



**MEETING THE CHALLENGES**  
Interdisciplinary research for global development



**DSA-ESRC Workshop series 2018-19**

**Responding to Environmental Change**

***University of East Anglia and the John Innes Centre***

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***Convened by Laura Camfield and Matt Heaton, supported by Vanessa Tarling***

***Summary Report***

***Matt Heaton, Laura Camfield and Sarah White, June 3 2019***

How can researchers and practitioners from the natural and social sciences and humanities work together to respond to environmental change in a way that supports development? This was the core question of the fourth of the DSA-ESRC workshops, co-sponsored by the John Innes Centre, and the Schools of International development, Environmental Sciences and Biological Sciences and the Sainsbury's Research Unit of the University of East Anglia. The workshop drew together specialists in anthropology, geography, computer science, environmental science, plant science, political science, economics, epidemiology, infectious diseases, economics, and value chain analysis. The morning sessions concentrated on interdisciplinary working. The afternoon focused more especially on how to support early career researchers from the global South.

Of the 39 participants, 29 were early career (defined as anyone below senior lecturer/research associate level), eight were from the global South and 12 were natural scientists.

### **1. Going back to go forward? How do we combine natural and social science to promote climate resilience?**

In her opening keynote, Cathie Martin stressed that climate change threatens food and nutritional security: what matters is not just calories, but the full range of vitamins and protein. This may mean re-discovering old and perhaps low status crops, using plant science to overcome any physical disadvantages, and social science to ensure people are happy to use them.

She gave the example of grass pea in Ethiopia, which is both drought and flood resistant, uses much less land and water than other crops, and as a legume, also fixes nitrogen in the soil. By comparison, the soybeans which are commonly grown are much less resilient to extreme climate conditions. However, grass pea has the great disadvantage that it

contains the neurotoxin OADP which can cause irreversible paralysis if eaten in too great quantities or concentrations.

Plant scientists concerned with nutritional security and climate resilience are thus working to produce safe forms of grass pea with very low levels of toxin, using colour so farmers can easily distinguish between safe and non-safe forms. To avoid the resistance that genetic modification can inspire, they are using selective breeding techniques of natural mutations. But there are also challenges that call on social science expertise if the project is to achieve impact. The link with paralysis means that grass pea has an image problem: it is associated with very low status, a crop that only the poorest would cultivate. Also, while as a subsistence crop it has high potential for family nutrition, it may produce lower yields and market value than soybeans, which are widely grown as a cash crop. It may thus raise issues of intra-household allocation of budgets, as well as different sources of family provision.

### *The politics of plant development*

Grass pea is just one 'traditional' plant that is more 'climate-smart' than many modern varieties. There is thus a significant move to seek out and reclaim indigenous crops. But this may go against the interests of agro-chemical and technology corporations. In Malawi, for example, the government has recently approved a seed policy which outlaws farmer managed seed: farmers are no longer allowed to keep their own seed for planting. The policy was designed by someone from a major multinational corporation. Farmers don't have a voice, so there is now lobbying against the policy. Some people from the Alliance for Food Sovereignty in Africa (AFSA) have received death threats. Meanwhile, although the 'improved' seeds grow much more quickly, they incur significant post-harvest loss. The farmers' own seeds were resistant to pest attack in storage. But government rhetoric was strong: 'we have to move with the times'.

In general, resilience is greater where multiple crops are famed together. Even where new crop technologies are developed, therefore, they should be viewed as complementing farmers' existing portfolios, rather than completely replacing them. Targeting staples for technological development can carry considerable risks, especially where the changes may compromise aspects – like taste – that people value highly. Improvements to non-staples may prove more welcome.

Having natural and social scientists working together also enables researchers to become aware of unexpected effects of innovation. For example, herbicide resistant crops may release girls from weeding duties, and so enable them to stay longer at school. Or crops that need weeding where no herbicide is available lead to girls being kept home from school.

### *Who cares about the climate?*

It is widely accepted that poorer people tend to be more at risk in the climate emergency. But this does not mean that climate change is their top priority. One participant described how the Ghanaian small-holders she spoke to listed as their concerns: 1. poor road networks limiting access to healthcare and markets; 2. high cost of agricultural inputs; 3.

pests and diseases; 4. lack of irrigation; 5. unreliable electricity supply; and 6. poor quality drinking water.

Changing behaviour and/or technology also entails risk, and researchers should be sensitive to this, especially amongst poor communities who have little margin for error.

This can also be an issue at national level. To encourage uptake of climate-resilient practice, it may be important to be able to demonstrate that how an intervention contributes to another priority the government has identified.

### *Communicating the message*

The tendency to urge climate action through a 'catastrophist' narrative was questioned. Positive change might be more effectively stimulated by an 'urgency to agency' approach. Archaeology has an important part to play, challenging ideas about how the climate was in the past. But reading the remains isn't always straightforward. You may be able to say that 4200 years ago there was a severe drought, but you cannot necessarily produce clear evidence that this led to civilizational collapse. Past events could be fast and catastrophic but there were fewer people so it was much easier just to re-locate. There is also the danger that knowing that people have adapted to climate change in the past could be spun to argue against the need for urgent action now.

## **2. How can we work together most effectively?**

*'Communication is key. We are wearing different lenses, but they all help us to see.'*

Disciplinary languages are a common challenge in inter-disciplinary research. Technical terms may carry a meaning not appreciated by others outside the discipline. Listeners may be reluctant to say they haven't understood, or think they have understood, not realizing how meanings may be discipline-specific. People need to be much more self-conscious about the terms they use, and how these may be unfamiliar to their colleagues.

### *Working to strengths while challenging differences in power*

There is an in-built bias within research where different project partners speak different national languages, but project impact reporting is assessed by the ability to write publications in one specific language. This can 'naturally' lead to mother-tongue speakers leading on publications, which can reproduce existing imbalances of power within the group, and differences of benefit derived from the research.

In a similar way, different disciplines may be seen as better suited to speaking to different groups of external stakeholders. In one project, for example, it was thought that the political scientists were best placed to speak with policy-makers, while the archaeologists could deal most effectively with the local people. Dividing up the work in this way improved the programme's efficiency. But it can also lead to trouble, where communication with one group of stakeholders is seen as more important, or higher status, than with another.

Compared with conventional scientific research, interdisciplinary research with development studies was seen as much more descriptively oriented, and solution focused. This makes national partners critical to the process. But communication is not always easy, especially if there are different norms around gendered interaction and hierarchy in different parts of the project team.

*'If you work on climate change then you have money!'*

Particular technologies or crops can become trendy, and attract disproportionate funding. Such trends may not be linked to real world impact, with the result that surges in investment fail to deliver results.

Funding calls that require relevance to specific research councils can act as barriers to interdisciplinary co-creation. Applicants risk penalties if they write projects too far beyond the reach of a particular discipline, especially where judging panels predominantly share a particular form of expertise. If research councils are to attract more genuinely interdisciplinary proposals, they need to reflect this in the composition of their expert panels.

Differences in funding required across disciplines can also undermine equality within research teams. Natural scientists running laboratories typically need much more funding than social scientists, resulting in colleagues commanding widely differing financial shares of co-created projects. The expense of laboratory based sciences could also be off-putting to potential social science collaborators.

The importance of having time to put together a funding proposal in a collaborative way was noted here as in other workshops. However, a different perspective was also put forward. This was the challenge of managing the long time between submitting an application and receiving funding – in the interval key people may well have picked up other commitments.

*A matter of sequencing?*

Perhaps conventionally, the model is for science to start in 'the lab' and then move into 'the field', with natural scientists featuring almost exclusively in the first, and social scientists being incorporated – often rather late in the day – in the second. This workshop, by contrast, suggested the humanities and social sciences were critical in shaping responses to climate change, due to their insight into the relations between people, their landscape and their practices. Participatory methods and engagement with diverse stakeholders were also seen as strengths of social science, and critical from the design stage onwards. In addition, socio-economic factors are recognised as the strongest influence on the ability to cope with, adapt to, and recover from shocks or hazards. Humanities and social sciences therefore have a clear role in directing research through identifying gaps for innovation, as well as designing paths for implementation in practice.

While deep interdisciplinary engagement is seen as most desirable, it was recognised that this does not always happen. Even within archaeology, for example, anthropologists, climate and soil scientists may all be working on 'the same' project, but in separate work packages, which limits their interaction. Similarly, adding in smaller, interdisciplinary

projects into a large grant could leave those projects vulnerable to not being fully integrated, and the first to be cut if funding constraints kicked in.

Ultimately, everyone agreed that building rapport between disciplines *prior* to research applications might lessen barriers of lack of shared understanding and varying styles of communication, and carry the greatest potential to overcome familiar patterns of dominance. The ideal was thus one of co-creation, including local people, not just academic experts. Short term funding calls militate against this. Collective programme design may be written up by one individual to ensure consistency of tone.

### *Engaging with local people*

In archaeological work, local people often know a great deal about the sites, and may be able to tell more than the expert outsider. The best way to find a site is to ask local people. It is also important to have local people on the dig so that you can hear their anxieties – for example, are you going to dig up their ancestors?

Incorporating accessible visual elements into projects with outreach components can also encourage local discussion and sharing of more bottom-up innovations.

### **3. 'The men just sit there with their arms folded.'**

The importance of gender awareness, and of learning from gendered enquiry, was mentioned at a number of points. Several participants were of the view that women were more likely to be early adopters. In Ghana, for example, smallholder male farmers felt at the mercy of the weather, while women had adapted their practice, safeguarding against post harvest loss of cassava through processing it into powdered form.

The lessons of intersectionality were thought important, to look not just at gender alone but in combination with other dimensions of identity, such as age, position in the hierarchy, wealth, nationality etc. In part this is about the way you organize consultations – who you talk to and how. For example, in the north of Ghana, there was a community consultation about what people got from the forest. All the women sat at the back, with the men at the front. Then they were divided into groups by gender. But an informant also told the researchers who had the wealth in the community. So then, without explaining the basis of it the groups were divided along wealth lines. By the second day, nobody cared about the seating arrangements.

African participants in particular stressed the importance of sensitivity to hierarchy, and showing people respect. This could be something as simple as not refusing water, then drinking from your own water bottle. It also affects matters of dress – e.g. women keeping a wrap with them which they could wear over trousers. Perhaps as a woman in particular, seniority is an issue within academic contexts. One of the participants explained how she said no to supervising a PhD as there was a professor there. She explained there is also need to be careful of criticising students of senior staff, as this can be seen to be criticising the supervisor. It can be difficult to tackle issues directly. As one participant explained:

'In Africa we give respect to whoever is at the top. I am assertive and I make my points. I don't leave the meeting room and have another discussion. Some say I am too vocal!

#### 4. **How can we best support Early Career Researchers (ECRs) from the global South develop inter-disciplinary research?**

Before attempting to answer this, the term itself needs to be questioned. Typically, ECRs are seen as people under 40 and within ten years of completing their PhD. In Africa, however, a 'young' scientist may be 45 years old.

This has knock on effects. As people are relatively senior before they go for their PhD, when they return they are often expected to assume heavy administrative duties. This is also because PhDs are still relatively rare in many African universities. If they don't get taken up with administrative responsibilities, they are overloaded with teaching, with no time to do research. There are very few post doc opportunities. There are also differences by place. Southern Africans, and particularly South Africans, were seen to be over-represented as scholarship recipients.

There was some discussion of the benefit of larger or smaller grants for ECRs. Despite the prestige of large grants in the natural sciences it was thought that early career researchers should first establish a strong line of research before bringing other people into the team. On the other hand, while value for money is good for smaller research projects, when there is a large project there is added value for ECRs in that there is critical mass, they are not isolated, but have other postdocs or PhDs also around.

Another issue is the research (un)readiness of the institutions which researchers from the global South return to. As one person put it: 'There is an ethic of going to study and then going back, but going back to what?' Building research capacity cannot be just about the individual, but needs also to be about the institution. Receiving institutions need to be ready to release the individual for subsequent periods to keep their research alive.

Teaching links can play an important part in research impact. High government staff turnover in Tanzania meant a loss of institutional memory. However, a long term relationship between a UK and Tanzanian academic department whose students go on to work in government meant that the academic department became a repository of knowledge.

There is chronic underinvestment in African research, particularly from national governments. Lab research in African countries also tends to cost more due to shipping costs and middlemen that supply reagents from the suppliers. These procurement costs therefore add further strain on weaker infrastructure. Shipping times mean that the cost of failure in lab work is more greatly felt in lost project time. What appear to be formally equal relations between institutions in the North and South, thus get translated into something very different.

This also relates to institutional overheads for research. Grants that specify need for international partners but fail to cover full indirect costs to those same partners were thought to place unfair burdens on Southern Hemisphere institutes. One researcher from

an African institution described her frustration that she repeatedly would be involved in grant proposals but the grant money largely remained in European institutions. This prevented progressive development of research at her institution despite apparent access to funding. The group felt that ethically, projects with international partners should expect a fair proportion of the budget to be spent in country.

### *'Your weak hand'*

One of the students studying for an interdisciplinary PhD suggested that he viewed his less strong subject as his 'weak hand', which his stronger subject could help with.

Some thought it was important to start young on an interdisciplinary path, that if more junior researchers learned interdisciplinary ways of working then they could go on to share these with more senior colleagues. A previous collaborative programme between UEA and the John Innes Centre aimed to advance this approach and similar projects are being proposed to continue this in the future.

Assuming the role of an active interdisciplinary researcher was accepted to be difficult, even at the early career level. Supervisors separated by discipline might disagree in their approach and encourage specialisation, actively or unintentionally, in their supervisee. This difference might be exacerbated when supervisors have unequal power. Not identifying fully with a conventional discipline group can lead to emerging interdisciplinary researchers being accepted by neither group, and so undermine their academic networking. International students in particular might find difficulty in obtaining jobs in academia upon returning having lost their 'disciplinary mooring.'

With this in view, mentoring may be of particular importance to focus and guide early career researchers. The first priority of the mentor would be to help the individual focus on their own path. Three of the attendees at the meeting were involved with African Women in Agricultural Research and Development (AWARD), a mentoring program. They viewed AWARD's 'purpose roadmap' as instrumental in giving their career progression direction, helping them with networking and gaining personal confidence to approach people and speak in public. PhD supervisors can also play a critical role in helping people convey the message in their research. It was suggested this space for learning, mentoring and training for early career researchers should be built into programme strategies. However, it was also said that mentoring can be paternalistic and neo-colonial. There is need also to think about mentoring from the global South.

### *Mobility*

Mobility grants provide ways to encourage career development. It was widely agreed that experiencing different cultures and visiting other institutions offered new perspectives and links. PhD methods training in southern contexts can be good in terms of the training received but also in providing contacts that may lead to jobs.

Interdepartmental exchange of early career researchers not only provided career development but also potential insights to inform higher level institutional partnerships. Returning researchers were able to identify overlapping areas of research that could then be explored by higher management and written into larger proposals. In this way,

exchange can drive researcher programs. To capitalise most effectively on this, institutions should be as open and informative to visiting researchers to allow them to navigate the new research environment. This may involve closer discussion with existing students: universities often don't know what international students don't know about navigating within the university and the locality more generally.

A strong emphasis on mobility in early career researchers can, however, be discriminatory against those who cannot travel. This might be particularly the case for those with families and disproportionately experienced by women. While mobility for researchers can be beneficial, the ability to travel alone does not make a better scientist. As in other workshops, the difficulty, particularly for Africans, of obtaining visas to the UK was discussed. Difficulties getting visas have also led to a shift in focus, with many seminars now being held in East Africa. However, recent Kenyan government restrictions on student visas, which have been tightened to control immigration from Somalia, have made it much harder for non-Kenyan researchers to work in the country. An absence of geographical mobility on the CV of an early career researcher should not be a barrier to employment or advancement.

A number of other ways in which institutions can be discriminatory to early career researchers were discussed. Targets such as demanding excellent publications in high quality English reduces transdisciplinarity and diversity in outputs. Similarly, suspicion of people with breaks in their career or who work part-time might restrict researchers with families, especially women.

*'Watch who you cite!'*

As citations are important in advancing academic careers, participants were urged to reference African women where possible. Barriers to equal participation are still considerable. For example, with an Africa based journal, peer reviewers in the North don't even bother to respond when you ask them to review a paper. One participant explained how she had resorted to creative use of funding for external supervisors, examiners etc. to build partnerships which might lead to a network on which to base a bid.