



**COORDINATING COMMITTEE FOR GEOSCIENCE PROGRAMMES
IN EAST AND SOUTHEAST ASIA (CCOP)**

54th CCOP Annual Session
28 October – 1 November 2018
Busan, Republic of Korea

Cooperating Country Report of UNITED KINGDOM

Submitted by

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(For Agenda Item 4)



**COORDINATING COMMITTEE FOR GEOSCIENCE PROGRAMMES
IN EAST AND SOUTHEAST ASIA (CCOP)**

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ANNUAL COOPERATING COUNTRY REPORT

Country/Organization:	UK/BGS	Period:	1 July 2017 – 30 June 2018
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1. Summary

BGS wishes to express its congratulations and best wishes to the Republic of Korea on the occasion of the Centennial of the Korean Institute of Geoscience and Mineral Resources.

In 2017-18 BGS has continued to pursue its research interests globally, funded from its own budgets, research grants or in response to direct commissions from UK and international government agencies.

In 2018 we are developing a new science strategy focused on three major challenges,

- decarbonisation of power production, heat transport and industry
- environmental change adaptation
- natural geological hazard and risk

These challenges will be underpinned by new investment and capabilities in Science Infrastructure and technologies for observation and experiment including subsurface energy infrastructure, catchments and cities, sea floor infrastructure and informatics for global geological risk.

In addition the UK Government is now fully committed to meeting the targets of the UN Sustainable Development Goals (SDGs), the 2015 Sendai Framework for Disaster Risk Reduction and the UN Habitat Directive. New funding initiatives are available to develop and expand international research and BGS has realigned up to 12% of its annual budget over the next 3 years to focus on new applied research programme entitled “*Geoscience for Sustainable Futures*” (<http://www.bgs.ac.uk/research/international/ODA/home.html>). We have implemented three research platforms, two of which are relevant to CCOP member countries with a focus on the Resilience of Asian Cities and Global Geological Risk.

In partnership with CCOP countries we seek to co-design and develop new projects that will have impact and underpin economic growth and social development. At the same time the UK university research effort is also expanding with new opportunities under the Global Challenges Research Fund (GCRF) and Newton Fund grant schemes aiming to link natural and human research. A number of Newton fund awards now involve CCOP member countries.

BGS is keen to explore partnerships with CCOP members especially in the fields of informatics, energy, resources and urban resilience. We have expertise and developing experience in specialised disciplines, including groundwater, informatics, urban geology, carbon capture and storage (CCS), shale gas, and geohazards (volcanoes, earthquakes, landslides and tsunamis).

2. Review of current technical activities and geoscience programmes in the CCOP Region (Multilateral or Bilateral)

China

Discussions are ongoing with Shenyang Geological Survey (SGS), which is a regional centre of the Chinese Geological Survey regarding the Global Black Soil Critical Zone Geoeological Survey (BASGES) programme. The aim is to better understand processes, such as carbon, nutrient and water cycling, in the black soils with abundant organic matter, to improve the soil ecosystem services, e.g. food production and generating clean water.

Hong Kong Geotechnical Office staff training in 3D modelling and urban data with visit to BGS in 2018.

Malaysia

BGS is a partner in a £19m 5-year multi-disciplinary UK research programme on Science for Humanitarian Emergencies & Resilience (SHEAR). This includes partners from Malaysian universities and government and is aimed at developing research on, hydrological controls on landslide risk as part of multi-hazard risk assessment and real time monitoring of risk, using remote sensing and big data. Project in 2nd year and progressing well.

Suburban Kuala Lumpur: With the support of JMG and the City Authorities (DBKL) and major suburban project has been set up to develop shared datasets, 3D modelling and revision of the geology of Kuala Lumpur to inform future development.

BGS is also investigatied use of electricity pylons as INSAR reflectors to monitor and exposure of the power grid to ground movement.

Philippines

BGS geologists are continuing to work with NGOs, government and local universities to explore safer building and self-recovery, our input is into the physical environment related to water supply and coastal hazards.

Singapore

In June BGS completed a 2 year contract with the Building, Construction Authority to log borehole cores, interpret seismic data and carry out geological mapping to revise the lithostratigraphical and tectonic frameworks of the geology beneath Singapore for planning and subsurface development.

The geology of Singapore is now recognized to be more complex than previously thought and the project involved building probably the most complex 3D geological model made by BGS to date. A successful workshop was held with the user community (engineers, academics etc) and the revised geological interpretation discussed and agreed. Discussions for further work are ongoing.

Republic of South Korea

BGS geologists continue to work with KIGAM in Quaternary mapping and urban geology. BGS staff delivered a training course as part of the International Geoschool attended by trainees from, Cambodia, Ecuador, Ethiopia, Fiji, Indonesia, Laos, Malaysia, Mongolia, Myanmar, Philippines, Thailand, and Vietnam.

Vietnam

Suburban Hanoi: After some delay a major project is agreed to underpin the planned development of Hanoi into a mega-city. With partners GDGMV and the State Peoples Committee of Hanoi, BGS is supporting development of this major project.

BGS hydrogeologists are also involved in groundwater studies and modelling of Ho Chi Minh city.

BGS secured funding for a Newton research workshop to connect UK and Vietnamese researchers in developing a catchment study on the Red River both upstream and downstream of Hanoi city, from this major research grant proposals will be prepared.

3. Proposed future activities and assistance to CCOP in support to current and future activities

With respect to the new funding initiatives mentioned above BGS is continuing to invest >£200,000 pa up to 2021 in developing joint research projects and is seeking local partners to bid into research calls in the following areas,

1. Resilience of SE Asian cities

The development and resilience of cities in SE Asia in the face of competing demands on resources (energy, water, food etc) and exposure to multi-hazards (typhoons, earthquakes, volcanic eruptions, landslides etc) requires integration of complex datasets and construction of 3D models to inform planning and development.

For example, South Asian cities have some distinct groundwater challenges, in coastal cities, such as Bangkok, controlling subsidence associated with groundwater withdrawal and managing multi-layered aquifers with legacy problems of contamination and saline intrusion are major local issues.

BGS is therefore very keen to discuss with CCOP members and to develop new opportunities in the region. We will deliver a **thematic urban workshop** in February 2019 in Kuala Lumpur covering some of the following topics

Urban geological mapping; geohazard mapping; core logging and interpreting borehole evidence; application of remote sensing and geophysical techniques; building 3 D water resource models and understanding uncertainty.

2. Managing and relating large datasets

The delivery of digital data to attract investment in the water, mineral and energy sectors increasingly relies on open source, smartphone applications, 3D models and web portals. These require geological surveys to have a digital workflow that encompasses data capture and the development of a central database linked to data feeds and visualization tools

Over many years BGS has developed such systems for data capture and formatting and database architecture and release. **We are interested to share our experiences with CCOP members and to explore the capacity building and knowledge exchange.**

3. Public awareness, communication and citizen science

Increasingly as countries seek to decarbonize their energy systems and develop alternative clean heat and cooling resources then public understanding around issues of geology and fracking, faulting and earthquakes and risks to water supply and the environment are crucial to gaining acceptance. BGS is heavily involved in public understanding of science in relation to the disposal of nuclear waste, fracking for shale gas and geothermal resources and perceptions of hazard and risk. **We would be interested to share and develop our experiences with CCOP members and to explore how we communicate in different cultures**

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