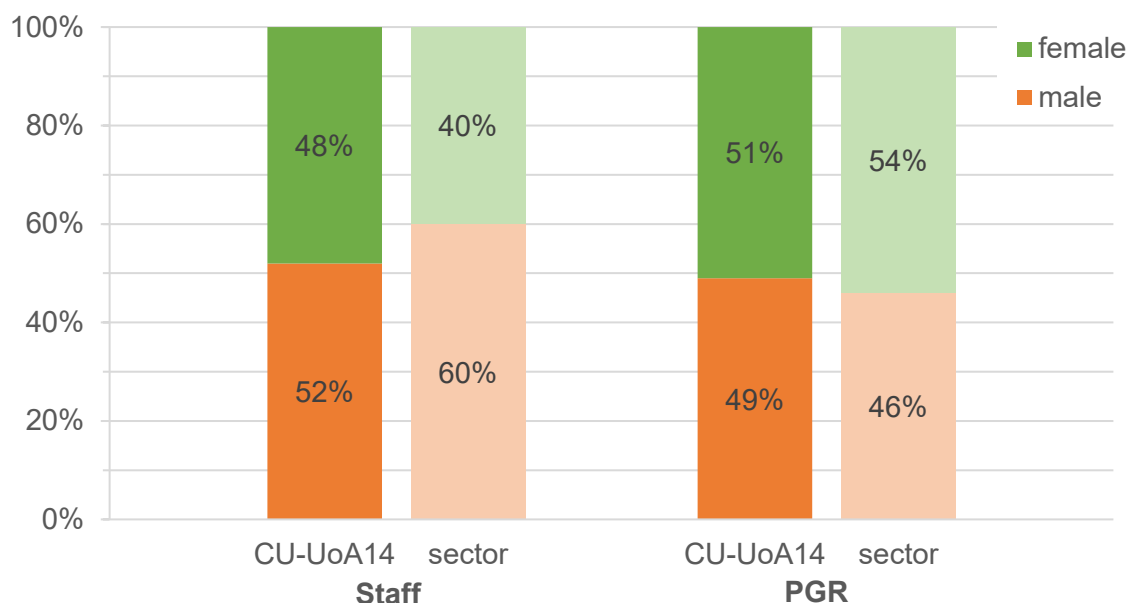
also provides opportunities for students to access teaching opportunities through our taught MSc programme.

Former students have secured employment in line with their academic interests. Five currently work at CAWR, two in permanent posts, the others in project-related positions. Four have secured teaching and academic positions elsewhere in CU; others have taken up employment at various institutions, including University College London, Rothamsted Research, NIAB East Malling, NGOs and the private sector.

2.4 Equality and Diversity

CAWR has an open and inclusive culture with a balanced mix of male and female staff and PGRs. The proportion of female staff and students is above the average for the sector (Figure 2.2).

Figure 2.2: Gender ratios for staff and research students in this submission compared with UK-wide sector (Geography and Environmental Studies)



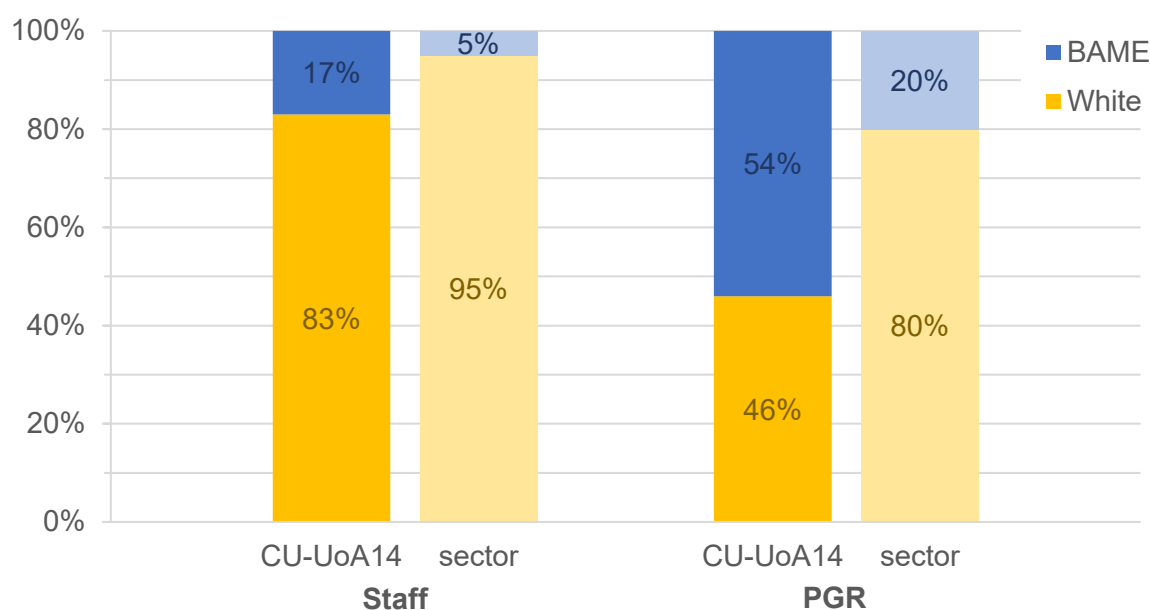
Source: Coventry University UoA14 data, Coventry University People Team, 31st July 2020, Advance HE 2018/19 data.

There has been a focus on encouraging female staff to take on leadership roles, with more females than males in senior roles, including the Senior Leadership Team of CAWR. CU policies enable flexible and remote working to support all staff with caring and/or parental responsibilities. All requests for flexible working have been approved and several staff have had the opportunity to alternate between full-time and part-time work to accommodate caring roles. Remote working is enabled through provision of laptops, tablet computers and mobile phones. Online participation in meetings has been frequent, even before Covid-19. Staff managing long-term illness have been supported to vary their working patterns as needed, and to undertake phased return to work if required. Through CU's annual progression opportunity, nine of our staff have achieved promotion during the current REF period (five female, four male).

Unit-level environment template (REF5b)

CAWR has a higher than average proportion of black and minority ethnic (BAME) staff and students (Figure 2.3). We are committed to ongoing work to continuously improve the representation and participation of scholars from BAME backgrounds, and during the reporting period, have begun an internal process to develop further practical pathways towards increasing diversity, strengthening equality and advancing decolonising practices in research and education. We have also created a new leadership role with a standing portfolio on equality, diversity and decolonising research for the period 2021–25.

Figure 2.3: Ethnic ratios for staff and research students in this UoA14 submission compared to UK-wide sector (Geography & Environmental Studies)



Source: Coventry University UoA14 data, Coventry University People Team, 31st July 2020, Advance HE 2018/19 data.

CAWR is keen to do more to encourage and enable participation from people with disabilities. Our current data (5% of staff and 2% of students) reflect similar trends to those in the sector for staff (5%) but below average for PGRs (12%) and this is an aspect in which we will seek to make improvements.

3. Income, infrastructure and facilities

3.1 Research Funding and Strategies for Generating Income

CAWR has benefitted from initial investment of around £5 million, followed by annual investment of £3.4 million (2014–20), primarily for staffing costs and overheads but also in capital expenditure at the Ryton site. All staff have annual bidding and income targets, tailored to reflect their career stage and other workload if appropriate (for example, project delivery, MSc teaching and PhD supervision). CU Research Services provides support at the pre- and post-award stages, with a dedicated Research Development Executive (RDE) responsible for signposting researchers to opportunities, providing support on bid writing and managing internal peer review processes, and a Research Delivery Support Partner who supports researchers with a range of aspects including grant agreement, financial management and reporting.

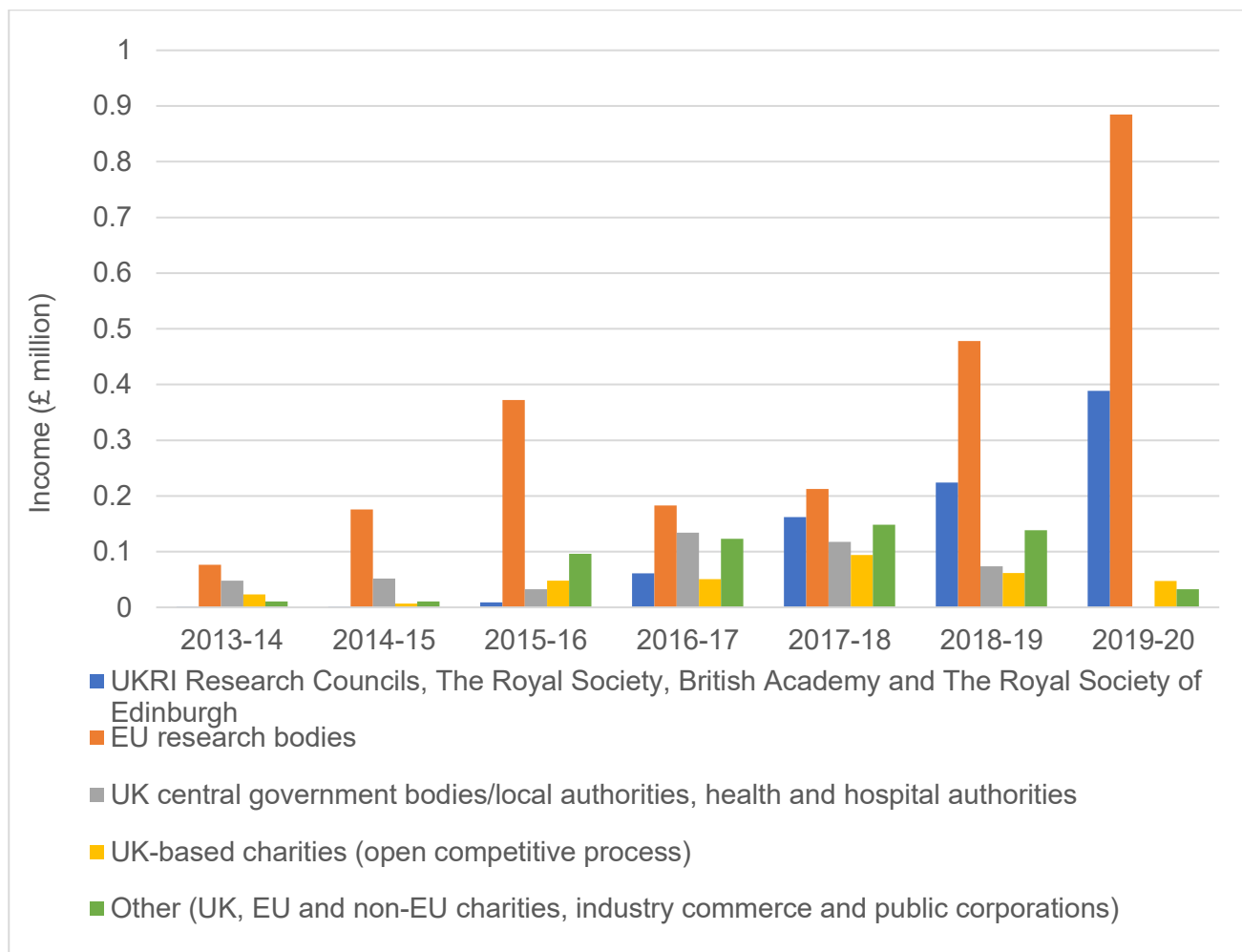
Staff have submitted 273 proposals with an overall success rate of around 34%. As a result, we have demonstrated annual growth in externally generated research income during the assessment period (Table 3.1).

Table 3.1: Externally generated research income by year (£million)

2013–14	2014–15	2015–16	2016–17	2017–18	2018–19	2019–20	Total
0.16	0.25	0.56	0.55	0.74	0.98	1.35	4.59

We have particularly focused on European Union (EU) funding sources and benefit from the support of a specialist RDE with expertise in EU programmes. Indeed, a notable highlight of our bidding strategy has been our success in winning grants from the EU (Figure 3.1). These accounted for just over 50% of research income, with 14 awards in total, eight as co-ordinator. Our success rate as beneficiary was 27.6% and as co-ordinator was 25%. For comparison, the success rate for H2020 between 2014–16 was 12.6% (source: *H2020 Key Facts and Figures 2014–16*, European Commission). The remainder of our external income consists of almost 20% from Research Councils and British Academy, around 10% from UK Central Government and the rest from UK private sector, charities and non-EU sources.

Figure 3.1: Breakdown of top five funding sources



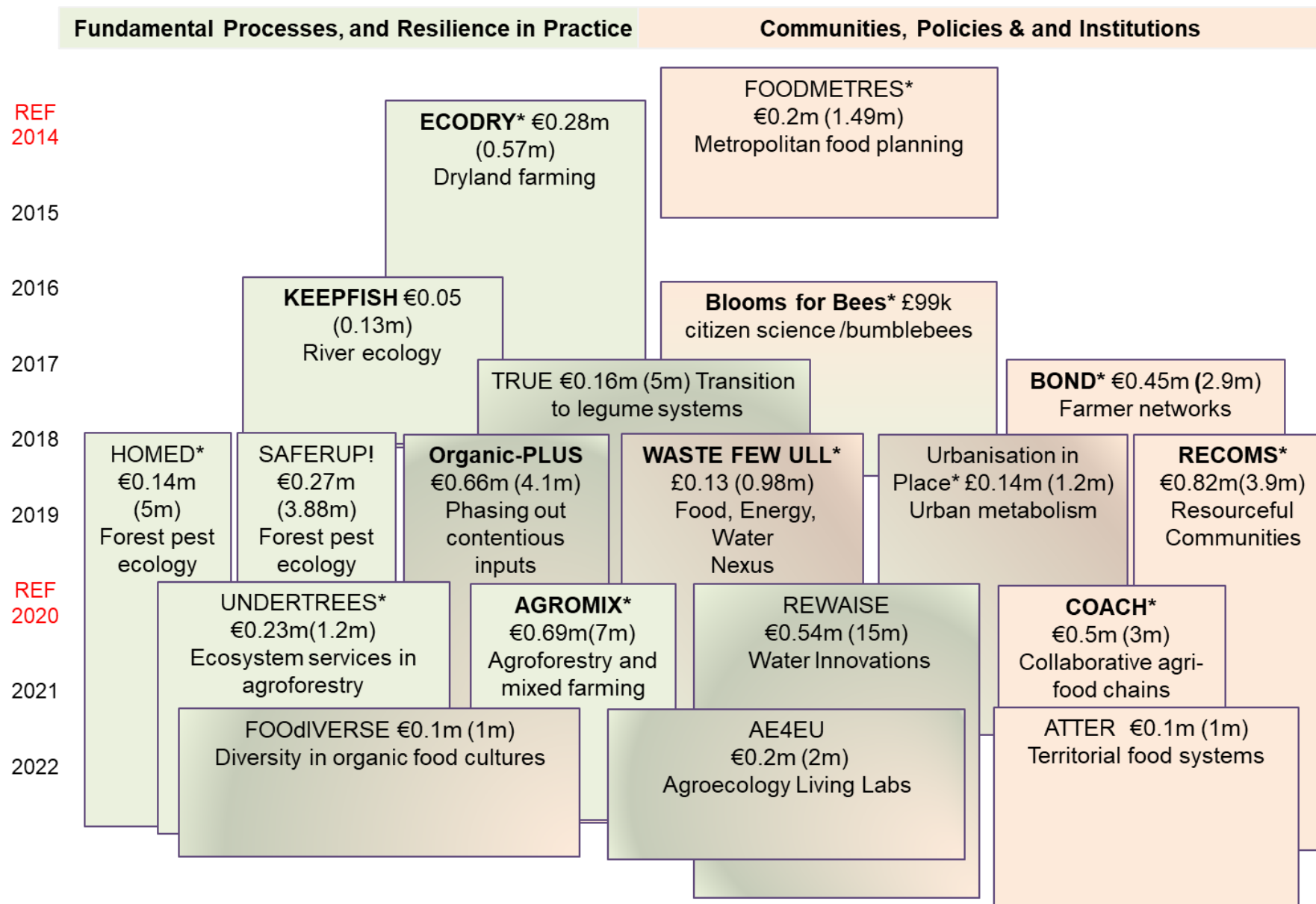
Source: Coventry University HESA research income 2013/14 – 2019/20 aligned to UoA14.

Our aim is to increase our funding per FTE by continuing to target EU sources, where we have had considerable success, but also by maintaining our wide portfolio of funding sources and seeking to improve our success rate with UK research councils.

The sustainability of our research going forward is illustrated by Figure 3.2, which illustrates our track record of successful projects and new funding already secured for 2021 and beyond.

Figure 3.2: Some of CAWR’s larger awards

Note: Projects co-ordinated by staff in CAWR are in bold; asterisk shows female PIs; figure shows value to CU (and total grant value in brackets; currency as indicated and numbers rounded). Actual income will vary according to exchange rates. Box sizes are not to scale, projects are two–four years and involve several members across the themes.



Unit-level environment template (REF5b)

External funding has supported the sustainability and vitality of the research environment as follows:

- **Funding for 12 research posts:** several project managers and professional services staff are also either fully or co-funded through external project income, which has enhanced our capacity to deliver high quality research and impact.
- **Enhancing researcher mobility:** Several mobility and knowledge exchange projects have contributed to the dynamic and lively research culture in CAWR. For example, **Wilkes** co-ordinated *KEEPPISH* (Marie Skłodowska-Curie Research and Innovation Staff Exchange, 2016–19, €126k) bringing together biologists, engineers and stakeholders from Europe and the southern hemisphere to exchange knowledge on mitigating the impact of hydropower schemes on fish migration routes (**Wilkes** et al., 2018, *Fish and Fisheries*). **Wright** co-ordinated *ECODRY* (EU IRSES FP7, 2014–17; €567k) funding international knowledge exchange on best agroecological practices in dryland and drought conditions (other examples are RECOMS and SAFERUP).
- **Outputs and impact:** Our impact case studies are primarily based on externally funded projects from a range of sources including the European Commission, industrial partners, charities and NGOs.

3.2 Organisational and Operational Infrastructure Supporting Research and Impact

Staff and PGRs benefit from a specialist operations team based at Ryton. The team handles day-to-day functions including organising and filming events, seminars, conferences and workshops; IT support; marketing and communications; alumni relations; internships; REF support; processing contracts with external suppliers; liaising with Honorary Research Fellows and visiting scholars; and induction for new staff and students. Additionally, researchers benefit from the specialist support of an International Research Engagement and Liaison Officer – a multi-lingual communications and knowledge-brokerage professional with expertise in facilitating the development of proposals involving multi-actor networks that bridge academia and civil society.

Staff have access to general facilities located on the main University Campus (labs, library) and those at Ryton (the site is serviced by a regular free minibus to enable transfer to and from the main campus twice daily). The Ryton Site includes generous multi-purpose and specialised spaces in which staff, visitors and PGRs can work, including open-plan spaces, small offices, quiet rooms, meeting rooms, a library, video-editing suite (including photography and film cameras for staff to borrow), a communal kitchen, and indoor and outdoor social spaces.

An area of significant investment is the Analytical Hub consisting of five dedicated laboratories, greenhouses and outdoor experimental spaces. Overseen by a Head Laboratory Technician, these cover Pollution Dynamics, Environmental Monitoring, Microbiology, Soil and Sample Preparation. This facilitates analysis of inorganic and organic compounds, microbiological assessment, and field and glasshouse experiments. The Hub is equipped with instrumentation capable of analysing virtually any matrix combined with advanced data analysis software (Box 3.1).

Box 3.1: Instrumentation available at the Analytical Hub

- LC-MS instrument (comprising a Thermo Scientific uHPLC Vanquish Flex + HRAMS Q-Exactive Focus)
- Automated dual on-line solid phase extraction/injection system (Thermo Equan Max Plus)
- Off-line solid phase extraction (Gilson ASPEC 271)
- Thermo Scientific GC TRACE 1310 with ECD, TCD and FID detectors
- FTIR and Raman microscopes (Thermo Scientific Nicolet iN10MX FT-IR and DXR3 Raman)
- Accelerated Solvent Extractor (Thermo ASE 350)
- Ion Chromatography (Thermo Scientific Integrion)
- Inductively Coupled Plasma-Mass Spectrometry (Agilent 8900)
- Inductively Coupled Plasma-Atomic Emission Spectroscopy (Perkin Elmer 5300 DV)
- Dumas Analyser (Skalar Primac SNC 100)
- Microwave digester (Milestone Ethos UP)
- Nikon high magnification microbiological fluorescence microscope

Investment in the high-performance Hub will enable CAWR to further its research investigating environmental degradation due to contamination with New and Emerging Pollutants. Staff have widened their research areas, attracted new PhD students and won large-scale funding grants. For example, the *Organic-PLUS* project, co-ordinated by **Schmutz**, **Evans** and **Rayns** is using the equipment to quantify the release of potential pollutants from biodegradable plastics used as mulches for weed control. The *TRUE* project includes Case Studies led by **Smith** and **Rayns**, comparing the mineral nutrient content in samples of heritage and modern varieties of broad, French and runner beans. The *SAFERUP!* Marie Curie ITN connects 15 universities in a study on the future of urban roads and pavements. **Coupe** and **Fathollahi** are testing the environmental safety of new paving materials (**Fathollahi** et al., 2020, papers in *Science of the Total Environment*, *Chemosphere* and forthcoming in *Jnl of Environmental Management*).

The state-of-the-art laboratory equipment has also helped secure three COVID-19 fully funded and GCRF funded PhD studentships starting in 2021: 1) Portable Hand-washing Facility using Bio-based Materials [...]; 2) Towards the Circular 'Plastics' Economy: Understanding the Impacts of Bio-plastics [...]; 3) Developing an innovative inkjet printing technique to fabricate a cost-effective electrode for renewable hydrogen production via ammonia electrolysis.

In addition to the analytical instrumentation two shipping containers were installed in 2018 to provide a facility for SuDS research. These provide 60 m² of floor space and have supported the work of three PhD projects: 1) Pervious Pavement Systems (CAWR fully funded studentship, 2015–19); 2) the removal of detergent characteristics from grey water using natural geo or waste materials (self-funded, 2016 to date) and 3) treating new and emerging pollutants associated with slums in developing countries using SuDS (GCRF fully funded doctoral studentship, 2020–24). Continuing research first begun as part of a £130k Knowledge Transfer between CAWR and SEL Environmental (2016–19), **Coupe** and **Trenchard** are using the containers to investigate how to grow and monitor ecologically beneficial green roofs. In addition to the shipping containers, the external space provides opportunities to design and carry out small-scale field experiments on SuDS interventions using nature-based solutions.

The Ryton site is also equipped with two glasshouses fitted with environmental control and lighting systems. These enable work on growing media (for example, the development of peat alternatives and sustainably sourced plant feeds in *Organic-PLUS*). The space is also used to carry out controlled

Unit-level environment template (REF5b)

experiments using bioremediation to treat greywater. Recycled stillages were installed in a glasshouse in 2019 under a Royal Society funded project (**Charlesworth**, £200k), where it was possible to exert experimental control using different kinds of aggregate and plants. Volumes and applications of artificial greywater were controlled and chemical analysis carried out on the effluent. Two polytunnels have been constructed to provide 250 m² of growing space, specifically to facilitate work on soil nutrient dynamics in protected cropping systems. These are supporting the work of a PhD on vegan organic crop production (CU Trailblazer studentship, 2020-23).

CAWR also has a close working relationship with Five Acres Farm, a community supported agriculture scheme based onsite. This collaboration enables us to conduct field trials under realistic commercial farming conditions, particularly regarding field vegetable production (for example, for research projects concerned with crop rotations, crop varieties, soil amendments and weed control measures).

The Ryton Site recently acquired a new high-performance computing facility with the aim of increasing its capability and potential for state-of-the-art climate modelling. The facility consists of 128 CPU cores and 83TB storage capacity. In addition, the numerical computation suite has three high-performance workstations, with 28 CPU cores and over 2,400 GPU cores each, for numerical modelling and spatial data analysis. Finally, researchers also have access to CU's central computing clusters which offer up to 3,600 CPU cores. These facilities have enabled the development of two new research clusters on climate modelling and hydro-ecological modelling.

4. Collaboration and contribution to the research base, economy and society

CAWR demonstrates effective research collaborations which enrich the research environment and enable it to engage with diverse communities, audiences and beneficiaries leading to societal impact. Its staff contribute to sustaining the disciplines of Geography and Environmental Studies, plus the many others with which we engage through our interdisciplinary and transdisciplinary research.

4.1 Research Collaborations, Networks and Partnerships

CAWR supports strategic partnerships with other institutions nationally and internationally to extend the quality, significance and reach of our research and impact. CAWR has Memoranda of Understanding (MOU) with the following universities: Andes Pluriversity (Peru), British Columbia (Canada), Catalunya (Spain), Hohenheim (Germany), Pisa (Italy), Santa Catarina (Brazil), Stellenbosch (S. Africa) and Vermont (USA). Each of these has created opportunities for new research and knowledge exchange. For example, the partnership with Stellenbosch enabled **Bennett** (funded by *ECODRY*) to work with colleagues from the Department of Animal Science. The main outcomes have been a British Academy-Newton Fund Mobility grant (*DARA*, 2015–16, £8k) enabling knowledge exchange between smallholder livestock farmers in Eastern Cape, South Africa; the *TOCASA* project (PI: **Bennett**, 2019–21), plus co-supervision of a PGR who has since won a post-doc position on the *TOCASA* project. **Bennett** and colleagues from Stellenbosch co-wrote five peer-reviewed journal papers. Additionally, CAWR's PGR **McLaren** was seconded to the Department of Agronomy at Stellenbosch for data collection. **Dehnen-Schmutz** has also successfully collaborated with colleagues from the world-leading Centre for Invasion Biology at Stellenbosch resulting in eight peer-reviewed journal papers. The MOU with Hohenheim, signed in 2015, has resulted in six peer-reviewed journal papers co-authored by staff and students from CAWR and Hohenheim, and contributed to successful H2020 grants (for example, *Organic-PLUS*, *TRUE*). **Lemke** also undertook collaborative supervision of three PhD students (two at CAWR; one at Hohenheim).

CAWR's honorary research programme also enhances the vitality of our research environment. Our 30 honorary research fellows are from France, Germany, India, Mali, Switzerland, the United States and the UK and they provide seminars, co-author publications and participate in the life of CAWR. CAWR's transdisciplinary practice is enhanced by collaboration with two 'artist research associates' in residence (Touchstones Earth). We also have an active internship programme with 20 interns hosted since June 2016 from a range of countries.

Our publications reflect our collaborative approach. We have co-authored publications with academic co-authors in 19 different UK universities, plus 22 different countries in Europe and Australasia as well as South Africa, the United States, Canada, China and India, plus government departments in Australia, France, South Africa, Germany and the UK (Source: Scopus).

4.2 Multi-Scale Engagement with Diverse Communities, Publics and Beneficiaries

As demonstrated in our impact strategy, engagement with communities, publics and beneficiaries is integral to our research approach, and takes a wide variety of forms. The Centre's media and communications strategy ensures our activities are disseminated to the general public, as well as specific constituencies through our monthly newsletter with circulation of over 1,300 subscribers, plus social media campaigns and maintenance of the CAWR YouTube library with 255 videos of our regular research seminars freely available.

Our engagement operates at multiple scales, from local to global. Locally, staff have been co-developing a shared food vision for Coventry. In 2016 they organised a workshop funded by CU, attended by 48 local stakeholders to discuss a long-term strategy for tackling food poverty. Later that year, they co-organised the Coventry Food Poverty conference, attended by 148 local representatives of food charities and the local authority, with a keynote by world authority on urban agriculture, Marielle Dubbeling. These events helped to catalyse the development of Feeding Coventry and the Coventry Food Charter (launched 2017). **Tornaghi** and **Saxena** are Trustees of Feeding Coventry, contributing their expertise to the strategic direction taken by the network and the operational processes. **Saxena** and **Tornaghi's** British Academy (£9k, 2018) funded research into social supermarkets developed the first systematic analysis of the different models of social supermarkets evolving in the British foodscape. They shared this knowledge locally, helping to shape plans for Coventry's own social supermarket, which was designed to overcome limitations identified in the research and move towards a more progressive model of enabling communities to build food resilience, by accessing healthy, sustainable and culturally appropriate food.

Nationally, staff are active in many networks supporting knowledge exchange and innovation in agroecological practices. These include **Innovative Farmers**, a not-for-profit membership network for farmers and growers running on-farm trials or 'field labs'. We have been involved with two field labs concerned with the use of biochar in cattle feed and alternatives to plastic mulches in horticulture. Staff are also regular contributors to **Organic Growers Alliance**, a membership organisation for professional growers. Activities include writing articles for their magazine and conducting on-farm trials. Since 1985 there has been a long-standing relationship between CU and **Garden Organic**, an organisation of approximately 20,000 members that promotes sustainable horticulture and food production. CAWR has worked closely with them on a number of projects such as a retrospective review of their 'Members' Experiments' citizen science programme. CAWR is also a member of SUSTAIN, an alliance of organisations and communities working together for better systems of food, farming and fishing. We have partnered with them on several projects, for example *FOODMETRES*, *Organic-PLUS*, *AE4EU*.

Internationally, staff are active in several influential networks and organisations. A high impact example is **Pimbert's** membership of the steering committee of the High-Level Panel of Experts (HLPE) of the United Nations Committee on World Food Security (CFS) (2013–17). **Pimbert** was co-author of five internationally peer-reviewed policy reports (*Sustainable Fisheries and Aquaculture for Food Security and Nutrition* (2014); *Food Losses and Waste in the Context of Sustainable Food Systems* (2014); *Water for Food Security and Nutrition* (2015); *Sustainable Forestry for Food Security and Nutrition* (2017); and *Nutrition and Food Systems* (2017) all published by the Committee on World Food Security, UN Food and Agriculture Organisation). His participation has allowed CAWR to directly use its research to influence global policy making and norm-setting for food and agriculture. CAWR continues to have a privileged relationship with government members of the UN Food and Agriculture Organisation and the CFS.

We excel at collaborative projects which draw together multi-actor networks to deliver impacts. Three examples illustrate this. First, **Hilmi**, developed a pilot project to test a new self-managed credit system for small-scale farmers (funded from CU Innovation Fund, £10k, 2015; More and Better Network, £18k, 2015-17). Working closely with Mozambique's National Farmer Organisation and the Alfredo Namitete Farmer Association, **Hilmi** trialled the new system, which led to increased local autonomy and improvements in agricultural output, biodiversity, nutrition and farmers' incomes.

Unit-level environment template (REF5b)

Money was reinvested into local infrastructure such as a borehole for drinking water and irrigation and communal gardens (*Sustainability*, 2019). As a result of this success, the scheme was extended to 17 other farmer associations, and in 2020 work began to roll it out nationally. This pioneering credit model was awarded for Outstanding Practice in Agroecology by the World Future Council, and subsequently adopted by international funding bodies including the Norwegian Society for Development and SIDI (French Social Investor). In 2020 the model was introduced to Brazil, Mexico and Costa Rica.

Second, **Charlesworth** et al. have demonstrated how multi-stakeholder collaboration and co-design with communities can be used to implement SuDS in refugee camps, to provide management of surface and greywater in addition to WASH. Funded by the Humanitarian Innovation Fund (£150k 2016-19), **Charlesworth** et al. (*Jnl of Refugee Studies*, 2019; *New Water Policy and Practice Jnl*, 2018) introduced the concept of SuDS to the NGOs responsible for the construction and management of camps in the Kurdistan Region of Iraq. This influenced a change in their normal practice of hard infrastructure (pipes, drainage ditches, V-shaped concrete channels) to consider the use of soft interventions (ponds, swales, trickle trenches). The CU team co-designed and built a SuDS demonstration site with the community at Gawilan refugee camp, KRI, believed to be the first of its kind.

A third example illustrates how we mobilise collaborations to ignite new debates and research questions. **Moeller** and **Pimbert**'s (*Sustainability*, 2018) paper demonstrated that less than 0.5% of total UK Aid funding was directed towards agroecology 2010–17. This research attracted attention from NGOs and government agencies and the methodology was replicated/adapted in Switzerland, Germany, France, Belgium, Denmark and the Netherlands. **Moeller** was then commissioned by the EU and International Cooperation for Development and Solidarity (£11k, 2019) to analyse the extent to which funding has been directed to agroecology via EU development assistance through the UN's Rome-based agencies and via the Green Climate Fund (GCF). The findings informed policy makers at the European Commission's Directorate-General for International Cooperation and Development and were used to improve the GCF Agriculture and Food Security sectoral guide, developing strategic priorities for GCF funding.

Individuals also engage with diverse audiences to promote agendas around sustainability, health, equity and social justice through their public roles. Examples include:

- **Brown**: Academic Expert on Birmingham and Lewisham Health Inequalities Review Academic Boards.
- **Dehnen-Schmutz**: member of the European Food Safety Authority Plant Health Panel (2015–21, two terms of three years), selection by competitive international call. Lead author in the IPBES invasive species assessment 2019–23 (competitive international call with nominations for final selection by national governments). Member of the working group on Invasive Alien Species (DG Environment, EU Commission and the working group on Developing an Invasive Non-Native Species Pathway Action Plan for Horticulture in the UK (Defra, by invitation, 2021–23).
- **Lennartsson-Turner**: member of the Pool of the Expert Group for Technical Advice on Organic Production, EU Commission 2010–15 and the Soil Association Certification Scrutiny Committee 2003–13; currently a member of the Benchmarking Committee of the Responsible Sourcing of Growing Media Initiative, the Health & Horticulture Forum, a sub-group of the Defra Horticulture Round Table Group and Green Care Coalition Management Group.
- **Pimbert**: Chair of the Board of Trustees of the Forest Peoples Program, UK.

Unit-level environment template (REF5b)

- **Singh:** Trustee for Race on the Agenda, a national NGO tackling racism and promoting equality, and the Anne Matthews Trust, an NGO providing residential centre and support for young asylum seekers.
- **Wright:** member of the Advisory, Research and Training Committee of the Biodynamic Federation and Chair of the Council of the Biodynamic Agriculture Association UK; member of the Permaculture Association Research Advisory Board, 2014–16; Council member of Writtle Agricultural College, 2013–16.

4.3 Contributions to the Sustainability of Geography, Environmental Studies, and Interdisciplinary and Transdisciplinary Research

Our staff review papers for over 100 journals including the major Q1 Geography and Environment journals (such as *Antipode*; *Geoforum*; *Gender, Place and Culture*; *Journal of Cleaner Production*; *Journal of Environmental Management*; *Ecology Letters*; *Nature Ecology and Evolution*; *Journal of Hydrology*; *Journal of Rural Studies*; *Earth Surface Processes and Landforms*; *Progress in Human/Physical Geography*; *Geomorphology*; *Transactions of the Institute of British Geographers*; *Urban Geography*; *Science of the Total Environment*), through to more specialised journals such as *Agroecology and Sustainable Food Systems* and the *Journal of Agriculture, Food Systems and Community Development*. The latter is the world's only peer-reviewed transdisciplinary journal focused solely on food and farming-related community development and also the world's first community-supported journal. This reflects our impact strategy and commitment to communicate with diverse audiences.

Staff serve on the editorial boards of a wide range of journals (Box 4.1). **Lennartsson-Turner** is Editor-in-Chief of *Biological Agriculture and Horticulture*. First established in 1982, it is the longest established international journal dedicated to organic farming and food systems. The Impact Factor (JCR, Citation Reports®) of BAH has increased steadily from 0.765 in 2015 to 1.674 in 2019 (most recent data) and it is now (2019 data) ranked 14/36 in Horticulture and 42/89 in Agronomy.

Box 4.1: Journal Editorial Boards/Advisory Boards (editors, associate editors)

Acta Horticulturae; *The International Society for Horticultural Science*; *Action Research*; *African Journal of Range and Forage Science*; *ARCPLAN*; *Biological Agriculture & Horticulture*; *British Journal of Social Psychology*; *Earth*; *Frontiers in Plant Sciences*; *Frontiers in Sustainable Food Systems*; *Frontiers in Sustainable Cities*; *International Journal of Cuban Studies*; *Journal of Agriculture, Food Systems and Community Development (USA)*; *Journal of Agroecology and Sustainable Food Systems*; *Journal of Environmental Research and Public Health*; *Journal of Insect Conservation*; *Journal of Plant Diseases and Protection*; *Journal of Political Ecology*; *Rethinking Ecology*; *Sociologia Ruralis*; *Sociological Research Online*; *Sustainability*.

Staff have also (co)guest edited a number of special issues in *Journal of Agroecology and Sustainable Food Systems*; *Agriculture and Human Values*; *Journal of Agriculture, Food Systems and Community Development*; *Sustainability*; *Environmental Science and Pollution Research*; *International Journal of Environmental Research and Public Health*; *Water*; *Internet Archaeology*.

Staff have reviewed book proposals and manuscripts for Routledge, Earthscan, Bloomsbury, Pluto Press, University of California Press, CABI, CRC Press (Agroecology series).

Unit-level environment template (REF5b)

Staff are members and fellows of numerous professional bodies that contribute to the sustainability of their various sub-disciplines within Geography and Environmental Studies. The following list is illustrative:

- British Ecological Society peer review college (**Farrell, Bennett**); **Smith** leads the Agricultural Ecology Special Interest Group
- Natural Environment Research Council (NERC) Peer Review College (**Charlesworth, Van De Wiel**)
- The African Lion Working Group (international), British Psychological Association, International Union for the Conservation of Nature (specialist group: Conservation Planning) (**Abell**)
- Royal Geographical Society, including Participatory Geography Research Group committee (**Denning**), Food Geographies Research Group committee (**Saxena, Kneafsey**)
- Higher Education Academy (**Farrell, Brown, Blackett, Dehnen-Schmutz**)
- Society of Antiquaries of London and Scotland (**Farrell**)
- Society for Environmental Geochemistry and Health (**Charlesworth**)
- Associate Fellow of the Royal Meteorological Society (**Eden**)
- British Hydrological Society (**Eden**)
- European Geosciences Union (**Eden, Dieppois, Van De Wiel** – also Science Officer)
- American Geophysical Union (**Eden, Dieppois**)
- Vice-Chair (Research) of the British Society for Geomorphology (**Van De Wiel**)
- European Representative on the Continuing Committee of International Rangelands Congress; Member of European Steering Group for UN International Year of Rangelands and Pastoralists 2026 (**Bennett**)
- International Society for Horticultural Science, Commission on Agroecology and Organic Farming Systems (**Schmutz**)

As well as convening numerous international conference sessions and providing keynotes, we have also hosted the following international conferences:

AESOP Sustainable Food Planning Group Annual Conference 2017 ‘Re-imagining sustainable food planning, building resourcefulness: food movements, insurgent planning and heterodox economics’: **Tornaghi** convened the conference, as Chair of the sub-group (2016, ongoing). The conference held in Coventry aimed to introduce the sustainable food planning community to the themes of agroecology and food commoning. About 145 people attended; 30% of the participants were planners, with the rest from public health, environmental science, political science, geography and agronomy. About 20% of participants were non-academics and 15% were resident outside Europe. A peer-reviewed book is forthcoming (Tornaghi, C. and Dehaene, M. (eds) (2021) *Resourcing an Agroecological Urbanism: Political, Transformational and Territorial Dimensions*, Routledge Studies in Food, Society and the Environment).

SuDSnet International conference 2018: Co-ordinated by **Charlesworth** and **Lashford** this two-day event was held at CU and attracted academics, practitioners and stakeholders from Australia, the United States, Italy, Spain, Denmark, Norway as well as the UK. It included a special session on integrating SuDS into challenging environments such as refugee camps. **Charlesworth** is the joint co-ordinator of SuDSnet, an international network for researchers and practitioners with over 1,000 members.

Unit-level environment template (REF5b)

Staff have evaluated PhD, grant proposals and competitions for UK national funding bodies including Arts and Humanities Research Council, Biotechnology and Biological Sciences Research Council, British Council, Engineering and Physical Sciences Council, Economic and Social Research Council, Medical Research Council, Natural Environment Research Council, Royal Society, Strategic Priorities Fund, UK Climate Resilience (UKRI), and international funders including:

- Belgium: Science Policy Office, National Fund for Scientific Research, Research Foundation Flanders
- Denmark: State Organic Research Programme (ICROFS)
- European Union: European Research Area Networks (ERA-NET) Cofund, H2020 (various calls), Marie Skłodowska Curie Individual Fellowship
- Germany: Biotechnology and Biological Sciences Research Council, German Research Foundation, Federal Office of Agriculture and Food (Bundesamt für Land und Ernährung (BLE)
- Global: LUSH Spring Prize for social and environmental regeneration
- Ireland: Research Council
- Netherlands: Organisation for Scientific Research
- Mozambique: SIDI Social and Environmental Investor – Grants Africa
- South Africa: National Research Foundation
- Sweden: Research Council for Sustainable Development
- USA: Agroecology Fund, National Science Foundation, National Aeronautics and Space Administration (NASA) Earth Surface and Interior Peer Review Panel

Prizes:

Chappell: 2018 Gerald L. Young Book Award of the Society for Human Ecology ('exemplifying the highest standards of scholarly work in the field of human ecology') for *Beginning to End Hunger*.

Dieppois: 2016 Stanley Jackson Award (greatest contribution of the year in atmospheric and ocean sciences in southern Africa) for 'Interannual to interdecadal variability of winter and summer southern African rainfall, and their teleconnections', *Jnl GPR-Atmosphere*.

Farrell: 2018 Don Brothwell prize for best paper published in the journal *Environmental Archaeology*, for Bunting, M.J. and Farrell, M. 'Seeing the wood for the trees: recent advances in the reconstruction of woodland in archaeological landscapes using pollen data', *Environmental Archaeology*.