Sustainable Places Research Institute

Sustainability Science and Sustainable Place-making in Hard Times: engaging research and practice

Terry Marsden

Director of the

Sustainable Places Research Institute

Cardiff University

1. The nature of sustainability science

2. Understanding space as a constituent of economies, ecologies and communities

3. Sustainability planning incorporating new spatial imagination

4. Some framings : the city region; new urban-rural relationships

5. Some applications

6. The Institute and its research programmes

Welsh Assembly Government's vision of a sustainable Wales

Enhancing the long-term wellbeing of people and communities is central to our approach to sustainable development. To promote this we are committed to a sustainable future for Wales where we:

- **live within our environmental limits**, using only our fair share of the earth's resources, for example by radically reducing our use of carbon-based energy and greenhouse gas emissions, moving towards becoming a zero-waste nation;
- **support healthy, biologically diverse and productive ecosystems**, by actively recognising and supporting our environmental assets including land, water and biodiversity;
- **build a resilient and sustainable economy**, including by fostering local economies and suppliers, supporting innovation, achieving the transition to a low carbon, low waste economy, and ensuring that Wales is the best location for business to locate, start up, grow and prosper;
- **enjoy communities which are safe, sustainable, and attractive**, where people enjoy good health, by having a much stronger connection with our local environment, economies and each other;
- **are a fair, just and bilingual nation** in which citizens determine their own lives, shape their communities and achieve their full potential, by ensuring equality for all is a core value to all our work.

Sustainability science as:

1.Covering a range of spatial scales between diverse phenomena: flows of water, energy, foods and people; and fixities of built form, infrastructure

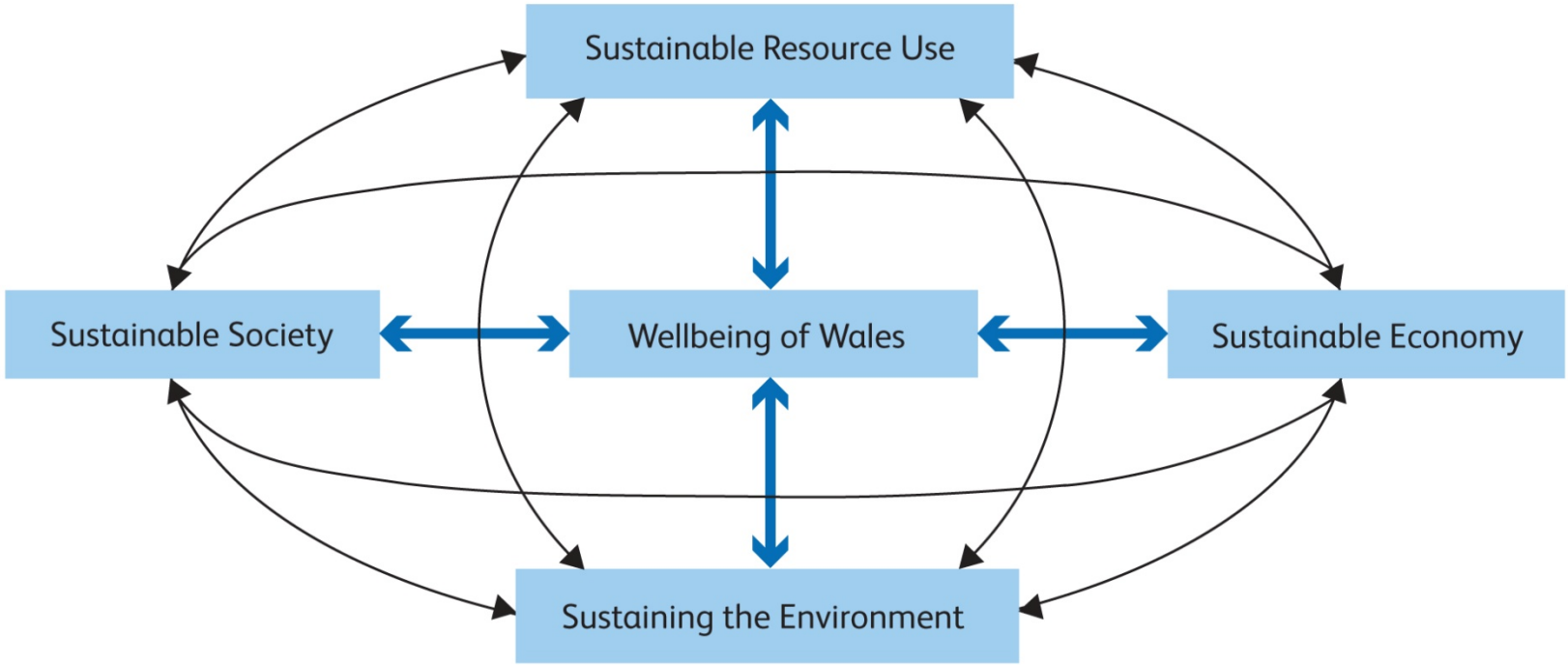
2.Accounting for temporal inertia and the urgency of adaptations

3.Dealing with functional (and dysfunctional) complexity resulting from multiple stresses

4.Combining scientific, expertise and public knowledges so as to make sustainable adaptations

5.Overcome ‘ the problem-solving rifts posed by the current system of academic specialisation’ (Ness et al, 2010)

Figure 1: Relationship between the chapters in the Sustainable Development Scheme

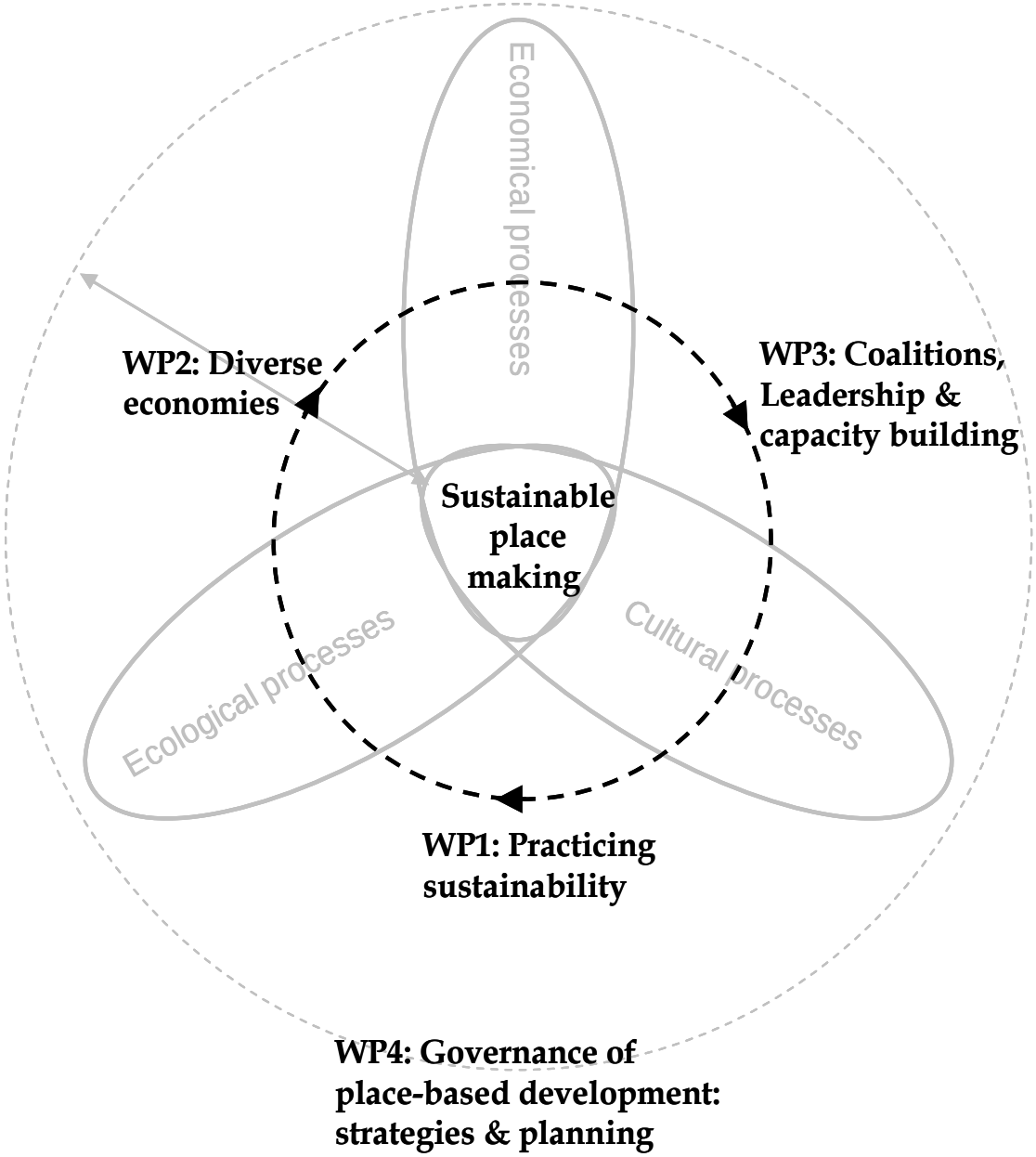


The Table opposite explains this structure showing that part of the vision of a sustainable Wales is relevant to each chapter, the main associated outcomes, and the headline and relevant supporting indicators of SD.

1. Wales developing as a sustainable European Region over the next decade

2. An emerging set of ecological economies (e.g as part of ‘Economic Renewal: a new direction’ July 2010)

3. New synergies between these economies, ecologies and communities


Economical processes
WP2: Diverse economies
WP3: Coalitions, Leadership & capacity building
Sustainable place making
Ecological processes
Cultural processes
WP1: Practicing sustainability
WP4: Governance of place-based development: strategies & planning

The ecological economy as:

‘the effective management and reproduction of resources (as combinations of natural, social, economic and territorial capital) in ways designed to mesh with and enhance the local and regional eco-system rather than disrupting and destroying it’

‘The eco-economy thus consists of cumulative and nested webs of viable businesses and economic activities that utilise the different types of environmental resources in urban and rural areas in sustainable ways. This does not lead to the net depletion of resources, but rather an increase in economic, ecological and community resources’.

Major challenges

1. Reducing ‘footprints’ and vulnerabilities; ‘meeting our targets’

2. Developing new business models with lower levels of public sector support

3. Convincing communities to embrace sustainability in hard times

How can we meet these challenges?

1. Reorganising ‘flows’ : energy, waste, food, commuters and tourists

2. Activating new supply chains in eco-goods and services

3. Creative and adaptive ‘place-making’

Cardiff University's

Sustainable Places Research Institute

- **Vision**
- **Science**
- **Approach**

Sustainable Places Research Institute

1. Create a more integrated, interdisciplinary and open-source platform for conducting and sharing sustainability science

2. Engage with policy development and ‘sustainable place-makers’

3. Help to bring about adaptive change in Wales to these challenges

4. Engaging and activating the community

1. Vision (for 2020)

- CU as a recognised and leading international location for the emerging field of "**sustainability science**" (SS)

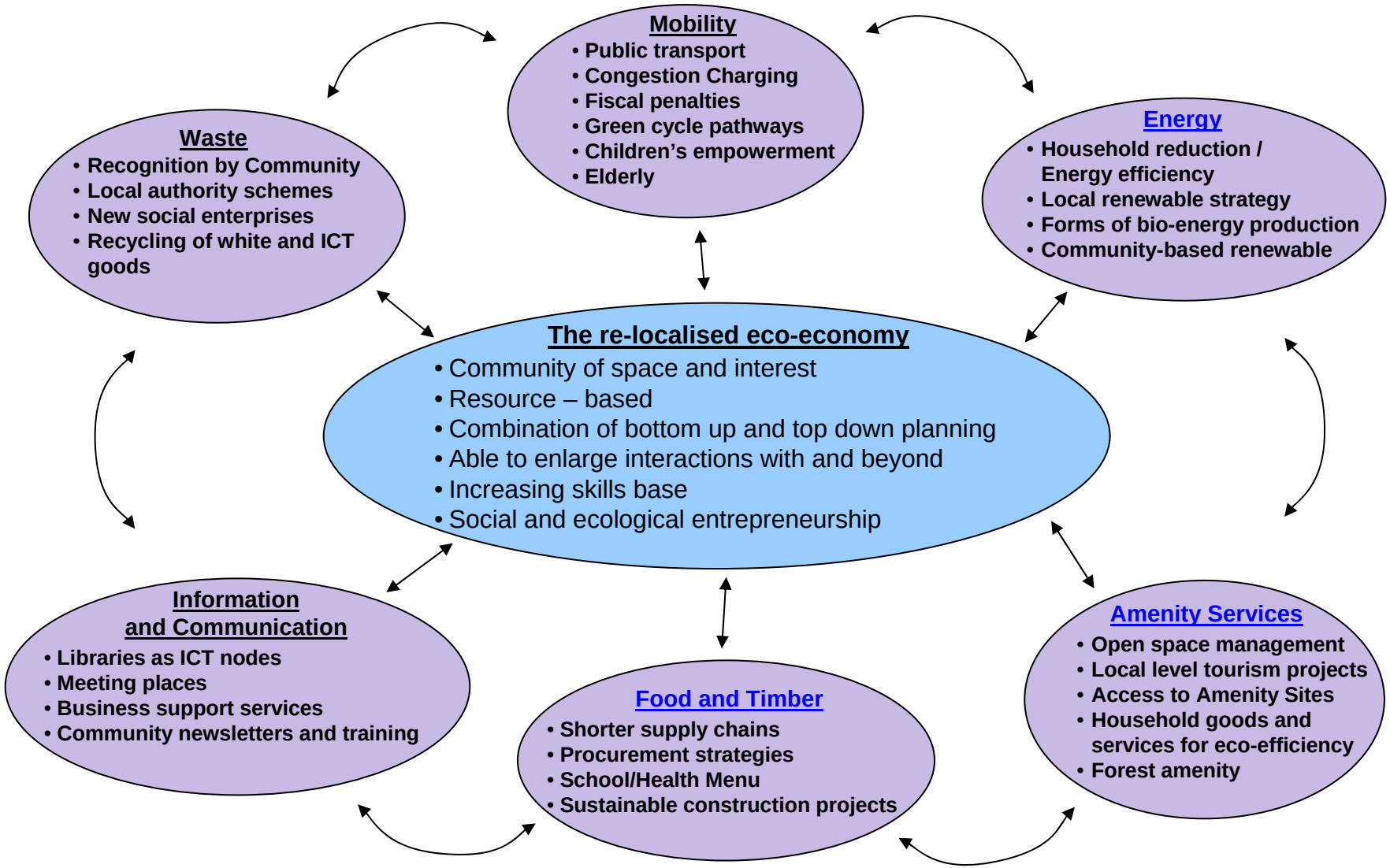
- CU as a place for the unique and distinctive development of place-based approaches to adaptive change

2. Science

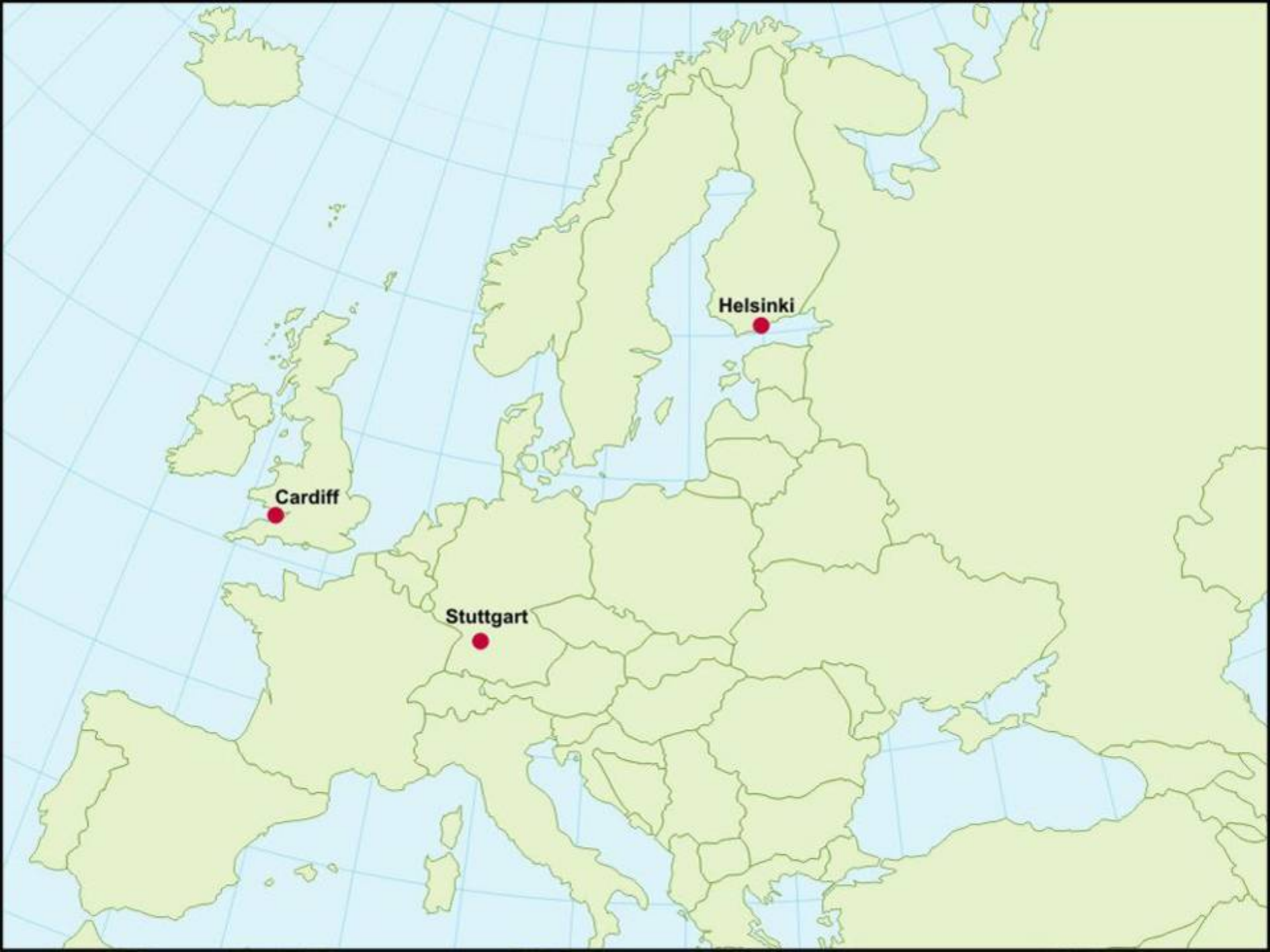
- The ‘how’ and ‘if’ questions: from placeless to place-based solutions
- A unique approach to understanding moves towards more sustainable adaptations and transitions
- Comparative City-regions and the development of a new interdisciplinary planning paradigm

- Resilient city-regions? The role of the emerging bio-economy and eco-economy
- Reconnected communities? Integrating physical and social sustainability
- Harnessing natural and social capital
- What do sustainable communities look like and how do we get there?

Sustainable Production and Consumption Spheres



Building Blocks for a Sustainable Eco-economy


Helsinki
Cardiff
Stuttgart

3. Approach

- Comparative city region research hub
- Six research programmes
- Doctoral/masters school
- Visiting external scholars and internal secondments
- International advisory board

Industry Logistics & Supply Chains

Sustainable Transport & Mobility

Energy Systems & Technologies

SD Policy & Governance

Present Situation:

A Range of Strengths in Key SD Issues

Urbanisation & Migration Trends

Healthy & Resilient Communities

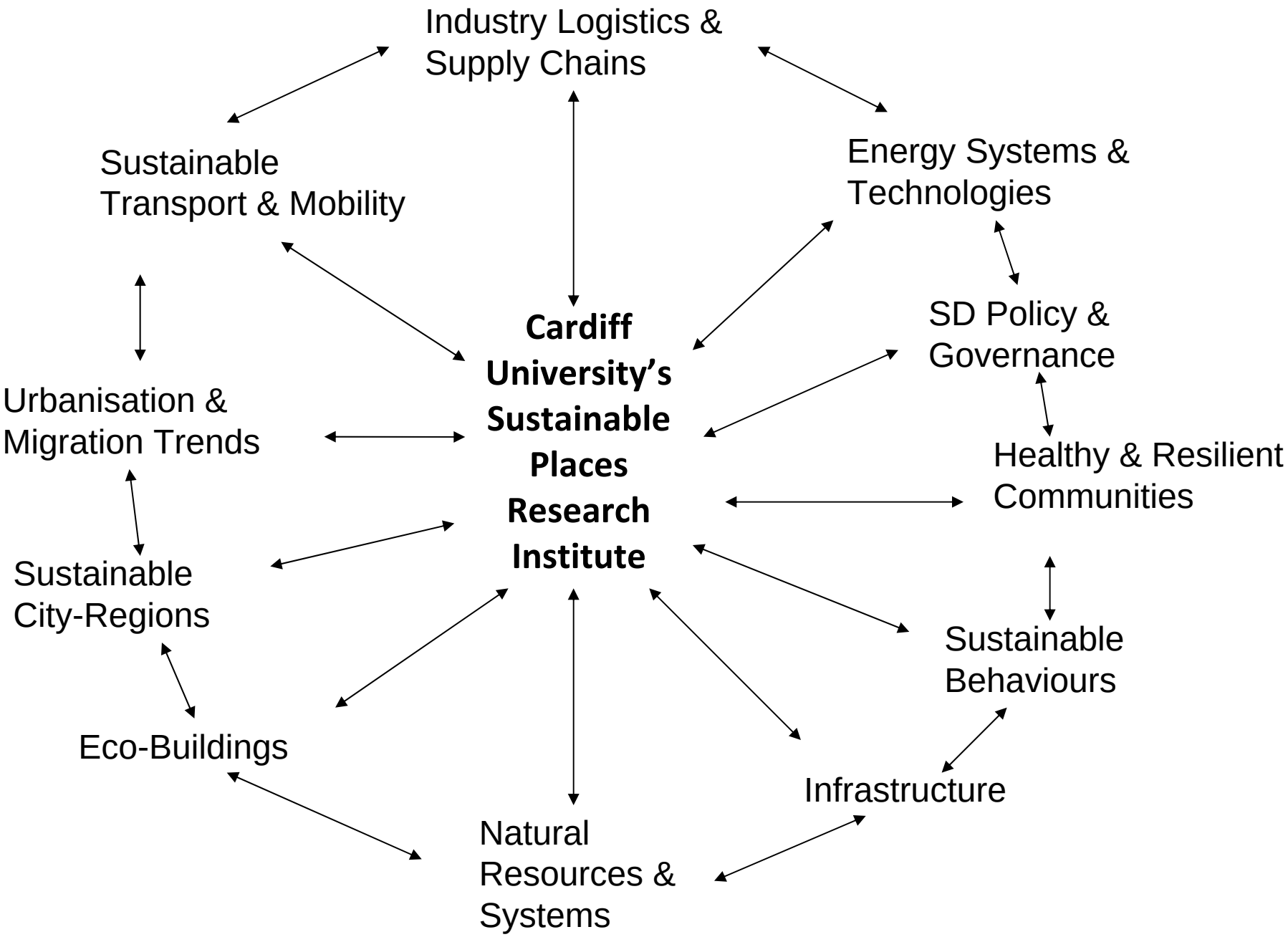
Sustainable City-Regions

Sustainable Behaviours

Eco-Buildings

Infrastructure

Natural Resources & Systems


Industry Logistics & Supply Chains
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Cardiff University's Sustainable Places Research Institute
SD Policy & Governance
Healthy & Resilient Communities
Sustainable City-Regions
Sustainable Behaviours
Eco-Buildings
Infrastructure
Natural Resources & Systems

Research programmes

- Transitions and adaptations in city regions
- Security, risk and resilient places
- Resilience and adaptation in coupled physical, ecological and social systems
- Health and connected communities
- Adaptive governance for social and ecological transitions
- Adaptations around mobilities, flows and migration

Selected city region contexts

- China-eco-city adaptations (Tianjin, Anji)
- Helsinki
- Cardiff and the Seven Estuary
- Stuttgart
- Toronto
- Porto Alegre
- Cairo

WP1 - Transitions and adaptations in selected city-rural regions

The purpose of this research programme is to explore, theoretically and through evidence-based practice, the meaning and parameters of sustainable place-making in a city-rural regional context.

In particular our interest here is with the various spatial scales at which the term sustainability is being used, how sustainable place-making it is being realised through a range of different projects and initiatives, and by whom. Key sectors through which the concepts of sustainability and sustainable place-making will be explored include: energy, transport, food, housing and waste.

Our starting point is with a review the literature (academic and policy) on sustainable regions, eco-cities, transition towns, sustainable communities, co-housing, green buildings (etc). We identify core social, ecological, political and economic dimensions of sustainable place-making and consider how they are currently being brought together in place.

Research questions will include:

- What are the main drivers or triggers which lead to action for creating sustainable places?
- What is the role of community in sustainable place-making?
- How is evidence of sustainable place-making currently being measured and recorded, at what scale, and for what purpose? What factors need to be taken into account when recording and measuring progress towards sustainable place-making?
- How are good practice models transferred and shared between different locations?
- What opportunities and/ or barriers exist for 'scaling-up' and 'scaling-down' practices of sustainable place making, in the pursuit of adaptive transitions?

Dr Alex Franklin

WP2 - Security, risk and resilient places

Key research themes:

1) Developing a conceptual framework for precautionary risk governance

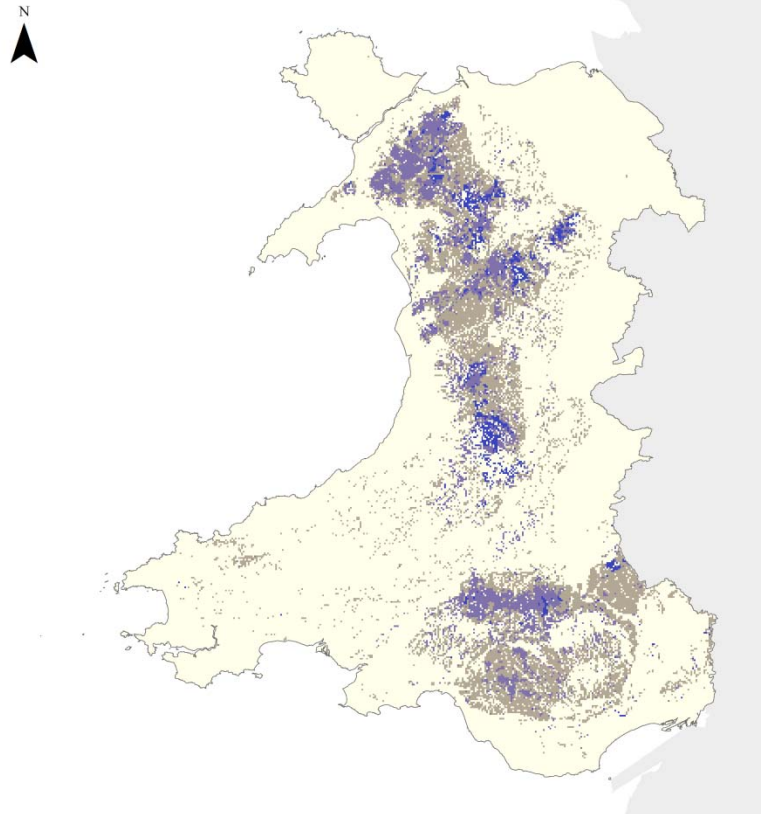
- Conventional risk governance relies on excessively complex, opaque, data-hungry and time-consuming analytical methods.
- Yet frameworks of the alternative approach - precautionary governance - tend to be abstract, self-contradictory, and value-laden.
- Our approach focuses on developing simple, frugal rules (heuristics) for evaluating, weighting, and synthesising information in risk evaluation.
- The idea is to allow for more transparent, rapid, flexible, and inclusive governance, whilst maintaining analytical rigour and consistency.

2) Exploring how to foster a sense of local responsibility for global crises

- Policy-makers are (belatedly) realising that encouraging lifestyle changes – rather than focussing solely on economic or technological fixes – is crucial in tackling climate change.
- Yet the problem is that despite widespread public concern about the issue, there is little enthusiasm for behavioural change at grassroots levels.
- Due to a widespread perception that the responsibility for climate change lies with abstract systems (consumerism, industrialisation, capitalism, etc.), rather than individuals and communities.
- How to foster a recognition that individuals actively participate within these systems, and can therefore shape or even change their nature (and thus encourage behavioural change)?

Where are ecosystem services delivered, who benefits

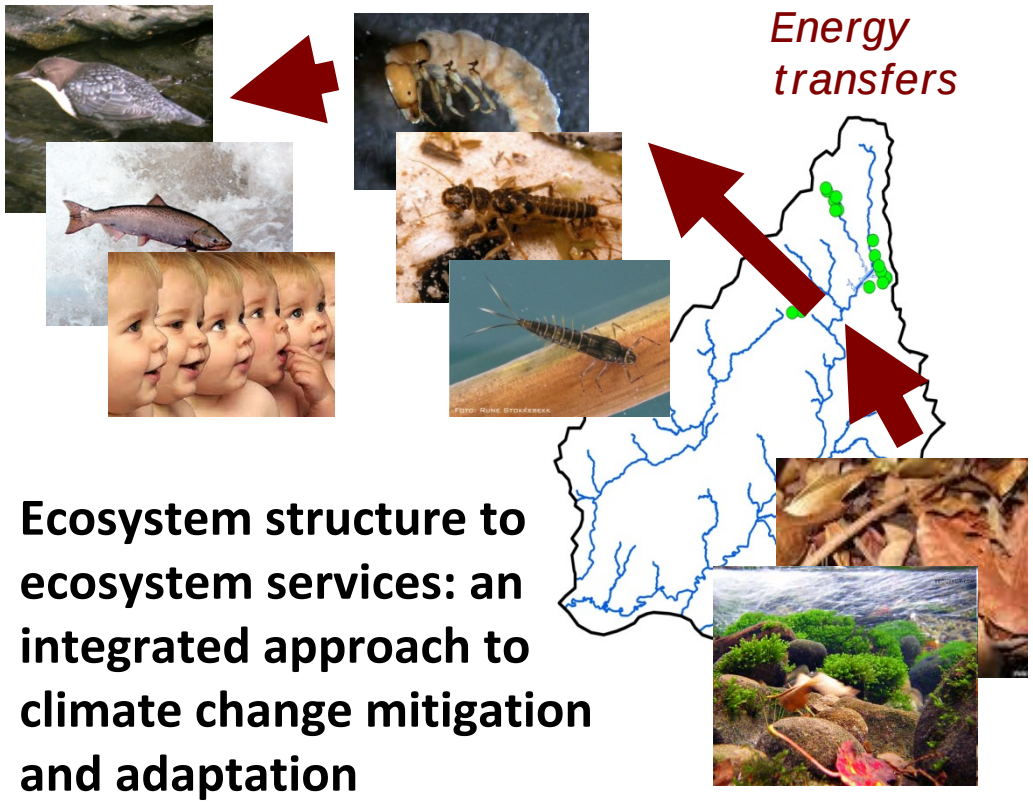
UK National Ecosystem Assessment



Regulating soil erosion: service delivered by vegetation in areas at risk

Derived using NATMAP-NSRI 2004, Baseline UKCIP09-Met Office 2009, 50mDEM-Crown 2009, Landmap-CCW2004.

WP3: Adaptation through resilience in natural-social systems: a functional approach



Ecosystem structure to ecosystem services: an integrated approach to climate change mitigation and adaptation

Llyn Brianne project, upland Wales

Dr Isabelle Durance

WP4 - Health and connected communities

Key research themes:

- Exploring the links / evidence connecting the built environment, community, health and well-being, to promote healthy behaviour
- The challenge of building age-friendly urban environments
- New approaches to healthy place-making and low-carbon living through new technology tools for healthy planning and decision support

Ongoing relevant research:

The correlation between physical and mental health in elderly people and urban greenery in Caerphilly

Places where this work is occurring:

- Caerphilly
- Cardiff

Dr Yi Gong

WP5 - Adaptive governance for social and ecological transitions

The main research questions being addressed:

What is sustainability governance? And how to conceptualise it in a place-based perspective?
What are the immediate challenges for governing social-ecological systems? How best to address these challenges in terms of policy and planning? How these have been addressed so far in flexible-adaptive and reflexive approaches and practices in sustainability science? How best to apply these practices and approaches to governance for sustainable places?

Some ongoing work relevant to these questions:

To answer the primary research questions, explorations are underway for good governance practices from around the world and close to home, with an aim to apply adaptive governance for sustainable communities.

Places where this work is occurring:

Cardiff as a city-region, also in the Welsh governance context
Stuttgart and **Xiamen**, especially for being Cardiff's twin-cities
also, **Helsinki**, **Toronto**, **Porto Alegre**

Dr Abid Mehmood

WP6 - Adaptations around Mobilities, Flows and Migration

- Developing a research agenda to understand the implications of the dynamic flows that occur within and between places or ecosystems
- We will identify research themes linked by the concept of socioeconomic and environmental flows across and between ecosystems to understand the implications, for the creation of more sustainable places, of the dynamic flows that occur within and between those places/ecosystems
- Sustainability impacts related to 'place' largely determined by flows within and between places (people, money, energy, water, soil, species, natural resources, produce, manufactured goods, waste, vehicles)
- Developing a research agenda to support this approach is challenging due to the number of issues and multiple disciplines that it cuts across
- Researchers need new tools and techniques to try to cope with this
- Citation network analysis is a potentially valuable tool in bridging the gaps between disciplines to inform a dynamic flow-based research agenda
- We will use citation network analysis to identify priority research areas, current knowledge gaps, and gaps in research collaboration or partnership between scientific disciplines

Dr Leanne Cullen-Unsworth

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