

# ESRC STEPS Centre

## Report 2006-2017



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This report covers the first 11 years of the ESRC STEPS Centre, involving three periods (Phase 1, Phase 2 and Bridge Year). We had a highly positive external review in September 2010 prepared by David Simon (then Royal Holloway). This final report, as required, responds to the objectives presented for each of the phases in proposals and contracts. We have followed the format required for a Director's final report as specified by the ESRC, but have not always followed the suggested page lengths. Much of the detail referred to in the body of the report is contained in Annex A, which gives details of all projects and cross-Centre activities undertaken. These individual cases are referred to in the text, with the report trying to draw out overarching themes and achievements.

### Part 1: Executive Summary

A number of special features of the ESRC STEPS Centre can be highlighted:

- A conceptual and methodological perspective on sustainability – the pathways approach – that challenges our understandings of how to achieve sustainability in diverse contexts.
- In-depth empirical interdisciplinary research on the politics of sustainability, cutting across a diverse array of topics and both rural and urban sites, clustered around four 'domains' – climate and energy; water and sanitation; food and agriculture; and health and disease.
- A well-regarded contribution to interdisciplinary and transdisciplinary methods for sustainability research, available through the STEPS methods portal.
- Strong international partnerships built over many years, emerging in the form of the STEPS Global Consortium, with hubs in Argentina, China, India, Kenya, Mexico/US, and Sweden.
- Excellent communications and policy engagement capacity around core themes of the Centre, both sectorally around domains, but also more broadly, for example around Rio+20, the SDGs, and our own initiative, the New Manifesto, 40 years on from the path-breaking Sussex Manifesto.
- Training a next generation of sustainability professionals through PhD and MA programmes and our highly successful annual STEPS Summer School, involving now around 300 participants, connected in an Alumni network.

Over 11 years, the Centre has had a range of important outcomes:

**Research/academic:** Our extension of the pathways approach continues with innovations in terms of disciplinary contributions (notably political economy perspectives) in recent years. As a normative, practical, intellectual tool the work is never complete, and testing, expanding, and challenging the approach in different contexts remains an exciting endeavour for both core STEPS members and a now much wider community engaging in pathways style analyses of sustainability dilemmas. In recent times, we have tried to link our approach to wider resilience, and hope to continue this conversation, while our embedding of the approach in both wider political economy perspectives and practice theory, for example, extends our understandings of power dynamics and the politics of opening up and closing down.

**Instrumental, policy outcomes:** The STEPS Centre approach has proven useful in diverse settings from agriculture and food policy to water and sanitation to urban development to confronting health and disease challenges. The range of policy outcomes across domains and projects is too long to list here, but can be seen in Annex A, where different activities are described. We will continue this engagement with policy on a sectoral, geographically specific basis, but also within the wider debate about how a

normative-political perspective on sustainability can be applied in development contexts globally, particularly around the implementation of the SDGs.

**Capacity building and strengthening:** Our Summer School, an innovation in Phase 2, plus our Global Consortium, built through Phase 2 and launched during the bridge year, provide a firm base to continue our capacity building work. With six global hubs very active and already interacting with each other and raising funds to continue, we have the beginnings of a longer term institutional framework. With 300 odd alumni associated with the Centre we equally have a global network of enthusiastic, mostly young, researchers and practitioners engaged with sustainability issues, who we see as the sustainability professionals of the future, carrying ideas, concepts, methods and practical examples from the STEPS Centre's work to diverse settings and challenges.

Our work has responded to the *ESRC's strategic priorities* through the fostering of new research (deepening the conceptual and methodological work, as well as expanding comparative empirical studies) that is interdisciplinary and international in reach; creating and maximising research infrastructure (through building the global Consortium as a platform and developing the methods portal); building capacity (through continued training of PhDs and post-docs at the Summer School, and through links with doctoral training at Sussex); and facilitating partnerships and creating impact (through the array of impact and engagement activities, and the strong collaborative basis for research).

Overall, in the operation and management of the Centre, flexibility, responsiveness and agility has been essential, but all this is based on a long-term intellectual project (building the pathways approach and its associated methodologies) and a deep commitment to a set of horizontal, global partnerships and networks that expands, extends and amplifies our work (most notably via the Summer School and Global Consortium hub networks). Being able to communicate these lessons and share these widely through a variety of media – from books and academic articles to blogs, videos and tweets – has been essential to ensure that the STEPS Centre has remained an open, inclusive platform for crucial debates on sustainability globally.

### **Future plans**

Compared to when the STEPS Centre was founded, our 'offer' is even more in demand. In an era when the politics of sustainability is in the news daily, when the world has signed up to the SDGs and the Paris Climate accord (or nearly so), and when the local and geopolitical dimensions of linking environment, society and development are so essential, the sort of groundwork that the Centre has done – in terms of research, but also crucially in terms of network and capacity building – has a vital role to play.

This is perhaps especially relevant in the UK where the research community rallies around tackling problem-driven 'global challenges' with cross-disciplinary work under the GCRF. The experiences, contacts, methods, core conceptual ideas of the STEPS Centre are relevant right across this agenda, offering the best of interdisciplinary social science in this global context. In the post-Brexit era, with the UK and its research community trying to carve out new relationships, the established, trusted, and globally extensive connections developed by the STEPS Centre are vital, especially through the STEPS Global Consortium. Through this, we can demonstrate a truly international and horizontally-connected vision for UK social science.

The STEPS Centre will continue to be hosted jointly by the IDS and SPRU at the University of Sussex, jointly directed by Ian Scoones and Andy Stirling. Over the next four years, hopefully with transition funding from the ESRC and co-funding from elsewhere, we will move from a Centre that funds and

administers multiple, individual research projects to one that concentrates on our core platform functions – convening, networking/partnership building; influencing, engaging, capacity building - where we believe the major added value and most effective leverage of a Centre comes.

From 2018-21, we will convene an annual event series, linking social and natural science researchers with artists and media professionals, around some big themes in the politics of - sustainability – provisionally transformations, uncertainty, natures and resilience; we will support the establishment and capacity of the STEPS Global Consortium, encouraging linkages across hubs, and supporting communications and engagement capacities; we will continue our successful Summer School, training a next-generation of sustainability professionals, linking our annual event at Sussex to e-learning and methods resources; and we will encourage a range of affiliate projects to make use of the STEPS Centre platform for sharing findings, and influencing debates.

## **Part 2: Introduction**

The STEPS Centre was established in 2006 as an alliance between the Institute of Development Studies and the Science Policy Research Unit at the University of Sussex. With a focus on the politics of sustainability, the Centre's core aims were to engage in the wider debate about sustainable development, particularly in the developing world, through a series of interlinked, empirical research projects and policy engagement activities. A strong communications element was embedded in the Centre's activities from the start.

The Centre emerged from conversations amongst the three co-directors (Leach, Scoones and Stirling) during the closing stages (1999-2000) of the ESRC's Global Environmental Change Programme, of which Leach and Scoones were co-directors. A convergence of conceptual, methodological and political interests in environmental change and sustainability were identified between work broadly under the label 'development studies' and under 'science and technology studies'. While using different theoretical literatures and working in different research settings, the possibilities for a highly productive interaction was identified. An initial attempt at a Centre bid failed, although with very positive views. One reviewer commented that the applicants were too young, so we waited a bit, and continued our conversations. In 2005-06, we applied again and were successful.

The original Centre proposal focused on three 'domains' (areas of policy engagement) around food and agriculture, water and sanitation and health and disease and three 'themes' (areas of cross-cutting research activity) around dynamics (on how systems change in complex environments), governance (how institutions and politics govern outcomes) and designs (how to understand dynamic change, and methods and tools for appreciating diverse pathways). Our central conceptual focus was what came to be known as the STEPS Pathways Approach, which drew from complex systems analysis, science and technology studies and institutional and governance theory. A major focus has been on how systems are understood and framed and how narratives emerge that define pathways of change (or hide and suppress them). In addition to our focus on institutions and governance regimes in the politics of sustainability, we have also been centrally concerned with the politics of knowledge and knowledge construction. As the title of the centre suggests we have been interested in how sustainability is mutually constructed through the intersections of social, technological and environmental processes.

In our second phase of work (2011-2016), we continued to elaborate and expand the pathways approach. In this phase we brought in wider expertise in political economy and international relations to explore the global political dimensions of sustainability in more depth. Based on work already started in Phase 1, we also added another domain on climate and energy to complement the other

three, and our work on urban – and especially peri-urban – spaces expanded significantly. In this phase, our network of collaborations expanded and deepened, and we launched our Summer School in 2012, as a route to reaching a wider number of people starting out in their careers as sustainability researchers. We also were able to raise complementary funds through a number of sources, and seek ways of linking our STEPS work with other affiliated Centres more strongly. STEPS was a core partner in the ESRC Nexus Programme, and this allowed for further networking, largely in the UK.

In the 11 years since the Centre was launched, we have conducted research through 28 projects (of varying sizes) in 30 countries and involving 38 Centre members at Sussex, and many other collaborators throughout the world (see Annex A, A7 as well as our project partners in Annex A sections D, E and F). We have had eight PhD students funded by ESRC and linked to the Centre and many other students at MA and PhD level engaged with the Centre, both at Sussex and more widely. During this period, the Centre has been directed and managed in a collective way with three co-directors until 2014 (Leach, Scoones and Stirling) and two since (Scoones and Stirling). The formal ESRC directorship shifted from Leach to Scoones in 2014, when Leach took on the directorship of IDS. During this entire period we have been lucky enough to have consistency in support from Harriet Dudley as Centre Manager, and Nathan Oxley (who started in 2009 as a Communications Assistant and moved to being the Centre's Communications and Engagement manager in August 2015 when Julia Day left, having served eight years as head of the Centre's Impact, Communications and Engagement Unit). Over 11 years, we raised over £35 million in co-funding, allowing the Centre to be the core of a wider network of affiliated projects, linked by similar conceptual, methodological and policy concerns.

Since 2015-16, on the back of long term engagements with partners since 2006, we established the STEPS Global Consortium, with partners in Argentina, China, Kenya, India, Mexico, Sweden and the US (Annex A, A7). This Consortium provides an extraordinary platform for on-going research and policy engagement around a number of themes, with each hub linking to STEPS at Sussex in different ways. Our vision for the Consortium is for a horizontal network that is more than the sum of its parts, and is able to co-construct research and influence policy in diverse settings in the Agenda 2030/Sustainable Development Goal (SDG) era.

A number of special features of the STEPS Centre can be highlighted:

- A conceptual and methodological perspective on sustainability – the pathways approach – that challenges our understandings of how to achieve sustainability in diverse contexts.
- In-depth empirical interdisciplinary research on the politics of sustainability, cutting across a diverse array of topics and sites, adding to a deepening of the pathways approach.
- A well regarded contribution to interdisciplinary and transdisciplinary methods for sustainability research, available through the STEPS methods portal.
- Strong international partnerships built over many years, emerging in the form of the STEPS Global Consortium.
- Excellent communications and policy engagement capacity around core themes of the Centre, both sectorally around domains, but also more broadly, for example around Rio+20, the SDGs, and our own initiative, the New Manifesto, 40 years on from the original Sussex Manifesto.
- Training of PhD and MA students, but perhaps especially in the context of the highly successful STEPS Summer School, involving now around 300 participants, connected in an Alumni network.

In sum, while having a solid conceptual core, our Centre has managed to engage with very diverse areas, linking them and projecting a distinct voice in a crowded field. Our website and its materials are

widely appreciated and used, and over time the Centre has contributed a substantial body of work to the wider literature, including 20 books in our own Routledge series.

### **Part 3: Centre objectives**

#### ***Phase 1: 2006-2011***

Objectives (derived from the contract/scientific programme):

- a) Major advances are expected in providing new understandings in the areas of dynamics, governance and designs.*

In the first stages of Phase 1 we invested considerable effort in developing our conceptual framework, with collective writing of working papers in each of the three thematic areas, and across all domains. These emerged as a now very well cited set of STEPS Working Papers in 2007. This provided the basis for further elaboration of the pathways approach, which was widely discussed in a range of meetings, articles and keynote presentations. Our summary paper on the pathways approach became an important reference point.

In 2010 we published the book *Dynamic Sustainabilities*, one of the first in our new book series with (then) Earthscan (now under Routledge) (Annex A, A4). This has become the most widely read statement on the STEPS Centre approach. In our conference in 2011 we debated the pathways approach with a wide audience, and this resulted in a special section of *Environment and Planning A*, where commentaries on the book were published. Our work on designs has focused on methodological development, which has emerged through the projects launched during Phase 1. This became a major focus for investment during Phase 2 (Annex A, A1).

- b) A programme of interdisciplinary research making significant contributions in the areas of development studies and science and technology studies, including good progress towards the achievement of the scientific programme*

Our projects in Phase 1 were clustered around the three domains. The scientific programme proposed nine projects. In practice, these changed during the design phases, and we ended up with eight projects in Phase 1, with one major project linked to each domain. These were:

- Agriculture and Food: Environmental Change and Maize Innovation Pathways in Kenya (project A1 in original proposal; Annex A, D7 in this report)
- Water and sanitation: The Peri-Urban Interface and Sustainability of South Asian Cities (project A2; Annex A, D2)
- Health and disease: Epidemics: Pathways of Disease and Response (project B2; Annex A, D4)

These core projects involved the hiring of three PDRs (Sally Brooks, Pritpal Randhawa and Sarah Dry, respectively linked to the above project areas) who were able to lead fieldwork and invest in writing and networking. As outlined in Annex A, each project has resulted in significant outputs, including books, journal articles and working papers. Our video projects linked to the first two. In each case the projects were interdisciplinary, field based, involved diverse partners from academic and NGO/policy organisations, and focused on major policy issues.

In each case they combined inputs from development studies and science and technology studies, and involved Sussex STEPS members from both IDS and SPRU. This was an important focus for learning and exchange, and provided the basis for building solid partnerships across the Centre, including across units at Sussex.

Other smaller projects were also linked to domains, and were adapted from the original proposal:

- Agriculture and Food - Beyond Biosafety: Lessons from Kenya and the Philippines (Annex A, D5)
- Water and sanitation- Reimagining Urban Futures: Climate Change and Cities (adapted from project C1; Annex A, D8)

During this phase we also encouraged new projects that cut across domains, and the Rethinking Regulation project (Annex A, D6) focused on links between food/agriculture (seeds) and health/disease (antibiotics) in China and Argentina (a combination of projects A3 and B1 in the original proposal).

In terms of the original proposal, the only area we did not pursue was the cross-cutting 'environmental and technological expectations and aspirations'. This proved too complex to initiate, and we concentrated on our core empirical work (above) instead, as explained in various annual reports and mid-term review.

We however did initiate two other efforts not in the original proposal. These were:

- *The New Manifesto on Innovation, Sustainability, Development*. We launched this in 2010, 40 years on from the original controversial Sussex Manifesto, which was one of the first interventions linking innovation and development, and involving both SPRU and IDS. This proved a very exciting venture, bringing together a large number of people across the world through roundtable discussions, and resulting in a major event (at the Royal Society) and publication (including on-line version), and involving some of the original contributors to the Sussex Manifesto (Geoff Oldham and Martin Bell). The wiki-timeline provided an interesting way of tracing events over 40 years, involving contributions from a wide community. The dedicated Working Paper series proved very popular, and a number of journal articles emerged subsequently (see Annex A, D1).
- *The Knowledge Society Debates*. Through complementary funding from UKIERI, we convened a series of knowledge dialogues, involving STEPS members and members of our Advisory Board, along with Indian colleagues in three cities in India. This process allowed for the sharing of experience from Europe (Brian Wynne, Andy Stirling) and the US (Sheila Jasanoff), exploring the politics of the new knowledge society. The result was a series of well attended and fully documented workshops and a special issue of Seminar, a widely read journal in India (Annex A, D3).

During this phase we also had six linked PhD studentships. They were associated with project work, including Paul Forster – linking to the avian influenza work under the Health and Disease domain and Anna Walnycki linking to the peri-urban water access work under the Water and Sanitation domain (see Annex A, A5).

We also contributed to the launch and teaching on the IDS based MA, Science, Society and Development, although our STEPS courses subsequently got merged with other MA offerings both at IDS and SPRU.

c) *Engagement with users in line with the initial strategy*

During this phase the Centre developed a detailed communications and engagement strategy, under the leadership of Julia Day. Following the launch of the Centre at an event in parliament, we developed a publication series, including both working papers and policy briefs/research highlights. These were

widely disseminated to a growing contacts list. A website was designed and built and the STEPS branding/logo was firmly established. Working with IDS and other communications outlets we made sure that STEPS was widely known.

Our annual symposia (see Annex A, A9) provided a good moment to widen our network around particular themes. Focused policy engagement around projects and domains occurred during this phase, including the use of multimedia outputs. We commissioned two videos to highlight the pathways approach (focused on the maize project and the peri-urban project in India). We launched a blog ('The Crossing') linked to the Centre allowing project partners to share early results and commentary on policy issues (see Annex A, B1).

The New Manifesto project, led by Adrian Ely, with our now enlarged ICE team (including Julia Day and Nathan Oxley) was a highlight for engagement with users, as were our Knowledge Dialogues in India. All these activities are detailed in the project/activity summaries in Annex A.

In this phase, we were increasingly concerned to embed communications and engagement within projects from the beginning, and began experimenting with the Participatory Impact Pathways Approach (adapted from Douthwaite et al, from the CGIAR). We found this a very useful hands-on approach, and this became central to our planning, monitoring and evaluation work from Year 2. A STEPS Working Paper by Ely and Oxley reflects on the approach (Annex A, A12).

During this phase we also engaged in a range of policy advisory inputs, ranging from government committees to parliamentary inquiries. For example:

- Invited STEPS evidence to House of Lords Select Committee on Science and Technology adopted as basis for key policy recommendation in Inquiry report.
- STEPS report on Transformative Innovation: policy analysis framework cited as basis for chapter in 2010 DEFRA Evidence Investment Strategy.
- UK Government NESTA report on Low Carbon Innovation in China cites STEPS '3Ds' approach
- STEPS work on diversity in technological directions cited in Royal Society report 'The Scientific Century: securing our future prosperity' 2010.
- UK Foresight Global Food and Farming Futures Project involves STEPS research in work on 'Governance' and 'Imagining the Difficult to Imagine Drivers of Change'.
- Submission to 2006 Parliamentary Inquiry on Water.
- OECD/UNESCO workshop, January 2009 'Innovation for Development: Converting Knowledge to Value' feeding into the 2010 OECD Innovation Strategy.
- OECD Expert Committee on 'Innovating out of Poverty' (April 2009), feeding into Meeting of the OECD Council at the Ministerial Level.

These are all detailed in annual reports from this period, and amounted to many such engagements, all helping STEPS to establish itself as a 'go to' Centre for advice on the intersections of environment, sustainability and development.

Our Centre Advisory Committee was established during this phase under the chairpersonship of Professor Judi Wakhungu (see Annex B for a list of members, rotated over time). The Committee helped the Centre in positioning ourselves in global debates, and helped refine our communications messages to different audiences. In the first phase we had David Dixon (sadly now late) the founder of SciDev.net, as our main advisor on our communications strategy, ably succeeded by Fred Pearce in Phase 2. During this phase, our network of policy contacts and links to media/journalists expanded massively, putting us in an excellent position to share findings widely.



In sum, the first phase established a very strong communications, impact and engagement capacity, along with the basic infrastructure (website, blog, social media, mailing list) for successful dissemination. Our clear branding, close links to IDS and SPRU and high profile international events (Manifesto, Knowledge Dialogues, Symposia) meant that the STEPS Centre's initial establishment and dissemination was highly effective.

## **Phase 2: 2011-2016**

In our Phase 2 proposal, we identified a number of objectives:

*Objective 1: Conceptual/methodological development of the pathways approach.* To tighten our focus on the *intersections* between the three themes (dynamics, governance and designs), enriching theory through engagement with six key specific conceptual areas where wider understandings are advancing rapidly and on which we wished to focus: 'transitions and transformation'; 'diversity and complexity'; 'political ecology and economy'; 'knowledge and imaginaries'; 'citizenship and participation'; 'innovation and distribution'.

We fulfilled this ambition in a number of ways. Initially we held a series of 'walkshops'. This was an innovation in this Phase to discuss collectively these conceptual underpinnings, extending or collective engagement in different literatures, and expanding our scope. These proved incredibly useful for the development of new projects. Later in this phase we undertook collective work around the book project, *The Politics of Green Transformations* (edited by Scoones, Leach and Newell), as well as various contributions by Stirling, expanding and extending the pathways approach. The methodology work in particular was extended in this phase with the establishment of a web portal on the STEPS site, as well as through engagement with the ESRC Nexus Network (see Annex A, A1).

*Objective 2: Expanding our coverage of domains and sectoral engagement.* To build on links with the Sussex Energy Group to develop an entirely new domain on Energy and Climate in order to complement continuing work on Water and Sanitation, Food and Agriculture and Health and Disease.

The establishment of the Climate and Energy domain proved highly successful, and generated an important new strand of work. This involved bringing in new people, including initially Professor Jim Watson and Dr Rob Byrne and Dr David Ockwell. This extended our network at Sussex to the School of Global Studies. The energy and climate domain was able to draw on substantial work, especially in East Africa, and connect the socio-technical transitions work well established in SPRU with the pathways approach (see Annex A, C2). The other domains continued, under existing leadership with a variety of events, policy engagements and dissemination activities (see Annex A, C1, C3 and C4).

*Objective 3: Empirical research.* To undertake an entirely new set of located, collaborative, cross-sectoral, cross-thematic projects, integrated into four clusters.

Cluster 1 on **risk and security: institutions for complex systems** will address 'securitization, risks and global systems' and 'formality and informality in urban environments'.

Cluster 2 on **socio-technical transitions in a changing climate** will address 'niche pathways and sustainability transitions in food and energy' and 'uncertainty from 'below' and 'above': responding to climate change'.

Cluster 3 on **political ecologies of global transformation** will address 'the political ecology of carbon: land and livelihoods in rural Africa' and 'socio-ecological dynamics of global commodity chains: meat and soybean'.

Cluster 4 on ***the socio-ecological dynamics of disease*** will address ‘zoonotic disease risks in intensifying livestock production systems’ and ‘integrated vector management in dynamic environments’

As before, the final projects took a slightly different configuration to the proposal, and the clusters did not really emerge as organising groupings. The final list of funded projects for Phase 2 was:

#### Cluster 1

- Dams, Securitization, Risks and the Global Water-Energy- Nexus Under Climate Change Scenarios (Annex A, E4) led by Allouche
- Pathways for Environmental Health in Transitional Spaces: Moving Between Formality and Informality (Annex A, E9) led by Marshall

#### Cluster 2:

- Climate change: Uncertainty from Below and Above (Annex A, E1) led by Mehta
- Grassroots Innovation: Historical and Comparative Perspectives (Annex A, E6) led by Smith

#### Cluster 3

- Political Ecologies of Carbon in Africa (Annex A, E5) led by Leach and Scoones
- A Socio-Technical Analysis of the Livestock Revolution: Innovation Pathways in Poultry Production in Sub-Saharan Africa (Annex A, E3) led by Sumberg

#### Cluster 4

- Responding to Zoonotic and Related Diseases in Intensifying Livestock Systems: Diverse Framings and Pathways (Annex A, E8) led by Loevinsohn
- Re-Emerging Transmissible Trans-boundary Animal Diseases – Comparing Rift Valley Fever with BSE (Annex A, E7) led by Millstone
- From Framings to Pathways: Bats and the Construction of Risk in Ghana (Annex A, E2) led by McGregor and Waldman

In addition we commissioned three smaller projects:

- An Assessment of Global Agricultural Assessments (Annex A, E10) led by Thompson
- The Political Economy of Avian and Swine Flu (Annex A, E11) led by Scoones and Forster
- Biochar and Anthropogenic Dark Earths (Annex A, E12) led by Leach

All resulted in significant outputs, as highlighted in individual project/activity profiles in Annex A, and on Researchfish.

*Objective 4: To develop Methods and Methodologies for further operationalising the pathways approach – aiming at a toolbox of novel interdisciplinary approaches for the appraisal and analysis of sustainability issues.*

As noted earlier, this strand of work led by Andy Stirling, with support from Rose Cairns and Nathan Oxley, increased in Phase 2, resulting in a dedicated methods portal. Nearly all projects have now contributed to this (see Annex A, A1)

*Objective 5: To expand and integrate our work on Impact, Communications and Engagement, ensuring follow-up to the high profile New Manifesto project and further embedding the highly successful*

*communications operation with the substantive research and policy interventions at the heart of the continuing STEPS Centre research agenda.*

As described for Phase 1, the ICE unit (Impact, Communications and Engagement) went from strength to strength. The publications series continued, with 20 books and over 100 Working Papers published by 2017. The blog took on a new lease of life with regular postings, and social media connections expanded significantly. A number of major communications related activities took place during Phase 2 (Annex A, A9). These included:

- Symposium on 'Credibility Across Cultures' in 2013 at the University of Sussex
- International symposium on Pathways to Sustainability at Jawaharlal Nehru University, 2014
- Resource Politics Conference, 2015
- Launch of the *Politics of Green Transformations* book in London
- An international conference on Pathways to Sustainable Urbanisation in India, 2016
- Co-hosting the *Contested Agronomy* conference in Sussex in 2016

We initiated a new annual STEPS lecture in 2012, and so far have had six lectures and several public events (see Annex A, B4).

A major role for the ICE unit in this phase was the wider linking with the emerging Global Consortium, launched at the end of Phase 2 (Annex A, A7). The current Consortium is:

- **South Asia:** Jawaharlal Nehru University, New Delhi, India.
- **China:** Beijing Normal University, Beijing, China
- **Latin America:** Fundación CENIT, Buenos Aires, Argentina.
- **North America:** UNAM, Mexico City, Mexico and Arizona State University, Tempe, USA
- **Africa:** African Centre for Technology Studies, Nairobi, Kenya
- **Europe:** The STEPS Centre (University of Sussex, UK) and the Stockholm Resilience Centre, Stockholm, Sweden.

Major events were held in Delhi, Argentina, China, and Kenya, profiling STEPS research with partners, and launching the new hubs. This internationalisation of the communications effort, with investment in capacity building in the new hubs was an important part of the work in the latter part of Phase 2, signalling a new way of working. During this phase the ICE unit also began to build up our alumni network, linked to Summer School participants, Visiting Fellows and others.

This period also saw the build up to Rio+20, and the subsequent launch of the SDGs in 2015. This provided a substantial policy opportunity to engage with the wider debate and present some cutting edge research and thinking (see Annex A, B2). We worked closely with our Swedish partner, the Stockholm Resilience Centre, including Johan Rockström, Per Olsson and others in preparing a series of papers on transformations that were widely publicised in advance of Rio.

During this phase we also started to produce 'impact stories' profiling key project areas (see below), allowing us to link findings over multiple projects/activities and over a number of years. This demonstrated the maturity of the Centre's work, as we were able to show how impact built over time, and was based on establishing and nurturing international networks across research, policy and practice.

In this period too, the STEPS Centre was associated with two ESRC International Impact Awards: first in 2015 for Ian Scoones' work on agrarian change in southern Africa and second in 2016 for the work

on Ebola that the STEPS Centre contributed to, building on the long-term work on health and disease, and particular epidemics, starting back in 2007 (Annex A, C4).

There were no linked PhD studentships in Phase 2, but we were successful in gaining funding for two scholarships linked to the then Sussex Doctoral Training Centre. These were Sophie Valeix on 'One Health and integration? Veterinarians and zoonotic diseases in Ghana' and Justin Pickard on 'Theorising infrastructure in Ahmedabad—obduracy, translation, and urban socio-technical change' (see Annex A, A5).

We continued to teach on Sussex MA programmes, and many PhD students with funding from different channels became involved with the Centre through supervision by STEPS members. A number of these attended the STEPS Summer School as part of their doctoral training.

### ***Bridge year: 2016-17***

Given delays in commissioning new Centre calls, the ESRC agreed for bridge funding to allow continuity in Centre operations. Our bridge year objectives were:

- i) To help generate a new agenda of work, through defining new project activities*

During this period, we initiated six new projects, building on past work, but involving new people and partnerships through the Global Consortium. These were all focused on exploring sustainability transformations, and included work on low carbon energy transitions (emphasising the role of state-business alliances), on environmental changes (concentrating on the transformations of value associated with the marketization of environmental services and products, including carbon), on agri-food system change (focusing on learning from histories of 'green revolutions'), on urbanisation (and the role of civil society mobilisation in urban change), on changing knowledge relations for socio-technical innovation (through the 'open science' movement) (see profiles in Annex A, F1-6).

All projects were aimed at developing the concepts, methodologies and partnerships for future funding bids, and many have already started this process.

- ii) To continue to extend the pathways approach*

We held a series of cross-project workshops to explore sustainability transformations, and learn lessons from each. All projects have contributed to the methods portal on the STEPS website, providing new applications and examples (Annex A, A1).

The project-focused discussions were complemented by the on-going series of 'theory afternoons' where we explored different dimensions of theory to push our conceptualisation of sustainability and transformations (Annex A, A11).

This in turn all linked to our on-going, and separately funded, work under the ISSC Transformative Knowledge Network, involving all hubs, as well as our 'transformations' events series, including the 'rapid transitions' discussions across the UK (see Annex A, A3).

Together this work substantially extended pathways thinking, theoretically, methodologically and in terms of particular applications.

- iii) To consolidate and disseminate the Centre's work through the new STEPS Global Consortium.*

Following the launches of the Consortium hubs, we have worked hard to consolidate activity and capacities across the Consortium. The IDS and SPRU 50<sup>th</sup> anniversary conferences provided important

moments for hub partners to come together and plan for future work. Efforts to improve coordination and communications capacities have continued.

*iv) To bring new staff into the Centre*

During this phase, we have brought in a number of new, early career STEPS members from both IDS and SPRU, including Saurabh Arora, Ashish Chaturvedi (a linked consultant based in India), Dominic Glover, Amber Huff, Wei Shen and Shilpi Srivastava and Jonathan Dolley. This has helped renew the STEPS membership, shifting age, gender and regional origin profiles across the Centre.

*v) To support existing infrastructure, and update it*

Bridge funding meant we could continue to support and expand our communications capacity. In this period, we have revamped the STEPS website, making it mobile compatible and more user friendly. This has meant reorganising material, and improving the ability to find material from a huge range of activities over the years. The new web platform is more secure, stable and adaptable, and also carries the new Global Consortium portal, with contributions from all hubs. Our ambition is to make the website a truly global one, with contributions from across partners. The web platform also links to our new e-learning site (Moodle), which was launched during 2017 (Annex A, B1 and B3).

*vi) To fundraise for onward work*

During this period, we have invested considerable efforts in fundraising. In addition to the project specific plans noted above, STEPS-wide efforts have included two major bids – first to the ESRC's Centres call (Transforming Resilience) and second to the GCRF Partnerships call (Governing the Nexus Partnership). Neither were in the end successful, after a huge amount of collective work and effort, but both gained superlative reviews, and will provide the basis for further bids into the future, including as part of the GCRF Interdisciplinary hub call.

### **Addressing ESRC's strategic priorities**

The STEPS Centre has contributed centrally to each element of the ESRC's overall mission, and across several strategic plans. The Centre has responded very directly to the aim of promoting and supporting world class research and related postgraduate training in the social sciences. The STEPS Centre has conducted top-rate research at the interface of science and technology studies, development studies and environmental social science, contributing conceptual and theoretical advances around pathways to sustainability, high-value empirical studies based on rigorous fieldwork in African, Asian and Latin American settings, and new methodological tools. It has linked this research to postgraduate training both through a vigorous PhD programme involving Centre-funded students and a wider group at IDS and SPRU, and through Masters' programmes. Second, it has advanced knowledge and provided trained social scientists who meet the needs of users and beneficiaries. Our work has ensured that beneficiaries – from local community groups to national and international policymakers and practitioners – are fully involved in the design and implementation of our research.

Our work aims not just to contribute to economic competitiveness, effectiveness of public services and quality of life in the UK, but to global sustainability goals and to progressive livelihood, wellbeing and distributional agendas for people in the global South. Nevertheless a variety of positive implications for the UK have been achieved: in better-conceived international development, environment and technology funding and programmes; in comparative lessons for the UK context drawn from other settings; and in improved understanding and governance of many issues that are truly global (food, energy, water, global climate change and disease risks), requiring internationally-co-ordinated responses.

The STEPS Centre has disseminated and promoted knowledge and understanding of the social sciences, with an international orientation, and directed towards natural scientists, technical agencies, and policy-making fora as well as to the general public. However, through selected events and media communications we have also contributed to the UK public's understandings and appreciation of social science, especially as applied to international environment and development issues.

The Centre's work has contributed to the ESRC's realisation of each of its core values. Regarding *quality*, we have emphasised scientific excellence very strongly, but in terms that move well beyond narrow, single-discipline notions of excellence to encompass values of interdisciplinarity, linking research and practice, and societal utility. *Independence* is also a vital attribute of STEPS work, which we insistently retain within and across our diverse relationships with partners and users. *Leadership and collaboration* are also areas where STEPS Centre plans have made central contributions. As a global research and policy engagement hub, through the Global Consortium we have expanded further in reach and profile. STEPS has become well placed to promote and showcase the UK's scholarly profile abroad and the ESRC's investment, impact and knowledge exchange work, within GCRF and other networks. Collaboration – across disciplines, researchers and policy-makers, north and south are also core attributes of STEPS work and plans, while we are particularly well placed to underscore the value of research informed by international perspectives.

Impact is now a central value for the ESRC as it is for the STEPS Centre. As already discussed, we have used multiple strategies to ensure ongoing interaction between research and policy and practice throughout the Centre's work. We have made distinctive contributions to each of the ESRC's defined impact routes/objectives. These include through world class research (via our project and domain activities and communications); through skilled people (via our capacity-building activities); through world class infrastructure (via the presence and facilities of the STEPS Centre at Sussex, and its global networks and virtual networks); through international leadership (via high profile presence in cutting-edge international debates and fora), and through partnerships (via the north-south, inter-institutional partnerships that underpin all our work). Moreover, we have devoted specific staff, resources and attention to an Impact, Communications and Engagement (ICE) unit and cross-cutting work stream on linking ideas and action. We hope to further build these in interaction with the ESRC and wider UK social science debates about impact and influence, providing leadership (e.g. workshop contributions), methods (e.g. developments of the STEPS PIPA approach) and critical engagement, and working closely with the ESRC's Knowledge Transfer team as and when appropriate to help the ESRC implement its own strategies.

The Centre has contributed to three of ESRC's Strategic Plans, but most centrally that of 2009-14 and 2015-20. The 2009-14 plan laid out seven areas of strategic challenge. The STEPS Centre was most closely aligned with the 'Environment, Energy and Resilience' challenge. Indeed the Centre's work and pathways approach is identified as one of the key achievements in this area during 2005-8, and this has continued to be the case. Our work has helped the ESRC meet several of its strategic priorities in this area, particularly in 'developing and delivering research on the drivers and implications of environmental change under conditions of uncertainty....' and 'collaborating internationally to understand the complex interdependence between alleviating global poverty, sustaining economic and social development, building societal resilience to environmental change and reducing the human impact on natural systems'. The STEPS Centre has contributed to a variety of cross-council initiatives, including LWEC, ESPA and more recently GCRF.

In relation to other challenges identified in the 2009-14 plan, the Centre also led to contributions to several other areas. These included Health and Wellbeing, where our health and disease domain and several projects will contribute understandings from international contexts to key questions around

health systems, the social dimensions of response to infectious disease threats and challenges, and policies and evidence for improved health and wellbeing in contexts of inequality. In relation to New Technology, Innovation and Skills, our work contributed to challenges around understanding the social drivers and implications of technological developments such as in biotechnology and information technologies; and contributes core knowledge, action and practices around innovation systems, continuing to bring international perspectives and a distinctive '3D' agenda to debates and interaction with UK and international agencies around the spread and governance of new technologies.

In relation to the current Strategic Plan (2015-20), the Centre responds in a number of important ways. The plans encompass the fostering of new research (deepening the conceptual and methodological work, as well as expanding comparative empirical studies); creating and maximising research infrastructure (through building the global Consortium as a platform and developing the methods platform); building capacity (through continued training of PhDs and post-docs at the Summer School, and through links with doctoral training at Sussex); and facilitating partnerships and creating impact (through the array of impact and engagement activities, and the strong collaborative basis for research – see elsewhere in this report).

The 2015 ESRC Strategy makes the case that future major research challenges will “be interdisciplinary and international in their reach, recognising that the most pressing global challenges show little regard for disciplinary or geographical boundaries”. Our vision for the Global Consortium and our commitment to transdisciplinary research squarely responds to this. The Strategy argues that key priorities “will also require input beyond social science”. The STEPS Centre’s engagement with medical, natural and engineering sciences, and co-funding from other research councils, is witness to this.

The 2015-16 Delivery Plan emphasises the importance of the international profile of UK social science. The Centre is glad to be a central contributor to the recent QS Global University Ranking that put Sussex the top in the world for Development Studies, above Harvard, MIT and Oxford. The STEPS agenda responds directly to two identified priorities for ESRC investment - Social Science of Environmental Change and Urban Transformations. The Plan notes the international scope of these challenges, and the importance of the Newton Fund. We have been involved in discussion with ESRC on the Newton Fund since its inception, and have applied to a number of windows with partners in Brazil, China, India and South Africa.

#### **Part 4: Centre activities, outputs and impacts**

##### **Centre activities**

In responding to each of the Centre’s objectives across Phase 1, 2 and the Bridge Year, the previous section has given an outline of overall activities, outputs and impacts already. Further, Annex A, combined with our Researchfish submission and earlier Annual Reports, plus the mid-term report and review, all provide much more detail on all our Centre activities and projects, giving indications of outputs and impacts for each over 11 years. This will not be repeated here, and so this section will be shorter than suggested.

Annex A lists activities under the following headings, in line with the suggested template, and includes a summary of outputs and impacts:

- STEPS Centre Crosscutting Activities (A)
- STEPS Centre Communications Activities (B)
- STEPS Centre Domains (C)

- STEPS Centre Projects Phase 1 (D)
- STEPS Centre Projects Phase 2 (E)
- STEPS Centre Projects Bridge Year (F)

Overall 48 project/activity tables are presented in this Annex.

### **Achievements and impacts**

Looking back over the 11 years of the STEPS Centre to date, we have met all objectives, and exceeded delivery on many (see above). In the period when annual reports recorded KPIs and reported against achievements, we over-achieved on all counts each year. This has not changed since. The flexibility of Centre funding has allowed us to drop a few things (see above), reconfigure some projects, but – importantly - launch new efforts in response to evolving opportunities and events that never appeared in the original proposals.

Our ability to re-gear work, building on nearly a decade of continuous effort and strong partnerships in West Africa, allowed us, for example, to respond in real time to the unfolding Ebola crisis in 2014-15. This allowed an evidence based response, involving solid social science contributions to be brought to bear. The contributions of the STEPS Centre (with others, including IDS, LSHTM etc.) was widely recognised, including by the then Chief Scientist, Mark Walport, and the ESRC's selection of the International Impact Prize in 2016.

The flexibility and support of the ESRC in this has been much appreciated, as some of these unplanned-for activities (initially unbudgeted) have been had the most influence and impact, and are essential for the Centre's on-going work and legacy. Three stand out:

- The New Manifesto project (2009-2010) (Annex A, D1)
- The STEPS Summer School (from 2012), and then the e-learning site (from 2016-17) (Annex A, A8 and B3)
- The online Methods portal (Annex A, A1)
- The STEPS Global Consortium (building from the beginning, launch in 2015-16) (Annex A, A7)

Similarly, being able to respond to the policy moment and be present at the big debates, bringing solid evidence to bear on international policy debates is witness to the capacity and responsiveness of the Centre. Our ability to be present at the Rio plus 20 conference and in discussions around the SDGs is witness to this (Annex A, B2), as has been our ability to contribute to a whole range of enquiries, consultations and informal policy discussions, including contributing in 2014 to the Chief Scientists' Report on the back of extended long-term work by STEPS.

In sum, flexibility, responsiveness and agility has been essential, but all this is based on a long-term intellectual project (building the pathways approach and associated methodologies) and a deep commitment to a set of horizontal, global partnerships and networks that expands, extends and amplifies our work (most notably via the Summer School and Global Consortium hub networks). Being able to communicate these lessons and share these widely through a variety of media – from books and academic articles to blogs, videos and tweets – has been essential to ensure that the STEPS Centre has remained an open, inclusive platform for crucial debates on sustainability globally.

### **'Outstanding science'**

Across all our work we have striven towards what ESRC calls 'outstanding science', but never in isolation from engagement and impact. A commitment to co-construction of epistemological and social/political orders is at the heart of our approach. With a normative-political starting point to our



perspective on sustainability, the notion of science as being separate from processes of change in society is alien to the STEPS approach. However, in relation to standard metrics of what is read, cited and regarded by peers as useful and important contributions, we can highlight four major cross-cutting contributions (as required), drawing from work across the Centre, including:

- Leach, M., Scoones, I., & Stirling, A. (2010). *Dynamic Sustainabilities: technology, environment, social justice*. Earthscan. Our 2010 book that has laid out our pathways approach and its intellectual origins as well as practical and policy implications. Google Scholar citations: 245. Debate on the book: Demeritt, D., Dobson, A., Li, T. M., Leach, M., Scoones, I., & Stirling, A. (2011). Pathways to sustainability: perspectives and provocations. *Environment and Planning A*, 43(5), 1226-1237.
- Scoones, I., Leach, M. and Newell, P. eds., (2015). *The Politics of Green Transformations*. Routledge. Our 2015 book, with multiple contributions across the Centre, laying out our perspectives on transformations, and the political, cultural, social and ecological dimensions. Google Scholar citations: 78. Positively reviewed in a number of journals recently.
- Stirling, A., (2008). "Opening up" and "closing down" power, participation, and pluralism in the social appraisal of technology. *Science, Technology, & Human Values*, 33(2), 262-294. Now a classic paper, laying out some of the core themes of the STEPS approach, Google Scholar citations, 763.
- Scoones, I., (2016). The politics of sustainability and development. *Annual Review of Environment and Resources*, 41, pp.293-319. A review article, covering many of the themes debated across the STEPS Centre during since 2005, but updating with more recent concerns. Good Scholar citations: 5

We could have chosen many other examples of more empirically focused contributions from particular domains and projects and from our 20 books in our series, 100 STEPS Working Papers and numerous journal articles (see Researchfish and the STEPS websites for more). There is no shortage of choice.

What are the characteristics of 'outstanding science' in these examples, and so what is the flavour of intellectual contribution of the STEPS Centre over the last 11 years:

- Academically rigorous, but theoretically and conceptually eclectic, drawing from very diverse disciplinary traditions. As problem focused 'disciplines', science policy studies and development studies, are not bound by particular disciplinary strictures, and draw from, *inter alia*, political science, anthropology, sociology, geography, international relations, and more, as well as cutting across to natural sciences, including ecology and environmental sciences.
- Emerging from a normative, political position and a social constructivist stance and science and knowledge, our work comes at challenges of sustainability from novel angles that reach out across disciplines and link to practical, political and policy concerns.
- Methodologically pluralist, not being boxed into qualitative, quantitative, participatory or extractive labels, our aim is to open up debates about pathways to sustainability, and broaden out the inputs through diverse knowledges and framings.
- Our work is aimed at making a difference, and so is linked to real-life problems and challenges, while not being applied nor pure science, with a productive mutual exchange between action and knowledge, practice and theory.

### **Impact stories**

In reflecting on our work over 11 years, we have produced a series of 'impact stories' that encapsulate how our work has had influence in a number of areas, cutting across projects, and evolving over time.

These are presented in a multi-media format through the Medium.com website in the links below. The following are the impact stories we have produced to date:

[Navigating a tangled web: how STEPS helped to build a community of new sustainability professionals](#). This impact story focuses on how STEPS has used its Summer School and other forms of training and engagement to build capacities and exchange ideas with researchers from around the world.

[The social life of infectious diseases](#). A multimedia story tracing our work on Ebola, avian flu and other diseases since 2006. The first in a short series of impact stories drawn from a decade of research and engagement, it focuses on how the STEPS Centre engaged with policy, practice and debates on how to prevent and respond to disease.

[From land grabs to the Anthropocene: exploring the politics of resources](#). This story looks at how the STEPS Centre responded to the explosion in land grabbing in 2007 and 2008 and revealed the role of 'green grabs' and 'water grabs'. Our work went on to explore the politics and conflicts involved in offsetting schemes and the 'green economy', and open up debates about emerging discourses such as the Anthropocene.

[Making futures](#). This story shows how our research revealed new insights about science, technology and innovation, and how these have been taken up in a variety of contexts. From the 'New Manifesto' to work on 'grassroots' innovation, STEPS researchers have opened up conversations around the world, exploring how citizens can be better involved in shaping the kinds of technologies, innovations and science that can contribute to more sustainable futures.

[Reshaping development goals](#). This story is about how the STEPS Centre engaged in the processes around the Rio+20 conference and the Sustainable Development Goals launched in 2015. It explores how the Centre sparked debates in various arenas about the implications of the SDGs, and how they would be implemented on the ground – from convening debates with leaders from the Least Developed Countries, to engagement with the UNDP and dialogue with leading thinkers and influencers on economics, earth systems and the Anthropocene.

What is common to these examples?

- All have made use of the core conceptual foundations at the heart of the STEPS Centre – the pathways approach – involving a critical, constructivist perspectives on complex systems; a focus on power and knowledge; and a commitment to 'opening up' debates about pathways to sustainability.
- These are not just one-off impact 'activities', but about sustained research and engagement over many years, with the often slow accretion of knowledge and insights that can be made use of in highly non-linear policy processes, capturing moments and opportunities.
- They have responded to particular policy moments (Ebola outbreak in 2014; land grabbing from 2007-08, for example), making use of concepts, methods and empirical insights around new contexts.
- They have built networks of researchers, practitioners, and policy makers – and the capacities of each to think about and respond to unfolding processes of change, with the 'pathways approach' central.

## **Main publications**

During the life of the Centre to date, we have produced 20 books, 100 Working Papers and over many journal articles. These are listed on our website, and included within Researchfish (at least in the recent period).

### **Outcomes and next steps**

The main outcomes have already been described, but can be clustered under a number of headings:

*Research/academic outcomes:* Our extension of the pathways approach continues with innovations in terms of disciplinary contributions (notably political economy perspectives) in recent years. As a normative, practical, intellectual tool the work is never complete, and testing, expanding, and challenging the approach in different contexts remains an exciting endeavour for both core STEPS members and a now much wider community engaging in pathways style analyses of sustainability dilemmas. In recent times, we have tried to link our approach to wider resilience/disaster reduction debates, and hope to continue this conversation, while our embedding of the approach in both wider political economy perspectives and practice theory, for example, extends our understandings of power dynamics and the politics of opening up and closing down.

*Instrumental, policy outcomes:* The STEPS Centre approach has proven useful in diverse settings from agriculture and food policy to water and sanitation to urban development to confronting health and disease challenges. The range of policy outcomes across domains and projects is too long to list here, but can be seen in Annex A, where different activities are described. We will continue this engagement with policy on a sectoral, geographically specific basis, but also within the wider debate about how a normative-political perspective on sustainability can be applied in development contexts globally, particularly around the implementation of the SDGs.

*Capacity building and strengthening outcomes:* Our Summer School, an innovation in Phase 2, plus our Global Consortium, built through Phase 2 and launched during the bridge year, provide a firm base to continue our capacity building work. With six global hubs very active and already interacting with each other and raising funds to continue, we have the beginnings of a longer term institutional framework. With 300 odd alumni associated with the Centre we equally have a global network of enthusiastic, mostly young, researchers and practitioners engaged with sustainability issues, who we see as the sustainability professionals of the future, carrying ideas, concepts, methods and practical examples from the STEPS Centre's work to diverse settings and challenges.

Our next steps are highly contingent on future funding. As discussed repeatedly above, a central aspect of Centre funding is to be able to respond to emerging challenges and policy moments. This is not possible with short-term project funding. While the Centre has been very successful in raising complementary funding (more than £35 million over 11 years), our core funding from ESRC has been vital, and has been the glue that has held things together, the seed funding that has allowed things to take off, and the funding that has allowed the deeper, sustained intellectual and methodological work that makes a Centre gain its distinct identity. With our unsuccessful bid for an ESRC Centre in 2016, we are hopeful that follow on, tapered funding for Centres now being offered will provide the basis to seek that always elusive and poorly appreciated core funding for the future.

### **Part 5: Director's role and Centre management**

The STEPS Centre was founded by three people: Melissa Leach, Ian Scoones and Andy Stirling, and was co-directed until 2014 by all three, with Melissa Leach as the main ESRC director. Since then, Ian Scoones has taken on this role, but the directorial role is very much a joint affair. Time allocations for

each of the directors has varied, but has ranged from 60% to 30%, with an average total of about 70-80% in total.

This core directorial group has been joined by others at different points in the Centre's life, with a changing and flexible matrix structure that has ensured decentralised responsibility and management. From the beginning we had three domains, led by domain convenors. These were extended to add a fourth domain in 2011. From 2014-2016, we had two deputy director roles for responsibility for impact and engagement and research respectively. And during the bridge year, we dropped the domain convenor role and instead had four thematic convenors, with a slightly different configuration. Each project had an internal PI lead (sometimes shared), and always with external partners. As we have built the Global Consortium, we have had 'hub champion' roles shared by Sussex faculty. Special initiatives, such as the STEPS New Manifesto, the transformation events series or the e-learning resource have been taken on by individuals within the Centre. The full staff list over the whole of the Centre's life is contained in Annex C, involving many faculty based at Sussex. Nearly every individual has taken on some level of responsibility: this has been very much a collective effort.

The whole operation has been anchored by two important functions. First, the research management/administration role, ably handled by Harriet Dudley from the beginning, assisted at various times by different people, but most recently Parveen Mungroo. Total time allocations for this role has ranged from 1FTE to 1.3FTE. Second, what became the ICE Unit in Phase 2 (Impact, Communications and Engagement), run by Julia Day from the beginning (full-time), joined by Nathan Oxley (0.5FTE), and then when Julia left, Nathan moved to a full-time role with a 0.5FTE assistant, Suzanne Fisher-Murray, during the bridge year. The ICE Unit was also supported by Adrian Ely, with a special focus on impact assessment and evaluation.

The following sections outline achievements under each of the headings in the 2011 contract.

- i) *Providing leadership to ensure the Centre performs well in the light of its objectives and its intellectual and engagement strategies*

The role of the directors has been to ensure that all the many moving parts of the Centre are effectively connected, but also engaged with the wider intellectual and political mission. Regular meetings with leads of different functions, combined with team retreats have ensured that the Centre has run smoothly. The ICE Unit has led on facilitating PIPA exercises (Annex A, A12) for all project activities since Phase 2, allowing us to reflect on and strategise around our engagement ambitions.

- ii) *Providing intellectual leadership to ensure the scientific quality of the Centre's outputs are as high as possible*

A key role for the directors has been to take a lead in developing the shared intellectual agenda of the Centre. Joint writing, seminars, theory afternoons, collective teaching, retreats and more have allowed this to happen. Continuous refreshment of ideas and theoretical perspectives has been facilitated with all members contributing. All outputs from the Centre are reviewed both internally (by Centre members) and externally. All Centre members have been encouraged to publish their material in peer reviewed outlets.

- iii) *Providing a lead on engaging with potential users of research, especially those outside the research community, to ensure the research is meeting the needs of users and beneficiaries*

Our PIPA exercises by project, domain and for the Centre as a whole identified who the key actors/networks were for each element of the Centre's work. These processes identified easy to reach

and more difficult to reach audiences, with strategies identified, appropriate to time/budgets. These individualised approaches were aggregated in our wider ICE strategy, led by our ICE team. Beyond this deliberate planning, the Centre – often through the directors – has responded to multiple invites to present at meetings, attend enquiries, contribute evidence, and be present, in alliance with others, at key events, and within important policy processes.

- iv) Providing input to public policy debates, to highlight the contribution of a major social science investment to important issues of public interest*

Our public outreach has been through extensive media engagement, usually linked to key moments in policy debate. Our contributions to wider debates about SDGs, rapid transitions to sustainability, biotechnology and GM crops, anti-microbial resistance, land and green grabbing and around the New Manifesto are all examples of where public engagement has been central to our engagement strategy.

- v) Providing input to ESRC policy debates, to help the Council's policymaking to take account of the views of those responsible for major investments*

Through several rounds the Centre has been involved in consultations on strategic priorities of the ESRC. This has been in relation to internal Council strategy, but also in relation to relationships with DFID (around joint DFID-ESRC funding) and more recently around the GCRF. STEPS directors have been involved in major ESRC selection and review processes, including for new Centres, and Professor Stirling sat on the ESRC's Research Committee for two terms (2009-12; 2012-15).

- vi) Providing a channel of communications for the ESRC with the research community to explain Council priorities.*

We have had close contact with our ESRC programme officers, and earlier through the Research Committee Liaison Member. We have had regular dialogue with the ESRC, and are able to share Council priorities with the wider community.

Overall in terms of management, and in line with our required responsibilities, the Centre has fulfilled obligations in respect of the Concordat on students and early career researchers, encouraging full participation in the Centre from the beginning. We have also employed an equal opportunities policy for recruitment, in line with IDS and University of Sussex rules.

### **Added value of the directors' input**

Earlier sections have commented on the added value of a Centre in terms of being able to be flexible, responsive and able to provide continuity in debate around a key topic, as well as supporting sustained partnerships over time. In the soft-funding environment of both IDS and SPRU, where most staff are reliant often on short-term project funding, and without long-term support, this sort of stability is vital, and allows for the linking of core funded work to a wider portfolio of funded work, leveraging considerable value from the Centre investment.

The role of the directors is to make sure this all happens smoothly, with full participation of all members, despite their often fragmented work portfolios. Feeling that you belong to a Centre, that it is your intellectual and political home is essential, and something that the directors can instil through their own commitment and passion.

The directors have to make a Centre be more than the sum of the parts. With multiple projects, and a complex matrix organisational structure, this is easier said than done. This means having and articulating a bigger vision – intellectual and normative – that binds people together, and a framework for work (such as the pathways approach) that provides a common vocabulary and reference point.

This also needs renewal so as to sustain the interest and engagement of long-term members, and make the environment exciting, enticing and somewhere where people want to work.

Balancing the collective goals with individual targets and priorities is important, and has to be managed carefully so there is sufficient openness, while at the same time coherence and direction.

### **Changes, problems and unexpected events**

We have had relatively little staff turnover over 11 years, although have actively tried to include new people (see above). Rapid changes in staff and capacity can easily be disruptive of the continuity of work in a Centre, but this has been mitigated, but keeping people engaged. This demonstrates the long-term commitment of many STEPS members to the Centre project, with eight members having been involved since the beginning. We have also encouraged new members to join, expanding the Centre and its staff profile. While sometimes accused of being insular from those not being funded by STEPS, this is far from the case in practice, given the array of people both at Sussex and beyond that have been involved on relatively little funding, and with each staff member having small time allocations provided.

Our institutional base has remained across IDS (formal contractees) and SPRU throughout. In the last few years, we have expanded to include staff in the School of Global Studies (Departments of Geography and International Relations). This cross-institutional arrangement on the Sussex campus has worked smoothly. A clear memorandum of understanding has governed the arrangement, and the associated financial transactions. The contrasts in DI/DA allocations has at times made management more challenging, as with DA arrangements, there is no possibility of managing in relation to deliverables, with management requiring only persuasion and good will to ensure outputs. With only a few instances over a decade where delivery of budgeted and promised outputs failing, this was a relatively small problem. Both in respect of institutional and individual staff arrangements, the Centre has operated in practice on the basis of trust and collegiality, rather than formal systems of management and contracting.

Some of our problems have emerged from our success. There have been expectations that have grown on what we can achieve and offer. This has brought pressures, and demands from others to be involved. One danger is the 'salami slicing' of commitments that results in people not having enough time to engage fully, and so feeling torn between commitments to the Centre and others. This is particularly challenging in soft funded institutions, where researchers are obliged to fill a portfolio of work at full cost.

One consequence of developing a strong, widely appreciated and recognised brand, with a strong international following is how to locate this within our existing institutional settings. This has largely been without problems, but there have been some frictions on occasion, as STEPS is cast as outside of and competitive to its own hosts. This again is the consequence of success, but something that has to be managed within the context of often hierarchical and territorial institutional politics. For most of the time, however, STEPS has been seen as a major asset to IDS and Sussex, and has been promoted as such, with its intellectual and practical contributions providing a significant source of reputational benefit across Sussex, as recently confirmed by the new Vice Chancellor.

Some unexpected events have proved amazing opportunities for making use of our research in exciting ways. This has been discussed earlier, with our flexible, responsive approach being able to seek out opportunities at moments that had not been planned for. Other unexpected events, such as the departure of key people such as co-director Melissa Leach and our head of the ICE Unit, Julia Day,

have been managed smoothly, as there have been existing capacities built within the Centre to take over without any disruption.

### **Changes in Centre's budget**

Overall, the activities of the STEPS Centre closely followed those outlined in the proposals, both for the first and second phases, and our financial reporting closely reflected the budget and financial breakdown as included in the Grant Offer Letters and associated financial appendices. The Centre benefitted greatly from the ESRC financial condition that permits funds to be vired within the Directly Incurred heading without the need to seek approval. This allowed the Centre to adapt flexibly to unforeseen changes in project plans and costs. These were sometimes staff cost changes as well as changes in non-staff costs.

It was therefore only on three occasions throughout the lifetime of the Centre that either the overall grant value was changed or approval was sought to vire between fund headings. The first occasion was in August 2008 when IDS requested that its named researchers be re-categorised as Directly Incurred Staff (from Directly Allocated Investigators). The reason provided for this request that the Institute receives no core HEFCE funding, and all costs charged to the STEPS Centre by IDS researchers are for time actually worked. ESRC agreed that it would be most appropriate for all IDS researchers to be costed in the budget as Directly Incurred, and we were informed that Brian Hooper had formally approved the change to the budget on 1 August 2008.

The second change that followed was initiated by ESRC in April 2010 when the rate of indexation that had been applied to the Phase one award was adjusted to reflect the falls in the official forecast levels of inflation for the financial years 2010/2011 and beyond. The adjustment resulted in a decrease in the overall budget from £3,838,096.47 to £3,821,847.47 (a total decrease of £16,249). Finally, the overall grant value for the Phase 2 award was adjusted when ESRC granted the Centre additional funding to cover a further 12 months' research activity, increasing the budget by £831,793.46.

### **Part 6: Reflections on the Centre and the Director's role**

From the beginning, the Centre has run smoothly, and relationships with the ESRC have been excellent. Having friendly, knowledgeable programme officers always available for informal discussions, has been essential, even when there have been hiccups in, for example, contracting with the Service Centre.

We have been delighted to invite programme officers and others from ESRC to our annual advisory committee meetings, conferences and so on, and have enjoyed them becoming substantively involved with the Centre, and not just with administrative management. The flexibility of funding, and the human-face to the process, has been a great asset, meaning that we have been able to do what have been able to do. In the early years the reporting was rather arduous, with very extensive annual reports and long lists of KPIs to be reported against. As we all agreed at the time, this was not especially useful.

The more light touch reporting since has been widely welcomed, although many remain unsure of the utility of the Researchfish posting, given all materials are available in a more useable and accessible format on our website. Collecting all this data has taken a huge amount of time, and has been very costly. We do hope it is used!

Rather than this data driven reporting, we have instead aimed to send an extended letter from the Director (along with our regular newsletters) to ESRC, our Advisory Committee and other close partners, as well as STEPS members, twice a year (usually May and December). This offers in an

informal way a narrative of progress, and some examples of what has been done, and associated highlights. This has been widely appreciated, and although not a formal or required mode of reporting, has been probably the most useful.

## **Part 7: Forward look**

We have reached a critical juncture in the STEPS Centre's life. We have built, and continue to extend, an intellectual and methodological approach (the pathways approach); we have engaged with a network of partners globally, linking to these ideas, intellectually, politically, practically (the STEPS Global Consortium); we have established a well-regarded training programme for next generation sustainability professionals (the STEPS Summer School), and we have created a widely used web space for sharing research, delivering e-learning and for engaging with policy debates.

In some ways the first 11 years have been the establishment phase. The basics are there, they are functioning well, and we have only just started realising the potentials of all these elements, now working together. This is why we do not want to pat ourselves on the collective back, and shut up shop. We have much more to do.

And compared to 2006 when we started, the STEPS Centre 'offer' is even more in demand. In an era when the politics of sustainability is in the news daily, when the world has signed up to the SDGs and the Paris Climate accord (or nearly so), and when the local and geopolitical dimensions of linking environment, society and development are so essential, in the context of 'global challenges', the sort of groundwork that the Centre has done – in terms of research, but also crucially in terms of network and capacity building – has a vital role to play.

This is perhaps especially relevant in the UK where the research community rallies around tackling problem-driven global challenges with cross-disciplinary work under the GCRF. The experiences, contacts, methods, core conceptual ideas of the STEPS Centre are for example relevant right across this agenda, offering the best of interdisciplinary social science in this global context. In the post Brexit era, with the UK and its research community trying to carve out new relationships, the established, trusted, and globally extensive connections developed by the STEPS Centre are vital, especially through the STEPS Global Consortium. Through this, we can demonstrate a truly international and horizontally connected vision for UK social science.

In our next phase (2018-21), with transition funding from ESRC and co-funding from a variety of sources, we will move from a Centre that funds and administers lots of individual research projects as we have done before to one that concentrates on our core platform functions, where we believe the major added value and most effective leverage of a Centre comes. This will involve:

- *Convening*: Each year we will hold a major event series, with one big event, or a series of smaller events, around a big theme in global sustainability. The aim will be to galvanise an international, interdisciplinary social science research community, together with policymakers and practitioners, to debate a big issue, coming to step-change solutions. Possible big themes – currently only keywords - may include, 'resilience', 'uncertainty', 'transformation' and 'nature'. These events series will allow STEPS approaches to articulate with a wider community in productive exchange. The events will be documented, animated and shared in innovative ways through multimedia approaches, and links with arts and media communities that we are currently building.
- *Networking*: We will continue to consolidate and build the STEPS Global Consortium, focusing on the six hubs that exist, but also contemplating adding others. We will build a coherent



governance structure, developing capacities in communications and policy engagement, so such functions are shared globally; and continue to work with collaborative research through Centre affiliated projects, which will be separately funded.

- *Influencing*: Through our now considerable network, centred on the Consortium, we will galvanise around particular policy processes that emerge in the post 2015 global sustainable development space. We will work closely with UN organisations, aid donors and national governments in realising the SDGs, but thinking about them as a wider political project for transformation, rather than as something divided up into individual goals and instrumentalised in policy.
- *Capacity building*: We will continue our STEPS Summer School each May, and look to expand this offer internationally in collaboration with our Global Consortium hubs. We will continue to update the e-learning site, with new curriculum contributions, and market this widely. We will explore the possibility of expanding our training to more professional training in shorter courses, for sustainability practitioners and policymakers.
- *Engagement*: We will continue with our communications and engagement work, via our website, social media, publication series etc. This will become a platform for both STEPS linked work at Sussex and increasingly across the Consortium through building the capacity of our Consortium hubs in communications and engagement work.

We will invite projects funded from elsewhere to affiliate with the Centre, and we will be active in fundraising for these, including from the GCRF, focusing on linking across hubs and with Sussex researchers affiliated to the Centre. The core requirements for such affiliations will remain as before – each must contribute substantively (intellectually and normatively) to the pathways approach, and provide some level of core funding for administrative/managerial and ICE functions.

The Centre will continue to provide a focus for intellectual activity around STEPS themes and will seek a wider network at Sussex and beyond to engage through events, communications activities and affiliated projects. We will continue to hold theory afternoons, seminars and other activities to enrich and extend the pathways approach at the core of our work.

We look forward to working closely with the ESRC in the next phases of the STEPS Centre.

## **Annexes**

Annex A: Research projects and individual work strands

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## A) STEPS Centre Crosscutting Activities

<b>A1. Project title:</b> Methods and Methodologies
<b>Researchers:</b> Entire STEPS team, led by Andy Stirling
<b>Partners:</b> Also involving as possible researchers from STEPS Consortium partner institutes
<b>Aims and objectives:</b> <ol style="list-style-type: none"><li>(1) To test existing transdisciplinary methods – and innovate and develop new variants and combinations – for appreciating alternative pathways to sustainability.</li><li>(2) To develop a methodological framework for distinguishing and organising these methods in order to help ‘broaden out’ and ‘open up’ pathways to sustainability.</li><li>(3) To undertake training and capacity building among early career researchers and partner networks, in order to ground, disseminate and improve these methods.</li></ol>
<b>Results and impacts achieved/potential for impact:</b> <p>Three stages in a dedicated strand of activity running through the entire eleven year duration of the STEPS Centre and its Bridge Year, undertook a wide variety of internal and external activities, meetings and initiatives in order to realise the above aims.</p> <p>A diversity of substantive outputs and achievements arose from this activity, including:</p> <ol style="list-style-type: none"><li>1) Significant methodological innovation embodied in a large number of STEPS projects outlined elsewhere in this reporting – and contributing to their publications and impacts as documented elsewhere in this reporting.</li><li>2) Dedicated publications and key parts of publications, specifically addressing different aspects and the underlying rationale of STEPS methodology and methods – as also detailed in outputs documented elsewhere in this present reporting.</li><li>3) Among these methods-specific outputs, are a recent internationally-collaborative paper in <a href="#">Sustainability Science</a> concerning diverse framings of sustainability in Thailand and India, with a further paper invited for Nature Sustainability.</li><li>4) Other STEPS methods outputs include multiple invited chapters for handbook volumes for ecological economics; environmental studies; innovation studies, law and regulation and by the US National Science Foundation and the OECD.</li><li>5) These outputs include a key strand of well-received activity in the STEPS-initiated ESRC Nexus Network initiative, which included production of a widely-cited monograph and the informing of the ESRC Training and Skills Committee.</li><li>6) The establishment of the University of Sussex during the lifetime of the STEPS Centre, of an ongoing non-profit university enterprise making available the STEPS-developed multicriteria mapping (MCM) software as a web-based tool.</li><li>7) Multicriteria mapping has been adopted as a method in literally hundreds of international projects over this time, including in major policy-related initiatives in a number of countries. It continues to experience significant growth in use.</li><li>8) A related particular STEPS-developed method, ‘diversity analysis’ has been widely acknowledged as a new means to address and make visible multiple kinds of social diversity – including adoption as a framework by UNESCO on cultural diversity.</li><li>9) But the main contribution of STEPS methods work lies not in any particular method, but in developing, disseminating and attracting international recognition for a capacity-building</li></ol>

contribution around a diversity of associated capabilities.

- 10) Recognition for the value of this STEPS methodological innovation as embodied in literally hundreds of invitations to speak on issues relating to STEPS methods by academic and policy institutions in dozens of countries, including many keynotes.
- 11) This also includes the organising of a two-part session at the 2016 ESRC Methods Festival in Bath and requests by researchers at numerous other research institutes to undertake dedicated training workshops on different aspects of STEPS methods.
- 12) Countries in which intensive in-person training has been delivered on various aspects of STEPS methods, include STEPS partners in China, Argentina, Mexico, Kenya, India the USA and Sweden, as well as Japan, Germany and the UK.
- 13) A major strand of highly successful methods capacity-building activities running through seven annual STEPS Summer Schools, in which a total of more than 250 early career researchers have been trained in STEPS methods and methodologies.
- 14) Development by STEPS Summer School alumni of a web-based resource portal on research and activism. This offers advice and resources on the practicalities and ethics of implementing STEPS methods to bridge the research / activism gap.
- 15) Developing as part of the wider STEPS website, of a major globally-accessible methodological resource – featuring 18 detailed briefings, as well as case studies, video materials and a comprehensive set of links to other web-based resources.
- 16) Integrated with and further adding to this resource, an innovative methods platform based on the successful Summer School framework has been incorporated as a major strand in the recently completed STEPS online course.

Overall, it is widely regarded that the STEPS Centre has been very successful in building an international reputation and establishing a strong legacy of excellence and practical accessibility in methodological innovation for ‘opening up’ pathways to sustainability.

**A2. Project title:** Conceptual Development of the Pathways Approach

**Researchers:** All STEPS members, Summer School participants, students and others

**Partners:** All project partners, especially those that became the Global Consortium

**Aims and objectives:**

Our original proposal laid out some of the ideas that became the STEPS Pathways approach. This was fleshed out in a series of collective activities during 2007, becoming the set of 7 working papers (below) on different strands of work. Our 2010 book, *Dynamic Sustainabilities*, consolidated this thinking. In Phase 2 we held a series of ‘walkshops’ and other activity-oriented events for STEPS members and partners in order to move the debate further. Themes discussed included knowledge and social imaginaries; social justice and inequality; innovation and technology; and political ecology and economy. Since 2012 our Summer School has become an important annual focal point for reflecting on and extending the pathways approach. During the bridge year and following a series of internal retreats, as well as the collective writing of the *Politics of Green Transformations* book, we highlighted a number of themes that we wanted to extend and work on, including incorporating historical and political economy approaches in the pathways approach. Our ‘theory afternoons’, initiated in 2015 provided a good opportunity to explore many of these themes (list below). A number of synthesis papers have emerged in recent years that complement the 2010 book. While broad and flexible, the ‘pathways approach’ has become a recognisable body of work, linked to a

range of theoretical perspectives, and associated with diverse methods (see methods portal).

**Results and impacts achieved/potential for impact:**

A number of highly cited outputs have resulted from this collective work, including:

Two major books:

1) *Dynamic Sustainabilities: Technology, Environment, Social Justice* (2010), by M. Leach, I. Scoones, A. Stirling, London: Earthscan

2) *The Politics of Green Transformations* (2015) I. Scoones, M. Leach, P. Newell (Eds.), London: Routledge

The original series of STEPS Working Papers:

Leach, M., Scoones, I. and Stirling, A. (2007) *Pathways to Sustainability: an overview of the STEPS Centre approach*, STEPS Approach Paper, Brighton: STEPS Centre

Scoones, I., Leach, M., Smith, A., Stagl, S., Stirling, A. and Thompson, J. (2007) *Dynamic Systems and the Challenge of Sustainability*, STEPS Working Paper 1, Brighton: STEPS Centre

Leach, M., Bloom, G., Ely, A., Nightingale, P., Scoones, I., Shah, E. and Smith, A. (2007) *Understanding Governance: pathways to sustainability*, STEPS Working Paper 2, Brighton: STEPS Centre

Stirling, A., Leach, M., Mehta, L., Scoones, I., Smith, A., Stagl, S. and Thompson, J. (2007) *Empowering Designs: towards more progressive appraisal of sustainability*, STEPS Working Paper 3, Brighton: STEPS Centre

Thompson, J., Millstone, E., Scoones, I., Ely, A., Marshall, F., Shah, E. and Stagl, S. (2007) *Agri-food System Dynamics: pathways to sustainability in an era of uncertainty*, STEPS Working Paper 4, Brighton: STEPS Centre

Bloom, G., Edström, J., Leach, M., Lucas, H., MacGregor, H., Standing, H. and Waldman, L. (2007) *Health in a Dynamic World*, STEPS Working Paper 5, Brighton: STEPS Centre

Mehta, L., Marshall, F., Movik, S., Stirling, A., Shah, E., Smith, A. and Thompson, J. (2007) *Liquid Dynamics: challenges for sustainability in water and sanitation*, STEPS Working Paper 6, Brighton: STEPS Centre

And a whole array of articles (see Researchfish for more)

- [The Politics of Sustainability and Development](#) | Scoones Annual Review of Environment and Resources 41, 293-319
- [Grassroots innovation and innovation democracy](#) A Smith, A Stirling ESRC STEPS Centre
- [Precaution in the Governance of Technology](#) A Stirling
- [Knowing doing governing: realizing heterodyne democracies](#) A Stirling Knowing Governance, 259-289
- [Accelerating sustainability: why political economy matters](#) H Schmitz, I Scoones IDS
- [Sustainable livelihoods and rural development](#) | Scoones Practical Action Publishing
- [Experiments in technology assessment for international development: what are the lessons](#)

for institutionalisation? A Ely, P van Zwanenberg, A Stirling *Technikfolgenabschätzung–Theorie und Praxis* 24 (1), 59-67

- [From controlling ‘the transition’ to culturing plural radical progress](#), A Stirling *The Politics of Green Transformations*, 54
- [Transforming power: Social science and the politics of energy choices](#) A Stirling, *Energy Research & Social Science* 1, 83-95
- [Approaches to uncertainty for policy-makers and their advisors](#) A Hart, D Spiegelhalter, S Kinghorn-Perry, A Stirling UK Government
- [A new innovation politics for global pathways to sustainability?](#) A Ely, A Smith, M Leach, A Stirling, I Scoones EPC Government and Policy
- [Transforming Innovation for Sustainability](#) J Rockström, P Olsson, C Folke, E Arond, J Thompson, A Ely, E Millstone, ...*Ecology and Society*
- [Dynamic sustainabilities: a response](#) M Leach, I Scoones, A Stirling *Environment and Planning A* 43 (5), 1235-1237

These have provided the foundation for further extensions, and debates, including with other conceptual approaches (such as socio-ecological systems etc.). A number of recent contributions to the literature have reviewed and engaged with the concept of pathways in relation to sustainability, identifying the STEPS contribution as central.

Many students at Sussex and beyond (not least around 250 Summer School participants) have made use of pathways thinking in different ways in their work (see list of STEPS PhD students). This body of work has become central to the STEPS Summer School and e-learning course.

### **A3. Project title:** Transformations Events

**Researchers:** Various, in particular Andrew Stirling, Peter Newell, Adrian Smith, Amber Huff, Ian Scoones

**Partners:** New Weather Institute for the series, plus local partners for individual events

#### **Aims and objectives:**

The Transformations event series was an activity carried out over the 2016-2017 ‘bridging’ year. The STEPS Centre had published the *Politics of Green Transformations* book in 2015, and continued the theme with discussions, reading and seminars related to field work during the bridging year. To complement and further inspire this, the *Transformations* event series aimed to engage a wider public audience in encounters between our own work and other parallel research centres and fields, where ideas of transformation are central. Instead of a larger annual conference, this would consist of a series of smaller-scale events throughout the year, in different parts of the UK, with a different thematic focus each time – learning from different kinds of transformations from diverse times and places with diverse causes and outcomes. We hoped that new alliances, ideas and debates could be opened up by engaging with activists, practitioners, academics and interested citizens in this way. We aimed to document the events as a series, and pull together multimedia resources from it, as well as present some common threads, themes and insights synthetically towards the end of the year.

#### **Results and impacts achieved/potential for impact:**

By fortune, the planning of our events coincided with a series on ‘Rapid Transitions’ conceived by the New Weather Institute with the involvement of Peter Newell (a STEPS member) through the Centre for Global Political Economy. The New Weather Institute aimed to learn from historical and

current examples of rapid transition in areas such as culture, finance, design, energy, though focused on the implications for achieving radical responses to climate change. STEPS and the New Weather Institute decided to join together in promoting the series and sharing resources and insights. The STEPS-led events explored transformations in Kurdish democratic confederalism, the digital revolution and the water-energy-food 'Nexus'. STEPS hosted materials from all the events on our website, presented as a series ([steps-centre.org/transformations-events](https://steps-centre.org/transformations-events)), including video, a collection of 8 blogposts/opinion pieces by participants and organisers, a dedicated mailing list, and newsletter updates with a 'Transformations' sub-brand and leaflet to tie the series together. At the end of the series, a jointly-authored booklet (also available open access) aimed at a popular audience, *How did we do that? The Possibility of Rapid Transition*, was produced, using examples revealed by the events series and incorporating ideas from both STEPS and the New Weather Institute. The booklet was launched at a public event at the Friends Meeting House in Brighton which included speakers who are strongly engaged in environmental movements and academia in the UK, which brought together those involved in the series and a wider network to inspire each other, and discuss practical ways forward in campaigning and networking for change. The event generated a very lively discussion both in the venue and on social media, with multiple ideas for follow up activities, including a proposal for an online platform bringing together examples and ideas from transitions and transformations around the world.

**A4. Project title:** Pathways to Sustainability Book Series

**Researchers:** Most STEPS researchers

**Partners:** Many partners

**Aims and objectives:**

We established the book series with the independent publisher, Earthscan, in order to provide a platform for sharing our work, and extending our audience. The book series is an important legacy of the Centre, with a total of 20 books published (or nearly so). The Centre provided around £3000 for each book, in order to buy back around 250 copies. These have been distributed to libraries in the developing world, mostly Africa. The books have been widely read, and the sales levels have been good for an academic series. Earthscan was taken over by Routledge and we continued the series with them. In the last year, we have experimented with a FreeBook series, whereby selections of existing books in the series are presented online with a short introduction for free. Pre-print chapters excerpted from books in the series have also been made available via the STEPS website. Since Open Access publishing budgets allocated by the UK government do not currently cover books, this is the best route to extending access, beyond our free distribution programme.

**Results and impacts achieved/potential for impact:**

Here is a list of all the titles, with authors:

- Agronomy for Development: The Politics of Knowledge in Agricultural Research edited by James Sumberg
- Grassroots Innovation Movements by Adrian Smith, Mariano Fressoli, Dinesh Abrol, Elisa Arond, Adrian Ely
- Sustainable Energy for All: Innovation, technology and pro-poor green transformations by David Ockwell & Rob Byrne
- One Health: Science, politics and zoonotic disease in Africa edited by Kevin Bardosh
- Adapting to Climate Uncertainty in African Agriculture: Narratives and knowledge politics by Stephen Whitfield
- Gender Equality and Sustainable Development edited by Melissa Leach



- *Governing Agricultural Sustainability: Global lessons from GM crops* edited by Phil Macnaghten & Susana Carro-Ripalda
- *Carbon Conflicts and Forest Landscapes in Africa* edited by Melissa Leach, Ian Scoones
- *The Politics of Green Transformations* edited by Ian Scoones, Melissa Leach, Peter Newell
- *Transforming Health Markets in Asia and Africa: Improving Quality and Access for the Poor* edited by Gerald Bloom, Barun Kanjilal, Henry Lucas, David H. Peters
- *Pastoralism and Development in Africa: Dynamic Change at the Margins* edited by Andy Catley, Jeremy Lind, Ian Scoones
- *Contested Agronomy: Agricultural Research in a Changing World* edited by James Sumberg, John Thompson
- *Regulating Technology: International Harmonization and Local Realities* by Patrick van Zwaneberg, Adrian Ely & Adrian Smith
- *The Politics of Asbestos: Understandings of Risk, Disease and Protest* by Linda Waldman
- *Rice Biofortification: Lessons for Global Science and Development* by Sally Brooks
- *Epidemics: Science, Governance and Social Justice* edited by Melissa Leach & Sarah Dry
- *Avian Influenza: Science, Policy and Politics* edited by Ian Scoones
- *Dynamic Sustainabilities: Technology, Environment, Social Justice* edited by Melissa Leach, Ian Scoones & Andy Stirling

Citation rates for each title have been good, especially for those addressing the broad scope of STEPS concerns. *Dynamic Sustainabilities* and *The Politics of Green Transformations* have become standard texts on many courses around the world. We have been especially pleased with the feedback from libraries that received free copies of the books over the years. With no acquisition budgets, these books have become essential additions to these libraries in Africa, and librarians have noted their extensive use.

#### **A5. Project title:** STEPS Centre Funded PhD Students

##### **Aims and objectives:**

Doctoral research and training has been central to the STEPS Centre’s research and capacity-building work since its establishment in 2006. With our group of eight funded doctoral students, we have wanted to expand our capacity building efforts in ways that extend (but also test) our approaches, and create a next-generation of STEPS-affiliated researchers.

By encouraging boundary-crossing and cross-learning – between natural and social science perspectives, science studies and development studies, between sectors, and between research and practice – the Centre has sought to encourage the development of ‘bridging professionals’ who can contribute more effectively to contemporary sustainability challenges. Through engagement with STEPS work on framing and narratives, we have sought to encourage critical reflection on assumptions and positions, contributing to building reflexive researchers and practitioners.

##### **Results and impacts achieved/potential for impact:**

Doctoral students linked to the Centre have worked on topics that connect closely with STEPS themes, domains and projects, a balance of independence and integration that successfully enabled students to draw from and contribute centrally to the Centre’s ideas and activities. All were co-supervised by a STEPS member from each institution, to encourage cross-institutional ideas and interaction. The students also had opportunities to become involved in wider STEPS activities, enabling them to develop wider skills, beyond their formal DTC research training, in areas such as workshop organisation, policy engagement, and communications.

**Students:**

1) Tim Karpouzoglou, completed November 2012

Title: *“Our power rests with numbers”. The role of expert-led policy processes in addressing water quality: The case of peri-urban areas in the national capital region of Delhi, India*

2) Paul Forster, completed December 2012

Title: *Risk, communications and behaviour change: Avian and pandemic influenza in Indonesia.*

3) Katharina Welle, completed November 2013

Title: *Monitoring performance or performing monitoring? The case of rural water access in Ethiopia*

4) Annie Wilkinson, completed December 2013

Title: *The process and practice of diagnosis: Innovations in diagnostics for Lassa fever in Sierra Leone*

5) Anna Walnycki, completed December 2013

Title: *Rights on the edge: The right to water and the peri-urban drinking water committees of Cochabamba*

6) Harley Pope, completed March 2014

Title: *Participatory crop improvement: The challenges and opportunities for institutionalisation in the Indian public research sector*

7) Sophie Valeix (ongoing)

Title: *One Health and integration? Veterinarians and zoonotic diseases in Ghana*

8) Justin Pickard (ongoing)

Title: *Theorising infrastructure in Ahmedabad—obduracy, translation, and urban socio-technical change*

**A6. Project title:** Biotechnology Research Archive

**Researchers:** Ian Scoones – and other STEPS members

**Aims and objectives:**

A decade after the major GM controversies, we realised that STEPS members had been doing a lot of work on this theme over many years, and decided to put it together in a single archive as a resource for students, researchers and activists. Contributors have included Sally Brooks, Adrian Ely, Dominic Glover, Erik Millstone, Ian Scoones, Andy Stirling, among others.

**Results and impacts achieved/potential for impact:**

Since 2010/2011, the archive has been widely used, and has become an important reference source.

The backgrounder produced by Ian Scoones, which summarised some of the big themes, has been heavily downloaded, and used for briefings, media articles and more.

Eldis, the development information service, produced a guide based on the materials in the archive, while the development newsletter produced a special iD21 issue.

Various events on this theme, including in India and the UK, have provided links to the archive, and it continues to be used.

<https://steps-centre.org/project/biotechnology-2/>

#### **A7. Project title:** The STEPS Global Consortium

**Researchers:** All STEPS members, but with hub champions for China (Adrian Ely), India (Fiona Marshall), Argentina (Adrian Smith), Arizona/US (Andy Stirling), Sweden/SRC (Ian Scoones) and Kenya (Dave Ockwell/Rob Byrne)

**Partners:**

The STEPS Global Consortium involves the following hubs in addition to STEPS at Sussex:

Argentina: Fundación CENIT (Centro de Investigaciones para la Transformación)

China: Beijing Normal University (BNU)

India: Jawaharlal Nehru University (JNU)

Kenya; ACTS, ATPS, Stockholm Environment Institute (SEI) Africa

Mexico: National Autonomous University of Mexico (UNAM)

Sweden: Stockholm Resilience Centre

US: Arizona State University (ASU)

**Results and impacts achieved/potential for impact:**

The establishment of the Consortium has been widely welcomed. We had successfully launches of hubs in East Africa (Nairobi), South America (Buenos Aires), India (Delhi) and China (Beijing) during 2015-16. Our Consortium brochure (download via [steps-centre.org/global](https://steps-centre.org/global)) highlights the activities and partnerships, while our new Global Consortium web pages at that address provide further information with regular news and updates.

During this period the 'Pathways Network' Transformative Knowledge Network was funded by the International Social Science Council (ISSC) ([steps-centre.org/project/pathways-network](https://steps-centre.org/project/pathways-network)), and this has provided a firm foundation for developing linkages between hub partners around themes of energy (Kenya and China), water/urban change (India and Mexico/US), and food/agriculture (Argentina/UK), with input from partners in Sweden on methodologies. This work has become an important platform for exchange across hubs, but also as a focus for policy engagement on the ground around the practical challenges of implementing the SDGs.

Wider methodological development around the idea of 'transformation labs' has been central to this work, as has reflection on linking research with activism and transformational change. To this end, we had some external funding to convene a process of reflection on scholar activism during the 2016 Summer School, resulting in a web based resource ([learning.steps-centre.org/mod/book/view.php?id=45](https://learning.steps-centre.org/mod/book/view.php?id=45)).

ISSC and STEPS funding has supported a number of junior researchers from across all hubs to come to Summer School in the last few years. This is consolidating the linkages across the Consortium through different individuals, at different career stages, beyond those who initiated the hubs.

During 2016 we applied (ultimately unsuccessfully) for two large GCRF funding sources (an ESRC centre and a GCRF partnership) together with the Consortium. While led by Sussex, both bids were co-constructed, and embedded across the Consortium. Having failed, the future of the Consortium

hangs in the balance, although ISSC funds continue during 2018, and we continue to seek further resources to support this enormously important network.

**A8. Project title:** STEPS Summer School

**Researchers:** Many STEPS researchers, led and convened by Andy Stirling and Ian Scoones

**Partners:** Consortium hub partners as participants, but also more broadly connecting to many organisations internationally

**Aims and objectives:**

With growing interest in the STEPS Centre, and the challenges of hosting MA courses and PhDs at Sussex (Phase 2 had very limited support for linked studentships, and on-going challenges of recruitment meant that the MA in Science, Sustainability and Development at IDS closed, pending a wider review of sustainability teaching at Master's level at Sussex, which has not yet concluded), we decided to launch a two-week Summer School in 2012 (see [steps-centre.org/summer-school](http://steps-centre.org/summer-school))

Since then we have run 6 Summer Schools, involving 252 students from 41 countries. All participants are currently undertaking doctoral studies or have recently finished. We have targeted this group, following wider assessments that this transition from study to professional careers is crucial, and where some of the major challenges – conceptual, methodological, practical – lie. MA post grad and other courses and more conventional professional training covers other needs, but this we identified as a gap. With huge demand for places ever since, this analysis proved accurate.

The core material for the course was originally the content of the *Dynamic Sustainabilities* book, but was extended to include an array of case studies from STEPS work. From the beginning the Summer School was designed to be an open, interactive space for learning, with a range of pedagogic tools. We had used the idea of 'walkshops' in the start-up to Phase 2 of STEPS, and two walkshops became central to the programme, alongside interactive exercises such as 'Rivers of Life' (for getting to know each other), World Cafés (to review diverse topics from different standpoints), open space bazaars (for sharing methods), and so on. The programme culminates in a student-run conference, which over time has changed from a fairly conventional format to a much more innovative space using a range of creative arts and multimedia approaches for discussing sustainability.

Since the beginning we have had high demand for around 40 places. Around 250 people apply each year, from every part of the world. We have been lucky to have had funding for bursaries for African participants from IDRC, from UKIERI for Indian participants, and from Sussex for Chinese participants (although these funds have now all ceased). Supplementary bursaries are supplied by STEPS core funds, although we do charge a fee of £700 which covers direct costs.

Given the high demand for Summer School training, we have also created an e-learning resource. This has been launched in June 2017.

**Results and impacts achieved/potential for impact:**

While never explicitly appearing in any of our proposals for funding, the Summer School is probably one of the most successful activities we have undertaken. It provides a focal point for the Centre each year in May, an opportunity to test out ideas with a fantastic group from all over the world.

In terms of the capacity building objectives of the Centre, the Summer School has become our core contribution. The feedback from participants each year has been uniformly positive. Some examples

of video reflections can be found [here](#).

The Summer School has built a really important network of committed researchers, many of whom keep in touch with each other and the Centre. The [Alumni group](#) was established to facilitate this, with Facebook and LinkedIn groups, and involves all past Summer School students, as well as others (such as Visiting Fellows, students, past staff) who have engaged with the Centre. This numbers over 300 today, and is a very active group, which we keep in regular touch with through posting material, encouraging blogs and an annual newsletter.

We are planning to keep the Summer School going and will be seeking funds for bursaries to ensure it maintains global participation. During 2017, we will be reviewing costs and exploring ways of making the Summer School a self-funding activity in time. We will market the e-learning course intensively during 2017, aiming to update it after a period, and following feedback from participants.

**A9. Project title:** Events Programme

**Researchers:** All STEPS members

**Partners:** Multiple, see table for details

**Aims and objectives:**

Throughout the Centre’s life we have had a very strong events programme, with a range of symposia, conferences and workshops. Many smaller events took place as part of projects, linked to specific dissemination activities. This report highlights larger events that cut across the Centre’s work, and were funded by ESRC core funds.

Our events programme provides an opportunity to convene people, but also we have been conscious to ensure that those who could not attend could gain access. In most cases we have posted reports on events in the form of blogs or event reports, as well as produced videos of talks or short interviews with participants, freely available to watch online. Many events have resulted in publications, including special issues and books. An archive of materials from selected major events is on our website: [steps-centre.org/events/steps-centre-conference-archive](http://steps-centre.org/events/steps-centre-conference-archive)

Number	Title	Dates	Location
100	STEPS Centre Symposium at the DSA 2007 Conference	18-20 September 2007	IDS
80	Farmer First Revisited (with Future Agricultures Consortium)	December 2007	IDS
70	Towards a Green Revolution in Africa (with Future Agricultures Consortium /Salzburg Global Seminar)	30 April – 2 May 2008	Salzburg, Austria
70	Reframing Resilience	24-26 September 2008	SPRU, The Freeman Centre
70	Dangerous Ideas in Development: GM Crops and the global food crisis (with APPG Debt, Aid & Trade)	10 June 2009	Westminster
65	Innovation, Sustainability, Development: Emerging themes, challenges and opportunities	24-Sep-09	SPRU, The Freeman Centre
44	Liquid Dynamics – Accessing Water and	2-3 November	IDS

	Sanitation in an uncertain age	2009	
50	Contested Agronomy	18-19 November 2010	IDS
195	Launch of 'Innovation, Sustainability, Development: A New Manifesto'	15-Jun-10	Royal Society, London
120	Pathways to Sustainability: Agendas for a New Politics of Environment, Development and Social Justice	23 & 24 Sept 2010	IDS
70	Water and Sanitation Symposium: Some for all?	22-23 March 2011	IDS
175	Global Land Grabbing (with Future Agricultures/Land Deals Politics Initiative)	6-8 April 2011	IDS
80	STEPS-led side events at Planet Under Pressure Conference	26-29 March 2012	ExCel London
60	Colloquium: Not another nexus? Critical Thinking on the 'New Security Convergence' in Energy, Food, Climate and Water (with SOAS)	26 October 2012	SOAS, London
150	Credibility across cultures: expertise, uncertainty and the global politics of scientific advice	6-7 Feb 2013	University of Sussex Conference Centre
70	Symposium on Exploring Pathways to Sustainability (with JNU)	10-11 Feb 2014	Jawaharlal Nehru University, New Delhi
75	Pathways to Sustainability in a Changing China (with School of Social Development & Public Policy, BNU)	20-21 April 2015	Beijing Normal University
210	<a href="#">Resource Politics: Transforming Pathways to Sustainability</a>	7-9 September 2015	IDS
100	Pathways to Sustainable Urbanisation (with JNU)	29-30 January 2016	Jawaharlal Nehru University, New Delhi
100	<a href="#">Contested Agronomy: Whose Agronomy Counts?</a> with Future Agricultures, Wageningen UR & CIMMYT	23-25 February 2016	IDS
150	One Health for the Real World (Dynamic Drivers of Disease Consortium + ZSL)	17-18 March 2016	ZSL
40	Sustainability Transformations: The Intersecting Roles of State, Market and Society (panel at IDS 50 Conference 'States, Markets and Society', 5 & 6 July 2016)	05-Jul-16	IDS
Between 20-150	'Transformations Events' – see steps-centre.org/transformations-events (with New Weather Institute and various local partners)	2016 and 2017	UK (London, Manchester, Wales, Brighton) + Sigtuna, Sweden

**Results and impacts achieved/potential for impact:**

Our regular events have been important for both sharing our research results but also extending our

research foci and scope. All provided excellent opportunities for networking, both across UK academics, but also globally. Several thousand people have engaged with the Centre through these events, always resulting in follow up in terms of future research collaborations, publications and so on. In our wider community, STEPS events are seen as fun, exciting and challenging – and we definitely aim to break the mould of the standard conference format (most of the time). While expensive to put on, and difficult to organise, with impacts often intangible (linked to connections made, conversations had), we believe these events have been central to the wider success of STEPS as a Centre. Indicators of impact are the willingness of participants to engage in follow-up activities and workshops (examples are the Contested Agronomy, Land Grabbing and Liquid Dynamics events). The South Asia and China events helped to launch the STEPS Consortium Hubs there, and positioned them as a source of expertise and engagement on important issues. The Transformations events culminated in the launch of an open access booklet, as well as emerging ideas for a longer-term research/activist/civil society network to work together on network building and creative actions for promoting transformations to sustainability in the UK and beyond.

**A10. Project title:** Land, Water and Green Grabbing

**Researchers:** Ian Scoones, Melissa Leach, Lyla Mehta and others

**Aims and objectives:**

Responding to the major post-financial crisis emergence of ‘land grabbing’, STEPS, together with other partners around the world (including ISS, the Future Agricultures Consortium, Cornell University, PLAAS and others), initiated a series of events/publication series aimed at exploring what was happening where, and what the consequences were. The aim was to enhance understanding, raise awareness and stimulate an evidence-informed policy debate about the implications of resource grabbing.

**Results and impacts achieved/potential for impact:**

Two major international conferences were held in 2011 and 2012 at IDS, Sussex and Cornell, Ithaca. These each attracted around 200 participants and many papers. They generated significant media attention, from a full page in *The Economist* to radio and TV interviews with many media outlets from Europe and Africa in particular.

A series of journal special issues, (co-)edited by STEPS members emerged from these events, including:

- Borrás Jr, S. M., Hall, R., Scoones, I., White, B., & Wolford, W. (2011). Towards a better understanding of global land grabbing: an editorial introduction. *The Journal of Peasant Studies*, 38(2), 209-216.
- White, B., Borrás Jr, S. M., Hall, R., Scoones, I., & Wolford, W. (2012). The new enclosures: critical perspectives on corporate land deals. *The Journal of Peasant Studies*, 39(3-4), 619-647.
- Wolford, W., Borrás, S.M., Hall, R., Scoones, I. and White, B., 2013. Governing global land deals: The role of the state in the rush for land. *Development and change*, 44(2), pp.189-210.
- Fairhead, J., Leach, M., & Scoones, I. (2012). Green Grabbing: a new appropriation of nature? *Journal of Peasant Studies*, 39(2), 237-261.
- Hall, R., Edelman, M., Borrás Jr, S. M., Scoones, I., White, B., & Wolford, W. (2015). Resistance, acquiescence or incorporation? An introduction to land grabbing and political reactions ‘from below’. *Journal of Peasant Studies*, 42(3-4), 467-488.
- Mehta, L., Veldwisch, G. J., & Franco, J. (2012). Introduction to the Special Issue: Water grabbing? Focus on the (re) appropriation of finite water resources. *Water Alternatives*, 5(2),

193.

Each of these has been very extensively cited, and the body of work has become the standard reference material on the subject. STEPS, with others, was able to respond to the moment, and galvanise interest, via small grants, events, and publications.

In 2015, STEPS hosted the major Resource Politics conference at Sussex, which provided an opportunity to reflect on, but also extend these debates. This was a defining event for many, connecting STEPS work to wider networks working on political ecology and resources politics internationally. A special issue of *Geoforum* is in production, emerging from this event, and edited by STEPS members (Allouche, Huff and Mehta)

See: <https://steps-centre.org/blog/impact-story-2-from-land-grabs-to-the-anthropocene/>

**A11. Project title:** STEPS Centre Theory Afternoons

**Researchers:** Peter Newell and all STEPS members

**Aims and objectives:**

During 2015-17, we had a series of STEPS ‘theory afternoons’, scheduled 2.30-5pm. These were aimed at sharing excitements around conceptual perspectives that could potentially contribute to the enriching of our STEPS pathways approach, and particularly thinking about the ‘transformations’.

**Results and impacts achieved/potential for impact:**

These were hosted by STEPS members/affiliates, but attended by a wider range of people, including PhD students, from across Sussex departments/units. Each session involved a short talk, often accompanied by a few key readings/videos, followed by an open, informal discussion, continuing very often in the IDS bar. A dropbox folder of relevant readings was generated and shared among those attending.

These informal afternoon sessions proved immensely useful during our bridge year period for consolidating our work, and extended significantly the original proposal for working only on 3 themes during the year.

The theory afternoons were complemented by a reading group on the ‘financialisation of nature’, which focused in on theoretical perspectives linked to our resource politics theme, and built on discussions at the 2015 Resource Politics conference.

We are hoping to continue both these initiatives, and a few theory sessions have been scheduled for the next academic year.

1. Relational agency (Andy Stirling and Saurabh Arora) June 2015.
2. Political economy approaches to pathways to sustainability (Peter Newell) October 2015
3. Nancy Fraser’s ‘triple movement’ ideas (Ian Scoones) November 18<sup>th</sup> 2015
4. Incumbency (Lucy Baker, Phil Johnstone and Andy Stirling): Tuesday 2 February 2016
5. Capitalizations/Financialisations of nature (Amber Huff and Andrea Brock) Thursday 28 April 2016
6. Feminist political ecology/economy, (Lyla Mehta) Friday 6 May 2016
7. Varieties of capitalism and beyond (Matthew Lockwood and Florian Kern): September 16<sup>th</sup> 2016



8. Toward an Ecology of Practices Approach to Participation, Democracy and Ethics (Saurabh Arora) October 14<sup>th</sup> 2016
9. Comparative analysis of transformational alliances, (Wei Shen and Hubert Schmitz) Friday 18 November
10. Technography (Dom Glover) April 7<sup>th</sup> 2017
11. Micro-mobilisations (Fiona Marshall and Gordon McGranahan) date TBC
12. Vernacular securities (Amber Huff and Jeremy Allouche) date TBC

**A12. Project title:** Participatory Impact Pathways Analysis

**Researchers:** All

**Partners:** Most project partners

**Aims and objectives:**

PIPA is a planning and monitoring & evaluation tool designed to help the people involved in a project, program or organization make explicit their theories of change - in other words, how they see themselves achieving their goals and having impact. It was originally designed for development projects on a much larger scale than the STEPS projects, but was seen as appropriate because of its flexibility and inclusivity. The STEPS Centre has used an adapted form of PIPA to guide its research projects since 2011.

PIPA begins with a workshop where participants share their visions for the project and draw network maps to identify 'impact pathways'. This involves a wider group of people than the immediate core project team in discussing the potential impact of a project and the strategies to achieve it. Visual, colourful network maps are created, along with text describing the project vision, power dynamics, agency, networks, power, attitudes, communication strategies and potential opportunities for intervention and change. The text and maps can then be revisited at intervals throughout the project, allowing ongoing reflection and adaptation to changing circumstances.

PIPAs were done retrospectively for some STEPS projects at the end of Phase 1, and they were done ex ante for 8 projects at the beginning of phase 2. The overall aim was to improve the potential impact and engagement of STEPS projects with the material and political circumstances in which they were conducted. The objectives were to create a greater sense of ownership of project impact within local partners and stakeholders; to generate documents which could be used as a reference & source of reflection throughout multi-year projects; and to help compare impact strategies across projects to inform the STEPS Centre's overall practice. An additional aim was to test how PIPA could be implemented in comparatively low-budget research projects and document this learning to share it with other potential users of the approach.

**Results and impacts achieved/potential for impact:**

One of the impacts from using this approach has been learning how to implement it effectively in project planning. The method has now been used in some affiliated projects, including the Dynamic Drivers of Disease Consortium and an ESRC-DFID project on farming and poverty in Kenya and India, using insights gained from the STEPS Centre's experience.

To share our learning from the initiative, the STEPS ICE (Impact, Communication and Engagement) team wrote a well-received [working paper](#) (Ely and Oxley 2014) on our use of PIPA, which was shared and discussed in person with the originators of the method – and shared via a seminar at the Institute of Development Studies. Since then, we have been called upon to provide guidance on using PIPA in other projects on the Sussex campus, including training for the DFID-funded Transform

Nutrition programme, a workshop at the campus wide ‘Sussex Impact Day’ and via blog posts on the STEPS and Research to Action websites. Adrian Ely was asked to outline our use of PIPA to the first UK Low Carbon Energy for Development Network workshop of the Understanding Sustainable Energy Solution (USES) Network in July 2014, and it was presented at an international workshop of the ACKnowl-EJ network in Beirut, Lebanon, June 2017.

For the projects themselves, we asked project convenors to report on the effects of using PIPA. Several projects reported that wider participation in the PIPA allowed a better informed plan for engaging with stakeholders; and had important team-building effects, crucial to the success of a multi-country research project. PIPAs helped with identifying key organisations to approach, filling in gaps in individual project members’ knowledge. One project (Grassroots Innovation) reported being surprised at the knowledge of networks already present at the start, which the PIPA helped to reveal.

When used iteratively throughout projects, PIPA has helped to reveal changes taking place in networks and policy arenas. In one project, the PIPA helped to make the case for recruiting an India-based communications officer who could help broker knowledge between policy makers, the media and local communities more effectively than a UK-based team.

The benefits from PIPA described above are discussed in more detail in the working paper, which can be downloaded here: [steps-centre.org/impact](http://steps-centre.org/impact)

We will continue to use PIPA in projects related to STEPS, and explore the implications and limitations of the approach. It has been added to the suite of methods written up on the STEPS website. While not a magic bullet, it has allowed STEPS projects across the board to develop a common approach to articulating and documenting impacts, and provided a quick and effective way to involve local partners in thinking together about the way that research projects engage with the wider contexts in which they operate.

**A13. Project title:** STEPS Centre Visiting Fellows

**Researchers:** STEPS Centre researchers supported and mentored the visitors

**Aims and objectives:**

To enable STEPS Centre partners and others whose work overlapped with the Centre’s research areas and methodologies to spend time at the Centre’s administrative hub (Institute of Development Studies, University of Sussex) developing their research and interacting with other STEPS Centre researchers and doctoral students.

**Results and impacts achieved/potential for impact:**

In addition to achieving the aims and objectives above, the visiting fellows have contributed greatly to the Centre’s thinking and approaches, and are key members of the Centre’s alumni network. A selection of the visitors are listed below:

First name	Organisation	Arrival date	Fellowship research area
Saverio Kratli	Institute of Development Studies	27/08/2007	Outbreeding animal science
Betty Kibaara	Tegemeo Institute, Kenya	26/11/2007	Environmental change and maize pathways in Kenya

Hannington Odame	CABE, Kenya	26/11/2007	Environmental change and maize pathways in Kenya
Karen Fisher	The University of Auckland	12/01/2008	Hybrid water governance in the Philippines
Louise Fortman	UC Berkeley	03/02/2008	Participatory research in rural livelihoods
Emery Roe	UC Berkeley	03/02/2008	High reliability management
Mark Dubois	The Worldfish Centre, Cambodia	24/06/2008	People-centred ecology linking human and ecosystem health
Chen Chuanbo	Renming University of China	30/07/2008	Health system reform in China
Ohid Yakub	Sussex University	01/09/2008	The development of Poliomyelitis vaccines
Shova Thapa	SPRU, Sussex University	17/09/2008	The 'resilience approach' in peri-urban sustainability
Laura Goldberg	CENIT, Buenos Aires, Argentina	29/09/2008	Regulation and use of drugs and seeds in Argentina
Erika Bjureby	The Rainforest Foundation	08/12/2008	Climate change mitigation strategies
Valeria Arza	CENIT, Buenos Aires, Argentina	02/01/2009	Rethinking Regulation Project research
Hannah Bulloch	Australian National University	08/10/2009	Food security in the Philippines
Joleen Timko	University of British Columbia	01/11/2009	Health and environmental interactions in Sub-Saharan Africa
Cressida Jervis Read	Sussex University	01/03/2010	Water, governance and place-making in Delhi
Adelaide Lusambili	NHS UK	01/03/2010	Health in peri-urban African areas
Anna Zimmer	Bonn University	01/03/2010	Waste water governance in Delhi
Synne Movik	Norwegian Institute for Water Research	01/03/2010	The peri-urban interface of South Asian cities
Awadhendra Sharan	SARAI, India	19/05/2010	The peri-urban interface of South Asian cities
Yantai Chen	China Institute for Science and Technology Policy	22/05/2010	Biotech innovation: A perspective from China
Eliza Lehner	Harvard University	21/06/2010	Biochar project research
Mariano Fressoli	Universidad Nacional de Quilmes, Argentina	04/10/2010	Social technologies in Latin America
Iokine Rodriguez	University of East Anglia	01/03/2011	Transforming an environmental conflict in Venezuela
Raphaelle Moor	Indian Institute of Management, Bangalore	03/01/2012	India at risk
Rosalind Rouse	ESRC	21/02/2012	Research Council developments in international development and health
Elisabeth Oosterlaken	TU Delft, The Netherlands	30/04/2012	The capability approach, technology and design

Andrés Hueso	Universitat Politècnica de València	01/09/2012	Sustainability of Community-Led Total Sanitation
Maria Armijos	Independent Consultant	01/07/2013	Environmental justice and sanitation policies
Katharina Welle	Independent Consultant	01/09/2013	ICT and the 3D agenda
Ben Ramalingam	Overseas Development Institute	01/10/2013	Complex systems and health
Jorgelina Sannazzaro	University of Salamanca	01/02/2014	Citizen participation and expert knowledge
Andreas Sheba	Manchester University	16/03/2015	The neoliberalisation/financialisation of nature

## B) STEPS Centre Communications Activities

**B1. Project title:** STEPS Centre Website and Related Digital Platforms

**Researchers:** ICE Unit (Nathan Oxley, Julia Day, Adrian Ely, Suzanne Fisher-Murray)

**Partners:** Global Consortium

**Aims and objectives:**

Since its launch in 2006 the STEPS Centre has used an independent, stand-alone website ([steps-centre.org](http://steps-centre.org)) to document our activities and encourage people from a variety of different audiences to engage with our work. The website has aimed to provide a living and growing archive of Centre outputs that is easy to search and browse by theme, type of output and so on; to advertise new events and news stories; and to provoke debate and engagement through a lively and regular blog. Until 2012 the blog was hosted separately and the site was maintained using the Dreamweaver content management system, but with the rate of production of publications and news, it eventually came to outgrow this format and new technology became available, making it necessary to refresh and reorganise the site.

In 2012, with new projects and a host of new activities, the website was redesigned and moved to a custom-built WordPress site, and all the existing blog content was integrated into the new platform, to prevent users getting lost and to create a closer integration between the blog and other kinds of content. In that new website we organised content into 4 'domains' (Agriculture & Food, Energy & Climate, Health & Disease and Water & Sanitation) and a growing list of projects. We also developed new kinds of content: video introductions by STEPS researchers to domains and projects; 'hot topics' for emerging and topical issues; impact stories; and a sub-section on Methods and Methodologies with video lectures, slides and examples.

In 2016 the site was further refreshed and made mobile-compatible, and 6 more themes added to the 4 original 'domains' (including Technology & Innovation, Urbanisation, Resource Politics, Governance, and Understanding Sustainability). These domains bring together blog posts, publications, news and projects together, and are updated automatically when new content is added. Similarly, a new platform for the Global Consortium was developed as part of this website refresh, bringing together regionally-specific content. A more engaging Methods portal was developed, as well as an expanded Learning section with links to the new online course.

The STEPS website has been only one of many online platforms and channels used by the Centre. Alongside its main website, the Centre has also created smaller, more focused web platforms for projects and events: the biggest was for the project [Innovation, Sustainability, Development: A New Manifesto](#), which since 2009 has housed an interactive, crowdsourced timeline, an interactive map of Manifesto roundtables, downloads of papers and the final Manifesto text, and an innovative '[Multimedia Manifesto](#)' with the final text interspersed with multimedia content and links sourced from the roundtables. We also provided support for the [African Farmer game](#)'s website and social media presence, and created successful standalone, free WordPress sites for the [Resource Politics conference](#) in 2015 and the [Contested Agronomy conference](#) in 2016, featuring calls for papers, video, blog posts and event information. All these events and initiatives have also been featured strongly on the main STEPS site and social media.

We have consistently shared our news, commentary and publications via the Institute of Development Studies and SPRU websites since the beginning, and regularly join forces to promote news on social media. We have also been much helped by the ESRC in profiling content on social

media, and around major announcements (including ESRC awards, new initiatives and articles in Society Now). We also coordinate with the hubs in the Global Consortium, and our affiliated organisations (e.g. Green Economy Coalition, Future Earth) for major announcements. There is an extensive archive of our video content on YouTube (<https://www.youtube.com/user/STEPSCentre>) and photo galleries on Flickr (<https://www.flickr.com/photos/stepscentre/>) showing our work on methods, major events, Summer Schools and field pictures. We have recently begun used the free blogging platform Medium.com for mainly long-form, multimedia pieces ([see this story for an example](#)), and impact stories, reaching another audience via Medium’s social tools. Since 2009, the Centre has been active on Twitter and Facebook. Mailing lists, with about 5000 subscribers in total, have been a crucial tool for us to drive content to the website, share news or publications, call for participation in conferences, and ensure that our events are well-attended. We always see a spike in website visits after newsletters, and regularly see our subscribers sharing our news on social media.

**Results and impacts achieved/potential for impact:**

Since our current analytics (Google Analytics) have been applied in 2012 the main STEPS site has had just under 800,000 pageviews (an average of 160,000 views per year). Views have been largely consistent year by year. Users in the global South are prominent, with India, Kenya and South Africa among the top ten sources of new users. The blog has been moderately successful in attracting engagement, with just over 200 comments – and has on occasion attracted wider debate (for example around the [Anthropocene](#)). The Manifesto site received 146,000 pageviews, and our videos have been watched on YouTube over 124,000 times. Key to the good reputation of our website has been the high level of willingness of academic STEPS members, Summer School participants, visiting fellows and project partners to contribute high-quality, thoughtful blog posts. This has led to a unique and extensive archive of comment and reflection spanning the history of the Centre, accessible to all, which will continue to live on and be shared – including many first-time bloggers and academics from the global South.

Although social media has been important for us in monitoring and joining online discussions around our thematic area, we have had to use it strategically, given other priorities. The STEPS Centre’s social media presence has especially been important in our use of Twitter around our conferences (in particular the Credibility Across Cultures symposium which featured a live projected Twitter feed, and the Resource Politics conference), the Summer School and publication launches, with a following growing to just under 5,800. We have kept a record of the social conversation around big events by using Storify (<https://storify.com/stepscentre>) – see the [Resource Politics Storify](#) for an example how this has been used. On Facebook, our main page has 960 followers, but more importantly, the site has been an important and relatively low-input tool for us to stay in touch with our Summer School alumni and to create spaces for them to interact with each other, with alumni regularly sharing photos of chance encounters, meetups and job opportunities.

Overall, our use of online platforms has taken a holistic and integrated approach, spreading our presence over a number of platforms and inviting different forms of engagement across each one. Despite the potential for fragmentation, there have been clear benefits in allowing us to experiment with formats and keep pace with developments in technology and online culture. There is much still to learn about how we can use the web effectively to inform and engage with users of (and contributors to) our research, and we regularly research new digital methods and discuss these with colleagues in our host institutions.

**B2. Project title:** Engaging with the Rio plus 20 Conference and the Sustainable Development Goals

**Researchers:** All STEPS members

**Partners:** *Stockholm Resilience Centre, Tellus Institute, Green Economy Coalition, International Institute for Environment & Development (IIED)*

**Aims and objectives:**

The Centre has galvanised its expertise to engage with the Sustainable Development Goal process from early in Phase 2 (see [SDG-related content on our website](#)). The STEPS Centre was active throughout Planet Under Pressure (see [list of activities](#)), considered an important stepping stone on the way to Rio.

The Rio plus 20 conference itself in 2012 provided an important moment. The STEPS Centre submitted a [position paper to the Rio+20 zero draft](#) preparation process, in which it argued that science, technology and innovation have essential roles to play in sustainability; but innovation should give recognition and power to poorer people. Melissa Leach as STEPS director attended the conference, and presented at a variety of events, including the [High-level Dialogue on Global Sustainability: Tipping the scales towards sustainability – The Future We Choose](#).

Meanwhile, the Centre led a series of Guardian articles profiling our research – both from individual projects/domains, and across the Centre.

- [It's time for sustainable development](#)
- [Why Rio+20 must not leave the politics out of sustainable development](#)
- [Edge of sustainability: why Rio+20 mustn't ignore people on city fringe](#)
- [Rio+20 must make inclusive innovation stepping stone to a sustainable future](#)
- [Achieving universal energy access](#)

Together with our colleagues at the Stockholm Resilience Centre (now part of the STEPS Global Consortium), we collectively prepared a paper linking SRC and STEPS ideas in new and productive ways. This was [published in the OA journal Ecology and Society](#) and was widely shared at Rio.

- Leach, M., Rockström, J., Raskin, P., Scoones, I., Stirling, A., Smith, A., Thompson, J., Millstone, E., Ely, A., Arond, E., Folke, C. and Olsson, P. (2012) Transforming innovation for sustainability, *Ecology and Society*, 17(2):11

In addition, Melissa Leach, Johan Rockström and Kate Raworth worked together in debates about how the planetary boundaries ideas can link with wider questions of social justice and social floors of income and well-being, contributing to an important piece in the [2013 World Social Science report](#):

- Leach, M., Raworth, K., & Rockström, J. (2013). Between social and planetary boundaries: navigating pathways in the safe and just space for humanity. *World social science report, 2013*, 84-89.

An [IDS briefing](#) was also produced based on STEPS work. These activities aimed to present a distinctive perspective on innovation and sustainability at a turning point for global collective action on development, by working with high profile and influential partners and networks, and through the media to maximise our contribution to the debate.

**Results and impacts achieved/potential for impact:**

Following Rio, the Centre was able to contribute widely to the debates around the SDGs, arguing strongly that the challenge was to think of these as a political platform for transformatory change, not one where a UN/governmental system got bogged down in goals and targets. This meant, as with all STEPS work, politics had to be central to sustainable development. Making this case, we published a series of articles in the Huffington Post, as part of a commissioned special feature on the SDGs around their launch in 2015 and on the STEPS site:

- [Gender should be part of the conversation across \\*all\\* SDGs](#)

- [Rethinking Africa's sustainable development pathways](#)
- [Giving flesh to the science and innovation we need to see](#)
- [Science, politics and the post-Rio+20 agenda](#)

In addition, STEPS members contributed to various parliamentary inquiries in the UK framed by SDG concerns in this period.

In 2016, wanting to take stock a year and half on, together with the Independent Expert Group for the LDCs and IIED, we co-hosted a meeting in London to reflect on progress and challenges around the SDGs. A [summary of the event](#) gives links to papers, interviews and other materials.

In order to link STEPS ideas on SDGs to a wider audience, Ian Scoones has given talks at UK festivals (Womad and Wilderness) in 2016 and 2017, encouraging a debate among a wider public on SDGs, and the importance of politics.

The [STEPS Annual Lecture in 2017](#), by incoming director of UNDP and former director of UNEP, Achim Steiner, focusing on implementing the SDGs, and provoked interesting debate, around the challenges of multilateralism today. Video from the lecture was widely shared online.

Our work on the SDGs links in turn to a wider discussion about the Anthropocene, and growth/degrowth. Led by Andy Stirling, these blog debates with Johan Rockström and Giorgos Kallis have been featured on the STEPS website. See:

- <https://steps-centre.org/?s=Anthropocene>
- <https://steps-centre.org/tag/degrowth/>

In the period to 2030, the STEPS Centre agenda remains highly relevant, and we will continue to engage in academic and public debates around implementing the SDGs.

### **B3. Project title:** STEPS Learning (E-Learning Website)

**Researchers:** Ian Scoones, David Ockwell, Andy Stirling

**Partners:** HowToMoodle (e-learning development company), + advice from Sophie Marsden (e-learning specialist at IDS) and Jonas Torrens, SPRU; Fondation Charles Leopold Mayer pour le progrès de l'Homme (FPH) funded the guide to linking research & activism.

#### **Aims and objectives:**

Launched in June 2017, this project builds on the highly successful STEPS Summer School (see separate impact case) to introduce a wider online audience to the STEPS pathways approach, case studies and methodologies. The website can be found at [learning.steps-centre.org](http://learning.steps-centre.org). The overall aim is to mobilise digital learning methods to support professionals around the world who are seeking to develop interdisciplinary approaches and skills in sustainability.

The objectives are to reach a worldwide audience, especially for those with limited access to funding; and to be used complementary to face-to-face engagement, to foster more in-depth understanding of the pathways approach among our partners, in particular in researchers involved in the Hubs in the Pathways to Sustainability Global Consortium.

Until now, the Summer School has been our most important vehicle for rapid training of a new community of sustainability professionals. While over 250 participants have benefited from this, many more have been unsuccessful in applying or have not had the resources to attend. The e-



learning resource aims to address this inequity by lowering the barrier to access for selected materials. A six-part course on 'Pathways to Sustainability', including video lectures, aims to fulfil this purpose.

In response to feedback from participants in previous years, at the 2016 Summer School we organised an activity on research-activism linkages, led by some of the participants and facilitated by Andy Stirling. The outputs of this activity – reflections, reading lists and links to scholar-activism resources – have been shared as part of the new e-learning site.

The website is built on the open-source Moodle platform – widely used in e-learning – so that content can be easily updated and expanded, with extra modules added to existing courses, or entirely new courses created. In creating it, we benefited from expert advice from others who had successfully developed online courses at the Stockholm Resilience Centre and IDS.

**Results and impacts achieved/potential for impact:**

The site was launched in June 2017 by STEPS with the help of its partners and funders, including the ESRC, the International Social Science Council, IDS and SPRU, and the Global Consortium hubs. The current content aims to be the step in the creation of a larger resource, with further courses and guides, depending on funding and demand from our partners.

The research-activism activity at the Summer School, funded by FPH by small honorariums to students who participated, was explicitly designed with the creation of an online resource in mind. Students reported that the exercise gave them a unique opportunity to reflect on their own practice and learn from each other's experience. Their feedback is summarised in a short series of video interviews here: <https://www.youtube.com/watch?v=D45UKs3xLEU>

Potential impacts and future activities include:

- The launch of an additional STEPS-related 'Health and Environment' course, in development
- Use of the online course in training within and via the hubs of the Pathways to Sustainability Global Consortium, with additional materials & modules to be developed by individual hubs in consultation with STEPS
- Integration into the offering of an emerging programme of online & blended learning by the Institute of Development Studies – discussions are ongoing
- Creation of further training courses on the platform, for particular audiences and themes (e.g. building on successful training courses with policy makers in Kenya carried out by the Africa Sustainability Hub)

**B4. Project title:** STEPS Annual Lectures

**Researchers:** Ian Scoones, Andy Stirling

**Partners:** Guest lecturers (see main text)

**Aims and objectives:**

In 2012 we established our STEPS Annual Lecture series. This coincides with the first day of the Summer School. In 2012 and 2013 we additionally held public debates as part of the Brighton Festival during the Summer School.

The annual lecture is open to the general public and is widely advertised in Brighton and Hove and Lewes. We have invited a range of speakers, aiming at big picture, provocative lectures for a general

audience.

Speakers have included Tim Jackson, Michael Jacobs, Mariana Mazzucato, Mike Hulme, Harriet Bulkeley and Achim Steiner. The public debates, held in central Brighton to increase access for the general public, have involved speakers and chairs from politics, business, local government, academia and campaigning organisations – including the MP Caroline Lucas, Nick Robins of HSBC, the journalist Tom Clarke, Jim Watson (now of UKERC), Doug Parr of Greenpeace, and the academic and campaigner Alice Bell.

The lectures frequently resonated with current events at a global scale, including the Paris Climate Change conference and its outcome in 2015 and 2016; and the implementation of the Sustainable Development Goals, amid perceived threats to current systems of global governance, in 2017. The public debates, because of their location and the more general audience, aimed to connect global concerns to local issues, and the audience were encouraged to participate.

#### **Results and impacts achieved/potential for impact:**

The following links are to videos/audio/slide shows of the lectures and public events:

- Video/slides: [Achim Steiner: Doomed to fail or bound to succeed? Sustainable Development and the Green Economy Agenda – Revisited](#) (2017)
- Video: [Prof Harriet Bulkeley: Can we govern the climate?](#) (2016)
- Video: [Prof Mike Hulme on climate change arguments and culture](#) (2015)
- Video/audio/slides: [Prof Mariana Mazzucato: The Green Entrepreneurial State](#) (2014)
- Video: [Prof Michael Jacobs: capitalism, carbon and climate change](#) | [Slides](#) (2013)
- Video: [Public debate on fuel poverty, climate change and social justice](#) (2013)
- Video: [Prof Tim Jackson: the future of the green economy](#) (2012)
- Audio: [Public debate on Rio+20 & collective action](#) (2012)

It attracts around 150-200 people each year, and the lecture theatre is always full to capacity. We have also encouraged discussion on social media around the events.

Although we have not collected individual responses to the lectures, they have regularly attracted a large audience, and been viewed or listened to by considerably more people (around 4,000) online.

The lectures have enabled STEPS to build on our relationships with the guest lecturers, and build informal links with the local community – including students and staff at the University who would not normally attend seminars; and visitors from Brighton & Hove and the surrounding area. The lectures have always been followed by a drinks reception, allowing informal networking and discussion; they have been a rich source of debate and provocation for the Summer School participants, and one of the selling points of the Summer School itself. Often, they have been the largest and most high-profile event of the year in the University where big issues relating to sustainability have been discussed with an open and diverse audience – arguably an essential part of the University's role in public life. They have also been an important way for the STEPS Centre to raise its profile, and that of the Summer School; through online channels, we have been able to share the video and audio more widely with an international audience.

**B5. Project title:** STEPS Centre Seminars**Researchers:** See below**Aims and objectives:**

To disseminate the research carried out by STEPS Centre members and affiliated partners

**Results and impacts achieved/potential for impact:**

Please see below a reduced list of seminars that were presented at the Institute of Development Studies to audiences made up of students and academics from all over the University of Sussex:

Name	Seminar title	Date
Mike Hulme	Climate Change in Context: Scientific Construction and Social Meaning	07/06/2007
Tom Downing	Climate Adaptation as a Social Process in the Risk Society?	08/10/2007
Polly Eriksen	Resilience, Food Systems and Food Security	29/10/2007
Bill Adams	The Political Ecology of Biodiversity Conservation	27/11/2007
Andrew Jamison	How to Combine Science and Politics in Environmental Governance	09/01/2008
Les Levidow	Global Biofuel Crops	24/01/2008
Geoff Oldham	The Sussex Manifesto and its Aftermath	06/02/2008
John Colvin	Approaches to Water Governance in the UK and South Africa	10/03/2008
Detlef Muller-Mahn	Disasters, Development and the Production of Risk	19/03/2008
Wenzel Geissler	Modern Times with Kenyan Government Medical Scientists	06/05/2008
Francis X. Johnson	Biofuels, Climate and Development: Emerging Issues and Challenges	15/09/2008
Fred Steward	Transformative Innovation for the Global Good	30/10/2008
Fabian Scholtes	Moral knowledge in technology-based development	31/10/2008
Andrew Barnett	Innovation - re-labelling research or a shift in paradigm	16/01/2009
Harriet Bulkeley	Socio-technical transitions and urban climate change experiments	09/02/2009
Louise Fortmann	Participatory Research in Conservation and Rural Livelihoods	09/02/2009
Emery Roe	High Reliability Management: Operating on the Edge	12/02/2009
Steve Lindsay	Screening Homes to Prevent Malaria	24/02/2009
John Harris	What is Science For?	26/02/2009
Jo Chataway	Below the Radar Innovation	09/03/2009
Hannah Bullock	Food Security in Pacific Island Countries	23/10/2009
Ponge Awuor	Indigenous Knowledge and Sustainable Crop Production in Kenya	23/10/2009
Anna Zimmer	Waste water Governance in Delhi	24/03/2010
Adelaide Lusambili	Flying Toilets: The Dirty Little Secret of Kibera Slums	31/03/2010
Mark Zeitoun	The Roots and Future of Water Conflicts in the Middle East	19/05/2010
Bruce Lankford	Play Mediation in Natural Resources Management	01/06/2010
Mariano Fressoli	Technologies for Social Inclusion in Latin America	17/06/2010
Undala Alam	India and Pakistan's Truculent Cooperation: Is 50 Years Enough?	16/11/2010
Lisa Richey	Brand Aid: Shopping Well to Save the World	25/11/2010
Ronald J. Herring	India's Second Transgenic Crop and Bt Cotton	09/12/2010
Ana Cascão	Breaking Waters: The Birth of a New Nile State	22/02/2011

Peter Mollinga	Irrigation Reform and Corruption in Indonesia	08/03/2011
Iokiñe Rodriguez	Reflexive Governance and Local Identity Building in Venezuela	31/03/2011
Arif Hasan	The Politics of Development	11/04/2011
Lucrezia Tincani	Wild Foods, Resilience and Food Security in Rural Burkina Faso	16/05/2011
Sam Wong	Tackling Elite Capture through Institutional Change	16/11/2011
Subodh Wagle	Independent Regulation: Experiences from India	02/12/2011
Jan Selby	Israeli-Palestinian Water Cooperation: A New Analysis	01/03/2012
Lindsey Nelson	Exploring Engineering Design Processes to Spur Educational Change	12/03/2012
Sarah Wolcott	Towards Strategies for Navigating Complex Change	29/05/2012
Ilse Oosterlaken	Local Content, Local Voice Podcasting Project in Zimbabwe	07/06/2012
Kate Raworth	A Safe and Just Space for Humanity: Living Within the Doughnut	10/10/2012
David Reubi	On the Economisation of Global Public Health	08/11/2012
Oliver Greenfield	Green Economy: Geopolitics and an Idea	12/12/2012
Mariana Mazzucato	The Entrepreneurial State: Implications for Innovation & Inequality	16/04/2013
Bram Büscher	The Politics of Neoliberal Conservation in Southern Africa	16/10/2013
David Tyfield	E-Mobility Transition in China	06/11/2013
Ben Ramalingam	Aid on the Edge of Chaos	04/12/2013
Paul Richards	Researching Social Cohesion in Sierra Leone	14/01/2014
Kevin Urama	Science, Technology and Innovation for Development	20/02/2014
Sam Geall	Chinese Environmental Journalism and Sustainable Development	11/03/2014
Debojyoti Das	The Dialectics of Social and Environmental Change in the Sundarbans	25/03/2014
Ted Shrecker	Exploring the Mechanics of the Inequality Machine	25/04/2014
Kamal Kar	The Potential of Community-Led Total Sanitation (CLTS)	20/05/2014
Daniel O'Connor	The Ethical Challenges of Using Social Media in Health Research	04/07/2014
Andrew Simms	Cancel the Apocalypse: New Pathways to Sustainability	08/10/2014
Bruce Lankford	Resource Efficiency Complexity and the Commons	15/01/2015
Andreas Scheba	Opportunities and Threats of REDD+ in Tanzania	17/03/2015
Hubert Schmitz	Low Carbon Innovation Paths in Europe and Asia	08/05/2015
Nora McKeon	Food Security Governance	14/05/2015
Yixin Dai	Chinese Renewable Energy Policy	15/07/2015
Deborah Brautigam	Will Africa Feed China? Rumors and Realities	16/11/2015
Glenn Stone	The Making and Unmaking of Agricultural Knowledge	10/12/2015
Helene Ahlborg	Power and Micro-Level Politics in Energy Transitions	11/04/2016
Kolya Abramski	Shifting Energy Demand, Expanding the Renewable Energy Sector	08/06/2016
Ray Ison	STEPS: To a Systemic Ecology of Mind	27/06/2016
Tania Li	What is Politics?	09/09/2016
Louise Fortmann	Authorship Practices in Participatory Research	03/04/2017
Charles Tonui	Community Based Organisation of Forests in Kenya	12/04/2017
Todd Crane	Interdisciplinary Science in Research for Development	02/05/2017
Ruth Hall	The Reinvention of Land Reform in South Africa	10/05/2017

## C) STEPS Centre Domains

### C1. Project title: Food and Agriculture Domain

**Researchers:** Domain Convenors: Erik Millstone and John Thompson; IDS – Imogen Bellwood-Howard, Sally Brooks, Dominic Glover, Melissa Leach, Jeremy Lind, Michael Loevinsohn, Ian Scoones, James Sumberg, Stephen Whitfield; Nalan Yuksel; SPRU – Saurabh Arora, Elisa Arond, Adrian Ely, Fiona Marshall, Harley Pope, Sigrid Stagl; Other key collaborators: Jens Andersson, Joanes Atela, Andy Catley, Ken Giller, Judith Good, James Jackson, Hussein Mahmoud, Eleanor Martin, Hannington Odame, Philip Woodhouse.

**Partners:** African Centre for Technology Studies (ACTS); Centre for African Bioentrepreneurship (CABE); Department of Engineering and Informatics, University of Sussex; Egerton University, Kenya; Future Agricultures Consortium; International Livestock Research Institute (ILRI); International Maize and Wheat Improvement Center (CIMMYT); Salzburg Global Seminar, Austria; Tufts University, USA; Wageningen University, The Netherlands

#### **Aims and objectives:**

The Food and Agriculture Domain of STEPS drew together long-standing streams of work in IDS on the political economy of agricultural policies (notably under the DFID-funded [Future Agricultures Consortium](#)) and SPRU (notably on EU-funded work on food safety and standards) with STEPS thematic and project work to build understandings of contemporary agri-food pathways and their governance. Overall, the STEPS approach has brought a focus on the diverse, and often conflicting, narratives about the future of agri-food systems, and the importance of bringing alternative visions rooted in farmers' own perspectives and practices centre-stage in key policy debates.

#### **Results and impacts achieved/potential for impact:**

Building on initial conceptual contributions in the first phase of the Centre (e.g. [STEPS Working Paper](#) and journal article in *Environmental Science and Policy* on 'Agri-Food System Dynamics'), the work of the STEPS Food and Agriculture Domain has resulted in high-profile contributions to a number of areas of debate, including: agricultural innovation (e.g. through the major STEPS/FAC conference and book [Beyond Farmer First: Innovation for Agricultural Research for Development](#); a major event with the Salzburg Global Seminar on directions and strategies [Towards an African Green Revolution?](#), and the publication of new articles, reviews and a ten-year [Biotechnology Research Archive](#) on whether GM technologies can work for the poor); food governance (e.g. through reports and facilitated workshops to the UK Foresight inquiry into [Global Food and Farming Futures](#) and the [UK Global Food Security Programme](#)), and *Livestock Standards and Regulation in Africa* (e.g. through a co-funded activity supported by the Wellcome Trust).

During the second phase of STEPS, the Food and Agriculture Domain team focused on analysing debates related to contemporary agronomic research and development. This led to the convening of an international workshop and [an international conference](#) and produced several journal articles and two books in the STEPS Earthscan 'Pathways to Sustainability' series, [Contested Agronomy: Agricultural Research in a Changing World](#) (2012) and [Agronomy for Development: The Politics of Knowledge in Agricultural Research](#) (2017). Building on the livestock theme, domain members also hosted an international conference and published a major book on [Pastoralism and Development in Africa: Dynamic Change at the Margins](#), with partners in the Future Agricultures Consortium. In addition, much domain work during this period also focused on global land/green grabbing, together with the affiliated Future Agricultures Consortium, the Land Deals Politics Initiative, and associated ESRC research on Anthropogenic Dark Earths, soil fertility and Biochar in West Africa. This work attracted significant attention, with over 7000 downloads of the lead article in a [special issue of the Journal of Peasant Studies](#) on green grabbing. It also produced the STEPS Earthscan volume on

[Carbon Conflicts and Forest Landscapes in Africa](#). Finally, in partnership with the University of Sussex Department of Engineering and Informatics, domain members produced an interactive computer game – entitled *'The African Farmer Game'* – to simulate small farmer decision-making under uncertainty in risk-prone environments. The game was shortlisted for the 'Nominet Trust 100' prize and featured on the Social Tech Guide website. It is being used in teaching and training settings around the world, from the University of Kwazulu-Natal to the University of Tokyo and is run every year during the STEPS Summer School.

**C2. Project title:** Energy and Climate Change Domain

**Researchers:** David Ockwell, Rob Byrne, Jim Watson

**Partners:** African Technology Policy Studies Network (ATPS), African Centre for Technology Studies (ACTS), Stockholm Environment Institute (SEI) Africa, Energy research Centre of the Netherlands (ECN), Low Carbon Energy for Development Network (LCEDN), Universidad Nacional del Centro de la Provincia de Buenos Aires (UNICEN), Indian Institute for Technology (IIT) in Delhi, Tufts University, University of Nijmegen, Climate Strategies, Tyndall Centre for Climate Change Research, Rand Europe, Tsinghua University, Carleton University, Kulima Integrated Development Solutions (South Africa), Practical Action (Kenya)

**Aims and objectives:**

For the STEPS Energy and Climate Change (E&CC) theme, the main aim was to identify pathways that would enable poor people to sustainably access energy services.

This problem connects with many aspects of development agendas and is complicated by different contexts, multiple scales, contested priorities, justice and equity, powers and politics, and historical experiences. It encompasses access to technologies at the personal and household level, as well as the community-scale, but also the infrastructure of energy supply and directions of industrialisation (e.g. the design and manufacture of technologies that are accessible – broadly understood – to poor people).

The E&CC theme took and developed a socio-technical perspective on transformative innovation to better understand these complexities, their dynamics over time, and how new 'pro-poor' sustainable energy pathways can emerge and be fostered. In particular, the E&CC theme worked on specific objectives to analyse the political economies of knowledge, capabilities and diversity, each of which is poorly articulated in socio-technical transitions thinking at present.

National and international efforts are increasingly (and urgently) mobilising around energy and climate change. These efforts are making the complexities and dynamics mentioned above much more visible, and could be seen as 'windows of opportunity' in energy and climate change 'regimes'. There are opportunities to challenge (dominant) narratives that integrate energy and climate change and thereby open up alternative narratives that could help shape pro-poor sustainable energy-service pathways.

Ideas with which we intended to engage

- Debates on energy access for the poor and marginalised in developing countries
- The role of energy in development
- International discussions about climate governance, particularly in respect of the impact on the poor and marginalised in developing countries

Ideas we intended to promote

- Direction, distribution and diversity (3Ds) in energy access interventions
- Political economy of knowledge, capabilities and the 3Ds in energy and development
- The pathways approach to analysis of pro-poor sustainable energy access

**Results and impacts achieved/potential for impact:**

In the E&CC theme we engaged with many of the actors we identified at the outset as being sympathetic to our ideas and/or strategic to the promotion of those ideas. We also engaged with several other actors as our activities unfolded. As a result of these engagements, our research, and internal STEPS Centre discussions, we developed our initial academic ideas and policy proposals, articulating these in various publications culminating in their synthesis in a book for the Pathways series.

We have presented and been invited to present our research and policy recommendations in many forums, both academic and policy. These include, amongst others: four Conferences of the Parties (COPs), UN Environment Programme (Paris), Green Climate Fund (Singapore), Technology Executive Committee (Bonn), UN Conference on Trade and Development (Geneva), two LCEDN knowledge-sharing events, German Development Institute (Bonn), Durham Energy Institute, Kings College London, University of East Anglia, Danish Technical University, University of Edinburgh, University College London, two Global Climate Policy Conferences (London and Dar es Salaam).

We also designed and delivered training on energy and climate change to senior executives of the African Development Bank, and wrote two background chapters for the 2012 African Development Report on Green Growth, both of which were used in the report with little editing. For the UNFCCC Secretariat, we were invited to write a report on how innovation systems are relevant to technology transfer in the context of climate change. Although we were not allowed to make public this consultation nor the fact that we undertook it (due to internal UNFCCC politics), it gave us an opportunity to articulate more thoroughly our ideas on innovation systems and climate change. This led to a journal publication but also to developing training for African policy makers in how innovation systems could be helpful to them achieving their nations' climate and development goals. We have been working on this with our Africa Sustainability Hub partners (ACTS, ATPS and SEI) to develop and deliver the training, along with ongoing support, for those African policy makers who are involved with the UNFCCC climate change negotiations. It is too soon to understand any impact from this training but the reception from the policy makers involved has been very positive so far.

In addition to the consultations noted above, we have conducted three research projects, two funded by the Climate and Development Knowledge Network (CDKN) and one funded by the ESRC (through the STEPS Centre). Each project has enabled us to develop various concepts related to our overarching perspective: theorising the role of innovation systems in climate technology transfer (CDKN-funded Climate Technology and Development project, working with ECN, Nijmegen, UNICEN, IIT and Tufts); theorising the building of innovation systems for pro-poor energy access (CDKN-funded Pro-Poor Low Carbon Development project, working with ATPS and supported by the Kenyan Ministry of Science and Technology); and theorising the political economy of innovation system building (ESRC STEPS-funded Political Economy of State-Led Transformations in Pro-Poor Energy Access, working with ACTS). The first two of these projects, together with the work for the UNFCCC, provided the material from which we published several journal papers and a Pathways Series book. And we have worked with two students to write papers based on their dissertations, supervised by us: one paper is on the importance of understanding energy practices for developing consumer finance business models for solar home systems; the other paper is on the gendered impact in Kenya of the climate technology entrepreneur narrative promoted by the World Bank. Indeed, we are attracting an increasing number of PhD students interested in applying and developing these ideas to energy access, gender and climate change.

### **Publications**

Byrne, R., Smith, A., Watson, J. and Ockwell, D. (2012) "Energy Pathways in Low-Carbon Development: The Need to Go beyond Technology Transfer", in D. Ockwell and A. Mallett (eds.) *Low-Carbon Technology Transfer: From Rhetoric to Reality*, Routledge, London and New York, pp123-142  
Byrne, R. and Mbeva, K. (2017) "The Political Economy of State-led Transformations in Pro-poor Low

Carbon Energy: A Case Study of Solar PV in Kenya”, STEPS Working Paper, 91, STEPS Centre, Brighton

Marshall, M., Ockwell, D. and Byrne, R. (2017) “Sustainable Energy for All, or Sustainable Energy for Men? Gender and the construction of identity within climate technology entrepreneurship in Kenya”, *Progress in Development Studies*, 17(2), pp148-172

Ockwell, D. and Byrne, R. (2016) “Improving technology transfer through national systems of innovation: climate relevant innovation-system builders (CRIBs)”, *Climate Policy*, 16(7), pp836-854

Ockwell, D. and Byrne, R. (2016) *Sustainable Energy for All: Innovation, Technology and Pro-Poor Green Transformations*, Routledge, Abingdon

Ockwell, D., Byrne, R., Urama, K., Ozor, N., Kirumba, E., Ely, A., Becker, S. and Gollwitzer, L. (2017) “Debunking free market myths: Transforming pro-poor, sustainable energy access for climate compatible development”, in F. Nunan (ed.) *Making Climate Compatible Development Happen*, Routledge, Abingdon, pp130-150

Rolffs, P., Ockwell, D. and Byrne, R. (2015) “Beyond technology and finance: pay-as-you-go sustainable energy access and theories of social change”, *Environment and Planning A*, 47(12), pp2609-2627

Watson, J. and Byrne, R. (2012) “Low-Carbon Innovation in China: The Role of International Technology Transfer”, in D. Ockwell and A. Mallett (eds.) *Low-Carbon Technology Transfer: From Rhetoric to Reality*, Routledge, London and New York, pp63-84

**C3. Project title:** Water and Sanitation Domain

**Researchers:** Lyla Mehta, Fiona Marshall

**Partners:** Institute of Health Management, Kolkata and Centre for the Study of Developing Societies, New Delhi

**Aims and objectives:**

The Water and Sanitation domain sought to develop alternative approaches to understanding and achieving sustainable and equitable water and sanitation practices. STEPS pathways thinking was applied to develop the novel concept of liquid dynamics, introducing this to cross-disciplinary research and policy fields concerned with water sustainability, helping to move the debate beyond aggregate, linear notions of scarcity – to great appreciation amongst social scientists, policy actors and some hydrologists and engineers (e.g. panels at World Water Week in Stockholm, and STEPS symposia on Liquid Dynamics).

**Results and impacts achieved/potential for impact:**

The water and sanitation domain work has been especially successful in connecting hitherto separate sectoral debates about water, and waste/health – especially through publications and dialogues in the context of the STEPS project Peri-urban Interface and Sustainability of South Asian Cities, with the integrative pathways approach providing a useful route to debate alternative policies for promoting sustainability.

Particularly productive links have been built with the IDS-based, DFID and Gates-funded programme on Community-Led Total Sanitation (CLTS), helping to advance debate in this innovative field through emphasis on complex local dynamics and diversity, and the politics of sanitation (e.g. STEPS panels at the a major CLTS international conference in 2008; STEPS WPs and articles, and contribution to a 2010 CLTS book).

We also contributed to debates around the Nexus, e.g. a Special Issue in *Water Alternatives* and also



presentations at various Nexus Network meetings.

STEPS thinking was also applied to a very high profile policy report that Lyla Mehta was invited to be team leader of, namely the High Level Panel of Experts Report on Water for Food Security and Nutrition.

We also addressed several topical debates concerning water grabbing, Integrated Water Resources Management and climate change, building on the concept of Liquid Dynamics. We produced a special issue on water grabbing and also several related papers which attracted a lot of attention (e.g. Special Issue for Water Alternatives 2012). STEPS affiliated projects funded by the Norwegian Research Council helped look at IWRM as a boundary concept and its politics in southern Africa which culminated in a Special issue for Water Alternatives (2016) and an edited book (2017) and water related uncertainties in the context of Climate Change (NFR funded project on Uncertainty, Climate Change and Transformation). In this context, we held a very successful STEPS conference in Delhi in 2016 with international experts which will be published a special issue for Regional Environmental Change.

We have sustained our interest in the sustainability of Community Led Total Sanitation, investigating how new sanitation practices can become truly sustainable. A workshop was organised with UNICEF India, the CLTS Foundation India and the National University of Ireland (Galway) on sanitation, transforming human waste and co-production in 2016. A proposal on this topic has just been submitted to the British Academy.

#### **C4. Project title:** Health Domain

**Researchers:** Gerry Bloom, Hayley Macgregor, Linda Waldman, Lewis Husain

#### **Aims and objectives:**

To advance understandings of how dynamic and uncertain disease ecologies, social and technological change are interacting and the implications for poor people's access to health amidst contemporary multi-level, fragmented governance arrangements.

#### **Results and impacts achieved/potential for impact:**

1. The work on strategies for engaging with complex, pluralistic health systems has contributed to marked changes in global debates, which now pay much more attention to strategies for influencing formal and informal markets for health-related goods and services and also to the need to take into account the complex nature of health systems. In July 2017 these ideas will be explored in a major workshop on Accountability for Health Equity. Some signs of the impact of this work are the levels of citation of papers on this topic by the research team, the leadership played by the research team in a network of researchers linked to Health Systems Global and the inclusion of this topic in the next biennial meeting of Health Systems Global in Liverpool in 2018.
2. The work on the links of ecology and human health has influenced the research and policy communities. Members of the health domain played a leading role in the development of several collaborative research studies focusing on specific locations. The learning from these studies strongly influenced the engagement of STEPS researchers in the global response to the Ebola outbreak in West Africa. This has led to an increased awareness in the global health community of the need to take into account the local context in managing

surveillance and response to outbreaks of infectious diseases.

3. The original domain working paper highlighted the need for more attention to be paid to the challenge of antimicrobial resistance and strategies for addressing it. The STEPS Centre supported a project on animal husbandry in China, which documented high levels of antibiotic use. When the UK Government decided to give very high priority to the problem, the ESRC commissioned members of the Health Domain to produce a background paper on addressing antimicrobial resistance in countries with pluralistic health systems, which informed its research funding strategy. Members of the health domain are now involved in several research studies of antibiotic use in animal husbandry, they are part of a team that is evaluating the Fleming Fund, which is supporting national action plans to address AMR in a number of countries and on an advisory panel to the joint UK-China AMR Innovation Fund.
4. One focus of the work has been on the lessons from China's management of health system adaptation to a rapidly changing and complex context and on the implications for China's growing engagement in global health. One outcome has been the establishment of a partnership with the Institute of Sociology of the Chinese Academy of Social Sciences aimed at deepening knowledge of the changing roles of the state and non-state actors in providing health and welfare services to the elderly in rapidly growing cities, with support from the Newton Fund. CASS intends to convene a major meeting in Beijing in 2018 that will focus on mutual learning between the BRICS. Members of the health domain are presently evaluating a UK-government funded project aimed supporting China's growing engagement in global health and in building a UK-China partnership in this area. They recently participated in an inter-ministerial meeting of the UK Government on options for building this partnership.

## D) STEPS Centre Projects Phase 1 (01 October 2006-30 September 2011)

### D1. Project title: Innovation, Sustainability, Development: A New Manifesto

**Researchers:** Adrian Ely (convenor), Melissa Leach, Andy Stirling, Ian Scoones (Centre Directors), Elisa Arond (Project Assistant), Julia Day (Communications Manager) and Harriet Le Bris (Administrative Co-ordinator). Advice and support from Geoff Oldham and Martin Bell, contributions from all members of the ESRC STEPS Centre and many other international colleagues and partners:

**Partners:** National Institute for Science, Technology and Development Studies (India), African Centre for Technology Studies (Kenya), African Technology Policy Studies Network (Kenya), Practical Action (Nepal/ Zimbabwe/ UK), TWAS (The Academy of Sciences for the Development World)(Africa and Asia Regional Offices), International Development Research Centre (Canada), Global Knowledge Initiative (USA), Tsinghua University (China), Corporación Biotec-Sede CIAT (Colombia), Instituto Venezolano de Investigaciones Científicas (Venezuela), Centre for Research on Transformation (Argentina), Science and Democracy World Forum (France), Knowledge in Civil Society (India), African Union Science, Technology and Research Commission (Nigeria), Marathmoli (India), TU-Delft (Netherlands) and more.

#### **Aims and objectives:**

In 1970 a radical document called the 'Sussex Manifesto' written by a group from the Institute of Development Studies and the Science Policy Research Unit helped to shape modern thinking on science and technology for development. Forty years on, the ESRC STEPS Centre (made up of researchers from the same institutions) decided to ask what kind of Manifesto was needed for today's world? In answering this question, the 'Innovation, Sustainability, Development: A New Manifesto' project involved contributions from all STEPS Centre members and a network of international partners. It used ESRC's support and leveraged other sources of funding to deliver a unique project over and above the Centre's contracted research programme. The project activities included a dedicated series of 13 background papers, an international seminar series and 20 roundtables conducted throughout the world – involving hundreds of individuals from women's groups in rural Maharashtra to researchers in Venezuela to the Zimbabwean Minister of Science and Technology. A dedicated website (<http://anewmanifesto.org>) was used to foster engagement from distant and geographically diverse regions.

#### **Results and impacts achieved/potential for impact:**

The ESRC STEPS Centre project 'Innovation, Sustainability, Development: A New Manifesto' had a demonstrable policy influence in the UK, Canada, India, Argentina and the USA amongst other countries, and in international organisations such as the OECD, UNESCO and IDRC, especially by opening up the concept of 'innovation' and applying it to the global challenges of poverty alleviation, social justice and environmental sustainability. The project has fed into numerous peer-reviewed publications and working papers (including papers co-authored with international colleagues in Sweden and the USA, China and across Latin America). An innovative website (<http://anewmanifesto.org>) had by early 2013 been accessed by more than 27 thousand unique visitors from 184 countries/territories and the project has featured in media reports not only in the UK but across Europe, China, India, USA, Brazil and Colombia. The project's wider impact was recognised in 2012 when it received the Ziman award from the European Association for the Study of Science and Technology (EASST) for the most innovative international cooperation in a venture to promote the public understanding of the social dimensions of science.

Below we outline some of the project impacts in the areas of academic advancement/ scientific

impact, teaching, learning and capacity-building, influencing policy in the UK and internationally, media uptake and public engagement.

Academic advancement/ scientific impact - the project has fed into peer-reviewed publications, including those co-authored with international colleagues in Sweden and the USA (Leach et al., 2012), a book (Leach et al 2010) and further collaborative research with partners in Latin America, India and Africa. The project insights were taken forward by further research, financially supported by organisations like the Rockefeller Foundation, the Climate Development Knowledge Network and the ESRC itself.

Teaching, learning and capacity-building - the project resources and website has been used as a teaching resource in Sussex, the Netherlands, Venezuela and Brazil. STEPS Centre partner Marathmoli (an information network and support service for women and other marginalised people of Maharashtra) reported the following after meetings in Sangamner: "In both the events, participants shared that the engagement with this project had led to a change in their perception of women's experiential knowledge and science and technology innovation, added value to their work and made them look at their work in new light." The project ran other events in Nepal, Sri Lanka and Zimbabwe in collaboration with the development NGO Practical Action and worked with TWAS to engage with young researchers in Kenya and India.

Influencing policy (UK) - Outputs from the Manifesto project influenced (and were cited in) reports by the House of Commons Science and Technology Committee 'Building Scientific Capacity for Development' (Science and Technology Committee 2011) and the House of Commons International Development Committee 'Post-2015 Development Goals' (International Development Committee 2013). In a debate in the House of Commons (23 October 2012) Martin Horwood MP (Cheltenham, Liberal Democrat) recommended the application of the Manifesto's '3D' agenda of direction, distribution and diversity (Hansard 2012).

Influencing policy (international) - The manifesto project was presented to national representatives at the OECD-IDRC event on 'Converting knowledge to value' in Paris on 28 Jan 2009. The project and associated research outputs (Ely and Bell, 2009) were cited in the OECD report that emerged from the event (Kraemer-Mbula and Wamae, 2010), which went on to inform OECD's work in this area. Andy Stirling was invited to present on the Manifesto as part of UNESCO's Science, Technology and Innovation Global Assessment Programme (Paris, 2011) and Adrian Ely contributed to a UNESCO Symposium on Innovation in Developing Countries (Kuala Lumpur, 2012). The Manifesto has also been presented at the World Social Forum (Dakar, Senegal, March 2011), the World Innovation Forum (Kuala Lumpur, November 2012) and various other international events. The Manifesto has also been mentioned in a US government discussion document (USAID, 2010) and technical papers from Argentina (INTI, 2012), Germany (KfW, 2012). The project's process and outputs influenced the formulation of the Canadian International Development Research Centre's (IDRC's) programming and was cited in numerous internal documents between October 2010 - March 2011 and further cited in the prospectus for the new programme on 'Innovation for Inclusive Development' (June 2011).

Media Uptake - The Manifesto was launched to an audience of 150 at the Royal Society in June 2010. It was translated (with the help of partners) into French, Egyptian Arabic, Portuguese, Chinese and Spanish. Media reports/ articles in newspapers and websites not only in the UK but across Europe, China, India, USA, Brazil and Colombia.

Increasing public engagement with research and related societal issues – Events specifically targeting the non-specialist public were held locally (Brighton and Hove, as part of the ESRC Festival of Social

Science 2010) and overseas (e.g. Paris, 2011). The wider impact of project on the public was recognised in 2012 by the European Association for the Study of Science and Technology (EASST) the Ziman Award for “cooperation in a venture to promote the public understanding of the social dimensions of science”.

**D2. Project title:** The Peri-urban Interface and Sustainability of South Asian Cities

**Researchers:** Fiona Marshall, Lyla Mehta, Pritpal Randhawa, Linda Waldman, Hayley McGregor

**Partners:** Centre for Studies in Regional Development; Dipu Sharan, Alankar and Bhagwati Prasad from SARAI, New Delhi; Local NGOS working in peri-urban Delhi

**Aims and objectives:**

Using water and peri-urban livelihoods as a lens, this project asked how sustainability can be defined and sought in relation to the peri-urban interface by:

1. Exploring different understandings of the function and dynamics of the peri-urban interface, and how this translates into management outcomes.
2. Understanding which planning priorities come to dominate and why, in the context of the political economy and spatial, temporal, local, national and international influences.
3. Through working with communities in and around the case study city of Delhi, and focusing on particular peri-urban systems, to expose the effects and implications for linked socio-technological-ecological processes and for particular groups of poor and marginalised people.
4. Examine how Sustainability/non-Sustainability have been institutionalized, and the opportunities for opening up processes of decision making.

**Results and impact achieved:**

Our fieldwork in villages in peri-urban Delhi supported by focus groups, multi criteria mapping exercises, and other activities, enabled us to unpack the politics of Sustainability in peri-urban areas and to unravel alternative visions of Sustainability that are often hidden due to issues of power and politics. Some selected insights are as follows:

- We uncovered the complexities of encouraging debate on the sustainability of a zone that is in principle thought of as transitional. Our underlying assumption that progress towards Sustainability of peri-urban areas impacts on the viability of the urban core (and rural hinterland) is challenged by some. Locally the project was also able to influence activities of local activists and larger NGOs (eg ActionAid) who began to engage with peri-urban sustainability issues and incorporate them into work programmes; a wider programme of dialogue builder reached a wider national and international audience.
- There is much debate which focuses on either pro-poor or on pro-environment actions. These two strands are arguably becoming increasingly divergent. This is played out in myriad ways on the ground. For example, an environmental justification for the displacement of the poor (beautification of the city), or a rights based lobby mobilising people through a social justice agenda to have legal access to ground water, but in areas already recognised as critically low. This represented an obvious and important niche for the project in bringing these issues together for discussion under a Sustainability agenda. This has been discussed and enthusiastically supported by academic stakeholders in Delhi.
- Diverse framings of the water ‘system’ in and around Delhi sometimes describe the water ‘system’ in a linear fashion – as arriving and being discarded, others recognise more of a cyclical process but with varying degrees of recognition and/or articulation of the original source of water. This has profound implications for understanding Sustainability and Sustainable water management. An important component of exploring opportunities for more Sustainable water

management has been to bring issues of access and quality together.

- With very little sectoral interaction in planning for water provision and treatment, key interactions between water quality, health and agriculture are not recognised in formal planning processes. Some of these interactions are specific to, or are greatly amplified in peri-urban situations. This, along with the many informal ways in which water is used in peri-urban are examples of the many critical gaps in information used in formal planning processes. This type of information can be mapped clearly onto the STEPS conceptual framework of incertitude to sustainability to pathways.
- In response to the failure of the dominant water management pathway and narrative of universal access to safe water, our field studies have demonstrated a variety of strategies to ensure that people have water. These include accessing water by illegal means or informally achieving access through legal processes. Essential for the many people in peri-urban areas who are forced out of or 'invisible' to the official system. Understanding how these are negotiated and the relationships between formal and informal processes may be critical for delivering alternative, more sustainable, water management pathways.
- A range of alternative water management pathways with different degrees of diversification and privatisation were explored by multistakeholder groups. The designing of alternative pathways will need to recognize potential conflicts between: Access and sustainability (e.g lining of canals to improve supply prevents aquifer recharge, ground water extraction in critical ground water areas); Justice and illegality (e.g. Access to water for the poor is a matter of justice which sometimes demands resorting to illegal means vs narrative of 'the poor stealing water'); Good governance and social justice; and Efficiency and equality (Concern over 'leakage' and government plans to reduce this vs tapping into formal supplies is essential access for the poor).
- The project hosted a range of multistakeholder activities to raise awareness and build a dialogue concerning peri-urban sustainability. The project hosted major workshops attended by academics from diverse disciplines, NGOs, government officials, activists and the media. A cross sectoral advisory board was created in India for support and advocacy for the ongoing work, whilst multi criteria mapping exercises and other project activities helped with the recognition and appreciation of alternative pathways to sustainability. The project contributed to: greater awareness of the situation of poor and marginalised peri urban dwellers and glaring inequalities in access; awareness and dialogue on the limitations of sectoral approaches towards water supply, management and quality issues; Awareness of implications of disregarding peri-urban issues for urban sustainability; Exposure to alternative visions of policy and management strategy; Recognising opportunities for opening up more socially just processes of decision making.

In addition, our impact activities were supported by a range of additional outputs including:

- Project website – 'On the Edge' (<http://periurbansustainability.org/>) An international resource centre and hub for debate. Including academic papers from many disciplines, grey literature, photos, film, news and contacts.
- Graphic Novel – 'The Water Cookbook' by Bhagwati Prasad. <https://steps-centre.org/publication/water-cookbook/> Bhagwati interacted closely with peri urban dwellers to develop this novel. The English version was distributed in schools as well as to activists, academics, and artists with engagement in environmental/social justice issues. A Hindi version will target students, activists and peri urban dwellers. Storyline: In Hindi mythology there are several stories which are related to human life and water. The most popular story is about *Bhaghirath* and the river *Ganges*. According to the story, Bhaghirath, the son of king Dilip had to do a long *tapasya* to bring the river *Ganges* on earth. In the process, he has to pray and run around different deities and only after that the *Ganges* came on earth. Our research shows that currently all the peri-urban dwellers are like Bhaghirath. It seems that all of them are doing a never ending *tapasya*. They have to run from the one government office to the other government office requesting for getting supply of potable drinking water in their settlements.

This novel would be based on experiences of several lives, social conflicts, place, community, water networks and government departments. It narrates the story of water crisis in trans-hindon region of Ghaziabad, translate the issues emerging from our research in a popular form of a graphic novel.

- Film - water and justice: peri-urban pathways in Delhi. A film illustrating the STEPS pathways approach through the voices of people with different experiences of water in peri-urban Delhi.

### **D3. Project title:** Risk, Uncertainty and Technology, India

**Researchers:** Ian Scoones

**Partners:** Indian Institute of Management, Bangalore, India, co-funded by UKIERI. UK-India Education and Research Initiative.

#### **Aims and objectives:**

Focusing on issues and settings in India, this project addressed how different institutions and groups frame and respond to risks and uncertainties associated with different areas of rapid scientific and technological advance - including pharmaceuticals, vaccines, crop biotechnology, and nanotechnology. These are all areas where rapid developments in science and technology are seen as key to economic growth, nationally and in the global economy. Yet, as new technologies are delivered in diverse settings, with different local needs and policy priorities, so a range of risks, uncertainties, ambiguities and indeed areas of ignorance arise. This project explored the diverse ways that corporations, state agencies, scientific institutions, farmers and consumers understand and seek to respond to such uncertainty, how their responses interact, and the implications for sustainability. Through both focused case studies (e.g. of genetically-modified crops) and through a wider series of exchange visits and joint workshops between researchers and practitioners from India and the UK supported by a grant from the UK-India Education and Research Initiative, the project sought to build a more deliberative and reflexive approach to considering different options for addressing uncertainties.

#### **Results and impacts achieved/potential for impact:**

The Knowledge Society Debates were a series of events exploring science, technology and innovation in India from 5-13 January 2009, held in Delhi, Hyderabad and Bangalore. Participants included a diverse range of Indian academics, policymakers and activists, and panellists included STEPS Advisory Committee members, Sheila Jasanoff, Brian Wynne and Shiv Visvanathan, as well as STEPS members, including Esha Shah and Andy Stirling. Experiences from Europe on risk governance were shared, notably the findings of the report, *Taking the Knowledge Society Seriously*, which several STEPS-linked participants had been involved with. Beyond a series of meeting reports, blogs, videos etc., a special issue of the widely read magazine *Seminar* was the result.

A major conference, involving business leaders and hosted by Infosys in Bangalore looked at risk, competitiveness and sustainability interactions, see: <http://stepscentre-thecrossing.blogspot.co.uk/2012/02/risk-competitiveness-and-sustainability.html>

On-going debates around genetically-modified foods provided the focus for a series of events, involving both activists and academics in India, as a follow up to earlier work on the politics of biotechnology policy in India by Ian Scoones (published in the 2006 book, *Science, agriculture and the politics of policy: The case of biotechnology in India*). These resulted a range of media coverage, see blog <http://stepscentre-thecrossing.blogspot.co.uk/2012/02/what-happened-to-biotech-in->

[bangalore.html](#)

The book, "*India's risks: democratizing the management of threats to environment, health, and values* (edited by Raphaëlle Moor and Rajeev Gowda, and published by Oxford University Press in 2014) was the main output of the UKIERI project. This was launched at a major public event at the British Council in Delhi in 2015: <https://steps-centre.org/event/indias-risks-book-launch/>

**D4. Project title:** Epidemics: Pathways of Disease and Response

**Researchers:** Melissa Leach and Ian Scoones

**Partners:** Collaborators drawn from social and natural scientists, including from FAO, WHO, LSHTM, IDS, Sussex Medical School and others

**Aims and objectives:**

Changing patterns of land use, interactions between humans, livestock and wildlife and new patterns of social behaviour have seen the emergence of a series of new infectious diseases that now threaten to reverse post-war progress towards improved global public health. While TB, HIV-AIDS and malaria receive the most policy attention, 'old' diseases of lower respiratory tract infection and diarrhoea remain the major killers, they are being joined by both new diseases such as SARS, avian 'flu and BSE, and modified versions of existing diseases. Diseases emerge from changing landscape-livelihood interactions in relation to drug resistance, genetic changes in pathogens and zoonosis, as new farming practices, increased mobility and increasingly intensive food, water and social systems allow new evolutionary niches to form. Drawing on a series of cases developed by STEPS Centre researchers together with wider networks and partnerships, this project has explored these interactions and stimulated reflection on procedures for addressing epidemics that support, rather than compromise, the livelihood needs of poorer people and wider principles of social justice.

**Results and impacts achieved/potential for impact:**

The project developed and applied the pathways approach, and its emphasis on framing and narratives, in relation to case studies of HIV/AIDS, SARS, multiple drug resistant TB, Ebola, avian influenza and obesity. Outputs included:

- A series of working papers, plus a major book (*Epidemics: Science, Politics and Social Justice*, Dry and Leach, eds. 2011). See also: <https://steps-centre.org/project/zoonoses/>
- The challenge to the 'outbreak' approach to disease response and the importance of understanding socio-ecological context, and local responses had major influence in the development of the 'One Health' approach, amongst a range of agencies, including FAO, DFID, WHO and others.
- The work provided the foundation for the STEPS application to the NERC-led ESPA programme, and the successful bid for the Dynamic Drivers of Disease in Africa programme. This went on to establish a core interdisciplinary partnership examining the links between disease emergence, ecology, poverty and wellbeing, across Africa. Most recently culminating in a Special Issue of the *Philosophical Transactions of the Royal Society B* (2017)
- The work also provided the basis for the major stream of work on Ebola from 2014, led by STEPS, with IDS and partners. This work won the ESRC Impact Prize in 2016.



See our impact story on this work - <https://medium.com/steps-impact-stories/the-social-life-of-infectious-diseases-d694d99114d4>

**D5. Project title:** Beyond Biosafety: Lessons from Kenya and the Philippines

**Researchers:** Erik Millstone, Sally Brooks, Paddy Van Zwanenberg

**Partners:** Centre for African Bio-Entrepreneurship (CABE), Kenya

**Aims and objectives:**

To compare the institutional and conceptual approaches to the regulation of agricultural biotechnology in Kenya and the Philippines, to identify similarities and differences, and to draw inferences concerning the scope for diverse approaches that may be consistent with the provisions of international treaties and conventions.

**Results and impacts achieved/potential for impact:**

It was not possible to pursue this project for two main reasons. Firstly the colleague who was expected to conduct research in the Philippines left the University of Sussex. Secondly, while the Kenya government has established relevant legislation, no decisions have yet been taken in relation to any specific product or introduction, which has created a data vacuum.

**D6. Project title:** Rethinking Regulation: Seeds and Drugs in China and Argentina

**Researchers:** Adrian Smith

**Partners:** Fundación CENIT, Argentina; Zhongnan University of Economics and Law, China; Beijing Normal University, China

**Aims and objectives:**

The aim in this project was to understand the realities of implementing global regimes for regulating technologies. We did this through the objectives of comparing and contrasting the way global regulations 'framed' the development and use of technologies – how they envisaged them working – with the realities of technology adaption and use on the ground in China and Argentina in the cases of GM seeds and antibiotics.

**Results and impacts achieved/potential for impact:**

The project led to a publications, presentations, briefings and a book (see Researchfish).

The seeds work in Argentina led to follow on projects for our partners there (Fundación Cenit) that looked at the political economy of GM seeds in the country, and also at the open source seeds movement that is developing an alternative approach to governing and regulating seed development. This subsequent work, along with our original project, has informed policy advice and activism in Argentina.

The antibiotics work in China has been picked up again by our partner, Beijing Normal University, and who are researching anti-microbial resistance. STEPS has also been consulted by UK agencies developing this work, as our research into regulatory realities provides relevant information for any regulatory recommendations to address this issue.

<b>D7. Project title:</b> Environmental Change and Maize Innovation Pathways in Kenya
<b>Researchers:</b> John Thompson, Sally Brooks, Erik Millstone and Molly Morgan Jones
<b>Partners:</b> <i>African Centre for Technology Studies – Serah Nderitu and Andrew Adwera; Centre for African Bioentrepreneurship – Hannington Odame; Tegemeo Institute of Agricultural Policy and Development, Egerton University – Betty Kibaara and Francis Karin</i>
<p><b>Aims and objectives:</b></p> <p>In a region where droughts and other extreme weather events are common, maize is central to food security for most households across East and Southern Africa. From national policy to individual households, maize security has come to be equated with food security. The resulting complex web of ‘maize politics’ directly influences both policy and families’ access to food.</p> <p>Consequently, concerns about maize production and access drive national agricultural research and development policy, leading to a virtual ‘lock-in’ to maize as the dominant pathway to food security. The ESRC STEPS Centre’s maize project sought to identify and analyse alternative ‘pathways in and out of maize’ in the face of dynamic environmental, social and technological change.</p> <p>The project analysed the various options for farmers in the region – from choosing alternative crops, to using new techniques or technology. It looked at how farmers and others see and make these choices in the context of climate change, uncertain markets and changes in land use. It also examined the assumptions and framings behind various interventions and proposals by governments, researchers, aid donors and private companies. The project ran from 2006 to 2011.</p>
<p><b>Results and impacts achieved/potential for impact:</b></p> <p>In the first phase of this study (2007–9), the STEPS Kenya team adopted a ‘pathways approach’ and took maize as a window through which to examine farmers’ and institutional responses to the experienced or anticipated effects of climate change, to the increasing volatility of input and output markets, and to the pressures of continuing land subdivision. This single-crop focus is less narrow than it would first appear, given the centrality of maize in Kenyan cultural, economic and political life. Maize has therefore served as an ideal entry point for engaging with a variety of stakeholders in different agro-ecological, socio-economic and institutional settings about the challenges they face and their perceived room for manoeuvre when dealing with those challenges. Moreover, given the ubiquity of maize in multiple, diverse livelihood systems across Kenya and elsewhere in Sub-Saharan Africa, national and international crop scientific institutions have responded with research into improved maize varieties more able to withstand the effects of drought and climate change.</p> <p>Our field research has revealed that maize plays many different roles in diverse livelihood systems. Firstly, and most fundamentally, of course, ‘maize is food’. It is the most important and widely consumed staple cereal crop, whether roasted or used as flour (<i>unga</i>), across different regions, ethnic groups and social classes. Secondly, it can often be said that ‘maize is cash’. Smallholder maize agriculture may not be profitable (in fact many small farms run at a loss, particularly if they factor in their own labour) but maize is one commodity in Kenya for which there is always a ready and accessible market. Harvested maize, for example, is often saved and used to pay school fees or to exchange for labour. Finally, for many poor farmers ‘maize is insurance’. That is, with the uncertainties of weather, markets and politics, farmers continue to plant at least some of their land with maize ‘just in case’ it will be a good year, even if these only occur one or two in every five years, with the most recent short rains of 2009–10 a case in point.</p>

In the second phase of research (2009–11), the STEPS team employed Multicriteria Mapping (MCM) to explore the potential and constraints of alternative ‘pathways in and out of maize’. It started from an assumption that concerns about the effects of climate change potentially present an opportunity to open up the debate about alternatives, both within maize agriculture (e.g., ones that might recognise farmer innovations and informal as well as formal systems and out of maize, to other crop-based livelihood options (e.g. alternative dryland staple crops and high-value horticultural crops).

Thus, in the second phase, fieldwork findings were distilled into a set of ‘innovation pathways’. These were used as the starting point for opening up discussions with a variety of key stakeholders on:

- i. the range and type of pathways – envisioning alternatives or ‘variants’ within,
- ii. relevant criteria for choosing one pathway over another in such a way as to factor in the cross-scale dynamics and constraints described earlier, and
- iii. critical examination of alternative visions of the future and governance arrangements needed to support and facilitate them.

Through this process we developed a typology of nine core ‘pathways in and out of maize’, focusing on lessons derived from Sakai, a risk-prone, low-potential area in Mbooni District, Eastern Province, where considerable effort has gone in to fostering local adaptation responses to climate change by various agencies. Work was undertaken with key stakeholder groups – local farmers and officials in Sakai, and assorted climate change and agricultural specialists and policy makers in Nairobi – using MCM. Each group was asked to analyse the core pathways, alongside any others they wish to add, according to their own criteria, which were then weighted in terms of priority. This process enabled depth and well as breadth of analysis. While there was some initial analysis and immediate feedback of results during the MCM interviews themselves, the data have since been analysed in more detail. In addition, the results and policy implications will be presented at a national workshop in Nairobi and with key stakeholder groups.

Key findings from the project were disseminated in set of STEPS Briefing Papers on Maize Innovation Pathways, a [STEPS Working Paper](#) and two videos ([Pathways In and Out of Maize](#) and [Seeds and Sustainability: Maize Pathways in Kenya](#)). In addition, the project informed a number of other initiatives, including a STEPS project on Biosafety Regulation: Lessons from Kenya and the Philippines and another on Integrated Seed Sector Development in Africa.

**D8. Project title:** Reimagining Urban Futures: Climate Change and Cities

**Researchers:** Lyla Mehta

**Partners:** SARAI – CSDS, India

**Aims and objectives:**

This project built on the work and contacts of the peri urban project to capture diverse narratives, imaginations and framings of climate change in Delhi, a city getting its water from distant Himalayan sources and in Mumbai a city by the sea prone to flooding and with over 50% living on the streets and in slums in low lying areas. It was done through analyzing secondary data as well as interviews with a wide range of stakeholders.

**Results and impacts achieved/potential for impact:**

The project resulted in a working paper:

Alankar (2015) *India's Megacities and Climate Change: Explorations from Delhi and Mumbai*, STEPS Working Paper 79, Brighton: STEPS Centre

Two blogs:

<http://reliefweb.int/report/world/southasiadisastersnet-issue-no-120-november-2014-managing-urban-risks-hfa2>

<https://steps-centre.org/blog/climate-change-transformed-indias-megacities/>

A roundtable in Delhi in 2013 that brought together academics, journalists and civil society working on climate change and cities.

This project also laid the seeds for the future STEPS project on Uncertainty from Below and Above, and the STEPS collaboration with the Norwegian Research Council project on Climate Change, Uncertainty and Transformation.

## E) STEPS Centre Projects Phase 2 (01 October 2011 – 31 March 2016)

<b>E1. Project title:</b> Climate Change: Uncertainty from Below and Above
<b>Researchers:</b> Lyla Mehta
<b>Partners:</b> Upasona Ghosh, Institute of Health Management, Kolkata; Awadhendra Sharan, SARAI, New Delhi; Vijay Kumar, Kutch
<b>Aims and objectives:</b> Ecological uncertainty has usually been theorized from 'above' by experts, natural scientists, and modellers who measure and make prognoses about water availability and variability, glacier movements as well as changes in temperature and their impacts on the soils, water and food systems. Social scientists have also contributed to theorizing about uncertainty. But the focus on models, diagrams and scenarios may have very little to do with how everyday men and women (poor or rich, urban or rural especially in the global South) live with, understand and cope with uncertainty and rarely have uncertainty from 'above' and uncertainty from 'below' been brought together. The project thus sought to : <ul style="list-style-type: none"><li>• Bring uncertainty from 'above' and 'below' together by seeking convergences and divergences in diverse knowledge systems, infusing the world of imaginaries into the hard nose world of science around climate change and evidence and trying to facilitate dialogue between the world of measuring and the world of experiencing uncertainty.</li><li>• Mapping more systematically storylines of uncertainty, climate change, scarcity histories, ethnographies, political ecologies and try and understand a range of pathways (both dominant and alternative) from a range of stakeholders in particular places.</li><li>• Examining patterns of resilience and coping – what works and why and why not? What are the limits to local knowledges of uncertainty? Which events undermine local resilience? How are these socially differentiated? (This refers to both adaptation and mitigation issues).</li><li>• Bring together patterns of ecological uncertainty together with major drivers of social and political change to understand issues of path dependency</li></ul> We examined these issues as they are framed globally and nationally and across different sites in India: two mega cities (Delhi and Mumbai), dryland Kutch and the Sunderbans. The localities offer ecological contrasts, rural- urban-peri urban emphasis and allow us to examine climate change issues across all the STEPS domains.
<b>Results and impacts achieved/potential for impact:</b> The project has generated diverse outputs directed to different user groups: <ol style="list-style-type: none"><li>1) Print articles in the India media</li><li>2) Articles and outputs linked to photovoice highlighting voices of local people confronted by uncertainty and climate change</li><li>3) The project led to further funding for the project 'Uncertainty, climate change and transformation' funded by the Research Council of Norway</li><li>4) We organised a very successful international conference with leading scholars working on climate change and uncertainty in Delhi in January 2016.</li><li>5) A special issue for Regional environmental change based on the workshop above</li><li>6) Several blogs for the IDS, STEPS website and also Indian portals</li></ol>

- 7) Outreach to Indian policy makers, trying to sensitise them to the need to embrace rather than control or manage uncertainty

**E2. Project title:** From Framings to Pathways: Bats and the Construction of Risk in Ghana

**Researchers:** Linda Waldman, Hayley MacGregor

**Partners:** Audrey Gadzekpo

**Aims and objectives:**

Our original research questions were:

1. How have different actors' framings of zoonotic spillover, associated risks and drivers shifted over time in interaction with growing scientific (and other) evidence?
2. In what ways have these framings influenced policy around zoonotic health threats, bat conservation and small scale livestock surveillance?
3. How has the construction of 'at risk categories' shaped the identities and sense of embodied risk of those living or working in close proximity to bats?

**Results and impacts achieved/potential for impact:**

Qualitative research – in the form of in-depth, open-ended interviewing – was undertaken in Accra, Ghana during May 2012 and October 2012. Twenty-six interviews were conducted with researchers, conservationists in government and NGOs, veterinarians, medics, military staff, public health and veterinary policy makers, a member of a traditional authority, and a member of the government disaster response agency. In the first set of interviews, we spoke to key informants who were in some way connected to the research and who were 'knowledgeable stakeholders' in public health, wildlife conservation, veterinary services and biology. The second round of interviewing involved an expanded circle of stakeholders (from the tourism sector, traditional leaders, scientists, conservation NGOs and other government representatives who were less 'knowledgeable' about the ongoing scientific research on bats and zoonotic disease).

Ethical approval was received from the Noguchi Institute of Public Health prior to the fieldwork beginning. Constraints in the ethics permission due to the limited public knowledge of the risks being identified by scientists from bats meant that we decided not to pursue the work that had been envisaged under research question 3.

Audrey Gadzekpo was approached and agreed to collaborate in the research in-country.

**Summary of the research**

At the time of the interviews in 2012, there was no definitive research evidence of disease spillover from bats to humans and no identified categories of 'at risk' people, although international researchers had alerted Ghanaian government officials that this possibility existed. In particular, scientific evidence showed that bats were associated with Lagos Bat Virus, Hendra, Nipah and Ebola. Key government representatives were concerned that widespread knowledge of the association between bats and Ebola would lead to panic and indiscriminate killing of the bats. This information was thus 'confidential' and not widely shared even within government.

Our research was done in collaboration with Ghanaian and international veterinary researchers who shared their scientific research with us. They also introduced us to key stakeholders and helped to ensure that key stakeholders were available for interview. This meant that, as researchers, we knew of this evidence and we knew that many key policy makers were not necessarily aware of the

connections between bats and zoonotic disease spillover. This unusual situation of being privy to 'confidential' information gave us particular insights about knowledge, networks and about power relations.

Our questions sought to broaden out understandings, by exploring the extent of different actors' knowledge about bats and disease spillover as well as their diverse interpretations about the nature of this evidence, the degree of risk and the need to act. We sought, not to know whether there was adequate evidence that bats harboured diseases and posed a risk of zoonotic disease spillover or not, but rather to explore diverse viewpoints in relation to disease, risk and health policy. This line of questioning revealed the different disciplinary and sectoral perspectives on bats and on disease, and enabled us to better understand how people's previous training and their different positions within government, or in other external organisations, influenced their perspectives, understandings of risk and possible pathways. This also helped to open up politics through highlighting alternative possibilities for dealing with the uncertainty around bats and zoonotic disease spillover. The central issue of how distinct actors approach policy-making in the context of uncertainty and diverse assessments of the risk of disease and the need for action, has highlighted the reality of multiple pathways of response. The method adopted of interviews with key actors and the triangulation of the different perspectives has brought out this dimension in the analysis of the data and the value of opening up.

During interviews, we asked stakeholders about their involvement with the media, their experiences of being cited in the media and their perceptions of media reporting. Although not initially planned, in turn, this led to a systematic search of the media to determine the sources of information on bats and zoonotic disease as well as how risk and uncertainty were being framed in both international and local sources. Although we did not interview any people identified as 'at risk' of disease, the media review enabled us to get a sense of public perceptions of risk and opinions regarding the inevitable trade-offs between human health, livelihoods and conservation.

#### **Outputs:**

A paper analysing this fieldwork has been published in STEPS Earthscan volume on the political economy of zoonotic disease. The paper is entitled:

#### **Responding to Uncertainty: Bats and the Construction of Disease Risk in Ghana.**

**Waldman, L., Gadzepko, A., MacGregor, H. (2016). 'Responding to Uncertainty: Bats and the Construction of Disease Risk in Ghana', in Scoones and Leach (eds). *The Political Economy of Zoonotic Disease Policy*. Earthscan.**

Since the fieldwork and the drafting of the paper, the Ebola outbreak in West Africa in 2014 has greatly increased the profile of zoonotic disease risk from bats. The fascinating situation has emerged where the scientific information that was carefully controlled at the time of this fieldwork, has now become public knowledge. In 2014, Audrey Gadzepko conducted a further 9 interviews focused in particular on the role of the military in framings of bats, disease and conservation in Ghana. She will also completed a follow-on media review in Ghana following the Ebola crisis. A further output is now in draft in the form of a paper that will include reflection on how the public space for framings of bats and disease has shifted since 2014 and the trade-offs that have emerged between public health framings and concerns about conservation.

#### **Further Outcomes of this work:**

The research in Ghana enabled partnerships with veterinarians from the University of Cambridge and these partnerships were taken forward in the Dynamic Drivers of Disease in African Consortium. Hayley MacGregor and Linda Waldman became involved in further work on endemic zoonoses and the human livestock interface. They have produced a further paper reflecting on anthropological perspectives in zoonotic disease research in the Phil Trans of the Royal Society Series published in

2017.

MacGregor, H. and Waldman, L. (2017). 'Views from many worlds: unsettling categories in interdisciplinary research on endemic zoonotic diseases'. In special issue on 'One Health for a changing world: zoonoses, ecosystems and human wellbeing'. *Philosophical Transactions of the Royal Society B*.

**E3. Project title:** A Socio-Technical Analysis of the Livestock Revolution: Innovation Pathways in Poultry Production in Sub-Saharan Africa

**Researchers:** James Sumberg and John Thompson

**Partners:** Martha Awo (ISSER, University of Ghana) and George T-M. Kwadzo (Dept. of Agricultural Economics and Agribusiness, University of Ghana)

**Aims and objectives:**

This project sought to use and extend the pathways approach to analyse pathways and framings, narratives, actors and networks associated with and impinging on the poultry sector and poultry development in Ghana.

**Results and impacts achieved/potential for impact:**

The project produced a new interpretation of the development and dynamics of policy and politics around the poultry sector in Ghana. Its broader potential impact will be in illustrating how policy works at the periphery of an agricultural policy system. At a practical level, project outputs have already been important in the framing of at least two livestock policy studies in Ghana.

**Outputs:**

Sumberg, J., M. Awo and G. T-M. Kwadzo. (2017). Poultry and policy in Ghana: Lessons from the periphery of an agricultural policy system. *Development Policy Review* 35(3): 419-438 (DOI: 10.1111/dpr.12223)

Sumberg, J., Jatoo, J., Kleih, U. and J. Flynn. (2016). Ghana's evolving protein economy. *Food Security* 8(5): 909-920 (DOI 10.1007/s12571-016-0606-6)

Sumberg, J., Kleih, U. and J. Flynn. (2015). Policy Advocacy for the Livestock Sector in Ghana. Unpublished report prepared for the Market Development (MADE) in Northern Ghana programme, and commissioned by Nathan Associates London Ltd.

Sumberg, J. and J. Thompson. (2013). Revolution Reconsidered: Evolving Perspectives on Livestock Production and Consumption. STEPS Working Paper 52: Brighton: STEPS Centre.

Sumberg, J., M. Awo, G. T-M. Kwadzo, D-D. D. Fiankor and J. Thompson. (2013). *Ghana's Poultry Sector: Limited Data, Conflicting Narratives, Competing Visions*. STEPS Working Paper 56: Brighton: STEPS Centre.

Blog: The limits of 'evidence': Evidence-Based Policy-making for African agriculture, Jan 24 2013, <https://steps-centre.org/blog/the-limits-of-evidence-evidence-based-policy-making-for-african-agriculture/>

Blog: Ghana: take 70,900 metric tons of frozen chicken, add politics, Nov 28 2012 <https://steps-centre.org/blog/ghana-take-70900-metric-tons-of-frozen-chicken-add-politics/>



**E4. Project title:** Dams, Securitization, Risks and the Global Water-Energy- Nexus under Climate Change Scenarios

**Researchers:**

Jeremy Allouche

**Partners:**

Dipak Gyawali and Carl Middleton

**Aims and objectives:**

The world of development thinkers and practitioners is abuzz with a new lexicon: the idea of ‘the nexus’ between water, energy and food. The various global crises since 2008 in energy, food and global finance, in addition to the uncertainties brought about by climate change, have highlighted the entwined relationship between these systems, together with their relationship to water security. These crises have also revealed the limits of existing top-down institutional approaches that have hitherto sought to manage these resources to compartmentalize them into individual silos. The idea of ‘the nexus’ has been put forward by a range of proponents – each with their own perspectives and agendas – as a new framing of these interdependent problems, demanding new and innovative solutions.

The aim of the project is to develop conceptual tools that ultimately aims to contribute towards unpacking existing formulations of the water-energy-food nexus, and rethinking some of its key tenets. We propose a dynamic approach to understanding the water-energy-food nexus. We take as our starting point the dynamic sustainability methodology (Leach et al, 2010). Framing problems in policy processes leads to particular solutions, whilst discounting alternatives, and with an emphasis on understanding this we focus in particular on how water, energy and food security is understood and represented by different actors, and its implications for the water-energy-food nexus, and environmental and social justice. Given that water-energy-food nexus problems are so-called “wicked” problems with no easy definition nor easy solution, we propose that “clumsy solutions” that benefit from the deliberative interaction of multiple worldviews on perceptions of problems are an appropriate approach to solving such real world problems (Verweij et al, 2006; Gyawali, 2009).

The project is testing its aims by comparing a set of real world water storage case studies from Nepal-India (sites - West Seti & Kulekhani) and Thailand-Laos (sites - Xayaburi & Rasi Salai), two pairs of countries that each share transboundary rivers and that are increasingly tied together by jointly developed water resource development projects and cross-border power trade. We will drill down into the discourse and practices associated with the energy-water storage-security nexus in these regions. We frame our analysis within the context of a new political economy of Asia and a new political economy of water -- both built upon the foundations of the old political economies -- that are imagining new visions for the future of Asia's major rivers.

Key thematic areas and research questions are as follows:

1. The nexus and a dynamic approach to water, energy and food security
  - a. Who is promoting the food-water-energy-climate nexus, how and why?
  - b. To what extent sustainability, resilience and security are understood as static systems?
  - c. How scarcity and crisis narratives are shaping the nexus?
2. The nexus and non-nexus in South & South East Asia : The political economies and imaginaries of Asia major rivers
  - a. What are the driving forces behind food and energy supply and demand affecting

- the new political economies of Asia's rivers?
- b. Does the nexus have a meaning in the region?
  - c. What are the imaginaries and unplanned developments around the Asia's rivers' future?
3. Storage solutions versus Storage systems: (re)discovering plural clumsy solutions towards social justice
- a. How storage options are justified according to different understanding of food, energy, climate and water security?
  - b. How do assessment tools promote particular storage solutions?
  - c. What is the local understanding and practice around the relationship between food, energy and water (now known as "the nexus")?
  - d. To what extent does storage systems in its different technologies addresses the trade-off/synergies within nexus? How to promote plural clumsy solutions?

**Results and impacts achieved/potential for impact:**

Through various outputs (special issues, blogs, conferences, workshops), the project has engaged with key actors on the topic and proposed that plural water-storage systems that accommodate varieties of large- and small-scale solutions, are an appropriate response to conditions of complexity and uncertainty, and to which resilience and robustness thinking is appropriate. Such a plural framing allows us to recast the definition of the water problem and redefine the boundaries of the potential solutions. If indeed a win-win solution may exist, then plural storage systems are seen as a way to address water-climate security as well as food demands and clean energy, whilst also ensuring that social justice prevails, in a world prone to financial volatility.

**E5. Project title:** Political Ecologies of Carbon in Africa

**Researchers:** Ian Scoones and Melissa Leach

**Partners:** Ishmael Hashmiu, c/o IITA, Accra, Ghana, Albert Arhin, University of Cambridge, Tom Winnebah, Njala University, Sierra Leone, Joanes Atela, c/o NEPAD/ACTS, Nairobi, Kenya, Misael Kokwe/Guni Kokwe, independent consultants, Lusaka, Zambia, Vupenyu Dzingirai, CASS, University of Zimbabwe

**Aims and objectives:**

New deals on climate change are giving increasing value to carbon – in market-based carbon trading and offset schemes. There has been a proliferation of funding and investment mechanisms under the new architecture of climate aid and finance, pushed by policy drivers at the international level. These include the Reduced Emissions from Deforestation and Degradation (REDD+), under the UNFCC Kyoto Protocol, as well as under voluntary carbon market schemes. This has resulted in a massive growth of projects, consultancies, private sector firms and advisory groups, aiming to capture the new value of carbon through a range of approaches, notably forest conservation and smallholder tree planting. These processes are already having a major impact on land and livelihoods in Africa, with importance consequences for land governance, local politics and the relationship between local land users and the state and markets.

We explored the following questions:

- What are the various policy measures, schemes, financing mechanisms and aid architecture (REDD and beyond)? Who is involved where, and what assumptions, interests and politics are at play?
- What are the imaginaries and logics of different actors involved in and affected by a

particular project? What forms of commensurability and contestation are emerging, as new pathways are created?

- How is carbon commoditisation reshaping land, livelihoods and ecologies? Who are the winners and the losers? What new political and ecological dynamics emerge through a revaluation of the landscape?
- What are the implications for the construction of 'just deals', and pathways that benefit small farmers and forest users?

Through a series of case studies across Africa, this project aimed to explore these processes, focusing in particular on how local experiences play out, reflecting on how interventions in landscapes become layered historically, always imbued with politics and culture.

**Results and impacts achieved/potential for impact:**

Through field research and a series of analysis workshops, papers were produced that became chapters of the book:

Leach, M., & Scoones, I. (Eds.). (2015). *Carbon conflicts and forest landscapes in Africa*. London: Routledge.

This was published in the STEPS Series and was well received. A number of media articles followed (including on the widely read redd-monitor site: <http://www.redd-monitor.org/2015/06/12/carbon-conflicts-and-forest-landscapes-in-africa/>).

The book has been used widely by students, policymakers and practitioners. As the first comprehensive and comparative attempt to look at the politics of carbon in Africa's forests it was seen as a ground-breaking contribution.

Engagements with UN-REDD, CIFOR, IIED, IUCN, WWF, ITTO and others have followed.

The research provided impetus to PhDs by African researchers on Ghana (Hashmiu and Arhin), Kenya (Atela) and Zimbabwe (MA and subsequently PhD student supervised by Prof Dzingirai). STEPS researchers provided support to these studies.

**E6. Project title:** Grassroots Innovation: Historical and Comparative Perspectives

**Researchers:**

Adrian Smith

**Partners:** Elisa Arond, freelance researcher, Bogota, Mariano Fressoli, CENIT, Buenos Aires, Dinesh Abrol, National Institute of Science, Technology and Development Studies, Delhi

**Aims and objectives:**

The aim in this project was to develop innovation theory and practical insight relevant to grassroots innovation. The objectives were to learn from a diversity of movements for grassroots innovation, raise awareness about grassroots innovation, organise workshops for researchers and practitioners, and shed constructive and critical light on the phenomena at a time when there is increasing interest coming from institutions and agencies responsible for innovation policy.

**Results and impacts achieved/potential for impact:**

Workshops, blogposts, presentations, conference sessions, articles, working papers and a book were all produced by the project (see Researchfish). The research has been cited and used by a variety of agencies - including OECD, UNDP, and the Inter-American Development Bank - and become a reference point internationally for the burgeoning study and support for grassroots innovation. A number of follow on projects have continued to work with some of the case studies, most notably the People's Science Movement in India, and Hackerspaces, FabLabs globally. The project enabled the Argentine partners to develop regional networks and follow-on projects on the topic of open science and collaborative knowledge production, and which was funded by IDRC and other international agencies. The work also underpinned an event organised by the PI with the Science Museum in London on people-powered appropriations of technology. The PI is currently seeking funds to develop analysis and impact further by drawing on examples from digital fabrication for a 'post-automation theory' that recovers and recentres social agency in debate and activity on technology, livelihoods, and sustainability.

**E7. Project title:** Re-Emerging Transmissible Trans-boundary Animal Diseases – Comparing Rift Valley Fever with BSE

**Researchers:** Erik Millstone

**Partners:** Hannigton Odame, CABE, Kenya

**Aims and objectives:**

This Kenya-based study aimed to identify ways in which pastoralists, policy-makers and those responsible for veterinary and public health might more effectively respond to the challenges posed by Rift Valley fever (RVF), with a particular focus on the impact on those who are most seriously affected namely nomadic pastoralists.

**Results and impacts achieved/potential for impact:**

A substantial quantity of data was gathered and analysed. The evidence was analysed, and that analysis was incorporated into a detailed report and into a Policy Briefing Paper; a video was also produced. All those outputs are available on the STEPS website. Those materials were presented to a stakeholder meeting that was held in Nairobi on 27th November 2014. Some 25 individuals participated at the meeting, and the participants included the Director of Veterinary Services, State Department of Livestock, of the Kenyan Ministry of Agriculture, Livestock and Fisheries, Mr Kisa Juma Ngeiywa. Other attendees included representatives of the International Livestock research Institute, the African Union's Inter-African Bureau for Animal Resources, and the Nairobi Office of the UN Food and Agriculture Organisation. Following that meeting, one of the Nairobi-based researchers from our project was invited to join a panel of the Kenyan Ministry of Agriculture, Livestock and Fisheries which was reviewing the government's RVF contingency plan. Subsequently a chapter based on this project was published. It is entitled 'Stepping Towards a Policy Response to Rift Valley Fever: Pastoralists and Epidemic Preparedness in Kenya', with H Odame, O Okumu and K Bardosh, Ch 6 in One Health: Science, politics and zoonotic disease in Africa, K Bardosh (ed), Earthscan, 2016. A paper has been prepared, and in June 2017 is being finalised for submission to the American Journal of Tropical Medicine and Hygiene.

**E8. Project title:** Responding to Zoonotic and Related Diseases in Intensifying Livestock Systems: Diverse Framings and Pathways

**Researchers:**

Michael Loevinsohn and Erik Millstone

**Partners:** Fang Jing, Institute for Health Sciences, Kunming Medical College, China, Ding Shijun, Zhongnan University of Economics and Law, Wuhan, China

**Aims and objectives:**

This project sought to enhance understanding of the interactions between the intensification of livestock production and the emergence of zoonotic and related diseases in China's Yunnan Province where pig production systems are being rapidly intensified.

**Results and impacts achieved/potential for impact:**

During visits to China by Sussex-based STEPS colleagues meetings were held with Chinese collaborators, and visits were made to several pig farms of contrasting sizes. An approach to further detailed empirical data collection was agreed, and a considerable quantity of data was gathered, and translated from Chinese into English. The STEPS colleague who was leading the project, however, left the University of Sussex, and took all the data with him. Subsequently his health deteriorated, and he has yet to share a draft of his analysis of the data that had been gathered.

**E9. Project title:** Pathways for Environmental Health in Transitional Spaces: Moving Between Formality and Informality

**Researchers:** Fiona Marshall

**Partners:** Jawarhalal Nehru University Centre for Studies in Science Policy & Centre for Studies in Social Medicine and Community Health; Toxicslink (Delhi based National NGO); Lokadhikar (waste pickers association)

**Aims and objectives:**

This project sought to examine:

- What processes are involved in the prioritisation of particular policy options and technological interventions in urbanising contexts in South Asia; specifically, what types of environmental health issues are formally recognised, which remain unrecognized, how and why?
- Who gains and who loses from current interventions in transitional spaces? How do people's understandings and imaginaries of environmental health, the impact of specific interventions, and environmental management priorities compare with those of local service providers and officials?
- What alternative environmental management scenarios, institutional and regulatory arrangements, as well as forms of citizen action, are emergent which will help in providing healthy, secure livelihoods for residents in transitional spaces?

A case study in India on urban waste management in Delhi, provided opportunities to engage with 'live' issues and opportunities for debate, and to consider alternative perspectives on environmental health challenges and alternatives scenarios for planning and management. This case studies had a particular conceptual focus emphasis on dealing with risk and uncertainty, and formality and informality in peri-urban transitional spaces.

**Results and impacts achieved/potential for impact:**

The Current dominant pathway for urban solid waste management in India promotes the creation of waste to energy incineration plants. We were able to understand the power relations and political processes that led to the selection and adoption of this particular technology and the neglect of other possible waste management pathways. We examined the implications of current waste management policy from diverse perspectives (<https://medium.com/hidden-sustainability/waste-not-want-not-db64790361a5>) and produced a re-casting of the policy asking what key questions and information gaps might emerge if environmental health and social justice concerns are to remain a central concern. Our study illustrated the implications of the current pathway for environmental health and social justice and considered if and how alternative perspectives and visions for waste management might become alternative pathways for environmental health.

Building on this work a policy brief on 'Rethinking urban waste management in India', was published and launched in Delhi on 5 May 2015 (<http://steps-centre.org/wp-content/uploads/Policy-Brief-April-2015.pdf>). The briefing brings together environmental protection and social justice agendas, which are often seen as divergent. The briefing details eight principals for the establishment of an alternative approach to urban solid waste management, through a sustainability lens. The principles could be adopted at multiple levels, but a key target for policy intervention has been the national Solid Waste Management rules. These are the guidelines formulated by the Ministry of Environment, Forests and Climate change (MoEFCC) that play a central role in determining how waste is collected, segregated, stored, processed and disposed of in Indian cities. Government officials, representatives of waste pickers associations, NGOs, industries and resident welfare associations were all present at the launch event, which coincided with the recent release of amended national waste management guidelines. Work by the project team had resulted in an invitation to be part of the formal committee process to amend these rules, and influence on the amendments made (<https://steps-centre.org/blog/urbanwaste/>); in particular in terms of the involvement of the informal sector and opening for decentralised waste management options.

Other areas of project impact have resulted from close collaboration with a number of waste pickers associations. One of these associations 'Lokadhikar' continues to work with project team members to collaborate with government agencies and others to develop plans for decentralised waste processing mechanisms.

Another waste pickers association – the All India Kabadi Mazdoor Mahasangh (AIKMM) has ongoing interaction with the team and is getting actively involved in decentralised waste management. It has, for example, been able to start a decentralised composting initiative in one localities of Gurgaon (a satellite town of Delhi) supported by project team members.

**E10. Project title:** An Assessment of Global Agricultural Assessments

**Researchers:** John Thompson, Erik Millstone and Ruth Segal

**Partners:** Clark Miller, Consortium for Science, Policy & Outcomes (CSPO), Arizona State University, USA; Silke Beck, Helmholtz Centre for Environmental Research, Germany; Martin Mahony, King's College London, UK; and Maud Borie, University of East Anglia, UK.

**Aims and objectives:**

This project was led by the ESRC STEPS Food and Agriculture Domain during 2013-15). It was a response and contribution to debates about the problematic characteristics of the global food system. The aim was to provide a challenge to the proliferation of diverse and competing global scientific assessments, each of which purports to be definitive and to analyse why many of the

assessments profoundly disagree with each other.

The STEPS Team hypothesised that these conflicting perspectives could be identified through and explained by their underlying up-stream framing assumptions. They aimed to:

1. identify and characterise their framing assumptions and
2. adjudicate between them, in terms of their accuracy and adequacy.

They also aimed to contribute to debates about food and agricultural policies, to enhance our understanding of the conditions under which it may be possible collectively to construct global knowledge-making for sustainability.

### **Results and impacts achieved/potential for impact:**

The STEPS team's analysis aimed to explain why these assessments and policy initiatives came to strikingly different conclusions. This was examined through three sub-questions:

1. Can different framings of the problems be identified in different processes?
2. If so what were they?
3. Have different framings informed the issues selected for attention, competing policy proposals and recommended practices?

The team also benchmarked the assumptions, diagnoses and prescriptions against STEPS Centre's substantive methodological assumptions linked to the '3-Ds' and an associated framework developed by the Food and Agriculture Domain Team. They asked if they acknowledged and addressed directionality, diversity and distributional considerations. Not attempt was made to be comprehensive. Rather the team tried to capture the overall envelope of debates.

So we focused on 3 assessments of agricultural science and technology and on 3 agricultural policy prescriptions that emerged between 2008 and 2012. The assessments included:

1. The International Assessment of Agricultural Knowledge, Science and Technology for Development (or IAASTD) (2009)
2. UK Foresight/Government Office for Science The Future of Food & Farming (2011)
3. UN Department of Economic and Social Affairs Food and Agriculture: The Future of Sustainability. A strategic input to the Sustainable Development in the 21st Century (SD21) project (2012).

The 3 policy documents were:

1. World Economic Forum New Vision for Agriculture initiative Realizing a New Vision for Agriculture: A Roadmap for Stakeholders (2010)
2. The G20 Action Plan on Food Price Volatility and Agriculture (2011)
3. The UN Committee on World Food Security Global Strategic Framework for Food Security and Nutrition (2012)

The STEPS Team found they could distil and compare the framing assumptions of these global assessments and policy documents. These helped explain the differences in conclusions and recommendations from their framing assumptions, which were linked to their institutional locations and perspectives. They could articulate a set of empirical and normative benchmarks by reference to which they could be appraised, and found they all exhibited shortcomings, though some were much worse than others.

By far the 'worst' performers against our criteria were the World Economic Forum, followed by the G-20. The 'best' assessment was the IAASTD and the 'best' report was from the Committee for Food Security. However, none of them satisfied all the criteria for achieving and reconciling scientific and democratic legitimacy. There is still significant scope for improving assessments of this nature.

Preliminary findings from this assessment were produced in the form of an extended review document and a final synthesis in a Working Paper, which is being developed into a journal article. They were also presented at the 2015 STEPS Conference on Resource Politics at a special panel session on 'Assessing Global Sustainability Assessments', with partners from Arizona State University, USA; Helmholtz Centre for Environmental Research, Germany; King's College London, UK; and University of East Anglia, UK.

**E11. Project title:** The Political Economy of Avian and Swine Flu

**Researchers:** Ian Scoones and Paul Forster

**Partners:** FAO and DFID who provided co-funding for the work, plus collaborators in Vietnam, Cambodia, Thailand and Indonesia, with further academics based in the US. Major interest from the UN, via UNDP.

**Aims and objectives:**

To explore the political economy of policy surrounding avian and swine flu, with case studies in SE Asian (avian flu), combined with an international mapping, based on interviews with key stakeholders

**Results and impacts achieved/potential for impact:**

- A series of major publications, including STEPS Working Papers, and the book 'Avian Influenza: Science, Policy and Politics' (Scoones, ed., 2010). See also: <https://steps-centre.org/project/zoonoses/>
- Engagement in formative 'One Health' meetings in Egypt, Rome, New York
- Building a researcher-practitioner-policymaker network around the issue, with a major conference co-hosted with the Centre for Global Health Policy at Sussex, focusing on lessons learned from influenza controversies in 2013 <https://steps-centre.org/blog/pandemic-influenza/>
- Multiple media engagements, including press interviews, blogs etc.
- Interest from DFID, FAO and UNDP on politics of policy focus for global health, influencing subsequent funding streams (including ESPA/DDDAC project, and ZELS projects)
- Affiliate projects for STEPS (DDDAC, funded through NERC and ZELS Tanzania and Myanmar, funded through BBSRC)
- Successfully defended PhD on avian influenza in Indonesia (Paul Forster)

**E12. Project title:** Biochar and Anthropogenic Dark Earths

**Researchers:** Melissa Leach

**Research partners:** Professor James Fairhead, University of Sussex, Professor Kojo Sebastian Amanor, Institute of African Studies, University of Ghana, Professor Johannes Lehmann, Cornell University, Dr James Fraser, University of Sussex/Lancaster

**Aims and objectives:**

This project investigated how charred carbon (biochar) is used to enrich soil by African farmers, and how it is being discussed and promoted as a potential solution to environmental problems.



Biochar is being promoted as a “triple win” to address climate change, energy and food security. Companies, schemes and public bodies have moved to capture its benefits, raising concerns about land rights and land grabs.

The research built on a related ESRC-funded project on ‘Anthropogenic Dark Earths in Africa?’ (PI Fairhead). Research concerning “dark earths” or terra preta had previously been confined to Amazonia. The project hypothesised that farmers in humid tropical Africa already manipulate soil carbon and associated ecology in similar ways. It brought together ecological anthropologists, historians and soil scientists from the UK, West Africa and the USA to examine farmers’ practices in research sites in the forest region of Ghana, Liberia, Sierra Leone and the Republic of Guinea.

STEPS research drew on the pathways approach to elucidate further:

- How African farmers enrich soils with carbon, and distinguish, value and use these soils
- How biochar is discussed and promoted by various groups and networks
- Who benefits from biochar, and how it can become part of pathways to sustainability that support smallholder farmers. What governance, policy and institutions would help?

#### **Results and impacts achieved/potential for impact:**

The research revealed widespread and important ways that farmers produce highly-fertile, carbon rich soils, with major impacts on landscapes shaped by settlement patterns, gender and social relations. Hitherto ignored by scientists, policymakers and practitioners, these ‘indigenous climate-smart agriculture’ techniques offer potential support to strategies to promote sustainable farming, and to enhance the sequestration of carbon in tropical agro-ecosystems, while also meeting small farmers’ perspectives and priorities.

The projects combined have led to a wide array of journal articles, including:

Solomon, Dawit; Lehmann, Johannes; Fraser, James A; Leach, Melissa; Amanor, Kojo; Frausin, Victoria; Kristiansen, Søren; Millimouno, Dominique and Fairhead, James, 2016, ‘Indigenous African soil enrichment as a climate-smart sustainable agriculture alternative’, *Front Ecol Environ* 2016; 14(2): 71–76, doi:[10.1002/fee.1226](https://doi.org/10.1002/fee.1226)

Fraser, J., Leach, M. & Fairhead, J. (2014) ‘Anthropogenic Dark Earths in the landscapes of Upper Guinea, West Africa: Intentional or Inevitable?’ *Annals of the Association of American Geographers*, 10/092014.

Frausin, Victoria, Fraser, James Angus, Narmah, Woulay, Lahai, Morrison K, Winnebah, Thomas R A, Fairhead, James and Leach, Melissa (2014) [“God made the soil, but we made it fertile”: gender, knowledge, and practice in the formation and use of African dark earths in Liberia and Sierra Leone](#). *Human Ecology*, 42 (5). pp. 695-710.

Leach, M., J. Fairhead and J. Fraser, 2012, ‘Green grabs and biochar: Revaluing African soils and farming in the new carbon economy’, *Journal of Peasant Studies*, 39:2.

Fairhead, J., M. Leach and K.S. Amanor, 2012, ‘Anthropogenic Dark Earths and Africa: A political agronomy of research disjunctures’, Chapter 4 in J. Sumberg and J. Thompson (eds) *Contested Agronomies*. London: Routledge.

The novelty and field-transforming nature of the findings mean these publications have attracted very wide interest, including amongst agricultural and climate scientists, and policy and public

audiences. There has been significant media interest, and findings from the project were covered in a [National Geographic article](#) in June 2016.

Through workshops, dialogues and direct interactions with agricultural projects and businesses, the project has also led to practical impacts. These include integration of farmers' 'dark earth' techniques into the government/Welthungerhilfe Food Security and Agricultural Development project in Eastern Sierra Leone; influence on the approach of biochar projects including the EU BeBi project in Sierra Leone and 'Carbon Gold' in the UK/Ghana, and the development of 'indigenous fertilisers' in Ethiopia.

## **F) STEPS Centre Projects Bridge Year (01 April 2016 – 31 December 2017)**

**F1. Project title:** The politics of Urban Sustainability Transformations: Mobilising Environmental Knowledge Exchange Partnerships between Social Movements, Researchers and Communities of the Poor

**Researchers:** Fiona Marshall, Gordon McGranahan, Ritu Priya, Pritpal Randhawa, Meghana Arora, Ramila Bisht, Jonathan Dolley

**Partners:** Jawaharlal Nehru University, Delhi. Local NGOs and community groups in Ghaziabad District, Delhi NCR. We have benefitted from an ongoing dialogue with STEPS global consortium partners, particularly via Arizona State University and UNAM, Mexico.

**Aims and objectives:**

To explore civil society led mechanisms for urban sustainability transformations through:

1. Examining the potential for new types of alliances between communities of the poor and social movements to influence elite capture of the urban environmental agendas. (Working Paper promised).
2. Understand the processes through which transdisciplinary research initiatives (across natural and social sciences and with civil society groups) can contribute to urban sustainability transformations through: building the legitimacy of subaltern knowledges, engaging with power and politics across scales, and building alliances to enhance the transformative agency of poor and pro-poor actors. (Journal article promised).

**Results and impacts achieved/potential for impact:**

Fieldwork was carried out throughout 2016 and early 2017 in Ghaziabad involving workshops, participation in meetings between civil society groups and in-depth interviews with a diverse range of activists and other civil society actors. The data was analysed and written up into a STEPS Working Paper.

'Local Environmentalism in Peri-Urban spaces in India: Emergent Ecological Democracy?' STEPS Working Paper 96

[https://opendocs.ids.ac.uk/opendocs/bitstream/handle/123456789/13042/Peri Urban Environmentalism.pdf?sequence=1&isAllowed=y](https://opendocs.ids.ac.uk/opendocs/bitstream/handle/123456789/13042/Peri_Urban_Environmentalism.pdf?sequence=1&isAllowed=y)

During the course of our research we came across a distinctive peri-urban civil society activism, which cannot be viewed in binaries and reflects a pluralist spectrum that allows for alliance building. This environmentalism in Ghaziabad is distinct from the 'environmentalism of the poor' practiced by rural and forest dwelling groups; from the dominant elite urban 'green development' practices and discourses of 'bourgeois environmentalism'; and from the urban politics of the poor. It reflects the

possibility of creating bridges across sectional interests—rural and urban, red and green ideological streams— and across classes.

‘Transdisciplinary Research as Transformative Space Making for Sustainability’, Marshall F., Priya R., and Dolley J. Invited article that has been submitted to the journal Ecology and Society for a special issue entitled Designing Transformative Spaces for Sustainability in Social-Ecological Systems. This paper has drawn together reflections on the literature around knowledge co-production, knowledge systems and transdisciplinarity as well as empirical insights from STEPS and STEPS related transdisciplinary research projects that the team have been involved in. We argue that in the context of persistent structural inequalities in knowledge systems, Transdisciplinary research (TDR) as transformative space making for sustainability must have a pro-poor emphasis. It should also engage directly with the power dynamics and politics that shape these inequalities, with the explicit goal of influencing the distribution of pro-poor transformative agency. To understand and harness the potential of TDR to contribute to this goal a new conceptualisation of TDR is required that goes beyond seeing TDR as producing useable knowledge and engages more deeply with issues of power and politics. Drawing on case studies in peri-urban India, we operationalise this conceptualisation by discussing the processes through which TDR can contribute to urban sustainability transformations.

**Potential Impacts:**

Direct involvement of researchers initiating and participating in meetings between local activists in Ghaziabad has helped to encourage more co-operation and co-ordination between different groups working on environment and poverty issues. The study has helped to develop new partnerships between previously disparate groups, and increased awareness of mutual interests in addressing environment and health challenges in peri-urban areas. There are also established relationships between these groups and the research team and much potential to engage further in constructive ways with urban development interventions that are underway or currently being planned.

The environmentalism working paper reveals the potential for cultivating alliances between diverse peri-urban groups and other civil society actors which will help inform impact strategies for transdisciplinary research in Ghaziabad and similar contexts.

The transformative spaces journal paper offers a novel way of thinking about transdisciplinary research that can help shape the design of future research projects. The case studies highlight the potential for such approaches in rapidly urbanising contexts in south Asia, whilst the paper presents an analytical framework that could be tested and augmented elsewhere. The local, national and international partnerships that we have established through the STEPS centre provides excellent opportunities to utilise this output for shared learning and cooperation to support transformative approaches to transdisciplinary research for urban sustainability.

STEPS urban theme partners across the global consortium have been building on this work to prepare proposals for future collaborative initiatives on urban sustainability transformations.

**F2. Project title:** Open and Collaborative Development

**Researchers:** Adrian Smith

**Partners:** CENIT, Argentina

**Aims and objectives:**

The aim in this short project was to identify the potential and dilemmas presented by emerging

movements for open and collaborative knowledge production for development in Latin America. The objectives were to review the research and activist literature on open and collaborative knowledge production, organise a regional workshop, and analyse issues identified through a knowledge politics and political economy appreciation of the phenomena.

**Results and impacts achieved/potential for impact:**

A workshop was held in Buenos Aires in March 2017. A blogpost about the event was produced, and a network created for participants to continue the discussions. A Working Paper is in press. Open science is very topical at the moment. We intend the dilemmas identified in our project to offer some cautionary advice about the efforts and changes needed in order to really realise the promise of open and collaborative approaches. We will do this by promoting the working paper, and seeking funding for follow-on activity.

**F3. Project title:** Exploring Marketization and Sustainability Transformations in the Context of Mangrove Afforestation, Reforestation and Restoration (ARR) Programmes in Kenya and Kutch

**Researchers:** Amber Huff, Lyla Mehta, Shilpi Srivastava, Charles Tonui (ACTS)

**Partners:** African Centre for Technology Studies (ACTS); Mikoko Pamoja Project; Mikoko Pamoja Community Based Organisation; Gujarat Institute of Desert Ecology (GUIDE)

**Aims and objectives:**

The primary objective of this project was to complete a preliminary study aimed at understanding and comparing processes associated with the ‘marketization of nature’ – how nature-based commodities and markets for trading them are brought into being – in the context of mangrove afforestation / reforestation / restoration (ARR) programmes in Kenya and India. The aims of the project included situating field-based research, site-level programme analysis and stakeholder analyses within the broader context of the national and international politics and economics of environmental mitigation to gain insight into how transitions to market-oriented environmental management are or can be associated with sustainability transformations.

Research sites included a mangrove conservation project linked to the Voluntary Carbon Market (VCM) and involving a direct-to-community Payments for Ecosystem Services (PES) programme on Gazi Bay in Kwale County in southern Kenya, and mangrove-based compensatory afforestation programs meant to mitigate environmental destruction associated with industrial development in Kutch, Gujarat, in western India. The focal settings and national policy contexts are distinct, but in both mangrove programmes have linkages to markets and market-like mechanisms, are frequently framed as ‘community-based’ or ‘community led’ yet bring together diverse and unevenly positioned actors including members of local communities, NGOs, scientists, private industry and government actors. In the two focal settings, we asked the following research questions:

- How are mangrove-based ‘nature goods’ – offsets and environmental services – assembled in terms of arrangements of marketizing agents, valorising and pricing instruments, and their encounters and relationships in the two focal project settings?
- What organisational, institutional and technical changes are at play in mangrove project contexts; in other words, are marketizing processes underway and can they be discerned at the ‘site’ of intervention?
- What are the competing claims and perspectives around the enactment of mangrove-based offsets and services on the part of diverse actors who come together ‘in place’ (e.g. farmers, herders, scientists, industry, government officials)?

**Results and impacts achieved/potential for impact:**

In both settings, mangrove forests are framed as charismatic, exceptionally important ecosystems both for ecological and economic reasons. This is part of a broader global ‘rebranding’ of mangroves in recent years as endangered, exotic, high-functioning ecosystems that can be developed to mitigate GHG emissions and bring economic growth through marketised nature trade and enhanced livelihoods. Although they are framed as the ideal abstracted ecosystem type for the era of the Green Economy, at the same time in many ways, mangroves can be understood as a contested and ‘unruly’ sort of object. This indicates a fruitful area for further analysis, bringing together concerns around contested claims, environmental struggles and value transformations not just in relation to mangrove ARR but across emerging ‘types’ of environmental goods and services more broadly.

Conservation strategies around both cases are framed around market-based or market-driven environmental policy instruments based on the idea that the best ways to protect the living environment incorporate mechanisms like privatization, marketization, commodification and financialization. Mangrove ARR does in many ways mask whilst reproducing existing arenas of control and accumulation by incumbent actors (state, private capital, etc.), shifting many of the costs associated with change to actors with less financial, legal and political power and privilege.

But one interesting thing that our research thus far highlights is that these market mechanisms, discourses and management regimes rely heavily on variable and new alliances as critical underlaborers in order to enact change that appears transformative’ – PPPs, NGO coalitions, international partnerships, those that allow a project to be branded as ‘community-led’ and socially responsible (including CBOs, Co-Management Agreements, Community Forestry Associations), and those that lend particular claimants moral and / or scientific authority in this time of global environmental crisis (alliances of science, state and market).

Aside from these impacts, our research has identified important policy gaps, particularly related to claims around the potential of mangrove ARR – and the broader policy paradigms that they are linked to – to unlock sustainable development opportunities for people on the local level. In the Kenya case, these stem from gaps in forest policy reforms meant to facilitate co-management of forests between members of forest dependent communities and the new Kenya Forest Service. In the Kutch case, these relate to the potential of Corporate Social Responsibility (CSR) directives and Public-Private Partnerships (PPP) to deliver positive outcomes for local populations impacted by both environmental change and the development of ARR projects.

These results are being communicated through working papers, communications with policymakers, blogs and forthcoming journal articles (currently in process), and a larger project proposal for examining these questions in a number of other cases is being developed. Particularly in the Kenya case, our results have received the attention of project developers and policy makers from the county to national level and our Kenya-based collaborator has been invited to share empirical insights from the project to inform further policy reforms.

**F4. Project title:** Toward a Comparative Analysis of Green Revolution Pathways**Researchers:** Saurabh Arora and Dominic Glover**Partners:** STEPS Africa Sustainability Hub (ASH): Dr. Joanes Atela, Mr. Charles Tonui, African Centre for Technology Studies (ACTS), Nairobi, Kenya**Aims and objectives:**

This project aimed to contribute to developing a conceptually-informed history of the Green Revolution in agriculture. Such a history is not dominated by impacts on smallholder farming produced by modern techno-scientific developments, development agencies and donors, but rather proposes a new pluralistic perspective on historical pathways of agricultural change in different parts of the world. This STEPS Bridge Year project is closely aligned with an on-going ESRC-DFID project (led by Saurabh), focussed on mapping pathways into and out of poverty as part of the Green Revolution in South India and Kenya.

In the Bridge Year project, our aim was to carry out a critical re-assessment of these Green Revolution experiences based on a conception of agriculture that was agent-centred and practice-focused, drawing on conceptual resources from Practice Theories, Actor Network Theory (ANT) and Technography. Our critical engagement with these conceptual frameworks represents a novel contribution of this work, which juxtaposed different intellectual traditions in the sociological and anthropological study of science and technology in order to draw out their similarities and contrasts and produce comparative and synthetic accounts.

Alongside this conceptual work, we aimed to carry out a discourse analysis on the academic literature on the Green Revolution in East Africa (focussing particularly on Kenya). Additionally, exploratory fieldwork was carried out in three rural sites in Kenya by ASH/ACTS researchers, in order to explore the potential for a bottom-up, community-based perspective to yield new insights into grand narratives of success and failure resulting from Green Revolution-style interventions in the country over the past several decades. The fieldwork explored systematic differences between three sites with contrasting agro-ecologies, governance frameworks and social and cultural institutions. This exploratory research employed an innovative combination of participatory approaches (transect walks, participatory workshops using Rivers of Life and focus group discussion (FGD) methods, and key informant interviews) to draw out the perspectives and valuations of local community members and groups.

**Results and impacts achieved/potential for impact:**

By setting up a critical dialogue between different conceptual approaches such as ANT and Technography, we have explored their similarities and differences, and shown how they may be used to supplement one another. For instance, we have shown how different conceptual vocabularies are used within these two approaches to discuss relatable ontologies. In particular we have explored the alternative ways in which these two frameworks understand and represent the ways in which human agency is mediated, through fields of practice, by materiality, through interactions between humans and nonhumans, within techniques, knowledge and practices, and within networks of social relations. We believe that this fruitful engagement between different schools/traditions offers a synthesis that will be valuable to academics who want to pursue studies of technology that do not just focus on artefacts, objects and material resources, but on agency, practice and technique, with the capabilities and intentions of human actors at the centre of attention.

A second strand of conceptual work focussed on the development of a framework for transformative engagement between diverse practices of knowing. This work led to a STEPS working paper that proposed four aspects of transformative (caring) engagement between practices. These are: a) *egalitarian commitment* to sharing epistemological authority between practices; b) *ontological sensitivity*, by letting other practices define their own relational bases of knowing and making; c) *nonsubsumptive learning* from other practices; and d) *affinity in alterity*, developed across widening divergence between practices. Enacting such caring engagement may require transformations in 'modernist' techno-scientific practices (such as those producing Green Revolution-style technologies). The latter practices are underpinned by control of nature. They also

disqualify 'vernacular' ways of knowing/making. Relinquishing control and disqualification, modernist practices open up possibilities to become *minoritarian*, admitting uncertainty, ignorance, ambiguity, fluidity and fragility. Engaging with each other, minoritarian practices transform the knowledges and artefacts they produce, in order to more effectively contribute to struggles for socio-ecological sustainability and justice in agriculture and beyond. We believe that this conceptual framework can be appropriated and used, especially in Development Studies, to rethink participatory research and technology development, farmers' knowledge systems, and participatory governance.

The discourse analysis of the academic literature on the Green Revolution (GR) in East Africa, another STEPS working paper, was governed by two questions: what figuration was given to agency in each GR study? In other words, who or what was given the capacity to act in the GR studies? The second question asked which agencies were considered prime movers that play leading roles in the GR narratives and which others were relegated to subsidiary roles? A wide variety of figurations of agency were mapped, including socio-ecological events presented as Malthusian or critical, heroic individuals, technology and its users, as well as relational entanglements between social, ecological and technical entities. The analysis revealed that the process of adjustment and adaptation between different social, ecological and technical entities, *in practice*, on farmers' fields and beyond, was largely missing in the GR discourse. In general, figurations of farmers' agency were not prominent in the discourse. Often, farmers' agency was considered ineffective or detrimental for agricultural transformation. Central among powerful prime mover figurations were national governments, donors, scientists, market-based approaches and agricultural intensification technologies. Such figurations provide legitimation to government- and donor-driven GR efforts in the last decade and a half, delivered largely through market mechanisms. The analysis lays bare the political content of academic discourses that underpin large-scale transformations such as the GR. The work is likely to produce impact in reconfiguring academic discourses on agrarian transformation, and poverty reduction, which must account for the agency of small farmers and farmworkers. Accounting for their agency may be critical for redirecting development support to the smallholders and workers, for furthering their agency alongside that of techno-scientific institutions and agri-business firms.

The field research in Kenya has produced an interesting and useful new perspective on Kenya's Green Revolution histories and diverse experiences of agricultural transformation in different parts of the country. We are confident that the novelty of this approach will draw attention in Kenya's research and policy communities, opening up new conversations about the strengths and weaknesses, successes and failures of agricultural development policy in the country. Our forthcoming publication will help the lead authors from ASH/ACTS to raise their profiles and secure a new audience for their expertise.

**F5. Project title:** The Political Economy of State-Led Transformations in Pro-Poor Low Carbon Energy: A Comparative Study Across China and Kenya

**Researchers:** Dave Ockwell, Pete Newell, Rob Byrne, Wei Shen, Sam Geall

**Partners:** ACTS, Kenya

**Aims and objectives:**

The aim of this research was to analyse historical transformations in low carbon energy in order to understand which political economy dynamics resulted in which distributional outcomes, for which actors and why. In particular, it is interested in the potential tensions between framings of energy access/poverty at a national policy level and the lived experiences and energy practices of poor and

marginalised people. It adopts a comparative approach across Kenya and China, focussing in particular on various different scales of solar PV (grid-connected, mini-grids, solar home systems and solar lanterns) in both contexts.

**Results and impacts achieved/potential for impact:**

The project resulted in insights specific to China and Kenya respectively, as well as comparative insights through comparing across the two contexts. These are presented in three separate STEPS working papers (currently being written up into journal articles), the abstracts for which are set out below.

**Geall, S., Shen, W. and Gongbuzeren (2017) Solar PV and Poverty Alleviation in China: Rhetoric and Reality, STEPS Working Paper 93, Brighton: STEPS Centre**

In 2014, China announced an ambitious plan to help alleviate rural poverty through deploying distributed solar photovoltaic (PV) systems in poor areas. The solar energy for poverty alleviation programme (SEPAP) initiative aims to add over 10 GW capacity and benefit more than 2 million households from around 35,000 villages across the country by 2020. This working paper traces the emergence and implementation of the initiative through discourse analysis of policy documents. Then, through a case study in the remote and largely pastoralist county of Guinan, in Qinghai province on the Tibetan plateau, we illustrate the constraints on implementing SEPAP and contested local perspectives on the buildout of ostensibly low carbon infrastructure for electricity generation.

**Byrne, R. and Mbeva, K. (2017) The Political Economy of State-led Transformations in Pro-poor Low Carbon Energy: A Case Study of Solar PV in Kenya, STEPS Working Paper 91, Brighton: STEPS Centre**

International efforts to achieve goals such as universal energy access and climate change mitigation are expected to stimulate billions of dollars of private financial flows to developing countries for clean (energy) technology transfer investments. Policies for realising these ambitions are framed in terms of neoliberal development orthodoxy, but critical voices call for more active state intervention based on arguments showing that free markets alone will not deliver the needed technologies and other innovations with the urgency required. This sets up the potential for a confrontation of contradictory ideologies in the making and implementation of policy: neoliberal orthodoxy at the level of global agreements versus state-led developmentalism at the national level. What this will mean for action on the ground, as those who promote clean energy access technologies and innovations seek to realise their development goals, is an open question.

**Ockwell, D., Newell, P., Geall, S., Mbeva, K., Shen, W. and Ely, A. (2017) The Political Economy of State-led Energy Transformations: Lessons from Solar PV in Kenya and China, STEPS Working Paper 92, Brighton: STEPS Centre**

Amid talk of the need for a low carbon 'clean energy revolution' to address the challenges of energy poverty and climate change, there is growing academic and policy interest in understanding the role of key actors that are expected to enable transitions and transformations towards a low carbon economy in a pro-poor way. Within the socio-technical transitions literature, there has been increased interest in "the state" as the primary actor with the responsibility, authority and capacity to address these issues. But understanding the role of the state in energy transformations requires an appreciation of context: what is possible given enormous differences in capacity and resources, autonomy and uneven access to different energy sources and technologies. Which technologies and energy systems receive support, whose energy needs get prioritised and which actors are charged with the responsibility for meeting energy needs are a function of very different decision-making processes, political systems and political economies.



**F6. Project title:** The Many Circuits of a Circular Economy

**Researchers:** Dr. Ashish Chaturvedi, Mr. Jai Kumar Gaurav and Ms. Pragya Gupta

**Aims and objectives:**

The overall aim of the research is to initiate the debate on the political economy of the transformations towards a circular economy. The current literature largely focuses on the technologies that could trigger the transformations towards a circular economy without focusing on the actors (or alliances thereof) that are likely to drive, or block, the progress towards such a transformation. The objective of the research is to develop a conceptual framework that combines circular economy models and situates them in the variable power geometries of actors. For analytical tractability we focus on urban waste management but the analysis could easily be extended to other stages of a circular economy such as repair or reuse.

**Results and impacts achieved/potential for impact:**

The research brings together two analytical shifts. The first shift is from technical to political analysis and the second shift is from single to multi-scale analysis. The existing literature focusing on technical analysis establishes the need to close material and shows how the transformation to a circular economy is a critical contributor to the sustainability of our planet. However, the technical literature does not highlight that there are multiple pathways to achieve such a process at scale. We argue that several actors with divergent interests are currently involved in shaping the pathways to this possible transformative process. The pathways on which we embark would have material consequences on the economic and social outcomes of those involved. Also, the models that are prioritised for implementation would be selected on the basis of contestations in the material and discursive arenas.

The emerging literature on political economy analysis focuses largely on a particular scale – either the local or the national level. In this paper, we extend that framework to examine how the narratives at different scales - local, national and supranational - interact with each other. We make the case for analysing narratives at different scales to pin down potential actor constellations that would drive the multiple conceptions of a circular economy. It is clear from the discussion above that the dominant narratives are likely to be those that bundle interests across scales.

By bringing together the two analytical shifts, we develop a conceptual framework to analyse how the narratives at the supranational, national and local level interact with each other and the implication thereof on the development of dominant narratives. The narratives on waste management that exist at the supranational, national and local level have been described with focus on India and the impact of a focus on techno-managerial solutions on the vulnerable and marginal communities in urban areas have been highlighted. This analysis will serve as a reference for stakeholders involved, particularly for actors involved in policy advocacy and policy making. Our analysis is suggestive of a complex relationship between the material and discursive arenas and that circular economy narratives are in a flux at this moment. As a result, it is critical to focus on the politics of circular economy. If evidence based research has to inform conceptions of a circular economy, now is probably the most important juncture to actively pursue the agenda, before the alliances are stabilised and certain narratives emerge as the clear front-runner. The potential impact of this paper is that it would broaden the debates on transformations to a circular economy from the 'what' and 'how' questions of transformations to a circular economy to the 'who' will drive such a transformative process.

## **Annex B: STEPS Centre Advisory Committee**

The STEPS Centre International Advisory Committee played key roles in helping to steer the Centre's strategies, intellectual agendas and impacts. During the life of the Centre, the Advisory Committee was able to come together to meet with the Centre's directors and researchers almost every year, usually just after the Centre's annual Symposium. There was also a second, virtual meeting each year in March to review the annual report and forward plan. Members were selected so that the Committee as a whole covered the range of STEPS work, including academics from different disciplines, sectors and international settings and people with expertise in policy, civil society and media arenas.

### **Chair (2014-2016)**

Professor Mike Hulme, Professor of Climate and Culture, Kings College London

### **Chair (2006-2014)**

Professor Judi Wakhungu, Cabinet Secretary for Environment and Regional Development Authorities, Kenya; and formerly Executive Director of the African Centre for Technology Studies (ACTS), Kenya.

### **Members (sorted alphabetically by surname)**

Professor Louk de la Rive Box, Rector, Institute of Social Studies, The Netherlands (2006-2009)

Mr. David Dickson, formerly Director, SciDev.net, UK (2006-2011)

Ms. Christine Drury, ex-Unilever, UK (2006-2011)

Dr. Dipak Gyawali, Pragya (Academician) of the Royal Nepal Academy of Science and Technology (RONAST) and Research Director of the Institute of Social and Environmental Transition, Nepal (ISET-N) (2011-2016)

Professor Sue Hartley, Director, York Environmental Sustainability Institute (YESI), University of York, UK (2011-2016)

Professor Katherine Homewood, University College London (2006-2009)

Professor Mike Hulme, Professor of Climate and Culture, Kings College London (2011-2014)

Professor Sheila Jasanoff, Pforzheimer Professor of Science and Technology Studies, Harvard University, USA (2006-2011)

Dr. Tony Marjoram, Senior Programme Specialist, Natural Sciences Sector, UNESCO, Paris (2006-2011)

Ms. Sunita Narain, Centre for Science and Environment, Delhi, India (2006-2009)

Mr Banji Oleyaran Oyeyinka, Director, Monitoring and Research Division, UN Habitat (2006-2011)

Mr Fred Pearce, freelance journalist (2011-2016)

Dr. Suman Sahai, GeneCampaign, Delhi, India (2011-2016)

Dr. Andrew Scott, Director of Policy and Programmes, Practical Action, UK (2006-2011)

Dr. Shiv Visvanathan, Centre for the Study of Developing Societies (CSDS), Delhi, India (2006-2009)

Dr. Joachim Voss, independent consultant, ex-Director-General, CIAT, Columbia (2006-2011)

Dr. Jimmy Whitworth, Head of International programmes, Wellcome Trust, UK (2006-2011)

Professor Brian Wynne, professor of Science Studies and CESAGEN, University of Lancaster (2006-2016)

### Annex C: STEPS Centre Membership List

First name	Surname	UoS affiliation	Role	Years
Sigrid	Stagl	SPRU	Research Fellow	2006-2008
Esha	Shah	IDS	Research Fellow	2006-2009
Elisa	Arond	IDS	Research Officer	2006-2011
Gerry	Bloom	IDS	Research Fellow	2006-2011
Sally	Brooks	IDS	Research Officer	2006-2011
Sarah	Dry	IDS	Research Officer	2006-2011
Paul	Forster	IDS	Research Officer	2006-2011
Catherine	Holley	IDS	Research Officer	2006-2011
Synne	Movik	IDS	Research Officer	2006-2011
Paul	Nightingale	SPRU	Research Fellow	2006-2011
Pritpal	Randhawa	IDS	Research Officer	2006-2011
Patrick	Van Zwanenberg	SPRU	Research Fellow	2006-2011
Melissa	Leach	IDS	Director and Research Fellow	2006-2014
Julia	Day	IDS	Communications Manager	2006-2015
Hayley	MacGregor	IDS	Research Fellow	2006-2016
Erik	Millstone	SPRU	Research Fellow	2006-2016
John	Thompson	IDS	Research Fellow	2006-2016
Linda	Waldman	IDS	Research Fellow	2006-2016
Harriet	Dudley	IDS	Administrative Manager	2006-2017
Adrian	Ely	SPRU	Research Fellow	2006-2017
Fiona	Marshall	SPRU	Research Fellow	2006-2017
Lyla	Mehta	IDS	Research Fellow	2006-2017
Ian	Scoones	IDS	Co-Director and Research Fellow	2006-2017
Adrian	Smith	SPRU	Research Fellow	2006-2017
Andy	Stirling	SPRU	Co-Director and Research Fellow	2006-2017
Jeremy	Allouche	IDS	Research Fellow	2011-2016
Jim	Sumberg	IDS	Research Fellow	2011-2016
Rob	Byrne	SPRU	Research Fellow	2011-2017
David	Ockwell	Global Studies	Research Fellow	2011-2017
Nathan	Oxley	IDS	Communications Assistant and Manager	2011-2017
Suzanne	Fisher-Murray	SPRU	Communications Assistant	2014-2017
Saurabh	Arora	SPRU	Research Fellow	2016-2017
Ashish	Chaturvedi	IDS	Research Fellow	2016-2017
Sam	Geall	SPRU	Research Fellow	2016-2017
Dominic	Glover	IDS	Research Fellow	2016-2017
Amber	Huff	IDS	Research Fellow	2016-2017
Parveen	Mungroo	IDS	Administrative Assistant	2016-2017
Wei	Shen	IDS	Research Fellow	2016-2017
Shilpi	Srivastava	IDS	Research Fellow	2016-2017