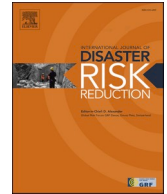




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International development and disaster risk reduction research: A UK research practitioner stocktake

1. Introduction

Researchers and research funders make frequent claims for work at the nexus of international development and disaster risk reduction (DRR), including climate change adaptation (CCA), to be impactful, co-produced and interdisciplinary. Do these claims stack-up? The research landscape on this topic is diverse and rich, with multiple funders, funding mechanisms and epistemic traditions deployed across diverse partnership modalities to address a broad range of issues associated with disaster risk and its reduction. Here, we present perspectives offered by the UK Disasters Research Group of funders, convened by the UK Collaborative on Development Research ([funder-groups/disasters-research-group/](https://www.ukcdr.org.uk/what-we-do/our-funder-groups/disasters-research-group/) [title="https://www.ukcdr.org.uk/what-we-do/our-funder-groups/disasters-research-group/"](https://www.ukcdr.org.uk/what-we-do/our-funder-groups/disasters-research-group/)><https://www.ukcdr.org.uk/what-we-do/our-funder-groups/disasters-research-group/>) and its sister committee, the UK Alliance for Disaster Research (<https://www.ukadr.org/>). These voluntary and independent committees convene the UK public sector funders for research on disaster risk in Low- and Middle-Income Countries (LMICs) and the UK-based research community focused on disaster risk.

A reflection on research practice and capacity in 2023 is timely for two reasons. First, the context offered by the mid-term review of the Sendai Framework for Disaster Risk Reduction, 2015–2030 (SFDRR) [1]. This found that, while progress has been made towards realising SFDRR priorities, implementation lacks consistency across countries with implications for science policy and research focus.

- Global access to national and sub-national disaster vulnerability, event and loss and capacity data (including the status of early warning systems) remains uneven and inadequate.
- Challenges remain in quantifying risk. This technical challenge hinders public and private investments in DRR, especially for human vulnerability reduction.
- Losses from disasters (including climate change loss and damage) undermine progress towards the SDGs, especially in countries with special situations such as small island nations and least-developed countries.
- Financing for action and research on DRR has not kept pace with the increasing economic cost of disasters. Including human and ecological costs, the gap is even greater.
- International financing for DRR as a proportion of overall disaster-related finance remains inadequate. Of the total disaster-related overseas development assistance between 2011 and 2020, only 5.2% was spent on disaster prevention and preparedness.
- There is inadequate international cooperation for DRR.
- There has been little devolution of DRR governance to the local level despite specific SDG targets. Where local DRR responsibilities do exist, they are often not accompanied by adequate financing and capacity, limiting observed change on the ground.

Second, the end of a UK government funding cycle with significant Overseas Development Assistance (ODA) investment. This period, roughly 2014–2022, included the UK Research and Innovation (UKRI) led Global Challenges Research Fund (GCRF) (£1.5 billion) and Newton Fund (£735 million). Both enabled LMIC-focussed work built on the principles of impactful, co-produced and interdisciplinary working. The closure of GCRF and Newton provides a concrete focus for reflecting on and identifying lessons for future research and policy funding cycles.

Drawing on lessons from the DRG and UKADR communities of UK-based international development researchers, research funders and research users, we take impact, coproduction and interdisciplinarity in turn. For each, we first consider key achievements and challenges and then propose specific areas for work to advance practice. We begin by examining impact as the overarching goal for

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applied research, and then its two core components - coproduction and interdisciplinarity. Combined, these point to lessons for transdisciplinarity, which we do not treat as a separate theme. There is already a robust literature on each; this is not reviewed here; rather, we focus on pressing concerns for those delivering research excellence, from a UK community perspective.

2. Impact

The SFDRR reminds researchers of the need for transboundary, regional, and international cooperation for impactful research. How can UK researchers and research funders amplify research to achieve this goal? There is a continuing need for researchers to communicate more effectively with research users. This means translating research priorities and findings into messages that can travel well within government and other organisations that can use and then amplify research through uptake.

Since the adoption of SFDRR, the risk landscape has changed remarkably, adding further communication challenges. The SFDRR now includes biological and technological hazards, natural hazard (and climate change-associated) risks, and their interactions. To overcome such communication challenges, it must first be recognised that we cannot do transboundary engagement until we speak the same language. An example of progress is the UNDRR Hazard Information Profiles (2021) [2]. These cover 302 global hazards including waste from COVID-19, cyber security, transport accidents, diseases, algal blooms, extra-terrestrial and economic shock events.

The recent inclusion of COVID-19-related data in the SFDRR monitor demonstrates how countries have taken steps to address the broad scope of the SFDRR; greater work is required to represent human-made and natural hazards. In the face of increasing shocks, deepening vulnerabilities, inequalities, systemic risks and cascading impacts, member states recognise the need to enhance cooperation relating to disaster risk data, information, and strategic foresight.

Within this context, priorities for enhancing the impact of research include.

- **Practise what we preach.** Make sure the organisational and science architecture is in place for the domestic interpretation, monitoring and implementation of SFDRR. Having in place the ability and political will to monitor, report and publish status reports will enhance the credibility of the UK as a global leader in science and practice in DRR. There may be important lessons from LMIC methods and experience for applied research on DRR/CCA in the UK, including making scientific tools freely available to end-users with appropriate training and support.
- **Connection between science and policy.** There could be more systematic support for representing UK-funded research at, for example, the UN level at UNFCCC CoPs or strategic discussions, such as the Global Goal on Adaptation process, where technical expertise is highly influential in agenda setting. Additionally, policymakers should be encouraged to take up residencies or fellowships in UK or LMIC universities. This would foster relationships and enhance communication between policy needs and the research community.
- **Flexible funding.** The NERC Urgency Grant Funding scheme, predominantly for physical and engineering science post-event assessments, is an example of a flexible, rapid response funding mechanism. A similar ESRC, AHRC, or cross-UKRI scheme, could be developed for the timely study of the behaviour of decision-makers, including humanitarians and UK government humanitarian aid during unfolding crises or post-event (or even post-policy-innovation.). Collaboration between FCDO and UKRI could open possibilities for urgency research within FCDO-funded aid projects.
- **It's not only about numbers.** Narrative and context are also important, arguably more so as a means of understanding the systemic nature of risk processes and how, where, when and who is best placed to intervene to reduce risk and mitigate cascading consequences. Narrative and cultural work can be essential elements of communicating to policymakers so they can make better decisions.
- **Open learning.** Encourage decision-makers with an open mind to learn from different approaches how to create public policy based on broad evidence. This could include efforts to bring together lessons from research and practice partners from LMICs dealing with specific hazard or vulnerability challenges with lessons for the UK.
- **Coordinated action** is required to link the SFDRR and SDG agendas where UK science has extensive expertise. There is quite a gap between the SDG and SFDRR narratives. The SDGs see the world as large blocks that are quantifiable. The SFDRR is more process-oriented, touching on systemic and multi-hazard risk and aspires for these to connect through to the SDGs. Concerted action could test how concepts like systemic risk or cascading risk can inform how to meet the indicators and targets of the SDGs.
- **Redouble efforts for vulnerability reduction.** Despite more than 40 years of research establishing the importance of physical and human vulnerability, hazard-based and exposure-led approaches are still predominant in DRR and CCA research and policy making. Part of the challenge is that work focusing on the root causes of human vulnerability, including failure to implement knowledge and lessons, often touches on questions of power and vested economic interest. Researching such power asymmetries can place researchers and local partners in danger. Human vulnerability is also difficult to validate against impacts because of a lack of systematically collected human vulnerability and impact data. We could better articulate these challenges rather than sidelining work in this area, which pretends there is not a problem and enables it to persist.
- **Incentives for progressive change.** CCA has increased focus on the need not only to do things better but to do things differently. This emphasises research to enable decision-makers and those impacted by decisions, to have evidence-based foundations for reflecting on the appropriateness of existing policy, opportunities for change, and blockages to desired change. Inclusivity is key, as is the application of normative and probabilistic, trend-based, futures methods to guard against path dependency and keep open scope for transformative adaptation.

3. Coproduction

Finding a contemporary DRR/CCA research proposal that does not champion co-production and broader collaboration with multiple stakeholders, partners or beneficiaries would be difficult. The experience of GCRF and Newton – which explicitly prioritised co-production and equitable partnerships, particularly in the context of the SFDRR - has been successful in acknowledging that science operates in a complex, interdependent, and interconnected world, and in training a generation of scientists in impact-focussed research. There is growing literature to support these practices that emphasise the interdependencies between coproduction, collaboration and equity in research-practice partnerships (e.g., Ref. [3]). Key challenges tend to arise from needing sufficient time in both developing collaborative projects and their implementation. This is especially so in projects that are co-produced, problem-focused and interdisciplinary – in other words, transdisciplinary. These require time to establish common aims and shared language and for the right balance of time for all collaborating partners across disciplines and geographies. A difficult challenge continues to be equitable collaboration between physical and social sciences and arts and humanities reinforced by the challenges of integrating human vulnerability into risk analysis and risk reduction strategies - and, indeed, the Western scientific drive to quantify over other forms of knowledge including Indigenous and local knowledge.

Co-production between science and science- or technology-informed partners, especially in middle-income country contexts, has made significant progress. Far more challenging is meaningful and equitable collaboration with low-income country partners or 'local' and 'community' level partners, including those with indigenous or local knowledge, more widely. Here, science capacity can be very limited, leading to some difficult tensions between considerations of equity in partnerships and discovery science considerations of quality. The balance will inform operational pathways to impact – even with investment in capacity strengthening.

From Arnstein's [4] Ladder of tacit versus active participation, through to related empowerment, othering, representation, empathetic and socially constructed narratives and a desire to decolonise the production of knowledge, matters of true collaboration and co-production (rather than 'participation' as a means to an end) face profound ethical and methodological dilemmas that are too often overlooked and reduced to data coproduction techniques. This takes the politics out of coproduction. We need to redouble critical focus for coproduction that allows decision-makers to have an evidence base to challenge policy drivers of inequality and risk in society. Resolving this is not easy – if it were, it would be done already! But the research community does need to be upfront about the limits of contemporary research project approaches, perhaps, especially at the level of funders who generate (or deny) cumulative program-wide impacts.

The GCRF community has championed codesign of research proposals and detailed methods to facilitate coproduction. This has helped to shift research design from supply-side (we have great science now, where can this be deployed?) towards demand-side (we have a problem, what science would be best to help?). This is a cultural and an ontological or methodological movement, part of a fuller appreciation of diverse knowledge worlds and viewpoints within knowledge generation and use. For some, there is still concern about the possibility of weakening formal science and the scientific method through these processes of engagement. Overall, there has been an advance in the recognition that science of any kind is more impactful when understood as one form of knowledge with particular attributes set within a dynamic and, at times, oppositional context of wider knowledge systems. Given the multiplicity of actors, their political positions and vested interests in current and future investments to reduce risk, multiple knowledge systems are especially salient to DRR/CCA, and perhaps most of all in the context of LMICs partnerships.

In seeking to advance coproduction, much emphasis is on initial planning and building the right team – but experience also points to the importance of ongoing research management focus to support partners in understanding how they grow together. Trust and compromise are key attributes in such processes. Time is needed: time to grow together and time to develop those long-term relationships. Simplicity is also important. Sometimes, if we over-analyse, if we're too specific about deliverables, etc., it can be challenging to achieve the necessary conversations.

How can researchers manage time to have those collaborations? How can research funders make sure to secure time for programmes to be effective?

Priorities for enhancing co-production include.

- **Demand-led orientation.** Working harder at understanding the consequences for research quality, trust building, and impact of success (or failure) of demand-led research - both when designing calls and project proposals and restraining supply-side dominance during research project implementation. This is a first step to enabling demand-led work that can still advance science and deploy the best science.
- **Urgency.** The need for science-informed action is now, and pressure is building, yet co-production takes time and is best when supported to unfold over time. Funders, research organisations like universities and research users could reflect on the best institutional form and partnerships to coproduce and collaborate with and without dedicated research funding.
- **Real-world impact.** How do we pivot collaboration and co-production to impact in the long term, ensuring that they are sustainable and measurable and not just a tick-box exercise in terms of the number of papers published and the papers that people can/cannot access?
- **Flexibility and creativity** in research design. There have been some promising innovations within GCRF, for instance, where adaptive management has been used to reflect on, revise and redirect a project's theory of change. Can this be encouraged by funders and professional research management training?
- **Power geographies in LMICs.** Systematic challenges, opportunities for policy and practical reform and opportunities for impact in LMICs are framed and highly influenced by development funders/donors. This adds a layer of complexity and requires researchers to collaborate with international (e.g., UN agencies or donor government agencies) national/local government and civil society

agencies. Accessing these powerful actors is often not straightforward; they often work in silos and are subject to political change hampering systemic, long-term and locally embedded partnerships. UK research funders and users could play a more strategic brokering role as part of funded research programme support for co-production.

- **Funding to support collaboration.** This might include two-stage funding to build in time for applicants to develop (equitable) partnerships; investing research funder budget to strengthen research management capacity in LMIC institutions; efforts to place a minimum percentage of time or financial budget with LMIC partners so that partnerships come with responsibility and efforts to start research programme scoping with LMIC research users – ideally, the beneficiaries (urban/rural poor), but if not, then their representatives within government.
- **Funding to match learning-cycles.** UK research funders could go further to support longer-term, flexible funding for impact. Examples of existing schemes include the UK MetOffice WISER programme, German research programmes, include some very long-term (e.g., 15-year) programmes and the Swiss National Science Foundation that provides for project follow-on funding for uptake.
- **Towards demand-led research programming.** Recent NERC experience with an innovative LMIC-led programme scoping exercise led to a broad call focus emphasising interlinked and cross-cutting themes. Remaining true to LMIC priorities is challenging for research funders who must tension this with researcher expectations. In this case, LMIC preferred cross-cutting priorities can be addressed from multiple research perspectives, creating a large pool of potential applicants. But, with limited funding, such wide calls are inefficient for the research community generating many project proposals, requiring considerable net community-wide time investment set against the small number of projects that can be funded. Are there ways to reduce inefficiencies and time burdens to compensate?
- **Joined-up UK government research support.** Research involving collaboration for impact with overseas governments can miss opportunities for visibility and impact when not seen by these governments as part of wider programmes of UK government activity, especially associated with FCDO. Making such relationships stronger between FCDO country offices and UK funded research project teams with coherent presentation of these projects to overseas governments could help set expectations for - and increase - research impact. In countries hosting many research initiatives, being seen as part of joined-up UK government investment could bring additional legitimacy, leverage and impact opportunity to projects/

4. Interdisciplinarity

The solution-oriented mission of GCRF was successful in supporting a range of interdisciplinary projects. These included projects built on previously dominant supply-side/physical science starting points but broadened design processes by encouraging demand-side scoping, social science, and arts and humanities starting points for problem definition.

Interdisciplinary ways of working take time to establish in a career. For early career researchers, the priority is to secure a permanent position. Perhaps largely because of the constraints of academic teaching, the majority of opportunities remain in disciplinary roles from which it becomes possible to grow an interdisciplinary network and reputation. There is tension here for those managing large interdisciplinary research projects. Such projects can accelerate an interdisciplinary career by providing the space for a researcher to quickly gain a wide network and develop skills and competencies to facilitate working across disciplines. Set against this is the time a researcher will often be asked to dedicate to managing relationships, brokering shared knowledge, and designing work that will mean less time for deploying research and for publications, and the possibility that publication formats may not match with disciplinary norms – for example, multi-authored papers rather than monographs. There is a need for hybridity in how work is recognised and rewarded to incorporate interdisciplinarity. The development of CRediT author statements and author reflexivity statements [5] are promising first steps. The tradition of single-author publications in arts/social sciences is particularly problematic (and not always equitable since research is partly produced through discussion).

While research project leads and teams are rewarded for academic outputs (e.g. publications) and impact (e.g. in Research Excellence Framework case studies), the time taken from these and invested in good project management (which includes early career researcher commitments to building interdisciplinary working environments) remains invisible and is not directly rewarded aside from a personal reputational gain. Research management is widely overlooked as a skill set, and unrewarded, performed by early career researchers, mid-career workpackage leads, professional services project managers, and principal investigators. Most vulnerable to impeded career reward and development are early career and professional services staff. Recent investment in large GCRF funded projects, including 12 GCRF Hubs of c£15 million each, has built a cohort of skilled project managers within UK universities. We need to ensure that universities and research funders support these people and do not lose that essential capacity for the UK.

Key points for interdisciplinarity include.

- **A UK body for Interdisciplinary Sciences.** This could include but could go well beyond CCA/DRR to embrace all interdisciplinary work to lead in the UK on advocacy into government, UKRI and universities, professional partnership building, curriculum development and professional accreditation.
- **How integrative are we?** To what extent is diversity, equality, and inclusion genuinely open, honest, and transparent in interdisciplinary, international development-facing work? Bringing together teams with cultures diversified by discipline and national identity requires considerable effort to establish meaningful working practices. Weekes-Richmond [6]; for example, is critical of well-meaning but narrow sensitivities to difference and exclusion. Significant emphasis has been placed recently on safeguarding research project colleagues and staff as an extension of research ethics protection of research subjects and collaborators. What lessons has this generated for future research management of large international and interdisciplinary projects?'

- **Institutional leadership and investment.** Many established interdisciplinary researchers could support early career networks and early career researchers. Many universities are establishing multidisciplinary centres for risk research or cross-panel promotion boards to recognise interdisciplinary contributions. Universities could also learn how to support interdisciplinary careers and identify broader criteria for academic progression from Geography departments (and the Royal Geographical Society guidance) that have social and physical sciences at their core.
- **Future research leaders.** Successful management of large interdisciplinary projects, especially when these are also international and coproduced, requires an effective principal investigator and senior management team. Leadership is needed to understand multiple epistemological positions. To date, leaders have grown organically. For a step change in research outputs and impact, we need some discussion on how to develop the skills to enable people to grow into confident PI roles from across all disciplines. There are, for example, relatively few leaders of large interdisciplinary projects from an arts and humanities background.
- **Fellowships.** One area that has been successful within universities is the university's own funded fellowship schemes. These have provided genuine opportunities for interdisciplinarity because they're not tied to individual academic schools or disciplines. However, funding shortages currently threaten these programmes.

5. Conclusions

There are considerable gains to be made from UK government coordination and promotion of UK-funded science. A small investment could bring great benefit in reputation to the UK and beneficial impact for global partners, for example, through the UNFCCC and Global Goal for Adaptation processes, or connecting SDG and Sendai Framework reviews. This would be particularly timely as the UK takes on the chair of the Intergovernmental Panel on Climate Change. Such targeted international impact and science leadership could be further advanced through investment in domestic capacity and structures to more comprehensively monitor and report on Sendai. Catalysing the considerable UK-based expertise in DRR/CCA and facilitating the bridging of domestic UK and LMIC focussed science, policy and practice would bolster the UK's credibility as an international leader in this field.

There is scope to learn from GCRF/Newton and continue innovation in UK research funding mechanisms. Urgency funding could be expanded to support research within unfolding crises as well as post-event, alongside the integration of social science and arts and humanities topics and methods with cross-UKRI support. Flexible methods for providing extended research funding for impact can learn also from UK-based and European experience.

Most fundamentally, perhaps, is the opportunity to establish a national lead body for Interdisciplinary Sciences. This is especially key for DRR/CCA including health, technological and natural hazards events and bridging LMIC and UK experience and expertise. While organisations like the Royal Society and Royal Academy for Engineers are notable in championing interdisciplinary events and even hosting interdisciplinary research funding, the lack of a centre of gravity for interdisciplinary work limits advocacy power and the building of professional opportunities for impactful, coproduced and interdisciplinary research and study within the UK.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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