

Environmental Audit Committee

Oral evidence: Environment in Focus, HC 1310

Wednesday 17 December 2025

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[Watch the meeting](#)

Members present: Mr Toby Perkins (Chair); Julia Buckley; Jonathan Davies; Carla Denyer; Barry Gardiner; Sarah Gibson; Alison Griffiths; Manuela Perteghella; Martin Rhodes; Dr Roz Savage.

Questions 1 - 39

Witnesses

[V](#): Dr Susan O'Leary, Centre for Research into Sustainability, Royal Holloway University of London; Dr John Hillier, Reader in Physical Geography, Loughborough University.

Written evidence from witnesses:

- [Written submission from Dr John Hillier and Dr Hannah Bloomfield \(EIF0034\)](#)
- [Written submission from Dr Susan O'Leary \(EIF0032\)](#)



Examination of witnesses

Witnesses: Dr Susan O'Leary and Dr John Hillier.

Q33 **Chair:** Welcome. We have come to the last of the five presentations and the IT is still performing to an outstanding level, so this is good.

I am delighted that we have Dr Susan O'Leary, the Director of the Centre for Research into Sustainability at the Royal Holloway University of London and Dr John Hillier, a Reader in Natural Hazard Risk from Loughborough University. You have 10 minutes on climate breakdown and multi-hazard weather risk. Over to you.

Dr Hillier: Thank you very much for the invitation to present this idea, firstly. I am John Hillier, Reader in Natural Hazard Risk from Loughborough. I will be leading off and then I will hand over to Dr Susan O'Leary from Royal Holloway to carry on.

Our suggestion is for an inquiry into the adequacy of existing governance and accountability arrangements to protect vulnerable households from prolonged and interacting weather risks in the UK—a slight change of title, as you might have noticed.

In coming up with a decent answer to this issue there are two key challenges. The first is that weather-driven co-occurring extremes are poorly understood and yet a view of the risk is still needed. Why is this tricky? If you look at the diagram on the left of the screen, the blue oval is the footprint of damaging wind and the triangle is the footprint of flood damage. They have a different size, a different shape, different location, possibly with a time lag, and that is complicated to understand. I will talk a bit about that. Then the second challenge is that risk frameworks emphasise resilience management and adaptation but rarely confront what government should look like when prevention fails, and Susan O'Leary will talk to that.

So, first, I will check back to challenge one and a brief introduction to multi-hazard risk, using the example of the UK and extratropical cyclones. Illustratively in 2022 we had a week where storms Dudley, Eunice and Franklin brought us high winds, snow and heavy rain, which led to flooding and landslips and then other societal impacts such as school closures and trees being felled. There were multiple storms over many days, they presented a variety of hazards in a variety of locations, and as human beings we are generally not very good at dealing with this. It is also worth remembering that this clustering or compounding of different events happens over much longer timescales. We can look at the bottom of the screen to see a timeline of the winter season in 2023-24. There were 10 named storms and two cold snaps. On the timeline at the bottom, we see that five of these storms brought significant



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flooding—they are highlighted in blue—including Henk and Babette. However, perhaps the big picture from this timeline is just how clustered and ongoing these events were. They might seem quite unrelenting in a sense.

We can move on from this and imagine what plausible future worst case scenarios that we should be planning for might start to look like. The Bank of England has recently introduced joint flood-wind risk into its stress tests; however, these are just two hazards and it is a very simple scenario. Admittedly it is the two key things for insurance but it is still simple. The National Risk Register does not include multi-hazard scenarios even though the most severe and costly incidents will very likely be multifaceted.

Finally, the technical report for the upcoming UK climate change risk assessment this only briefly covers this complex topic of joint hazards. We got just about over 1,000 words to cover the entire topic, but what we did do was use the limited existing scientific evidence to tentatively envision two high-impact scenarios. First, we have a wet and windy winter, say, 15 to 20 storms, with three major storms in a one to two-week period. Now, let us say the first of these storms looks like the 1987 hurricane—not a hurricane hurricane, except it will be more likely because of the increased chance of sting jets in future. Then we have a major flood event, perhaps like Storm Desmond—a bit more likely because we have a wetter climate in future. Then we have a storm surge like the east coast storm surge of 1953, which is in the National Risk Register except it is a bit more likely because the sea level is a bit higher.

Then we move on to a hot, dry summer, which I based on 1976, which is the example in the National Risk Register, except I added in an intense short period of greater than 40°C heat like we had in 2022 but extended it a bit. This brings along with it the joint risk of extensive large wildfires, because there is quite a lot of fuel in this country and we are not very practised at dealing with these things. Also this type of event typically ends up with a band of severe convective storms coming through, so imagine the severe damaging hail you get in central Europe at the moment coming through after all this lot, which brings us to this overarching question: what might this do to the UK? I will illustrate this with a few questions.

For the summer scenario, how would staff fatigue and water shortages perhaps at nuclear plants have played out had our 40°C scenario lengthened? In the winter scenario, how do infrastructure providers cope after the fifth storm in a season? Then we can bring this to the more UK household aspect by asking how this intersects with existing vulnerabilities. At this point I will hand over to Susan O'Leary.

Dr O'Leary: The hazards that John has just pointed out obviously do not fall evenly across society, and the scientific picture naturally leads to a social one where the same communities repeatedly experience the sharpest and longest impacts, leading to a climate vulnerability gap. Climate disruption is often geographically based but its effects and



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recovery capacity are a social issue. Evidence shows that climate vulnerability to be structural and systemic. Aspects such as poor-quality housing, low incomes, insecure renting, health precarity and limited access to services creates an exposure to harm from climate disruption. At the same time the Climate Change Committee, along with many other bodies, finds the institutional response and ambition of the UK adaptation efforts to be inadequate. They are very clear the UK is unprepared across every major sector. In particular they find efforts to be fragmented and piecemeal, the policy landscape is very crowded, delivery is not forthcoming, outcomes are inadequate, responsibilities are unclear and scrutiny is needed to make sense of them.

So each of the elements on, for example, the slide I am showing now has a partial mandate, but none with a collective or overall accountability. Evidence on the levels of vulnerability and the piecemeal nature of climate adaptation is therefore well known, documented, and indeed this Committee will be familiar with this through previous inquiries it has undertaken that have reached similar findings, for example your recent heat resilience inquiry.

My intention here is not to repeat that evidence, but I can certainly speak to it during your questions and answers if you want. Instead what I would like to suggest is that while we know about the mounting intersection of climate multi-hazard risk, as John Hillier has outlined, and vulnerable communities and households, we need to better understand what this means in terms of our climate adaptation efforts. I have three main points in this respect. Current efforts, as John has pointed out, rely on episodic hazard focus adaptation rather than vulnerability. So responsibilities are organised around floods, roads, plans and this is entirely appropriate but it is unclear at this point whether these plans can function where vulnerability and multiple hazards intersect. People experience climate disruption through social systems and we are fast approaching a point where climate vulnerability as I outline is falling into the category of predictable severe and unevenly distributed harm. It is unclear whether governance arrangements have caught up with this yet, and the absence of a protection or even a safeguarding style of accountability in this context is becoming increasingly visible.

My second point is that that adaptation as currently designed and conceptualised in efforts towards this focuses on bounce-back and recovery. We assume we will return to the stability and the ability to bounce back, and while this is not unreasonable there is a need to understand the reliability of this assumption when hazards compound as John has outlined and intersect with existing levels of vulnerability. The assumption of rapid recovery is not wrong in principle but it is contingent. It depends on housing quality, income security, service access and institutional support. Repeated and overlapping shocks can exhaust recovery capacity faster than it can be rebuilt especially in already stressed communities and households.

My third point is that accountability to the extent that it exists at all across the fragmented system is not focused on vulnerability outcomes.



We tend to focus on procedures and what preparedness needs to be in place but not on whether vulnerable households and communities were or will be protected.

We have done a lot. Risk is recognised and plans exist, not satisfactorily, as John has outlined at the level of multi-hazard, and the issue here is not an absence of policy, but it is unclear whether existing arrangements are sufficient to deliver protection in practice.

We would suggest here that there is a need to examine existing and in-process adaptation efforts through this multi-hazard and vulnerability lens. The focus given in the evidence we have already and that has been in front of this Committee is a necessary evolutionary accompaniment to current adaptation efforts. Given the Climate Change Committee's assessment of the adaptation efforts and the reaction of multiple Government and cross-Government Departments we think this is very timely, and it is an appropriate time for the next level of parliamentary scrutiny in this respect.

This final slide sets out the questions that in our view now require parliamentary scrutiny, and they are also available to you in the briefing sheet that we provided. Thank you.

Q34 Chair: Excellent. Thank you very much indeed, both of you. We come now to questions. Do we have any colleagues with specific questions on that? My first question would be this. You might well be conscious of the inquiry this Committee did into flooding, and in some ways this is a natural follow-on from that and you might think that this will cover similar ground. Can you think about where we got to in the recommendations that we made and the analysis we did and give us an idea as to how you think this complements the work we have already done and how we might need to be careful not to duplicate stuff we have already done?

Dr O'Leary: I would refer also to the heat resilience inquiry that had a lot of similar issues that we both outlined here. I think to complement both what myself and John are proposing, we often tend to look at these hazards in isolation—so flooding or heat resilience—and, as John has outlined, not in terms of multi-hazard risk and how this compounds already existing levels of vulnerability within households within the UK. That is the first point. The second point is what is clear from the Climate Change Committee's adaptation report in March this year: that we are still not at a level where the adaptation efforts that have come out of inquiries and policy—the very crowded policy landscape and inquiry landscape—have led to a joined-up effort in how they translate into the protection and safeguarding of vulnerable communities in the presence of these multi-compounding risks.

Dr Hillier: Can I use a very quick example in the wider compounding hazards landscape? I will bring this back to me. I go running, and I hurt my knee, then a couple of days later I hurt my thumb, so in terms of doing any exercise I now cannot use the bottom half of my body or the top half of my body, and if I lost my spectacles I would be utterly



useless. Each one independently does not matter as much, but when you get these things together then they can have a much more severe effect, potentially. If you plan you can mitigate but if we do not then, well, we will do what people typically do in all hazard prevention worldwide, or hazard response, which is hindsight. We are great at that but we are not very good at forward planning.

- Q35 **Julia Buckley:** Back in the olden days I used to work in a council, a couple of different councils, and we always had the emergency planning team, and then it became a person and they had a plan and they were part of a network across the country of other such people. Is there any reason why that person, team, plan could not be trained to do this more complex, multifaceted approach? Could we use existing resources to alert them to a new way of looking at this?

Dr Hillier: Perhaps if I can take this to start off with. Potentially, I would perhaps embody the scientific answer to why this is not as easy as it sounds. As an individual, having the expertise to cover all the hazards is quite tricky, and if you develop a large team it then becomes this slow-moving monster that likes to create broad, thin answers and does not dig into detail. You have hit upon an absolutely key point about how to configure something. I would say a few highly trained individuals—you need a bit of expansion but possibly, if well designed, not much.

- Q36 **Julia Buckley:** They usually work in partnership. They design, plan and they bring a committee together every three months to look at it and bring in the police, the ambulance, the fire to ask if they are on the right track. I suppose the missing bit is that they might not be doing this complex multifaceted planning. They are thinking, "Here is our plan for the flood and here is the one over there for the wildfire", and I think what you are asking is where is the person worrying it might all happen within the same week.

Dr Hillier: Yes, exactly. Science also happens in these siloes and rarely gets joined together to tackle the multi-hazard problem, and I suspect exactly the same is happening all over the place. It would be great to get some steer on the design of how you bring a small team together like that to do these things functionally.

- Q37 **Chair:** We have a resilience strategy, a national adaptation programme and there has been a lot of discussion about climate security, but as you have pointed out little by way of practical measures for what happens when these risks are realised. What is your sense as to why so far it has not been such a priority either for the public or for Government?

Dr Hillier: Realistically, it gets very complex, and the way of reducing that is by coming at it with a couple of simple scenarios. The error bars for what those scenarios might look like are huge. Being completely honest, with the climate change risk assessment I got the multi-hazard risk part mainly because I do not think anybody else wanted it, and everybody looked around for perhaps the best person to do it, but that was then 1,000 words of mainly me trying to imagine these plausible scenarios—by which I mean more likely than not in the next 30 years. It



would be great to see a properly configured scrutiny of what those scenarios might be to limit this, and then you can start to follow those through the food chain—what might happen if this plausible scenario happens.

- Q38 Barry Gardiner:** You are outlining that there could be a multiplicity of such different scenarios and therefore preparation for any one of them crystallising would be extensive and costly. How would you counter the argument that it is more important that we are now taking steps to mitigate, to reduce the environmental damage, to sort what is creating the problems and spending our resources and our energy there rather than in preparing for what might happen and what would be catastrophic if it did, but when you do not know which one of those multiplicity of scenarios might crystallise?

Dr Hillier: There are a couple of elements there. Why spend our energy? We should mitigate anyway, but I will bow to the panel on climate change. It is going to happen, probably, in their view, and even if not we do not know how to deal with this in the present day—even if you forget about any possible future change we still do not know how to do this in the present day.

Why are scenarios useful? Well, they give you something to adapt to and something to consider. There is a great phrase I like here, which is “low regret adaptation”. Insulate a house. If it gets warmer it is great. If AMOC shuts down and the north Atlantic circulation changes and we suddenly get 10°C colder, insulating a house still works. There are some strategies that you can adopt for adaptation and mitigation that will work in a variety of scenarios. So there is the job of working out what they are, working out what are good strategies that will work for a variety of scenarios, but using a couple of picked ones as illustrative guides.

- Q39 Barry Gardiner:** What are the recommendations that this Committee could make in an inquiry? What you have just said is contained there in our adaptation strategy already. That is a very good example, but it is one they have already crystallised and expanded.

Dr Hillier: My quick answer is the multi-hazard part, but I will hand over to Susan.

Dr O’Leary: I think you are correct. The ambition is there, the intent is there in a very crowded policy and infrastructure landscape. As you know there are multiple ways in which responsibility is distributed across the scene. What I think is a question for the EAC is about the predictable gaps in this crowded policy landscape for vulnerable communities, which are already experiencing layers of vulnerability. Layer this on top of that, and how are they falling through the net in this respect and what would that look like? What would a vulnerability lens look like in the context of a multi-hazard risk scenario? Again, that is lower-regret. We are looking at vulnerability. It is always good to look at vulnerable pockets of society anyway. Then that would feed into conversations that are happening currently from the cross-governmental perspective. We have the Climate Resilience Steering Board, which is mandated. Its arrangements and the



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level of ambition in relation to climate adaptation are being worked out at the moment. This is the right time to embed these things within it, and this Committee and an inquiry that this Committee might run would contribute to those conversations at a very important time within the adaptation landscape of what we are doing.

Chair: Excellent. Thank you very much indeed, Dr Hillier and Dr O’Leary for those presentations. We are very grateful.

I will bring this meeting to a close now. The public meeting will cease. I would like to take this opportunity to thank every organisation that has presented and also to thank every organisation that wrote in, because it was very difficult for us to narrow then down to the five here today. There were many other very strong recommendations that did not make it to this final five. Thank you everyone for how you have engaged with this important piece of work. We will bring this meeting to a close. We will go into private session now. Watch out for the white smoke. Thank you very much.