Workshop one: training themes

This workshop contributes classroom and field content for the first year of training within the Cresting project. Activities comprise a combination of speakers, discussion, and site visits. There is also time scheduled for meeting with supervisory teams.

Topics covered are:

1. Stakeholder perspectives on the circular economy
2. Employment in the circular economy
3. Career development planning
4. Research methodologies: transdisciplinary research, interdisciplinary research and critical realism
5. Ethics in research
6. Investigating the circular economy in practice

This handout provides a brief rationale for each topic so that participants know what to extent, what is the purpose, and can prepare in advance. A reading list is also included. There is no expectation that everything on the list will be read in advance, but it would useful if participants can have done some preparatory reading.

1. Stakeholder perspectives on the circular economy

Although generally agreed to involve a range of approaches to resource efficiency, the meaning, nature, achievability and implications of the circular economy are open to debate. However, trying to embed resource efficiencies into the economy beyond the present emphasis on 'end of pipe' solutions such as recycling, involves not only participation by many different stakeholders (including the public and government as well as all manner of companies), but active collaboration between them. As with sustainable development initiatives, stakeholders may be expected to frame the circular economy in ways that relate closely with their own activities. That, alongside potentially conflicting economic interests, may present challenges in terms of devising and implementing circular strategies with which stakeholders are prepared to engage. As a first step to understanding different perspectives, and the contexts from which they derive, we have a number of speakers from industry, local and national government, a professional body and a local and national NGO. Notably, this session is shared with the Chartered Institution of Wastes Management; most of the non-Cresting audience will be people from across NE England who work in the waste industry as either independent consultants, employees of waste companies or local authorities,. With each speaker, consider what the circular economy means to them, and what they see as the challenges in achieving it. Several questions come to mind, you might think of many others. What are the similarities/differences in these views? How do they compare with previous experience you may have had? Any consistency in the challenges outlined, or initial thoughts on how to approach those? How well do the ideas emerging fit with academic work e.g., how do different organisations engage with environmental initiatives, or how do different organisations present themselves environmentally?

2. Employment in the circular economy

An important aim of Cresting is to train the ESRs for employment, especially research-related, relevant to the circular economy. But what might that mean? We will have a better idea as the project progresses, but we need to start thinking about this now so that we can make the training as relevant as possible. This session will involve discussion in small groups. The discussion can be quite wide as what a circular economy might look like, but focusing on exploring ideas about employment opportunities/requirements likely to emerge in the circular economy.

3. Career development planning

Related to the identification of potential employment opportunities, is consideration of skills that you might need to develop to be equipped to take on those roles. As everyone has a different background, and might also have different intentions for the future, this is an individual task though may still benefit from discussion. The programme Handbook lists the training provided within Cresting; other skills will be offered by your host university. There may be topics that would be useful to add to a workshop for everyone to share, or there may be specialist topics that only one or so ESRs are interest in. It may be possible to finance such training through the project. Career development planning is an ongoing process. We will revisit this every six months as part of reviewing overall progress. Following this introduction to the exercise, ESRs should discuss their thoughts with their supervisors, who should feedback any identified gaps or duplication in the training programme to the supervisory board.

4. Research methodologies: transdisciplinary research, interdisciplinary research and critical realism

Whilst all the projects within Cresting have a list of research questions to address, the research designs and methodologies to be applied are only outlined in general terms. An important training experience for ESRs over the coming months will be to discuss and define the approach to be taken with their supervisory team. Thursday's session, which is shared with the White Rose ESRC Doctoral Training Partnership, presents, and invites discussion on, two approaches to research that are important to Cresting: transdisciplinary research and critical realism.

One of the unique features of Cresting compared to other research into the circular economy is the use of critical realism as the overarching research philosophy, though its significance will undoubtedly vary between different projects. Critical realism seeks to understand and explain issues in context, as opposed to (for example) looking for common patterns and universal cause and effect relationships. Many different research methods can be applied to this end, with the aim of uncovering the underlying influences on a situation, which might not be directly observable. Critical realism does not imply any specific disciplinary approach (though is more widely practiced in some disciplines than others), and has therefore been proposed by various authors as an approach to interdisciplinary research. Dr Amber Fletcher from Regina University in Canada will be leading the session on critical realism.

Another key feature of Cresting is the breadth and depth of involvement with non-academic stakeholders. This affords a ready-made opportunity for transdisciplinary research. As you will see, there are different understandings of this term. Broadly speaking, transdisciplinary implies having a level of involvement in research from non-academic actors. The extent to which the non-academic actor(s) are actively involved in the execution of a project can vary (and of course that partly reflects their preferences), but transdisciplinary implies something much more than interviewing stakeholders, or providing them with updates to progress. We will hear about some different approaches and the challenges of this type of research. Dr Sjors Witjes from Radboud University in the Netherlands will be leading this session.

5. Ethics

The ethics of research is an area of great importance. Aside from the need to be open and fair with research participants, this is also a highly regulated aspect of research. Holding information about people, and their potentially confidential views, comes under data protection guidelines on the one hand, and rules about open access to publically funded research outputs on the other. So we have to not only follow good research practice, but be able to document that we are. It is of paramount importance that all research carried out within Cresting follows the project's ethical and data management guidelines. The purpose of this session, however, is firstly to (re)introduce ideas about ethics in research as a principle and to consider the issues that will come up within Cresting. Secondly, we will review the process by which individual projects within Cresting will gain ethical approval. This will resemble the University of Hull process of peer approval, whereby academics with similar research interests review ethical approval applications from colleagues and/or their students. Dr Lewis Holloway from the University of Hull will lead the ethics session.

6. Investigating the circular economy in practice

We will be visiting two contrasting companies in the Yorkshire region. Both of which position themselves as sustainable in some sense.

Drax is one the largest power station in the UK. It is located near Selby, in North Yorkshire. Until quite recently it was 100 % coal fired. Swayed by a range of policies (variously taxing carbon emissions and subsidising renewables), the company has largely switched to using biomass as its fuel. It is now the largest renewable energy generator in the UK. As the biomass is residue from the timber industry, a claim can be made that this is not only renewable energy, but also an example of circularity. Given that the biomass is sourced from North America, however, to what extent would you say that the operation is sustainable? What else would you want to know in order to make a judgement? We will have a guided tour of the site, which is quite a spectacle, and there will be plenty of opportunities to ask questions of the guide.

Note that for health and safety reasons everyone must wear full length trousers and long-sleeved tops for this visit. You will be supplied with safety gear (e.g., high-vis vest and hard hat), which you must wear as directed by the guide.

Wold Top Brewery, in Driffield in the East Riding of Yorkshire, is a family business making beer from locally sourced barely and water (filtered through the chalk of the Yorkshire Wolds and accessed through a borehole). Established in 2003 in response to declining income from arable farming, the brewery has since won prizes for sustainability, business performance and the flavour of its beers. Besides the local sourcing, sustainability features include (or have included) onsite generation of electricity from wind energy, use of agricultural/production residues as animal feed and/or for composting, and measures for wildlife conservation. This may be a model of regenerative development. If the business model is as sustainable as it appears to be, what are the transferable elements/principles? But also, we could note that they are selling a premium product (i.e., not affordable by everyone), and obviously not a health food.

Reading list

Try to read something from each section ahead of the workshop. Not all items will be available at all institutions; pdfs of journal articles can be provided if needed.

Critical Realism

Ackroyd, S. and Karlsson, J. Ch (2014) Critical Realism, Research Techniques, and Research Designs. In Edwards P.K. et al., *Studying Organizations Using Critical Realism: A Practical Guide*, Oxford University Press. Pp. 21-45.

Archer, Margaret, et al. (1999) Critical Realism and Research Methodology. *Alethia*, 2(1) 12–16. Taylor doi:10.1558/aleth.v2i1.12.

Archer, Margaret, et al. (2016) What Is Critical Realism? *Perspectives: A Newsletter of the Theory Section, American Sociological Association*, December 2016 http://www.asatheory.org/2/post/2016/12/what-is-critical-realism.html.

Danermark, Berth, et al. Explaining Society: An Introduction to Critical Realism in the Social Sciences. Routledge, 2002. Chapters 2 and 3 (or entire book if you're seeking a full text)

O'Mahoney, J. and Vincent, S. (2014) Critical Realism as an Empirical Project: A Beginner's Guide." In Edwards P.K. et al., *Studying Organizations Using Critical Realism: A Practical Guide*, Oxford University Press. Pp. 1-20.

Fletcher, A.J. (2017) Applying critical realism in qualitative research: methodology meets method. International Journal of Social Research Methodology. 20(2) 181-194, https://doi.org/10.1080/13645579.2016.1144401

Sayer, A. (1997) Critical Realism and the Limits to Critical Social Science. *Journal for the theory of social behaviour.* 27(4) 473-488.

Sayer, A. (2000) *Realism and Social Science*. SAGE Publications Ltd.

Sayer, A. (2002) Method in Social Science: Revised 2nd Edition. Routledge.

Sorrell, S. (2018) Explaining sociotechnical transitions: A critical realist perspective. Research Policy 47 1267–1282. https://doi.org/10.1016/j.respol.2018.04.008

Zachariadis, Markos, et al. (2013) Methodological Implications of Critical Realism for Mixed-Methods Research. *MIS Quarterly*, 37(3) 855–879.

Interdisciplinary research

Greckhamer et al. (2008) Demystifying Interdisciplinary Qualitative Research. *Qualitative Inquiry*, 14(2) 307-331. https://doi.org/10.1177/1077800407312049

Baerwald T.J. (2010) Prospects for Geography as an interdisciplinary discipline. *Annals of the Association of American Geographers*. 100(3) 493-501 https://doi.org/10.1080/00045608.2010.485443

Frodeman, R., Thompson Klein, J. and Mitcham, C. ed., (2017). *The Oxford Handbook of Interdisciplinarity*. 2nd ed. OUP.

Schoolman, E.D., Guest, J.S., Bush, K.F. and Bell, A.R. (2012) How interdisciplinary is sustainability research? Analyzing the structure of an emerging scientific field. *Sustainability Science* 7 67-80. DOI 10.1007/s11625-011-0139-z

Repko, A.F. and Szostak R. (2017) Third edition. Interdisciplinary Research; Process and Theory. Sage. ISBN 1506330487

C. F. Gethmann, M. Carrier, G. Hanekamp, M. Kaiser, G. Kamp, S. Lingner, M. Quante, F. Thiele (2015) Interdisciplinary Research and Trans-disciplinary validity claims. Springer International Publishing. ISBN 331911400X

Transdisciplinary research

Angelstam, P. *et al.* (2013) 'Solving problems in social-ecological systems: definition, practice and barriers of transdisciplinary research', *Ambio*, 42(2), pp. 254–65. doi: 10.1007/s13280-012-0372-4.

Carew, A. L. and Wickson, F. (2010) 'The TD Wheel: A heuristic to shape, support and evaluate transdisciplinary research', *Futures*, 42(10), pp. 1146–1155. doi: 10.1016/j.futures.2010.04.025.

Hessels, L. K., & Lente, Harro, V. (2008). Re-thinking new knowledge production: A literature review and a research agenda. Research Policy, 37(4), 740–760. doi:10.1016/j.respol.2008.01.008

Lang, D. J., Wiek, A., Bergmann, M., Stauffacher, M., Martens, P., Moll, P., … Thomas, C. J. (2012). Transdisciplinary research in sustainability science: Practice, principles, and challenges. *Sustainability Science*, 7(S1), 25–43. DOI 10.1007/s11625-011-0149-x

Polk, M. (2015) Transdisciplinary co-production: Designing and testing a transdisciplinary research framework for societal problem solving. *Futures* 65, 110-122. https://doi.org/10.1016/j.futures.2014.11.001

Siebenhüner, B. (2018) Conflicts in Transdisciplinary Research: Reviewing Literature and Analysing a Case of Climate Adaptation in Northwestern Germany. *Ecological Economics* 154 117–127. https://doi.org/10.1016/j.ecolecon.2018.07.011

Toomey, A.H., Markusson, N., Adams, E., and Brockett B. Inter- and Trans-disciplinary Research: A Critical Perspective. GSDR 2015 Brief. https://sustainabledevelopment.un.org/content/documents/612558-Inter-%20and%20Trans-disciplinary%20Research%20-%20A%20Critical%20Perspective.pdf (UN Global Sustainable Development Report: this Brief appears to be related to, but not a distinct part of the 2015 GSDR https://sustainabledevelopment.un.org/globalsdreport/2015)

Verouden, N.W., van der Sanden M.C.A. and Aarts, N. (2016) Silence in Interdisciplinary Research Collaboration: Not Everything Said is Relevant, Not Everything Relevant is Said. *Science as Culture*, 25 (2), 264–288, http://dx.doi.org/10.1080/09505431.2016.1141191

Wickson, F., Carew, a. L. and Russell, a. W. (2006) 'Transdisciplinary research: characteristics, quandaries and quality', *Futures*, 38(9), pp. 1046–1059. doi:10.1016/j.futures.2006.02.011.

Witjes, S. (2017). Leapfrogging through retrospection: Ferreting out sustainability integration within organisations. Utrecht University, Utrecht, The Netherlands.(especially chapter 1.4, 1.5 and 7.2.) https://files.acrobat.com/a/preview/56e087b1-bbef-424a-9f3b-74b0eb4d91c8

Ethics

Comstock, G.L. (2012) Research ethics: a philosophical guide to the responsible conduct of research. CUP: Cambridge.

Traianou, A. and Hammersley, M. (2012) *Ethics in Qualitative Research: Controversies and Contexts*. London: SAGE Publications.

Sustainability research methods

These have been recommended by Sjors as good for transdisciplinary research, but a wider application.

Fahy, F., & Rau, H. (2013). *Methods of Sustainability Research in the Social Sciences*. (F. Fahy & H. Rau, Eds.). London, UK: SAGE Publications.

Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S., Scott, P., Trow, M., … Scott, S. (1994). The *New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies.* Information Processing & Management (Vol. 31). SAGE Publications.

Franklin, A., & Blyton, P. (2013). *Researching Sustainability: A Guide to Social Science Methods, Practice and Engagement*. Taylor & Francis.

Martens, P. (2006). Sustainability: science or fiction? *Sustainability: Science, Practice and Policy*, 2(1), 36–41.

Söderbaum, P. (2009). Making actors, paradigms and ideologies visible in governance for sustainability. *Sustainable Development*, 17(2), 70–81.

Lynham, S. a. (2002). The General Method of Theory-Building Research in Applied Disciplines. *Advances in Developing Human Resources*, 4(3), 221–241.

Van de Ven, A. H. (2007). *Engaged scholarship: A guide for organizational and social research*. Oxford University Press on Demand.