Research for a Future

A toolkit for researchers who want their work to better support a fairer, safer, and more sustainable future

Faculty for a Future

Who and what this toolkit is for

Emissions are still rising,[1] nature is still in decline;[2] multiple environmental hazards are already interacting with pre-existing and emerging social crises and inequalities. Substantial harm has already been caused or is soon to endanger more of the planet's inhabitants. In the coming years, humanity will face challenges like never before.

This is our reality after decades of well-intentioned research.

This toolkit, produced by an international group of academics, activists, and research consultants, is for any researcher who feels a responsibility for the work they do to help limit harm from these crises, and is keen to explore how their work can better contribute towards a fairer, safer, and more sustainable world.

Researchers are sometimes rightly worried about allowing their values to enter their work, because they see it as potentially violating a responsibility to neutrality. This presents an associated risk of being accused of political or other motives. But there is a difference between personal values compromising the objectivity of our research - which the empirical method [3] protects against[4] - and the values that underpin what kinds of knowledge are considered important and desirable to progress.

In this sense, **the practice of research can never be value-free**: what we see as worthwhile to investigate, the assumptions we make, the analyses we construct, the outputs we produce and for whom, and – crucially – how we react as human beings to our own and our colleagues' findings: all these decisions are always laden with values.

Often, these values have led academic research to overlook knowledge and solutions from communities and practitioners seeing harm unfolding in the real world, or to ignore the social factors that influence what research is funded, and how it is acted upon. Academics cannot ignore our part in the harm caused so far to the natural world and those living in it.

Meanwhile, the core values that today bind democratic societies together – trust in science among them - are being eroded by insufficient action on converging crises, despite decades of effort by academics to highlight danger and propose solutions.

This ultimately leads us to ask - **what is the purpose of academic research?** Do we act responsibly if we merely supply information to wider society and leave it to policy makers to interpret our findings in a wider context? Who determines which research questions are worthy of funding? Are academics playing the fullest role possible in minimising harm? Does the current science-society contract work?

The aim of this toolkit is to help you understand how you can navigate these questions without undermining your credibility or abusing your authority. You can be both an excellent academic progressing high quality rigorous research, and an active citizen using all your knowledge, skills, experience and privilege to effect positive change.

Faculty for a Future

This toolkit is not intended to provide detailed methodologies or research questions - these are for you to decide. Rather, it is designed to:

- Help you explore the various ways in which your research can credibly serve societal needs amid colliding crises;
- Offer tools to help foster the more diverse collaborations necessary to address the complexity of Earth's current predicament;
- Provide advice on securing funding for such research amidst an inadequate grantmaking system.

This toolkit is for you, if:

- You are an early career researcher considering how your research can meaningfully address a world of increasing and colliding crises;
- You want to become more crisis-aware in your day-to-day work and make your existing research more relevant in face of those crises;
- You are thinking about refocusing your research to more directly apply to understanding and addressing environmental and social crises;
- You are already researching crises, but want to explore whether you can fine-tune your approach to take greater responsibility for societal transformation. You want your research practice to better embody a more just and equitable world by placing on an equal footing the first-hand experience of those most affected by what you study;
- You are a senior researcher who wants to better understand how your experience and access to power can be used to help promote research that provides positive outcomes.

All research is crucial

You might have read the above thinking it's only relevant to the applied sciences, social sciences and arts. Not so. Even if your research does not address societal issues and you feel it should be done for the sake of generating new knowledge alone, we encourage you to think about the questions and the advice laid out in this toolkit. They are just as relevant to fundamental research as they are to purpose-led research, as all research operates within a specific cultural context that is by no means value-free.

Such knowledge can be crucial, for example, in encouraging a sense of wonder and respect for the natural world. In such a way it has the potential to make a profound impact, if well communicated. See our Communicating Complex Crises toolkit for advice on how to credibly relate your fundamental research to the values it upholds and the broader picture of a world in crisis. The toolkit contains a series of tips on how to do so in a way that remains closely tied to your area of expertise and doesn't risk harming your credibility.

Faculty for a Future

Contents

Faculty for a Future

The world ahead

Faculty for a Future (F4F) has distilled existing research at the intersection of social and ecological crisis into **six key points** describing the world ahead. This toolkit – along with the rest of our work – is informed by this diagnosis of the problem.

1 **A systemic sustainability crisis** - The world isn't just suffering from a climate crisis, but also **severe damage** to the wider natural world.[5] This includes soil degradation, species extinction, water scarcity, and more - all of which damages our wellbeing. At the same time inequality, discrimination, mistrust and other **social crises** are rife.[6] These environmental and social issues don't exist in isolation – **they are entangled.**[7]

2 **Driven by systems of exploitation** - The pressures on the Earth and our societies have their roots in social, economic, and political systems that have historically exploited people and nature. From colonial to industrial capitalism down to the currently dominating economic order, these systems have entrenched values, norms, and behaviours that are unsustainable, as well as exacerbating inequalities in wealth, political influence and exposure to climate risks and pollution. Who and what we prioritise in our societies **is a choice** - what we decide now determines our future.[8]

3 **Causing severe harms now** - Environmental degradation and social instability are already causing wide-ranging, long-lasting, and **unpredictable harms**.[9] These range from crop failure and supply chain disruption (leading to rises in the cost of living), to loss of land, livelihoods, and lives. It would be dangerous to assume these harms won't combine in potentially devastating ways.

4 **Unequal harm, shared danger** - Those who have contributed least to these crises are typically being **harmed first and worst** by environmental shocks.[10] And those with the most direct influence on decision making and existing power structures tend to be the most polluting and least affected. This injustice entails a moral imperative to act. It is also important to recognise that typically sheltered regions are starting to experience **severe shocks**.[11] In an interconnected world, even seemingly distant disasters ripple out to produce **global harms**.[12] These unequal but shared dangers will intensify.

5 **Urgent action to avoid catastrophe** - If we do not address these crises quickly, we risk harms so severe they overwhelm the ability of societies to cope – something already experienced by the most marginalised. Every moment of delay means a **worse outlook for all** - even those who profit from it in the short term.[13]

6 **Together, we can rapidly correct our course** - While our situation looks daunting, history shows that rapid social, ecological, and technological **transformations across society are possible** with sufficient cooperation.[14] Everyone has a role to play but academics, as trusted educators and knowledge holders, have **a particular responsibility** to challenge the status quo.[15] By ensuring our professional and personal choices bring us into collaboration with others outside our usual sphere, and by building new structures together with those hitherto marginalised, we can face this polycrisis from a place of reflexivity, justice and reconciliation. Together, we can realise a safer, healthier, and fairer world.

Check out **our website** for links to a few recent reports that offer more detailed insight into the roots and implications of increasingly connected crises.

Faculty for a Future

Introduction

Rewriting the science-society contract

If you are reading this toolkit, you're probably questioning the traditional science-society contract - the idea that if academics produce rigorous evidence on social and environmental issues, policy makers will implement policy that improves society. You might even feel that your research is being abused to create the mere impression of action, allowing those with stakes in business-as-usual to continue as before. This can create strong feelings of disempowerment, and lead to another difficult question:

How can I regain a sense of agency and credibly take more responsibility for ensuring my research serves society?

Academics of many disciplines and traditions have been using methodologies that take greater responsibility for how research affects and engages with wider society for many decades. Traditionally this was more the domain of academics from the arts, humanities, and social sciences (AHSS) under banners including action research and participatory research. But newer paradigms such as integration and implementation science, sustainability transformations, and responsible research and innovation show that broader collaborations, including those involving natural scientists, can also play a vital role in transformative research.

More and more academics are already rewriting their part in this contract in various ways. This introduction is designed to help you think about how you can better situate your research and rewrite the contract in a way that is right for you.

Faculty for a Future

Scrutinise how societal change happens

The process by which societies change is not simple or linear. This video presentation from Sussex University's STEPS Centre shows how policy evolves through **a complex back and forth** between experts, policymakers, the legal system, the media, social movements, and other civil society actors. On many issues relevant to social and environmental crises, lobbyists and other special interests have disproportionate and hidden influence.

Meanwhile, communities most impacted by such crises often have little access to top-down decision-making processes. Some may be independently enacting sustainable and resilient ways of living, while others may be struggling to function, or having to leave their homes in search of more hospitable conditions.

"The pace of a transition can be impeded by 'lock-in' generated by existing physical capital, institutions, and social norms. The interaction between politics, economics and power relationships is central to explaining why broad commitments do not always translate to urgent action."

IPCC Sixth Assessment Report, Working Group III, Technical Summary, p.55.

Analyse where your expertise might be most helpful

Academic research has a particularly crucial role in navigating this landscape, because it has the potential to support and legitimise the work of all of these actors, as well as better understand the links between them.

Critically analysing where or to whom your empirical expertise might prove most useful does not make you a biased advocate. On the contrary, it is essential. In the absence of such analysis, credible research can inadvertently end up serving interests or systems that perpetuate inaction, or excluding knowledge and people in a way that causes harm or mitigates for one problem by worsening another.

Depending on circumstance, skillset and preference, the outcome of this analysis may encourage you to collaborate with any mix of policy-makers, legal personnel, social movements, media professionals, creatives, and local or indigenous communities.

Faculty for a Future

Section Two covers how to go about such collaborations in more detail. There is also great potential for more fundamental research to involve and collaborate with others. For example, the IPCC refer to the importance of indigenous knowledge in meteorology, and how this knowledge can help us adapt to increasing climate variability.[16]

EXERCISE: Try mapping the key actors in your area of interest through the five questions highlighted in **this tool.** Consider in addition the potential for transformation to arise from the bottom up, for example in collaboration with experience-based learnings of local knowledge holders.

Understand power dynamics and your own place within them

Reflecting on how our own position as academics and members of academic institutions can facilitate or obstruct the transformations needed to stop social and environmental harm is an essential part of taking responsibility for our research and ensuring that it serves society.

You may yourself experience **power inequalities** on certain occasions, or even on a daily basis.

These could be inequalities **between disciplines,** often reflected in more authority given to the voices of natural scientists compared to academics who engage with the social and cultural dimensions of crises. One consequence is that natural scientists are often invited to speak about social and political issues, but the reverse is rarely the case.

There are also large power imbalances **between countries and institutions**, with prestigious ones - mostly concentrated in the Global North and higher income countries - holding more access to funding, publication in influential journals, and international policy forums than their Global South or lower income counterparts.

The source of funding typically influences what assumptions and analyses are behind academic research, and what type of research enters public discourse. **The concentration of funding capital and the prevalence of knowledge produced in the Global North can have the effect of strengthening narratives and solutions that have caused harm.**[17] Most often, this harm is caused to non-academic communities who are experiencing the effects of crises first and worst - and who have typically been objects (rather than participants) of research at best, and excluded from the conversation at worst.

In an ever more complex world, conversation and collaboration are key, both between disciplines, and between academics and other societal actors who have experience in and/or are affected by an issue.

This latter form of collaboration is often called co-production,[18] and at its best invites all stakeholders in a research issue to share power and responsibility throughout the life of a project, from hypothesis to dissemination. Co-produced research attempts to avoid privileging one type of knowledge over another, and is attentive to differences in status and power.

Reflect on your values and standpoint

To carry out truly equitable research, it is therefore imperative to first reflect on our values and where they come from. It's important to consider whether, and in what way, our research might be complicit in reinforcing dominant narratives that could perpetuate harm. **That is why we need to confront the reality that our background, values and disciplinary training inform the way in which we think about and do research** - our standpoint.

Values are inherent in all research, and are typically closely related to the values held by society at large. But they also have the potential to cause great harm. The inequalities that sprung from centuries of colonial domination are intimately linked to the founding of modern universities and the assumptions inherent in much academic knowledge production.[19] This legacy persists today in the way that Global South and indigenous researchers and perspectives are hardly visible in both academic curricula and the public sphere.[20]

Faculty for a Future

This marginalisation is pervasive in academia, and its implications are grave, especially in environmental research, which has all too often overlooked knowledge and solutions from academics and communities who see complex crises play out on the ground and understand how they are deeply interrelated. **Explicitly acknowledging this matters. Without addressing these inequities, research can be complicit in more harm.**

EXERCISE: Watch this video to reflect on your standpoint and use this reflective tool to connect with your motivation to do research collaborations.

For example, the climate science-policy interface has promoted nature-based carbon offsets in a manner that enables high-income countries to continue overconsuming by commodifying large tracts of land mostly located in the Global South. As a result, land grabs and ecological degradation are all too common consequences of generally well-meaning climate science. Some academics have already pointed out that assuming access to land is colonial.[22]

Even the seemingly harmless discourse of 'the anthropocene', 'anthropogenic', and 'human-induced', now embedded in the IPCC and popular science, is influenced by this legacy.[23] By centering on the Industrial Revolution and humanity at large, it overlooks the impacts that colonial capitalism had on the rest of the world, and frames all of humankind as equally responsible for social and environmental harms.[24]

There are active efforts by the research community to address these historical legacies and power dynamics,[24] and increased efforts to establish equitable research frameworks. For example, many scholars are calling for the sustainability sciences to unpack the legacies of colonialism and engage with the knowledge and experience of scholars and communities from the majority world based in the Global South.[26] Section Two offers guidance on addressing power imbalances with a variety of stakeholders to ensure you conceptualise and develop your research in an equitable manner.

Rewriting the contract

Reflecting on whether our research may be complicit in reinforcing norms and systems that perpetuate harm is **difficult but necessary** work. Most of us were not trained to think about the factors above, how they influence our work, and what we can do about it. This **makes research collaborations more challenging, but also vastly increases their potential for transformation** - both in terms of research outcome and our sense of meaningfully contributing to societal needs.

Academics have the power to rewrite the contract. We can do so by better situating our research in a landscape where many actors interact with varying levels of power. Academic practice is accountable for stopping and repairing harm and for contributing to the reconciliation and redistribution of power.

Embracing reflection and accountability from the outset reduces the likelihood that listening to impacted and marginalised communities becomes performative or tokenistic. It can help inspire and encourage partnerships between Global North and Global South academics that are genuinely equitable and redistributive, rather than allowing those with superior access to funding retain more sway in setting and implementing research agendas. Thoughtful and power-sensitive collaborations between academics and non-academic communities can hold the same transformative potential.

Section One is designed to help you orient your work towards a research programme that is more likely to serve society's needs, in a way that you feel comfortable pursuing. Its seven propositions are meant to offer inspiration for new transformative research ideas.

Section Two offers advice on identifying and connecting with potential research partners, together with tips and tools to help you take forward research ideas in collaboration with others.

Section Three offers advice for how to maximise your chances of getting transformative, co-produced research funded. It's still tougher to do such research, but the door is gradually opening among traditional research funders. By increasing the quantity of skilled applications for such research, we can collectively accelerate this transformation in research culture. We also share tips for finding funding from more unconventional, philanthropic sources.

Section One:

Orienting your research to support transformation

There are many different ways in which your research can credibly contribute to a safer, fairer, and more sustainable world. What is appropriate for you will depend on your expertise and area of interest.

- **How does your field diagnose or relate to the crises we face?**
- **What knowledge do we still need to understand them?**
- **Do you have expertise in transformative solutions? If so, what are the social obstacles to their implementation?**
- **What do other disciplines and societal actors think about these diagnoses and solutions?**

It sounds obvious, but early conversations with diverse perspectives will help you address the issues in which you're interested in a way that is cognisant of the interrelations between and implications of the multiple causes, obstacles, and solutions to the polycrisis.

While the methods of engagement may vary, transformative and co-produced work is possible whether your research is fundamental and enquiry-oriented, or applied and solution focused. Our vision is for co-produced, transformative research to become the default for most academics. Regardless of your field, **this toolkit builds capacity for such work.**

Rigorous science for transformation

Worried that working with other actors might lead to accusations of ulterior agendas? Consider submitting to a journal that accepts registered reports. These allow you to submit the hypotheses and methods for a piece of research before you have performed the analysis, with a guarantee of publication regardless of result, so long as the method is adhered to.

Below are seven propositions for how you could gear your research to support transformation. This is not an exhaustive list, but an ideas board that we hope will lead you to reimagine the boundaries of what is possible for your research to achieve - even if it seems to not directly be related to social or environmental crises.

Better understand crises, transformation, and the wonder of life

Knowledge generation has a crucial role to play in navigating to a more just, sustainable, and safe world amid converging crises. There are still big gaps in our understanding of how crises might interact in the future, and how to navigate the governance and social cohesion challenges they pose. There is a pressing need to effectively engage political leaders, media influencers, business leaders, and the general public about the dangers and challenges we already know about, or those we have the ability to predict or explore.

Alongside this, there is an equally important need to confront the limits to academia's ability to anticipate likely futures. With this comes a responsibility to develop understanding of how to transition society towards decision-making processes and social philosophies that are able to respond to unknowable future challenges in an inherently uncertain and unstable world.

It is also vital to better understand why sufficient action is not happening to address elements of crises that we already know a lot about. For example, we might bring together academics with direct experience of the political obstacles that inhibit decisive policy action and social scientists with a strong theoretical grasp of power structures and mechanisms of inducing change. This could lead to targeted insights and recommendations that help overcome these barriers to progress.

Finally, there is a big role for fundamental research when it comes to addressing the polycrisis. The results of research that is driven by curiosity and the quest for new insights often elicits a sense of wonder for whatever is studied: the rich tapestry of life on Earth, our place in the cosmos, or the ingenuity and elegance of ecosystems and human societies. Such knowledge can be crucial in addressing social and environmental crises, because a deep appreciation of what is at stake can cultivate greater willpower for transformation.

For example, research on the **intelligence of fungi in the soil** can make such a positive contribution,[27] as it teaches us to respect the inherent intelligence and worth of all forms of life. If you're doing this type of work, communicating it beyond academia in a way that speaks to the broader picture of a world in crisis is essential. We recommend that you read the subsection on collaborating with the arts on page 20, as well as our **Communicating Complex Crises** toolkit.

If you are looking for inspiration on research hypotheses, the executive summary of the IPCC WGIII's Sixth Assessment Report highlights the importance of understanding the intersection between crises and his identified a number of discipline-spanning knowledge gaps.[28] Addressing these gaps, along with those identified in analogous sections of other key UN-sanctioned reports (see Section Three), may increase the chance of a successful funding application.

Below we also share a number of examples of projects or research initiatives that are furthering integrated understanding of social and environmental crises, and how to cultivate transformative responses to them.

EXAMPLES

- **Cohort 2040** - developing a programme to equip future leaders with the skills to continue the struggle for a better world in an era of uncertain environmental destabilisation
- **Mission Climate Project** - developing models to identify specific areas where climate instability is likely to cause socio-economic instability between 2025 and 2035, and site-specific tools to aid decision-making
- **Cascade Institute** - analysing the interactions between systemic risks, anticipating future crises and opportunities, and developing social interventions to shift humanity's course
- **Navdanya** - producing practice-to-theory research (and many on the ground actions) to show how agroecology can increase nutrition, health, and farmers' incomes while rejuvenating the environment and enhancing climate resilience, amid multiple crises

Amplify experience-based learnings of communities

While experts and policy-makers debate the causes of social and environmental crises and offer solutions, for example modelling mitigation pathways, communities around the world are being impacted.

With hazard-prone areas typically inhabited by poor and marginalised communities who have contributed the least to socio-environmental crisis, many have already been forced to adapt and transform quickly to minimise adverse consequences on their livelihoods and well-being.

Knowledge based on generations of lived interaction with their surroundings has in many cases led to particularly effective strategies to withstand extreme events, manage chronic stresses such as economic, water or food insecurity, and develop socially just, ecologically sound ways of living. In other cases, poor decision-making, inadequate resources and support mechanisms, or particularly severe extreme events have caused substantial suffering.

One crucial contribution academics can therefore make is to understand and amplify such learnings, so that they can be considered by communities who are at risk of experiencing similar conditions, and policy-makers tasked with keeping such communities safe. However, it is important to bear in mind that community-based knowledge offers local solutions that may not be universally applicable, and researchers should be wary of turning such learning into one-size-fits-all solutions. What is important is to work with different types of knowledge to produce feasible solutions for particular contexts. Co-production is particularly crucial in this case, to ensure that research is genuinely beneficial to all parties involved.

The Rapid Transition Alliance evidences many examples of local transformations happening across the world. What inspirational work is happening in your region that could be amplified through academic rigour? Check out more examples below, and read more about developing equitable research partnerships in Section Two.

EXAMPLES

- **TAPESTRY** - Transformation as Praxis: Exploring Socially Just and Transdisciplinary Pathways to Sustainability in Marginal Environments
- **PASTRES** - Pastoralism, Uncertainty and Resilience: Global Lessons from the Margins
- **Devenir Universidad** - New pedagogies designed to generate place-based knowledge within a process of an Amazonian territory becoming a university
- **Nature and local democracy** – how a River Parliament shows what community control can do - an example from the Rapid Transition Alliance
- **Living Language Land** - A journey through endangered and minority languages that reveal different ways of relating to land and nature
- **Fruit and vegetables for sustainable health diets** - A project seeking to increase fruit and vegetable intake starting with consumers, understanding dietary patterns and addressing barriers to desirability, accessibility, affordability and availability through cost-effective solutions
- **Sustainable landscapes and livelihoods** - A 'landscape approach' to development and conservation that harmonises livelihood and environmental values and objectives through cross-sectoral and locally adapted solutions to challenges

Collaborate with communities for problem solving and capacity building

Just as academics and wider society can learn from listening to what is already happening on the ground, academic research, guided by local knowledge and needs, can also help develop or co-develop practical tools in favour of communities most affected by crises. These will vary depending on the research topic and on-the-ground needs – but most research will have implications that, if made accessible, can help communities in some way. Examples include:

- **Food, water and energy sovereignty:** research into practices that secure stable, resilient, and local economies, long-term healthy ecosystems;
- **Natural disasters:** research that seeks to combine experience-based risk prevention and disaster preparedness skills with scientific observational–statistical methods; or research that looks at community-based organisational capacity building;
- **Climate science:** research into how climate science can be demystified and made useful to local communities, its results translated into accessible language, and how priorities can be set for future climate research to maximise its benefits for the wellbeing of most affected communities;
- **Heat stress:** improved low-cost building design to improve resilience under extreme heat and humidity; co-designing and disseminating community-based heat action plans.

If you want to make the entire research process not only accessible but also co-developed to better serve the needs of a community, various forms and frameworks of participatory research can support you.[29] Watch this webinar series to learn about the benefits of participatory research and its application in real-world contexts, and read this introduction chapter to explore its focus on transformation.[30]

Consult the community you seek to collaborate with on what tools and capacity building they would benefit from, and incorporate it in your research proposal. Desired interventions may not be clear from the beginning of your collaboration, but you can explore and revisit them with your community partners using action research (AR) methodologies,[31] which allow for the co-design of community interventions, rather than assuming a pre-existing solution.

Due to the uncertain nature of the impacts of interacting crises, working out how to respond or adapt is not only difficult to predict, but can also lead to increased vulnerability to risks. For example, this primer on maladaptation in the case of the climate crisis provides illustrations of both infrastructural and behavioural maladaptation, and emphasises the need to address the drivers of vulnerability and the power imbalances within the adaptation process.[32]

Co-production that includes multiple actors with different types of expertise as well as those with decision-making and implementation power can create critical opportunities to stop such maladaptation from happening, whichever aspect of social-environmental crisis your research is relevant to.

Faculty for a Future

EXAMPLES

- **Anticipating Crises due to Extreme Heat in Pakistan. Using Weather Forecasts Effectively** - Start Network members in Pakistan activated a heatwave alert and collectively analysed weather forecasts to raise the alert before temperatures reached deadly levels
- **Cultivating Skills For Community Resilience as a Part of the Collaboration for Adaptation and Resilience in Mali (Co-FARM)** - Increasing the resilience and adaptive capacities of water resource users through collaboration
- **International Centre for Climate Change and Development (ICCCAD)** - Bangladesh-based research and capacity-building centre working closely with local communities to co-develop climate adaptation interventions

Engage with the legal system

The legal system has become an increasingly important instrument to ensure other societal actors - including governments - meet commitments or obligations to address various environmental and social crises. More than 1000 climate litigation cases have been filed in the last six years alone, with many more focusing on environmental degradation and human rights.

Arguments made in these cases rely on rigorous evidence. Objective academic research therefore has a fundamental role to play in supporting the legal system to function effectively.

Whether your interest/expertise is in loss and damage or social media's role in political polarisation, there are likely to be litigation efforts that would benefit from closer collaboration between the legal and academic sectors. To understand how you might be able to orient your research towards filling evidence gaps in the legal system, you could:

- Browse for cases in your area of interest, and start a conversation with someone involved in one of them;

Faculty for a Future

- Scan the Grantham Research Institute's 2021 and 2022 global trends in climate change litigation reports. They share information on litigation trends relevant to people with expertise including infrastructure development, financial markets, adaptation, government commitments, corporate accountability, human rights, value/supply chains, subsidies, equality and just transition, and investor-state disputes;
- Search the following environmental and human rights litigation databases:
  - Global Climate Litigation (Sabin Centre for Climate Change Law)
  - Climate Change Laws of the World (Grantham Research Institute)
  - Climate Rights and Remedies Litigation (University of Zurich)
  - Climate Litigation in the Global South Project (Global Network for Human Rights and the Environment)
- Contact civil society organisations or social movements highlighting injustices relevant to your expertise – you may be able to open up new ground for litigation in areas for which rigorous evidence is thus far insufficient, or help with strategic community-driven litigation.

EXAMPLE: Attribution science: increasingly, civil society groups are seeking remedies from high-emitting corporations and governments for losses suffered due to their part in climate destabilisation.[34] Courts rely on scientific evidence to evaluate a causal link between a defendant's behaviour and the plaintiff's losses. This evidence is typically provided by attribution science, **a field** that quantifies to what degree human emissions are driving changes in climate, ecosystems, and extreme weather, and the relative contribution of different actors or activities.

To date, most litigation in this area has not been successful - but this is largely because evidence submitted lags behind the state of the art in climate science, and is not geared to pass legal causation tests. **A recent study**[35]- summarised in **this article**[36] – outlines three key areas where attribution science research could address gaps in the evidence provided to lawsuits on climate change impacts, and therefore improve the prospects of litigation as a route to compensation for loss and damage, regulatory actions, and emissions reductions.

In the future, it's possible that attribution science could even assist in holding specific high-polluting states and corporations to account in the courts.

Support non-profits, movements, community groups, or journalists

In recent decades, civil society actors such as social movements, advocacy groups, activists and journalists have been on the frontline demanding systemic change to address the social-environmental crises. There is **increasing evidence** that these demands and the communications used to present them have managed to influence public opinion and inspire political progress.[37]

These groups **benefit from** and frequently seek academic research and evidence-based knowledge to raise awareness and advance action on environmental and social issues.[38] Campaigns or reports frequently benefit from input from acknowledged experts. The **Global South Climate Database** is just one example of an initiative meeting demand from civil society actors - in this case journalists - for diverse expert voices.

Sometimes, civil society actors lack academic evidence for truths that appear obvious on the ground. This presents an opportunity. Research can be designed to rigorously answer questions that are key to particular groups or communities.

While the research system's grant-making process is still **typically too burdensome** for most civil society actors,[39] there is increasing interest among research funders to support civil society collaboration (e.g. UKRI).[40] As such, there is great potential for academics, who are familiar with the grant-seeking process, to seek out and co-design such collaborations.

It may require some skill to frame funding proposals for community-led research questions in terms that will be amenable to research funders, or to situate questions within a wider proposal. See Section Three for further advice on this.

Research outputs also need to be made available in accessible language, with key messages of interest to civil society highlighted, and efforts made to disseminate outputs to interested parties not already involved in designing the research.

Think about how your expertise can strengthen the work of civil society actors whose interests intersect with your area of expertise, then have a conversation about how your research can best support them. University-based youth campaigns and local groups may be a good place to start connecting with wider social movements.

Faculty for a Future

EXAMPLES

Civil Society Research Collective - a group of international academic researchers working with civil society actors to investigate how advocacy informs inclusive development

Emancipatory Futures Map - part of a University of the Witwatersrand research programme, mapping and platforming emancipatory organisations and movements that demonstrate that other ways of living are possible

Centre for Climate Change and Social Transformations - a multi-university centre that works with a range of civil society organisations to co-develop practical research that help realise systemic transformations

Centre for Humane Technology - an NGO that shifts technology towards a future that supports well-being and global democratic functioning. Just one example of a crucial civil society actor whose work is supported by academic insight

Act as a knowledge-broker

Grossly insufficient policy action on the climate crisis alone, in the face of overwhelming evidence and politically palatable technological solutions, suggests that centring research proposals around engaging or informing those who influence and implement policy addressing complex social and environmental crises is often likely to be an uphill task.

Any decisions to engage policy influencers need to be carefully considered with analysis of who among different policy actors and levels holds decision-making power, the influence of private sector actors and other special interests over relevant decision-making processes, the level of awareness of the issue among the relevant decision-influencers, and whether you have the skillset and access to meaningfully influence the landscape. It may be that the best way to engage policy influencers is to focus your outputs on a part of the system that holds their attention more than policy briefs or round tables.

Conversations with others who are involved in policy discussions - from public servants to other academics to advocacy groups - can help clarify both your analysis of whether your energies are best spent directly engaging policymakers and implementers, and how to design your research methodology and outputs to be effective. See Section Two.

If you think conditions are favourable, you may want to consider orienting a funding proposal around 'knowledge brokering'. This may involve new knowledge generation, but should devote significant time and resources to making knowledge - new or old - accessible, useful, and delivered to maximise the chances of implementation.

Doing this well requires careful thought, time, and effort to develop meaningful relationships with relevant policy, business, and advocacy communities. These communities typically operate with very different languages,[41] timescales, and priorities to academic researchers. If it sounds like an avenue worth exploring, read this to better understand the skills that are crucial to cultivate.[42]

It is particularly worth considering the influence of the private sector. On climate for example, much more attention has been paid to problem recognition in policymakers than how policies are then implemented.

EXAMPLES

- Read this **recent article**[43] sharing the experiences of 40 researchers from four countries working in the 'knowledge broker' space on climate, to better understand the complexities, obstacles, and opportunities
- For three specific examples of typical policy engagement experiences, as well as more general information about engaging in the science-policy dialogue, see **this workbook** from the Zurich-Basel Plant Science Centre

Faculty for a Future

Already engaging policy influencers?

Some of you will have already established long-term relationships with policy-influencing communities that you feel continue to hold potential for positive influence. In this case, the challenge would be to use your unique first-hand experience to reflect on where the blocks to evidence-based progress are, and assess whether you can fine-tune your work to help ease them. It could be as simple as recommending that an academic from a different discipline is invited to your research-policy interface, so that the issue you're working on is approached with a fuller range of social and environmental considerations in mind.

Conversely, if you have consistent first-hand experience of the science-society contract being broken behind closed doors, is this something the public should know about? International Consortium of Investigative Journalists is set up to securely receive information that might be of public concern. It's worth reflecting on where responsibility for inaction stops.

Partner with the arts

Creatives and artists have long been using different media to make social and environmental crises and transformation more visible, accessible, and meaningful. The arts and humanities can help us visualise the interrelationships between forms of life and between crises,[44] envision alternative futures rooted in more sustainable relationships with nature and each other, and sense less anthropocentric ways of being in the world.[45] Crucially, they can help us emotionally connect[46] to these issues through experiential[47] and often place-based perspectives. This is in sharp contrast to the often abstract language of academic publications.

The creative arts are therefore a powerful tool. Collaborating with the arts is particularly important for academics engaged in knowledge generation about crises, routes to transformation, and any insights that might help engender a deeper cultural connection to nature and each other.

Similarly, artists working on these issues can benefit from collaborating with scientists to ground and develop their work alongside key empirical insights.

In addition to offering a more creative way of presenting and disseminating research findings, artists can also participate in earlier phases of research, including data collection and analysis, through an approach known as arts-based research.[48] This transdisciplinary approach, which integrates artistic theories, methods and practices within social and scientific research contexts, is increasingly being used in sustainability science and other disciplines that address interlocking social-environmental crises.[49] The aim is to facilitate societal transformations by bringing together diverse perspectives and approaches.

To find the right collaboration, search for and connect with artists who work in your area of interest. Check artists' websites or social media to learn more about their projects and portfolio. Look for ongoing exhibitions or project activities at museums and visual and creative arts centres to further connect with artists. Speak to colleagues in the arts department, who may either be engaged in artistic practice or can connect you with artists. There are also plenty of online or local networks, platforms and nodes that develop art-science collaborations, such as:

- **Arts for sustainability transformations** - Explores how creative practices of arts-science interactions and arts-based research generate relevant perspectives and boost collective capacities to address the urgent sustainability challenges of today
- **Artwork.earth** - The Atlas for Art on Ecology and Climate, Energy and Resources
- **Art, Biodiversity and Climate (ABC) Network** - Engages creative practitioners and researchers to build a new common imaginarium of the world as-it-could-be, transcending academic disciplinary boundaries and short-term political incentives
- **The art-science node** - A creative & innovative platform for sharing knowledge and experience committed to the creation of the synergy between Art, Science and Technology
- **GROW Art/Science** - An interdisciplinary platform for art/science projects
- **Art & Science Initiative** - A platform that brings the exploratory nature of both art and science to a new arena - creating knowledge from passion-driven interdisciplinary collisions and accelerating their implementation into real-world solutions

EXAMPLES

Funeral for a Glacier - Why Iceland Held A Glacier Funeral: Andri Snær Magnason On Memorializing Ok Glacier & The Climate Crisis

Court for Intergenerational Climate Crimes - a large-scale installation in the form of a tribunal that prosecutes intergenerational climate crimes

The Feral Atlas (the more-than-human anthropocene) - an exploration of the ecological worlds created when nonhuman entities become tangled up with human infrastructure projects

The Shore Line Project - profiles the efforts of educators, artists, architects, scientists, city planners, and youth organisations from nine countries who are confronting coastal challenges with persistence and imagination, featuring stories of resilience from shoreline communities around the world

Climaginaries - explores innovative and creative ways of envisioning how a post-fossil world might look like, and the means through which it can transpire

Graphic Series on Indian Agriculture and Food Security - Soni and Lucky venture across India as they search for tough answers on food security and explore the complexity of Indian agriculture

System Change Hive - a creative engine room to explore alternative futures and visions of society

Creatures - Creative Practices for Transformational Futures - EU Horizon 2020 research project investigating the potential of creative practices in art, design, and related cultural fields to support positive eco-social change

Urban Futures Studio - transdisciplinary research centre investigating 'techniques of futuring'

Section Two:

Planning your research collaboration

Once you have decided what kind of collaborative research you'd like to carry out, the next step is working out how to go about working together. Collaboration with a diversity of people and forms of expertise is not always easy - but it is crucial to fully understand how connected crises are manifesting in the real world, and therefore how to address them.

The importance of interdisciplinary collaboration between academics from Science, Technology, Engineering, and Mathematics (STEM) disciplines and those from the Arts, Humanities, and Social Sciences (AHSS) is only recently being recognised by funders.[50] Similarly, the crucial integrated insights of place- and experience-based knowledge-holders are only recently starting to be more widely appreciated.

The IPCC's AR6 WGII report repeatedly emphasises the value of diverse forms of knowledge and has called for the integration of indigenous and local knowledge and greater attention to equity and justice.[51] How academic research responds to these calls is up to us.

This section is designed to help you foster more diverse collaborations to equitably address this century's defining challenges.

Identify & connect with stakeholders

A key first step to fruitful and equitable collaboration is recognising the different groups that are affected by and have expertise relevant to your area, question, and output of interest.

There are myriad potential combinations of academic and non-academic actors that could collaborate to produce transformative research. Whether you go with one of the approaches outlined in Section One above or not, the tools below will help you identify which stakeholders - academic and non-academic - are most relevant to your starting interest.

Identifying stakeholders

- This handy primer from i2Insights guides you through four approaches to identifying groups affected by – and with interest, expertise and influence in – your research area.
- You might do a constellation analysis or role-play exercise to assess the relevance of various actors in addressing your research question or area.

Faculty for a Future

Mapping/selecting stakeholders

- One approach is to map stakeholders based on their influence and interest in the research. Use this mapping technique to assist you.

- Another is to select stakeholders based on their legitimacy, power, and the urgency they assign to the problem. This tool can help you narrow down your choices.

Whoever you engage with, it is key that you recognise the different experiences of the world you may each have. Power and status can differ between academic individuals and disciplines, and much more so between academics and non-academic knowledge holders. The subsections below offer more specific guidance for interdisciplinary and transdisciplinary collaboration.

» **If you're thinking of establishing partnerships with local organisations or community representatives, think further about who is being most affected by and/or has underappreciated insight in your area of interest, and find a trusted local organisational partner who is working in the region. Climate Land Ambition & Rights Alliance and weADAPT are two networks of research and community organisations with interest in community-led learnings. See also the Endorsements and Weavers sections of the Global Tapestry of Alternatives.**

Fostering interdisciplinary collaboration

Multiple UN bodies emphasise that socio-ecological challenges will require more collaborative work across disciplines than is currently the norm in a still strongly siloed academic system. Given the nature of advancing crises, we need more interdisciplinary collaborations that reframe research questions to account for both their social and natural dimensions. For example, important research gaps have been identified where social science is vital in strengthening climate mitigation.[52]

Check out these short resources from SHAPE-ID and UKRI to explore how combining expertise in **interdisciplinary collaborations** contributes to tackling complex crises, from critically reframing problems to understanding lived experience.

You may want to do some preparatory work to understand the different theoretical and philosophical foundations of different disciplines:

- This guide helps natural scientists understand and integrate social science (also available as a blogpost)

- Here is a brief overview of tools and methodologies in STEM subjects

- Use this set of questions for personal reflection or as a group exercise to understand different theoretical foundations and successfully integrate different methods for knowledge production

Faculty for a Future

Partnering with non-academic communities

Non-academic communities often see crises in an integrated manner that academia can find difficult to capture.

This subsection focuses in particular on local and indigenous communities, because they have typically been most marginalised from academic research agendas, and because their experience of living through and having to actively adapt to the impacts of social and environmental crises is particularly important in bridging knowledge and practice gaps. Funders are increasingly recognising the need for such collaborative research.[53]

However, most of the guidance below will also be useful in collaborating with other non-academic actors.

Engaging equitably and embedding accountability in research with Indigenous communities

Experiential and ancestral knowledge has systematically been marginalised in comparison to academic knowledge, and where local and indigenous communities have been engaged in research, it has often been as research objects rather than partners with relevant knowledge and input into the study's design.

This global systematic review (2018)[54] found that an overwhelming 87% of climate studies still practise an extractive model that grants minimal participation or decision-making authority to Indigenous researchers. Historically, such research practices have created mistrust in academic researchers and have caused direct harm through the advancement of solutions from academia, industry, or governments that disregard local and indigenous knowledge, and/or larger social and political contexts. For this reason, special care needs to be taken to foster trusting, non-extractive, and mutually beneficial relationships, engaging with local and indigenous communities as equal holders and producers of knowledge.

The resources below offer guidance on and examples of equitable research practice:

- **CLEAR's guidelines for research with Indigenous groups**
  - **Community Peer Review Guide**
  - **Indigenous Data Sovereignty contracts**
- **Memorial University (CA) Indigenous Research Agreement**
  - **Guide prepared by Indigenous researchers**
- **You'll find ten questions for guiding responsible research practice with Indigenous communities in this article**
- **Indigenous Research Collaborative Digital Garden**

Faculty for a Future

Before you reach out

Working with non-academic stakeholders requires more preparation, because of the sometimes damaging way in which academia has typically interacted with those outside it.

Recognise and address power imbalances

- This 10 step Diversity primer illustrates how personal assumptions, values, interests and power asymmetries shape perceptions of what constitutes 'good' research and desired outcomes.
- This tool will help you identify behaviours and dispositions that are often unintentional but can create unequal relationships among research partners. Can you recognise any implicit biases you may have when interacting with others?
- We often don't recognise how ingrained certain dispositions can be. This comic is a playful exploration of imbalances that often go unnoticed even when we have our best intentions at heart.

Have a conversation with academics from other disciplines at your institution, who may be connected with the type of stakeholders you are trying to engage with, or may be able to help you better understand the political context or power dynamics in the respective situation.

Acknowledge that building relationships takes time: Research co-production takes longer than usual research, as various stakeholders have different demands on time, community protocols and feedback processes.

If you are thinking of engaging with local or indigenous communities, remember that working through a trusted local organisational partner is likely to be the most equitable and sensitive way to build trust.

Consider professional facilitation: Collaborating equitably in the context of power imbalances and cultural differences presents various challenges and, beyond knowledge of appropriate methodologies, it requires strong interpersonal skills. An experienced facilitator can be invaluable in building trust among research partners.

In the absence of a facilitator, you will need a framework for engaging with each other, through which each partner's expertise and experience is expressed and considered on an equal footing. Only through doing so will you arrive at a shared understanding of the research agenda and desired transformation. Remember that power imbalances will inevitably occur in the research group and that different stakeholders embody different levels of privilege and power. To navigate these in practice, you will need tools and processes to ensure constructive engagement.

Build trust among research partners and co-design your research agenda

Early stage trust-building through listening and dialogue is vital in convening a diverse group with different expertise to collectively shape the research agenda and outcomes. Listening and empathy are crucial skills in building trust among the research partners. Take turns in presenting everyone's perspective and exchange ideas as a minimum. To ensure meaningful engagement with a diversity of perspectives, the group should exercise **reflective and generative dialogue** to open the potential for new insights and learning.

Listening and dialogue

- This **toolbox dialogue approach** will help the group uncover personal and disciplinary assumptions and **offer clarity on stakeholders' differing perspectives and positions.**
- Run a workshop using the Nomadic concepts tool to generate a more integrated understanding of key aspects of your research topic. As tensions will inevitably arise in the process, use **this framework** to address them and cultivate facilitative leadership to pave the way towards a shared purpose and agenda.
- Use the **Shared Learning Dialogue (SLD) process** to facilitate learning and a common understanding of the desired research agenda. This process has been successfully applied in Asian countries, in both urban and rural contexts.
- This **Circle of dialogue of wisdom framework** is particularly useful for North-South collaborations.

Co-designing the research agenda cultivates a shared sense of purpose among research partners and allows for the collective planning of the desired transformation. The following methods will aid in discovering common goals and shaping a research agenda that is sensitive to different types of expertise and approaches:

Synthesise ideas

- The **1-2-4-All method** is a simple method that helps with synthesising ideas. It also allows you to test and improve the strength of agreement.
- **The Delphi method** involves several rounds of polling to rate arguments provided by different stakeholders. It is a popular method for reaching agreements in the first analysis of the research topic.
- Run a **design thinking workshop** with your research partners to map different approaches to the research topic in more dynamic and inclusive ways, using diversified methods such as visual thinking and storytelling.
- The **Constellation analysis** method builds on the connections between social actors, natural elements, technical elements as well as cultural aspects to develop strategies for transformation.
- For large research groups seeking to integrate natural and social sciences, the **Double helix process** facilitates the collective generation and refinement of research ideas.

Gear research agenda towards societal and knowledge demands

- Check that your research agenda responds to relevant societal and knowledge demands using the **Three types of knowledge tool**
- The **Outcome spaces framework** assists with planning for the desired transformation
- Encourage critical dialogue about research outcomes using the **Emancipatory boundary critique tool.** Answer the set of questions as a group to critically challenge suggested outcomes and reflect on their social and ecological implications.

Section Three:

Funding

Much progress remains to be made, but the funding door is opening for transformation- oriented research. This section provides advice on how to maximise your success with traditional academic funding sources. It also collates and shares funding opportunities from the philanthropic world that you may not be aware of. These funders are typically ahead of the curve in the value they place on societal usefulness and transdisciplinarity in research.

Please also sign up to our newsletter for updates on our efforts to engage funders to orient their priorities towards societal transformation. We'll be seeking your ideas about how to be most effective.

Conventional funding sources

Some funders already actively recognise the value of transdisciplinary and transformative research in their funding strategies.

- The Belmont Forum is a good first port of call - it's a partnership of funding organisations and councils committed to transdisciplinary research that helps understand, mitigate, and adapt to environmental change. They run their own calls for proposals, and you can check their about page to see which national funding bodies value collaborative, applied research enough to contribute to the forum.
- SHAPE-ID, a comprehensive EU-funded project supporting inter- and transdisciplinary research, has also compiled some advice to help you identify such funding schemes.
- Your research institution should have dedicated administrative support (such as a Research Officer) to help you identify funding sources that fit your needs. If you are seeking to refocus your research, they may also be able to support you in this journey.

Of course, many grantmakers don't actively value such work, and even in those that do, attitudes to transformative research can vary substantially between calls and reviewers. Skilfully communicating the necessity of your approach is therefore crucial to success.

Shape your proposal

Equality, Diversity and Inclusion (EDI) - most funding bodies will by now have made a formal commitment to what is known in English-speaking territories as Equality, Diversity, and Inclusion. Reference the commitments they make to justify collaborations and socially beneficial outputs.

Impact - in the UK, UKRI assesses whether proposals have 'an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond

Faculty for a Future

academia'. Funding bodies in many other countries similarly assess impact. Economic impact is much easier to communicate, so if your expected impact is social, take extra care to explain clearly who will benefit from taking part, and how. There are opportunities to include wider development issues such as the development of social capital, progressing Sustainable Development Goals. For a wealth of advice on integrating impact into grant proposals in the UK, EU, and Australia, check out Fast Track Impact.

State your case clearly - Assume your evaluators will not be expert in inter- or transdisciplinary approaches, or in the breadth of interlocking crises. SHAPE-ID offers ten tips for developing transdisciplinary research proposals, many of which will help you to be clear on the necessity and structure of your approach, and avoid technical jargon. The same advice applies to justifying socially useful outputs.

Get inside the mind of evaluators - SHAPE-ID has put together a list of resources to help research evaluators judge transdisciplinary proposals. Scanning through them will help you understand how to score well with reviewers who are open to such approaches.

Point to previous successes - Evidence the validity and necessity of your approach by referencing where else have the methods you propose been used, and what the impacts were.

Signal that you know what collaborative, transformative work takes - Collaboration requires more time and resources, as do producing socially useful outputs. Clearly building this into your proposal will signal that you have thought hard about your research design. If budgeting for such work is new to you, check out the budget section of this SHAPE-ID page.

Play the game – Despite good intentions, large funders of academic research continue to be swayed by perceived disciplinary excellence. If nothing else, this can often be assumed to be easier to assess as it involves number of papers in high impact journals and previous funding success. But this does not mean that excellent disciplinary research cannot be transdisciplinary and transformative. What it does mean is that there may be occasions when leading with disciplinary excellence within a transformative research proposal will increase the probability of the proposal being successful.

Invoke the UN - calls for impactful research and the integration of knowledge from diverse stakeholders have intensified in recent key UN-sanctioned reports on environmental crises. These reports are designed to orient and influence the activity of society's cornerstone institutions, and can be used to justify transformative, co-produced research methodologies. We've selected a few of the most pertinent quotes below.

Faculty for a Future

UN quotes that may be useful in supporting funding bid

Urgency and scope of transformation

IPCC Special Report on Global Warming of 1.5C (2018), Foreword, page V: "[…] limiting warming to 1.5°C is possible within the laws of chemistry and physics but would require unprecedented transitions in all aspects of society"

IPBES Global Assessment Report on Biodiversity and Ecosystem Services (2019), pXVIII: "Goals for conserving and sustainably using nature and achieving sustainability cannot be met by current trajectories, and goals for 2030 and beyond may only be achieved through transformative changes across economic, social, political and technological factors."

UNEP Emissions Gap Report (2022), pXVI: "[…] incremental change is no longer an option: broad-based economy-wide transformations are required to avoid closing the windowof opportunity to limit global warming to well below 2°C"."

Necessity of interdisciplinary and transdisciplinary approaches

UN Office for Disaster Risk Reduction, Distilled Global Assessment Report (2019), p8: "We must break away from the prevailing practice of compartmentalized research, hazard-by-hazard risk assessment and management if we are to improve our understanding of complex systems and risk and collectively identify solutions… For example, we should redesign our research methodologies to operate in a transdisciplinary manner, to engage non-traditional counterparts (e.g. indigenous wisdom, the faiths, citizen science), and allow for innovative and collective action."

IPBES Global Assessment Report on Biodiversity and Ecosystem Services (2019), p11: "The global assessment […] made a concerted effort to include a diversity of worldviews and knowledge systems including systematic analyses of evidence on indigenous and local knowledge and issues, and dialogue meetings involving experts and representatives from Indigenous Peoples and Local Communities."

IPCC Sixth Assessment Report, Working Group II (2022), Ch1, p155: "Indigenous Peoples have been faced with adaptation challenges for centuries and have developed coping strategies in changing environments. Along with other local groups, they hold relevant knowledge about the environment and environmental change, the impact of those changes on ecosystems and livelihoods, and possible effective adaptive responses. […] Therefore, the participation of Indigenous Peoples in climate change decisions and the inclusion of Indigenous knowledge in the IPCC assessment process should be of high priority (following recommendations in UNESCO, 2018b, and UN, 2020)"

IPCC Sixth Assessment Report, Working Group III (2022), Ch4, p454: "Quantitative tools for assessing mitigation pathways could be more helpful if they could provide information on a broader range of development indicators, and could model substantively different alternative development paths, thereby providing information on which levers might shift development in a more sustainable direction. Doing so requires new ways of thinking with interdisciplinary research and use of alternative frameworks and methods suited to deeper understanding of change agents, determinants of change and adaptive management among other issues."

UNDP RBAP Polycrisis and Long-term Thinking Development Foresight Brief (2022), p17: "Longstanding mainstream intellectual traditions of treating issues in isolation may have been appropriate in an era where risks were less systemic, but it is no longer sufficient for our highly interconnected world where those interrelations continue to increase… It is therefore paramount to encourage policymakers to embed cross-disciplinary thinking, or approaches that combine a wide array of disciplines, into their decision-making frameworks and institutional knowledge architectures. "

Faculty for a Future

Need for co-production / attention to justice and equity

IPBES Global Assessment Report on Biodiversity and Ecosystem Services (2019), p19: "... there are increasing calls for considering issues of legitimacy, fairness, social equity and rights (including human rights to the environment and to cultural identity) in environmental science-policy interfaces."

IPCC Sixth Assessment Report, Working Group II (2022), Ch9, p1402: "Collaborative partnerships between research, agricultural extension services and local communities would create new avenues for the co-production of knowledge in climate change adaptation to better inform adaptation policies and practices across Africa."

IPCC Sixth Assessment Report, Working Group III (2022), Technical Summary, p127: "Explicit attention to equity and justice is salient to both social acceptance and fair and effective policymaking for mitigation (high confidence) [...] It is anticipated that institutions and governance frameworks that enable consideration of justice and just transitions can build broader support for climate policymaking."

Unconventional funding sources

Philanthropists are recognising that the slowness of the traditional academic research funding system to structurally incentivise transdisciplinary and transformation- focused work is a serious problem, and are taking matters into their own hands. They're also increasingly questioning research funding models that reinforce problematic North-South power dynamics.[55]

However, it can often be difficult for academics to know where to look to apply for philanthropic research funding. Below we offer some advice and tools for accessing more unconventional funding sources.

- Consider asking your relevant institutional department to subscribe to grant finding databases from Inside Philanthropy (US and international), Grant Watch (North America and international) or Grants Online (UK). They each only cost a few hundred dollars. You may even want to allocate some of your personal research budget to these services.
- Africa-based academics (and those interested in international collaboration with African academics) can search for philanthropic research funding opportunities on Philanthropy Circuit, searching the 'Research' and 'Science and Technology' sectors. This service is free.
- You may want to spend some time looking through lists of funders or funder networks, such as those provided by the Environmental Funders Network (Europe) or the Ford Foundation (international).
- Faculty for a Future periodically advertises unconventional funding opportunities via our newsletter.

As with any funding source, it's important to do your research on any potential grantmaker. This is not always a simple story. While we recommend particular vigilance with foundations associated with companies that have been beneficiaries of colonialism, pollution and extractivism, some are now operated separately from their source company or industry, and can be genuine sources of funding for reimagining society. Equally, the nature of wealth generation over the last few centuries means that most grantmakers have profited from harm in some way, and those without such direct associations can fund work that causes further harm or entrenches destructive systems.

The key is to take the time to understand whose interests the people behind the grantmaking organisation represent, and how they go about their work. Information is usually publicly available to help you make informed early decisions - it just might take a bit of digging. Beyond that, cultivating personal relationships with such individuals is worthwhile to trust that their money is being spent responsibly and transformatively. Ultimately, your own personal ethics will be the most important guiding factor on which funders you want to work with.

Conclusion:

Realising a better future

There is a clear link between our individual actions as academic researchers and the structure of research funding. The latter responds to demand and discourse. An increasing number of decision-makers in funding bodies are feeling the same concerns as any academic reading this toolkit likely does regarding humanity's trajectory.

If we lead by example in the work we seek funding for, and take every opportunity to engage our internal and external colleagues on what is at stake, we can accelerate the transition in research funding culture towards equitably addressing colliding crises.

What this actually involves will be different if you're an early career researcher compared to a senior academic. But if we all use the privilege we have, together we can play our part in realising a more just, sustainable, and safe world.

Early career researchers: get strategic

In a research system still primarily structured around discipline-based evaluation and recognition criteria that incentivise grant income and a high publication rate, pursuing a transdisciplinary, transformation-focused career will be easier if you're tactical. In addition to the above guidance, SHAPE-ID have developed a suite of advice specifically to support early career researchers in their development - you can find it **here.**

Senior academics: use your privilege

Most academics working in senior research positions today have had to progress within their various disciplinary silos. You might already be taking opportunities to open more space for new pathways of progression for earlier career researchers. But it's always possible to challenge yourself to see what more you can do to transform the research landscape with the power you have.

If you are looking for new ways of wielding this privilege, you might consider some of the following questions in the context of social and environmental crises: How can you make the degree programme you direct or department you lead more fit to navigate the polycrisis? How can you change how job applications are reviewed and interviews judged? What influence do you have over education and research matters at your institution or in a research network you play a role in? How can you shape future funding calls from government, business, and philanthropic sources?

Much of academic leadership can be onerous, but it is accepted within academia that this service is vital - and there is always scope to push the boundaries. Such leadership is a privilege that can be used to develop new spaces and opportunities for transformative research for younger generations of researchers, as well as yourselves.

Faculty for a Future

Authors

Project led by:
Iulia Lumina, Community Engagement & Research Lead, Faculty for a Future
Jordan Raine, Director, Faculty for a Future

Lead authors:
Iulia Lumina, Community Engagement & Research Lead, Faculty for a Future
Jordan Raine, Director, Faculty for a Future

Authors:
James Dyke, Associate Professor in Earth System Science, University of Exeter; Academic Lead, Faculty for a Future
Wolfgang Knorr, Academic Lead, Faculty for a Future; climate scientist of 30 years, currently independent consultant for European Space Agency
Ali Rowe, Creativity and Cross-Community Impact Lead, Faculty for a Future
Clara Saglietti, Education and Advocacy Lead, Faculty for a Future

Editor:
Josephine Lethbridge, Director of Communications, Faculty for a Future

Graphic designer:
Stephanie Aungier

Acknowledgements

This toolkit was developed after a series of discussions with the F4F community, followed by primary and secondary research. We are deeply grateful to those we spoke to and those who contributed in other ways, and to the academics and communities whose work we have built on. You can further explore this work in the links, Appendix and Endnotes.

We hope that this aggregated resource will encourage a culture of sharing, collaboration and acknowledgement of the efforts and insights – community-based, activist or academic – of those who have come before.

Faculty for a Future

Appendix

You may find the following resources useful in supplement to this toolkit:

GENERAL

General and comprehensive toolkits and resources for inter- and trans-disciplinary research collaborations

- SHAPE-ID Toolkit. Shaping interdisciplinary practices in Europe
- Integration and Implementation Insights. A community blog providing research resources for understanding and acting on complex real-world problems
- td-net toolbox
- Integrated Research Toolkit
- Centre for Unusual Collaborations (CUCo) resources

REFLECTION

Reflect on values and assumptions in your research, perspectives it might miss and harms it might cause

- The value of values in climate science
- Challenging colonial practices in research. A guide for researchers
- Guide to challenging coloniality
- Can we decolonise our doctoral training?
- The Coloniality of the Scientific Anthropocene (Vishwas Satgar)
- Being in the room privilege. Elite Capture and Epistemic Deference (Olufemi O Taiwo)
- Ethical Action in Global Research: A Toolkit
- Impact as research ethos
- Decolonial Research Methods: Resisting Coloniality in Academic Knowledge Production

COLLABORATION TOOLS

Tips and methods for successful collaboration

- The importance of communication in inter- and trans-disciplinary research (10 min video)
- Top 10 tips for working in multi-stakeholder collaborations
- Two lessons for early involvement of stakeholders in research
- Ten dialogue methods for integrating judgments
- Community Voice and Power Sharing Guidebook

RESEARCH IMPACT

Plan research outcomes that lead to transformation

- Ten Reflective Steps for Rendering Research Societally Relevant
- Partnering for Change: Link Research to Societal Challenges
- Five principles for achieving impact
- Ten Essentials to Contribute More Directly to Transformational Change
- Societal Impact Toolkit

FUNDING

Advice on writing forward-thinking grant proposals

- Developing interdisciplinary research proposals
- Top 10 Tips for writing inter- and transdisciplinary research proposals
- Applying for grants
- Evaluate Inter- and Transdisciplinary Research
- Fast Track Impact

Faculty for a Future

End notes

1 United Nations Environment Programme (2021). Emissions Gap Report 2021, Nairobi. Available at: https://www.unep.org/resources/emissions-gap-report-2021

2 UN Report: Nature's Dangerous Decline 'Unprecedented'; Species Extinction Rates 'Accelerating'. Available at: https://www.un.org/sustainabledevelopment/blog/2019/05/nature-decline-unprecedented-report/

3 Longino, H. E, (1990). Science as Social Knowledge: Values and Objectivity in Scientific Inquiry. Princeton University Press.

4 Douglas, H. E. (2009). Science, Policy, and the Value-Free Ideal. University of Pittsburgh Press.

5 UN Report: Nature's Dangerous Decline 'Unprecedented'; Species Extinction Rates 'Accelerating' (2019). Available at: https://www.un.org/sustainabledevelopment/blog/2019/05/nature-decline-unprecedented-report/

6 Organisation for Economic Co-operation and Development (2021). The inequalities-environment nexus Towards a people-centred green transition. Available at: https://www.oecd.org/greengrowth/the-inequalities-environment-nexus-ca9d8479-en.htm

7 Lawrence M., Janzwood S., and Homer-Dixon T (2022). What is a global polycrisis? And how is it different from a systemic risk? Cascade Institute Technical Paper #2022-4. Available at: https://cascadeinstitute.org/technical-paper/what-is-a-global-polycrisis/

8 Dyke, J. and Steinberger, J. K. (2022). Climate breakdown: even if we miss the 1.5°C target we must still fight to prevent every single increment of warming. Available at: https://theconversation.com/climate-breakdown-even-if-we-miss-the-1-5-c-target-we-must-still-fight-to-prevent-every-single-increment-of-warming-178581

9 Quiggin, D., De Meyer, K., Hubble-Rose L., and Froggatt, A. (2021). Climate change risk assessment 2021. The risks are compounding, and without immediate action the impacts will be devastating. Chatham House Environment and Society Programme. Available at: https://www.chathamhouse.org/sites/default/files/2021-09/2021-09-14-climate-change-risk-assessment-quiggin-et-al.pdf

10 Islam, S. N. and Winkel J. (2017). Climate Change and Social Inequality. DESA Working Paper No. 152. Available at: https://www.un.org/esa/desa/papers/2017/wp152_2017.pdf

11 Milman, O., Witherspoon A., Liu, R., and Chang, A. (2021). The climate disaster is here. The Guardian online. Available here: https://www.theguardian.com/environment/ng-interactive/2021/oct/14/climate-change-happening-now-stats-graphs-maps-cop26

12 Moser, S.C. and Hart, J.A.F. (2015). The long arm of climate change: societal teleconnections and the future of climate change impacts studies. Climatic Change 129, 13–26 (2015). Available at: https://doi.org/10.1007/s10584-015-1328-z

13 UN Office for Disaster Risk Reduction (2019). Reducing Disaster Risk. 2019 Global Assessment Report on Disaster Risk Reduction. Available at: https://undrr.maps.arcgis.com/apps/Cascade/index.html?appid=826a093e725b4bb6a0afbf277bac50ac

14 Sharpe, S. and Lenton, T. M. (2021) Upward-scaling tipping cascades to meet climate goals: plausible grounds for hope, Climate Policy, 21:4, 421-433. Available at: https://doi.org/10.1080/14693062.2020.1870097

15 Geen, A. J. K. (2021). Challenging Conventions - A Perspective From Within and Without. Frontiers in Sustainability, Volume 2 - 2021. Available at: https://doi.org/10.3389/frsus.2021.662038

16 Intergovernmental Panel on Climate Change Sixth Assessment Report (IPCC AR6) (2022). Working Group II. Climate Change 2022. Impacts, Adaptation, and Vulnerability. Ch. 8, p. 1235. Available at: https://www.ipcc.ch/report/ar6/wg2/

17 McLaren, D, and Markusson, N (2020). The co-evolution of technological promises, modelling, policies and climate change targets. Nature Climate Change 10, 392-397.

18 Research Design Service London (2021). Public involvement vs co-production: what's the difference? Available at: https://www.rds-london.nihr.ac.uk/news/public-involvement-vs-coproduction/

19 Adams, R. (2022). Cambridge University finds it gained 'significant benefits' from slave trade. The Guardian online. Available at: https://www.theguardian.com/education/2022/sep/22/cambridge-university-finds-it-gained-significant-benefits-from-slave-trade

20 Nobles, M., Womack, C., Wonkam, A. and Wathuti, E. (2022). Science must overcome its racist legacy: Nature's guest editors speak. Springer Nature. Available at: https://www.nature.com/articles/d41586-022-01527-z

Faculty for a Future

21 For a critical appraisal of Net Zero, see the work of Climate Land Ambition & Rights Alliance (CLARA) here: https://www.clara.earth/netzero

22 Liboiron, M. (2021). Pollution is Colonialism. Duke University Press. Read the introduction here: https://www.dukeupress.edu/pollution-is-colonialism

23 Maslin, M. and Lewis, S. (2020). Why the Anthropocene began with European colonisation, mass slavery and the 'great dying' of the 16th century. The Conversation. Available here: https://theconversation.com/why-the-anthropocene-began-with-european-colonisation-mass-slavery-and-the-great-dying-of-the-16th-century-140661?fbclid=IwAR3hAszDqzoBQrgiuaRXnagVsxMXj07ke5X1PPEMndI0OFi9xE7Iox0Sg3Y

24 Yussof, K. (2019). A Billion Black Anthropocenes or None. University of Minnesota Press.

25 Research must do no harm: new guidance addresses all studies relating to people. Springer Nature. Available at: https://www.nature.com/articles/d41586-022-01607-0

26 Metha, L. (2022). Why sustainability sciences must be decolonised. Available at: https://tapestry-project.org/2022/04/25/why-sustainability-sciences-must-be-decolonised/

27 Hammer, E. and Aleklett, K. (2021). The secret life of fungi: how they use ingenious strategies to forage underground. The Conversation, Available at: https://theconversation.com/the-secret-life-of-fungi-how-they-use-ingenious-strategies-to-forage-underground-156610

28 Intergovernmental Panel on Climate Change Sixth Assessment Report (IPCC AR6) (2022). Working Group III. Climate Change 2022. Mitigation of Climate Change. Ch. 1, p4-5. Available at: https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_Full_Report.pdf

29 Vaughn, L. M. and Jacquez, F. (2020). Participatory Research Methods – Choice Points in the Research Process. Journal of Participatory Research Methods, 1(1). Available at: https://doi.org/10.35844/001c.13244

30 Ospina, S. M., Burns, D. and Howard, J. (2021). Introduction to the Handbook: Navigating the Complex and Dynamic Landscape of Participatory Research and Inquiry. In: Burns et al (eds)., The SAGE Handbook of Participatory Research and Inquiry. Available at: https://opendocs.ids.ac.uk/opendocs/bitstream/item/18245/Burns%20et%20al%20HB%20-%20Introduction.pdf?sequence=1&isAllowed=y

31 Ely, A. (2022). Transformations: Theory, research and action. In: Adrian Ely (ed.), Transformative Pathways to Sustainability. Learning Across Disciplines, Cultures and Contexts. Routledge. Available here: https://www.taylorfrancis.com/chapters/oa-edit/10.4324/9780429331930-5/transformations-theory-research-action-adrian-ely?context=ubx&refId=871bce45-82fd-4433-8326-bd6be0e53d00

32 Schipper, E. L. F. (2020). Maladaptation: When Adaptation to Climate Change Goes Very Wrong. Primer Volume 3(4), p.409-414. Available at: https://www.cell.com/one-earth fulltext/S2590 3322(20)30483-8?_returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS2590332220304838%3Fshowall%3Dtrue

33 Setzer, J. and Higham, C. (2022). Global trends in climate litigation: 2021 snapshot. LSE Policy Publication. Available at: https://www.lse.ac.uk/granthaminstitute/publication/global-trends-in-climate-litigation-2021-snapshot/

34 Grantham Research Institute on Climate Change and the Environment, London School of Economics and Political Science. What is climate change 'Loss and Damage'? (2022). Available at: https://www.lse.ac.uk/granthaminstitute/explainers/what-is-climate-change-loss-and-damage/

35 Stuart-Smith, R.F., Otto, F.E.L., Saad, A.I. et al. (2021). Filling the evidentiary gap in climate litigation. Nature Climate Change 11, 651–655. Available at: https://doi.org/10.1038/s41558-021-01086-7

36 Stuart-Smith, R., Otto, F.E.L., Wetzer, T. (2021). Guest post: How attribution can fill the evidence 'gap' in climate litigation. Carbon Brief. Available at: https://www.carbonbrief.org/guest-post-how-attribution-can-fill-the-evidence-gap-in-climate-litigation/

37 Thiri, M. A., Villamayor-Tomás, S., Scheidel A. and Demaria, F. (2021). How social movements contribute to staying within the global carbon budget: Evidence from a qualitative meta-analysis of case studies. Ecological Economics, Volume 195, 107356. Available at: https://doi.org/10.1016/j.ecolecon.2022.107356

38 Civil Society, research-based knowledge, and policy (2007). ODI. Available at: https://odi.org/en/publications/civil-society-research-based-knowledge-and-policy/

Faculty for a Future

39 See van de Klippe, W. (2021). To support civil society organisations, research funders must listen to their needs. Available at: https://blogs.lse.ac.uk/impactofsocialsciences/2021/09/02/to-support-civil-society-organisations-research-funders-must-listen-to-their-needs/

40 UKRI - Supporting Collaboration. Available at: https://www.ukri.org/what-we-offer/supporting-collaboration/supporting-collaboration-esrc/opportunities-for-civil-society/

41 Lyall, C. Shaping Interdisciplinary Practices in Europe (SHAPE-ID). Top Ten Tips for working with policymakers. Available at: https://www.shapeidtoolkit.eu/wp-content/uploads/2021/05/Top-ten-tips-policy.pdf

42 Miller, F. and Melbourne-Thomas, J. (2022). Facilitating narratives for knowledge co-production: A knowledge broker's role. Integration and Implementation Insights blog. Available at: https://i2insights.org/2022/05/31/narratives-for-knowledge-co-production/

43 Lewis, D., Rahman, M.F., Twinomuhangi, R. et al. (2022). University-Based Researchers as Knowledge Brokers for Climate Policies and Action. The European Journal of Development Research. Available at: https://doi.org/10.1057/s41287-022-00526-0

44 Muhr, M. M. (2020). Beyond words – the potential of arts-based research on human-nature connectedness, Ecosystems and People, 16:1, 249-257. Available at: https://doi.org/10.1080/26395916.2020.1811379

45 Palmer, J. and Fam, D. (2022). Pause... How art and literature can transform transdisciplinary research. Integration and Implementation Insights blog. Available at: https://i2insights.org/2022/08/23/art-and-literature-transform-transdisciplinarity/

46 Amsen, E. (2019). Climate Change Art Helps People Connect With A Challenging Topic. Forbes. Available at: https://www.forbes.com/sites/evaamsen/2019/09/30/climate-change-art-helps-people-connect-with-a-challenging-topic/?sh=2f709ad475d0

47 Zaidi, K. (2021). Why are the arts and humanities vital to tackling climate change?. UK Research and Innovation blog. Available at: https://www.ukri.org/blog/why-are-the-arts-and-humanities-vital-to-tackling-climate-change/

48 Chilton, G. and Leavy, P. (2020). Arts-Based Research: Merging Social Research and the Creative Arts. In: Patricia Leavy (ed). The Oxford Handbook of Qualitative Research (2nd edn). Available at: https://doi.org/10.1093/oxfordhb/9780190847388.013.27

49 Heras, M., Galafassi, D., Oteros-Rozas, E. et al. (2021). Realising potentials for arts-based sustainability science. Sustain Sci 16, 1875–1889. Available at: https://doi.org/10.1007/s11625-021-01002-0

50 What can the Arts, Humanities and Social Sciences Bring to Inter- and Transdisciplinary Research? SHAPE-ID. Available at: https://www.shapeidtoolkit.eu/wp-content/uploads/2021/05/Guide-AHSS-Contributions-to-IDR.pdf

51 Intergovernmental Panel on Climate Change Sixth Assessment Report (IPCC AR6) (2022). Working Group II. Climate Change 2022. Impacts, Adaptation, and Vulnerability. Available at: https://www.ipcc.ch/report/ar6/wg2/

52 Frankhauser, S. (2019). Why we need more social science research on climate change. Grantham Research Institute on Climate Change and the Environment blog, London School of Economics and Political Science. Available at: https://www.lse.ac.uk/granthaminstitute/news/why-we-need-more-social-science-research-on-climate-change/

53 see, for example the 2022 UK Research and Innovation (UKRI) funding opportunity on "Research partnerships with indigenous researchers". Available at: https://www.ukri.org/opportunity/research-partnerships-with-indigenous-researchers/

54 David-Chavez, D. M. and Gavin, M. C. (2018). A global assessment of Indigenous community engagement in climate research. Environmental Research Letters, Volume 13(12). Available at: https://iopscience.iop.org/article/10.1088/1748-9326/aaf300#erlaaf300s4

55 McGovern, T. (2021). Five Lessons on Global North-Global South Partnerships: A Blueprint for Reciprocity in Research. Inside Philanthropy. Available at: https://www.insidephilanthropy.com/home/2021/11/24/five-lessons-on-global-north-global-south-partnerships-a-blueprint-for-reciprocity-in-research