



Government  
Office for  
**Science**

# **The Use of Science in Humanitarian Emergencies and Disasters: Progress Report**

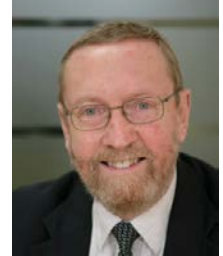
**November 2012**

**SHED Progress Report**

Government Office for Science

# Foreword

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Professor Sir John Beddington, the Government Chief Scientific Adviser

In June 2012, I published a report called the “Use of Science in Humanitarian Disasters” (the “SHED” report). It identified six recommendations on how Government could improve its use of science advice in predicting and preparing for disasters, and I committed to report progress on the six recommendations in November 2012.

This is my report on the achievements in the initial six months since the SHED report was accepted by Ministers.

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# Introduction

1. In June 2012, at the request of the Secretary of State at the Department for International Development (DFID), Sir John Beddington published a report highlighting how Government could improve its use of science in both predicting and preparing for disasters, drawing on the Chief Scientific Advisors' network across Government. The report was called "The Use of Science in Humanitarian Emergencies and Disasters (SHED)" and focussed primarily on Government, and changes to the way Government plans and prepares for international humanitarian emergencies.
2. There were three main recommendations to make a real difference to improve the way that Government uses science advice. The first recommendation focussed on establishing an expert group to provide systematic advice to Ministers on emerging international risks and the uncertainties in assessing those risks. The second recommendation established a group who will meet when an international emergency occurs and will provide a prognosis for the "reasonable worst case", based on scientific advice.
3. A further recommendation proposed the establishment of a group of experts who could provide advice on specific hazards when an emergency occurs.
4. There were three further recommendations which look further forward and reflected additional evidence gathered during the preparation of the report. The fourth recommendation proposed enhancements to existing cross cutting research coordination mechanisms to provide better engagement between disciplines. The fifth recommendation was to develop the evidence base for action in response to early warnings from risk assessments. The final recommendation was to consider the possible benefits in a greater partnership between the public and private sectors to improve the developing, sharing and using of data to predict and prepare for humanitarian disasters.
5. The SHED report in June 2012 committed to provide a first report of progress on these recommendations in November 2012, and this report does that.

## Overall progress

6. In the first six months of operation, there has been a good deal of work in not only setting up a Secretariat but, more importantly, in practically taking the work forward. Highlights are:
  - Staffed Secretariat established.
  - Risk and horizon scanning group (recommendation 1) established and has established a working routine. No reports have yet been reported to the National Security Council on emerging issues, but the minutes from both of these meetings can be found on the Government Office for Science Website.

- A list of experts has been drafted and is ready to be used (recommendation 2). This list will be further strengthened over time to maintain a comprehensive breadth of expertise for a wide range of natural hazards.
- The Humanitarian Emergency Expert Group (recommendation 3) has not been called. Officials have trialled a process.

## **The SHED Secretariat**

7. The SHED Secretariat has been established and is funded by DFID, FCO, MOD and GO-Science. The secretariat is based at the UK Collaborative for Development Sciences (UKCDS). The Secretariat will work closely with all Government departments and notably GO Science. The Secretariat will report to the Government's Chief Scientific Advisor (GCSA) as Chair of the RHEG.

## **Better Anticipation of risks across Government**

8. The mechanisms set up by SHED provide a way that existing resources and expert capabilities within Government can be used more effectively in a coordinated and integrated way. Using SHED, the Government will be able to anticipate risks better and also identify more opportunities for dealing with natural hazard emergencies world wide.
9. There is on-going work across Government to identify a new approach to horizon scanning so that Government thinks strategically and is not surprised when a sudden strategic shock occurs. The SHED mechanisms complement that work, and also build on previous work from GO Science. In particular, the Blackett Review published by the GCSA in 2011 which provided advice on how the Government can minimise strategic surprises from high impact low probability risks.

# Progress against each recommendation

## Recommendation 1:

*The Government Chief Scientific Adviser should establish a risk expert group to provide advice to Ministers on emerging international risks. Initially, the group should meet quarterly, and provide regular reports as risks emerge.*

10. This group has met twice since the report was issued in June 2012 and October 2012. Quarterly meetings are scheduled for the coming year. Members of the group are:

- Sir John Beddington (CHAIR)
- Chief Scientific Adviser Ministry of Defence
- Chief Scientific Adviser Department for International Development
- Chief Scientific Adviser Foreign and Commonwealth Office
- Chief Scientific Adviser Department of Health
- Chief Scientific Adviser Department for the Environment, Food and Rural Affairs
- Chief Scientific Adviser Department for Energy and Climate Change
- Chief Scientific Adviser UK Met Office
- Chief Scientific Adviser British Geological Survey
- Cabinet Office
- Brendan Gormley (ex-Chief Executive of the Disasters Emergency Committee).

11. Both the risk expert group (known as the Risk and Horizon Scanning Expert Group or RHEG) and the Humanitarian Emergencies Expert Group (HEEG) will be as transparent as possible and follow the principles established by the Scientific Advice Group for Emergencies (SAGE) for UK emergencies<sup>1</sup> and will also follow the principles established by which scientific advice is used alongside other evidences sources to inform policy<sup>2</sup>. A communications strategy to reflect these principles is in development.

### *Identification of emerging risks*

12. The RHEG will produce a quarterly unclassified summary of emerging risks. Some assessments may be sensitive, and in those areas a decision will be made on a case-by-case basis. An initial methodology to identify emerging risks has been developed, which involves Departments reporting on their priority risks.

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<sup>1</sup> <http://www.cabinetoffice.gov.uk/resource-library/scientific-advisory-group-emergencies>

<sup>2</sup> <http://www.bis.gov.uk/assets/goscience/docs/g/10-669-gcsa-guidelines-scientific-engineering-advice-policy-making.pdf>

13. At its second meeting in October 2012, the RHEG considered the first six monthly forward look based on monthly to seasonal forecasting from the Met Office, and also assessed the potential impact from current animal and human diseases. The RHEG also considered the scientific advice available prior to and during the Pakistan floods in 2010 to inform policy makers of how the assessment of risk changes over time and the opportunities to improve the utility of models through multi-disciplinary approaches.
14. Based on this forward look, the group agreed that a framework to categorise emerging risks, how far in advance the risk can be predicted, and the level of uncertainty that can be attributed to the risk. This tool will better inform decision makers and allow actions to be taken that are proportionate to the levels of uncertainty and/or likely impact associated with an emerging risk.
15. The forward look will consider the following areas: flood; tropical storms; earthquake; tsunami; volcano landslides; extreme temperatures; drought; health epidemics and pandemics; animal diseases and pests; plant pests and diseases; space weather.
16. This approach will be informed by the 'Ready-Set-Go' tool outlined in the International Research Institute for Climate and Society's report on '*a better climate for disaster risk management*.' This tool highlights the actions that could be taken in response to seasonal, intra-seasonal and weather forecasts indicating a potential hazard.
17. As an example, emerging risks could be classified as being in the 'Ready' stage when long-term forecasts indicate a potential hazard but when there are high levels of uncertainty associated with the prediction. At this stage, actions such as on-going monitoring and testing contingency plans could be taken. A risk would move into the 'Set' stage once the level of uncertainty associated with the prediction decreased. Finally, emerging risks would come under the 'Go' stage when data indicates that a disaster or emergency is imminent and actions to respond to the situation should be implemented. It is recognised this cascade process is likely to differ depending on escalation of the hazard; for example, many geo-physical hazards have a limited lead-time when compared with hydro-meteorological hazards.
18. The process to identify emerging risks will continue to evolve and will be a standing agenda item at all future RHEG meetings. The ultimate aim for the group will be to agree a quarterly summary of emerging humanitarian risks. Any issues of concern will be reported through the Secretary of State for International Development to the National Security Council (NSC) and will be shared with Government departments. The Secretariat will ensure that it aligns the RHEG reporting with risks assessment activities already being undertaken by departments, such as those being undertaken by DFID's Conflict, Humanitarian and Security Directorate (CHASE), the Domestic Horizon Scanning Committee or the JIO (see below), to avoid duplication and/or conflicting messages.
19. Between the quarterly RHEG meetings, the Secretariat will continue to gather and analyse emerging information on existing risks which could change the current risk assessment. This will be done in conjunction with science providers such as the UK Met Office and British Geological Survey. This information will include indicators

provided by international institutions such as FEWS NET<sup>3</sup> and also existing advice from Government advisory bodies such as the UK National Expert Panel on New and Emerging Infections (NEPNEI) for emerging animal and human diseases. NEPNEI was established as part of the CMO 'getting ahead of the curve' infectious disease strategy. The panel provides a review of any new or emerging infectious diseases reported in this country or from elsewhere in the world.

20. The process of the flow of information has yet to be established and more details will need to be considered by RHEG as the work of the next few months gives greater clarity to how the details of the information gathering process will work. This information can be considered by the RHEG when rapidly emerging risks are found between the scheduled RHEG meetings.

#### *Building national and international links*

21. The RHEG is keen to establish links with key national and international organisations to ensure that existing resources are used effectively to better anticipate and respond to hazards.

#### *National links*

22. Since the publication of the SHED report in June, the Secretariat has been speaking to Government departments to identify priority areas and risks. There are a number of activities currently taking place across Government for which the RHEG will contribute, either through risk assessment or as a peer review process. The following paragraphs summarise the Secretariat's discussions with DFID, the Cabinet Office, The Ministry of Defence (MOD), and the Foreign and Commonwealth Office (FCO)

#### **DFID**

23. The Government response to the Humanitarian Emergency Response Review (HERR) committed DFID to 'incorporate global risk mapping into existing risk management tools used by senior decision makers with immediate effect'. DFID is working in collaboration with a private sector risk management company to carry out global assessment of humanitarian risk and trends, using an index based risk approach to quantify hazard, vulnerability and capacity. This work is being carried out by the Conflict, Humanitarian and Security Department (CHASE) of DFID.
24. CHASE will be one of the main users within DFID of the RHEG emerging risks assessment. CHASE will include RHEG assessment results in quarterly reporting to Ministerial and management reporting, where appropriate. Following initial discussions at a meeting with CHASE officials, advice on the impacts of the El Nino Southern Oscillation was identified as one of the key areas for the RHEG to provide advice.

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<sup>3</sup> The Famine Early Warning Systems Network.



25. The El Niño Southern Oscillation (ENSO) is closely monitored and modelled as its behaviour contributes seasonal weather changes in many parts of the world, including areas where DFID have humanitarian concerns due to climate or meteorological hazards. RHEG assessments should include ENSO status in terms of hazard risks which DFID will be able to combine with the range of evidence they have on global humanitarian risk.

#### Cabinet Office: Joint Intelligence Organisation (JIO)

26. The Joint Intelligence Organisation leads on intelligence assessment and development of the UK intelligence community's analytical capability, supporting the work of the Joint Intelligence Committee and National Security Council. The Joint Intelligence Organisation incorporates the Assessments Staff and the Professional Head of Intelligence Analysis.

27. The Assessments Staff consists of intelligence analysts seconded from a wide range of departments and disciplines. It is responsible for drafting assessments of situations and issues of current concern, providing warnings of threats to British interests and identifying and monitoring countries at risk of instability. The Assessments Staff draws upon a range of intelligence, primarily from the intelligence agencies but also diplomatic reporting and open source material. The Joint Intelligence Committee agrees most assessments before they are circulated to Ministers and senior officials. Assessments from the RHEG will be an additional source of evidence for the JIO.

#### Cabinet Office: Civil contingencies Secretariat (CCS)

28. CCS lead on the delivery of improved resilience across the government and public sector, and lead the cross-departmental response through COBR. Where an international emergency had significant cross-departmental impacts then one option would be for a COBR to be called. COBR could request science advice from a SAGE. The responsibility for SAGE would fall to GO Science and the Lead Government Department, but the SHED Secretariat would be expected to be working alongside GO Science to make most effective use of their international expertise.

29. The Domestic Horizon Scanning Committee (DHSC) provides a 'heads up' to departments on potential disruptive challenges to the UK over the next 6-12 months. This includes the impacts of natural hazards such as Icelandic Volcanoes and bad weather and also considers space weather. However, it is possible that an emerging natural hazard internationally could affect either the UK or its interests internationally (including UK nationals) and emerging risks identified by the RHEG which could impact on UK interests will also be sent to CCS for consideration as part of the DHSC (and for additional follow up if required).

30. CCS also coordinates an assessment of risk over the medium term (next 5 years) to inform contingency planning and preparations for an emergency response and recovery. In response to both the Blackett review and the House of Commons Select

Committee inquiry on the use of science advice in emergencies the National Risk Assessment for the first time in 2012 drew on external scientific advice and expertise to inform the annual review of the assessment.

31. CCS also handles liaison with EU and NATO partners on international civil protection issues. The Team works with partners across government to coordinate UK policy on EU and NATO civil protection activity. The SHED Secretariat met with CCS several times over the summer to discuss the work of the Secretariat and the SHED will build closer links with this group in coming months.

#### Ministry of Defence: Defence Science and Technology Laboratories (DSTL) Horizon Scanning Unit

32. GO Science are already working closely with the DSTL horizon scanning team. The current focus of the group is on providing advice to MOD on potential emerging technological developments which could provide a strategic shock to MOD objectives. Alongside the GO Science Horizon Scanning Unit, the SHED Secretariat have agreed to work closely with them in considering how best the RHEG can support the work of the DSTL team with our emerging risks summary.

#### Foreign and Commonwealth Office: Crisis Management Department

33. The FCO's Crisis Management Department (CMD) ensures that the FCO responds effectively to crises overseas. This is done by developing crisis policy and best practice, coordinating FCO crisis planning, training and exercising, and delivering appropriate assistance to British nationals and ensuring duty of care to staff in a crisis.
34. CMD use scientific advice in a number of different ways: it helps them to effectively plan for crises by identifying the main risks faced by UK consulates overseas and potential places of safety within countries; reasonable worst case scenarios enable them to write realistic, but challenging exercises to test the response of UK consulates overseas; scientific advice is taken into account when writing FCO Travel Advice; and, perhaps most importantly, scientific advice augments their crisis response, helping them to assist British Nationals and to give them the best service and advice.
35. The forward look produced by the RHEG will support the FCO in identifying future risks, and can also provide a critical challenge function to existing (and future) emergency response plans produced by UK consulates. The Secretariat have provided advice to the CMD about potential earthquake risks in Nepal, and have also supported a recent FCO exercise (see recommendation 3).

#### *International organisations*

36. As outlined in the 'Use of Science in Humanitarian Emergencies and Disasters' (SHED) report, the international landscape for disaster risk reduction and emergency response is complex. In general the efforts of international organisations can be broadly grouped into three areas:

- Provision of timely and reliable funds in response to humanitarian emergencies.
- Disaster Risk Reduction emergency preparedness and response coordination and/or delivery.
- Risk assessment and science provision.

37. The Central Emergency Response Fund (CERF) is an example of a mechanism that has the ability to provide a rapid financial response to assist victims of humanitarian emergencies and disasters.

38. The UN International Strategy for Disaster Reduction (UNISDR) and the UN Office for the Coordination of Humanitarian Affairs (OCHA) are examples of organisations that provide a coordination role. The UNISDR, in particular, coordinates international disaster risk reduction efforts and advocates for greater investments in risk reduction actions.

39. A large amount of information related to emerging risks is available from a wider variety of sources. For example, within the EU, the Monitoring and Information Centre (MIC) has a role to provide daily alerts of disasters across the world. It has close links with organisations that coordinate the response to an emergency. Other examples include the Global Science Forum of the OECD, which is involved in a number of risk modelling initiatives and the Integrated Research for Disaster Risk initiative (IRDR) that endeavours to bring together the natural, socio-economic, health, and engineering sciences in a coordinated effort to reduce the risks associated with natural hazards.

40. It is essential that the structures put in place as a result of the SHED report build and draw on the vast amount of work on-going internationally adding value rather than duplicating effort. To meet this aim, the Secretariat are in the process of developing an approach for the RHEG and the HEEG to engage and share information with the international community.

## Recommendation 2:

*The risk expert group should, under the direction of the Cabinet Office, ensure there is a list of experts available who can be approached to provide advice on specific hazards and their impacts.*

41. Working with Cabinet Office, the Government Office for Science has identified 24/7 contact numbers for all Government departments, science agencies, and selected experts who may need to provide science advice rapidly in an emergency. These contact details have been provided to the SHED Secretariat to facilitate any emergency response from the Humanitarian Emergencies Expert Group (recommendation 3 below). Discussions are on-going to understand how best for all organisations to share data on specific individuals more widely.

## Recommendation 3:

*The GCSA, working with relevant CSAs, should establish procedures for a Humanitarian Emergency Expert Group (HEEG) to be convened during an emergency. The group would immediately provide a prognosis of the “reasonable worst case”, based on science advice, following a major rapid onset emergency. This would inform response options.*

42. The Terms of reference, core membership of this group and basic ways of working have been agreed. The purpose of this group is to provide rapid advice to Government when COBR has not been activated. A department can activate a HEEG through the relevant departmental CSA’s office or, in a fast changing emergency, directly through the SHED Secretariat.
43. A response protocol has been agreed with FCO and was successfully tested during an exercise. This exercise tested the Secretariat’s ability to convene a group of science advisors at short notice. A larger exercise to test provision of emergency advice, including real time scientific advice, is being considered next year.
44. The DFID duty officer phone is manned 24/7 to respond to any sudden onset disaster. FCO, Cabinet Office and MoD colleagues also have duty officers with email contacts. CHASE are working with the SHED Secretariat to integrate a SHED 24/7 response into their Standard Operating Procedures.

## **Additional recommendations**

45. There were three other recommendations in the SHED report.

### **Recommendation 4:**

*DFID UK research councils and other UK funders of science should further strengthen and improve cross disciplinary working. This may be through a cross governmental organisation. Together they should establish a more effective approach towards engagement between researchers and research users, both in the UK and internationally.*

46. The Secretariat has been in discussions with DFID and NERC to scope out opportunities for future multidisciplinary research collaboration to improve disaster anticipation and resilience. Whilst this dialogue is in its early stages the initial feedback has been positive.
47. Discussions are also underway to explore a suitable mechanism with which to provide a more joined-up approach to disaster anticipation and resilience across RCUK. This will look to build on the work of the UKCDS Disasters Research Group that brings together funders and users of research.

### **Recommendation 5**

*The emerging findings of the GO Science Foresight Project should be used to inform the work DFID is currently undertaking on disaster resilience. It will also inform DFID’s ongoing work in developing the evidence base for action in response to early warnings from risk assessments (including previous international responses) and slow onset disasters.*

and;

## Recommendation 6

*The Government Chief Scientific Adviser will use the output of the GO Science Foresight Project to further consider the benefits in the public and private sectors developing, sharing and using data to prepare for and predict humanitarian disasters.*

48. The Foresight Report on Future Disaster Anticipation and Resilience was published on the 27<sup>th</sup> November. That report has made a number of wide ranging recommendations for actions that could be taken within the next 10 years to reduce the impacts of disasters arising from hazards up to 2040. The Secretariat will also be exploring how there could be greater coordination of public sector information and expertise with the private sector. This work will include any specific issues raised in the Foresight report, and other work within GO Science looking at improved collaboration on the use of data by both public and private sectors.

## Conclusions

49. The recommendations in the SHED report identified specific actions that the Government could take now to improve the way it responds to international humanitarian disasters. In the first six months of operation, there has been a good deal of work in not only setting up a Secretariat but, more importantly, in practically taking the work forward. Over time, these new groups will make a significant difference to the way the UK Government both prepares for, and responds to, international humanitarian emergencies.

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