espa ecosystem services for poverty alleviation

Policy and Practice Briefing

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Interdisciplinary research for development impact: How can funders walk the talk?

Academic research is often called upon to provide actionable evidence for sustainable development, yet academic culture remains largely limited to individual disciplines. ESPA's experience confirms that an interdisciplinary approach makes research more relevant to real-life questions, potentially leading to greater impact.

Key messages

- **Interdisciplinary research takes extra time** at every stage: from defining research questions, to agreeing data-collection techniques and sample sizes, to publishing. Project timelines needs to allow for team interaction, mutual learning and flexibility.
- **Interdisciplinarity is about keeping sight of the 'bigger picture'**. Team composition should reflect a mix of disciplinary expertise, and also include generalist researchers who are able to work across disciplines.
- **Interpersonal relations are crucial to the success of interdisciplinary processes**. Facilitation skills are critical, but are generally not prioritised in team composition and leadership.
- **Interdisciplinary research requires flexible management**. Interdisciplinary enquiries can open new avenues of investigation, and even completely reframe research questions. This unpredictability should be treated as an opportunity not a problem.

Introduction

Academic research is increasingly called upon to provide actionable evidence for sustainable development. As the demands for 'impact' grow, the limits of single-discipline investigation become apparent. Most funders see interdisciplinary research as an avenue to tackle complex global challenges.[1] Yet this emphasis clashes with an academic culture that remains, to a large extent, within the boundaries of individual disciplines.[2]

This briefing is based on a comprehensive review of Ecosystem Services for Poverty Reduction (ESPA) documentation, including project proposals and reports, an online survey and key informant interviews.[3] It draws on the 2013 ESPA Learning Review, which focused specifically on interdisciplinarity, as well as a workshop on Interdisciplinarity for Development Impact at ESPA's Annual Science Conference in November 2017.

ESPA P4GES researchers gather data in Madagascar.
Photo credit: P4GES project (www.p4ges.org)

ESPA-funded researchers and a Ghanaian wildlife guard take measurements at a meteorological station in Ghana's cocoa-forest area.
Photo credit: Mairi Dupar, ESPA

What is interdisciplinarity?

Interdisciplinarity can be defined as a process where researchers from different disciplines work together to integrate knowledge and methods, to create something greater than the sum of its parts. The term is often used loosely and interchangeably with similar concepts, such as multidisciplinarity and transdisciplinarity.

Multidisciplinarity is mostly used to indicate different disciplines working towards a common objective, interacting with each other but without the synergy of approaches that characterises interdisciplinarity. **Transdisciplinarity** generally refers to the inclusion of stakeholders' perspectives, in addition to disciplinary ones. Views differ on the extent to which these different definitions are analytically and operationally useful.[4] Throughout the lifespan of ESPA, the term 'interdisciplinarity' has been used loosely, to indicate a spectrum of collaboration and integration among researchers from different fields.

Working at the interface of natural and social sciences, ESPA has had a strong commitment to interdisciplinarity from the outset. A consistent requirement of its funding calls was to demonstrate interdisciplinarity in team composition, research questions, approaches and methods.

Findings

ESPA's experience confirms the assumption that an interdisciplinary approach makes research more relevant to real-life questions, thus potentially leading to greater impact. Many ESPA researchers describe their experience of interdisciplinary collaboration as personally and professionally enriching, 'exciting' and 'fun'. But they point to the fact that interdisciplinary research comes with its own characteristics and challenges.

Interdisciplinary research takes extra time

It takes longer to define interdisciplinary research questions that are both cogent and feasible: a question that is exciting for one discipline can be boring and mundane for another.[5] Agreeing on methodologies, sample sizes and data collection is

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also challenging. Trying to 'fit everything in' can lead to overly time-consuming fieldwork and research fatigue on the part of local participants. On the other hand, compromising on disciplinary academic standards can lead to a no-win situation, where results may be seen as not rigorous enough for *any* field. As for publishing, deciding on a journal that is suitable for everyone may be challenging.

Simon Willcock, an ESPA researcher, says: 'An anthropologist may require a single case study in great depth, whilst a collaborating natural scientist might [want] to include 50 communities or more. The team might agree to work to less depth but cover 10 communities. Whilst this may harmonise the interdisciplinary collaboration, allowing data collection to proceed smoothly, it might cause issues when attempting to publish the findings. Should the paper be sent to an anthropology journal (where it faces being rejected as too shallow) or a natural science journal (where the small sample size may be criticised)?'

Ian Scoones, another ESPA researcher, notes: 'Breaking out of existing institutional cultures, structured around disciplines and sectors, is incredibly difficult. There are different languages and different styles of collecting, analysing and writing up data. Fieldwork means different things to different disciplines, as does paper writing, policy engagement, and so on. To work together we have to learn both new languages and cultures, and be patient and respectful. It is not easy, it is not quick, it is not cheap – but it is ultimately worth it.'

Case study 1: Can Paying for Global Ecosystem Services Reduce Poverty? (P4GES)

The ESPA P4GES project in Madagascar explored how ecosystem service payment schemes can effectively reduce poverty in tropical forests. In rural Madagascar, muddy roads are often unsuitable for vehicles, with many areas only accessible by foot and makeshift rafts over several days. This created challenges for the interdisciplinary team to select study locations and sampling techniques. Hydrologists needed to reach the field sites regularly for data collection, with expensive and heavy equipment that was hard to transport. Therefore, they favoured nearby sites that were accessible from urban areas. For social scientists, it was important to have a sample that included communities in remote areas. This resulted in only partial overlap between biophysical and socio-economic study sites. As a work-around, the hydrologists trained and employed local assistants in some remote locations to maintain equipment and collect data in their absence.

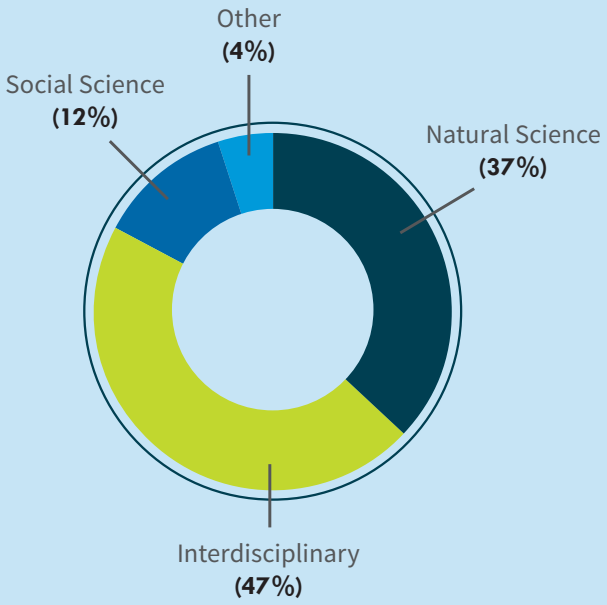
> **ESPA investments are highly interdisciplinary, linking the social, natural and political sciences to address a series of focused research questions and evidence challenges using systems thinking, acknowledging the interconnectedness of social and ecological systems**
>
> ESPA Impact Strategy (2016)

Interdisciplinary work is also more likely to get delayed, as work packages are closely interdependent, rather than progressing in parallel. If one work package is deferred for whatever reason, the domino effect is much more significant than in traditional projects. 'Running out of time' just when things are getting exciting is a common complaint by researchers in interdisciplinary projects.

Interdisciplinarity is about keeping sight of the 'bigger picture'

Researchers who have been part of successful interdisciplinary projects talk about an 'a-ha' moment when the value of seeing a problem through an interdisciplinary lens is revealed. Often, this epiphany is born out of frustration with the inability of traditional paths to solve real-life puzzles.

Where ESPA articles are published: Types of journal



Even with strong initial motivation, it is hard for team members to keep an interdisciplinary mind-set throughout a project, particularly if their background falls squarely within one discipline. It is therefore important that the team includes generalists – also referred to as T-shaped researchers – who have knowledge of other disciplines and the ability to collaborate (the horizontal bar of the T), in addition to in-depth expertise in their own discipline (the vertical bar).

Scale matters too. In smaller projects, a generalist can be involved in all work packages and interact with specialist researchers. Larger projects tend to adopt a 'hub-and-spoke' model, where leadership in the hub must dedicate sufficient time and resources to examine and understand all the complexities of the project, and facilitate necessary connections.[6]

Successful outcomes depend largely on good interpersonal relations

Genuine interdisciplinarity cannot be reduced to mere questions of technical coordination or methodological compromise: it requires a change in how researchers think about problems, and a willingness to work outside one's comfort zone.

Case study 2: Dynamic Drivers of Disease in Africa (DDDAC)

The DDDAC project focused on diseases that are transmitted from animals to people (zoonoses), and their interaction with ecosystems and poverty. In Zimbabwe, it looked at trypanosomiasis (sleeping sickness in humans), a disease carried by tsetse flies. Initially, the project used a classic approach, with different disciplinary work packages proceeding in parallel. But the team reached a standstill: the various disciplinary pictures were not adding up to solve the overall research question. Researchers were forced to examine the broader picture, asking more general questions, interrogating each other's data and analyses, and – crucially – conducting field work together. Abandoning disciplinary silos made it easier to listen to local people, which led to a eureka moment: distribution of tsetse flies is not uniform, as it had been assumed, but rather concentrated in small habitat patches with specific biophysical and social-cultural characteristics. While statistically rigorous, random sampling was ultimately misleading. This has major implications for approaches to disease control. While 'area-wide' approaches have dominated (and failed) previously, DDDAC showed the need for targeted interventions in specific habitat patches.[7,8]

While personality clashes can happen in any team, in interdisciplinary projects they can be compounded by the different disciplinary backgrounds, attitudes and perceptions of team members. Defensive attitudes can emerge if researchers feel that their discipline is not given adequate credit. Facilitation skills are crucial – and yet they are not generally present, encouraged or supported in research teams, and the incentives and resources for teams to meet in person are often insufficient.

Interdisciplinary research needs flexible management

While any research process is inherently unpredictable, interdisciplinary research is particularly likely to lead to 'unknown unknowns'[9] – questions that were not envisaged at the design stage. New research avenues, and even completely new framings of a problem, can emerge. In this unpredictability lies the great richness of interdisciplinarity and its potential for impact. But this can also pose very real challenges, particularly if a project is expected to comply with the more linear pathways of traditional research. Flexibility and adaptive management are required: funders should provide strategic and operational advice on how to explore unintended project outcomes, and be open to discussing changes in timeline and budget.

Recommendations for funders

Funders can play a catalytic role in promoting interdisciplinarity. ESPA's experience points to recommendations at three crucial stages:

Calls for proposals

- Ensure enough time between calls for proposals and deadlines, to accommodate the longer timeframe of interdisciplinary project design. A stepwise application process is recommended for research teams to explore their interest in a particular idea, without having to commit to the time-consuming process of preparing a full application. Funders may consider a final iterative phase where shortlisted proposals can be adapted based on feedback.

> **"Interdisciplinary research is particularly likely to lead to 'unknown unknowns' - questions that were not envisaged at the design stage"**

Debating research results and policy solutions.
Photo credit: Climate and Development Knowledge Network

- Provide clear and consistent guidance to prospective applicants: is interdisciplinarity a required or desirable dimension? How will levels of interdisciplinarity be assessed? How will interdisciplinarity be weighed against other selection criteria?
- Consider seed funding to allow researchers to test the feasibility of an interdisciplinary research question and/or the viability of an interdisciplinary team.
- Advertise calls to a wide audience, beyond the 'usual suspects', to reach champions of interdisciplinary research.

Reviewing proposals[10]

- Ensure review panels have a mix of disciplinary expertise, and also include members experienced in conducting and assessing interdisciplinary research, who have themselves a T-shaped profile, and are able and willing to work across disciplines.
- Give clear guidance to panel members on how interdisciplinarity will be assessed, which factors will be taken into account, and how it will be weighed against other selection criteria.
- Provide clear feedback to successful and unsuccessful applicants on how their proposal met the interdisciplinary requirements of a call.

Project implementation

- Design funding and review cycles that are linked to the more time-intensive interdisciplinary process: for instance, an interdisciplinary project needs a first year to develop its methods properly. An interim review provides an opportunity to adapt timetables and negotiate planned project extensions.
- Envisage the possibility of top-up funding to capitalise on promising opportunities that emerge from interdisciplinary work.
- Encourage feedback between project components and allow the possibility of restructuring projects 'en route'.
- Demand that teams come together regularly in person, and provide the necessary funds to support this.
- Consider having external advisors (e.g., members of the original selection panel) engage with the project team at key stages as 'critical friends'.
- Track interdisciplinarity as part of monitoring and evaluation processes, and ensure that processes are in place to capture learning from the outset.

Credit

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About the ESPA Programme

ESPA is a nine-year global development research programme established in 2009 with funding from the Department for International Development (DFID), the Natural Environment Research Council (NERC) and the Economic and Social Research Council (ESRC). ESPA is one of the most comprehensive research programmes on linkages between ecosystem services and human wellbeing, aiming to provide world-class research evidence on how ecosystem services can reduce poverty and enhance wellbeing for the world's poor.

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Endnotes

1. Tang, P., J. Molas-Gallart and I. Rafols (2014), 'The relationship between interdisciplinarity and impact'. Swindon: Economic and Social Research Council (www.esrc.ac.uk/files/research/research-and-impact-evaluation/esrc-interdisciplinary-research-report/).
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8. Scoones, I., V. Dzingirai, N. Anderson, E. MacLeod, L. Mangwanya, F. Matawa, A. Murwira, L. Nyakupinda, W. Shereni and S.c. Welburn (2017) 'People, patches, and parasites: The case of trypanosomiasis in Zimbabwe', *Human Ecology* 45 (5): 643-654. DOI: 10.1007/s10745-017-9929-y.
9. See Bammer, G. (2016) 'Six types of unknowns in interdisciplinary research', *Integration and Implementation Insights* (https://i2insights.org/2016/05/10/six-unknowns-in-interdisciplinarity/).
10. For an in-depth review of ESPA's review process from the perspective of interdisciplinarity, see Meagher, L. and C. Lyall (2013) *Learning review for Ecosystems Services for Poverty Alleviation (ESPA)*. Edinburgh: Research for Results (www.espa.ac.uk/results/espa-programme-learning).

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