**Science for humanitarian emergencies and resilience (SHEAR)**

The aim of this programme is to improve disaster risk assessment and forecasting, disaster risk monitoring and the integration of these into practical decision-making in low to middle income countries across sub-Saharan Africa and south Asia.

Science for Humanitarian Emergencies and Resilience (SHEAR) is a new international research programme that focuses on four areas:

* disaster risk assessment (mapping and analyses)
* sub-seasonal to seasonal forecasting
* disaster risk monitoring
* the integration of these into practical decision-making.

The programme is targeting lower to middle income countries across sub-Saharan Africa and south Asia, focusing on the co-production of knowledge using a multidisciplinary and problem-centred approach.

NERC research will specifically address:

* hydrological controls on landslide risk as part of multi-hazard risk assessment
* real-time monitoring of risk, for example satellites and big data
* applications of weather and climate forecasting.

This overall aim will be to improve the characterisation of the hydrological controls on natural hazards thereby enabling better prediction of their occurrence and scale, with a focus on landslide risk.

The NERC component of the SHEAR programme’s research will be targeted around two main themes. Additional cross-cutting themes will enable a highly interconnected and multidisciplinary programme. The two main themes are:

1. world-leading research into hydrological controls on landslide hazard as part of multi-hazard risk assessment
2. flood and drought risk assessment and modelling in Africa as part of multi-hazard risk assessment.

The crosscutting themes will connect the landslide-focused research in theme 1 with research into new applications of flood and drought risk assessment modelling in Africa as part of multi-hazard risk assessment in theme 2. These are:

* real-time monitoring of risk (for example, satellites, big data, vulnerability indicators)
* applications of weather forecasting in risk assessment and preparedness.

The programme will link across existing strategic research programmes run by NERC and ESRC such as Increasing Resilience to Natural Hazards and Probability Uncertainty and Risk in the Environment.

Since 1980 natural disasters have caused more than 2.5 million fatalities, of which around 95% have occurred in developing countries. The [2011 Humanitarian Emergency Response Review (HERR)](https://www.gov.uk/government/publications/humanitarian-emergency-response-review) recognised that a more effective response to natural disasters requires greater investment up-front on preparedness and resilience. The mid-term review of the [Hyogo Framework for Action](https://www.preventionweb.net/publication/hyogo-framework-action-2005-2015-building-resilience-nations-and-communities-disasters) highlighted that since 2005 progress has been made in disaster risk reduction in many countries but this is unequal and many of the world’s poorest people are being left behind. The Science for Humanitarian Emergencies and Resilience (SHEAR) programme’s outcome will be to enhance risk reduction through improved forecasting and decision-making for disaster preparedness and response. This will be enabled by improved characterisation and forecasting of co-dependent natural hazard risks, delivered through new, tailored knowledge mechanisms and tools.

A number of scoping studies have informed the development of the SHEAR programme, highlighting the gaps in current science that are necessary to predict the impacts of multiple natural hazards. A key area of interest is the intersection between the hydrometeorological sciences and geophysical sciences that is necessary for monitoring and predicting so-called cascading (or secondary) natural hazards like landslides and floods that follow primary events. For example, how does extreme precipitation lead to landslides, what controls the spatial scale of the landslides and how are landscapes likely to respond to future changes in the hydrological cycle? What is the role of hydrological pre-conditioning in landsliding?