



## INDONESIA

**Under its remit as a delivery partner of the Newton Fund, the Royal Academy of Engineering has partnered with the Ministry of Research, Technology and Higher Education of the Republic of Indonesia (RISTEKDIKTI) to enhance engineering teaching, research and innovation outcomes in Indonesian universities by building bilateral industry-academia links.**

One of the partnerships funded through this scheme brings together academic researchers from Institut Teknologi Bandung (ITB) in Indonesia and London South Bank University (LSBU) in the UK with industry partners Lembaga Penerapan Teknologi Tepat (LPTT), Mantra, CLEAR Community and Atelier 10. Together they have worked on two projects that address the impact of coastal pollution on tourism in Indonesia.





## PROJECT HIGHLIGHTS



**150** attendees participated in dissemination workshops in London and Batu Karas, Indonesia



**3** reports and guidance notes published to share best-practice and lessons from research



**50** students and researchers from both countries will be trained in BIM software in 2019

### BUILDING COLLABORATIVE PARTNERSHIPS

For their first project *Developing Indonesian coastal areas as sustainable tourism destinations – a replicable integrated engineering model for exemplary waste management*, academic researchers from ITB and LSBU worked with a local non-governmental organisation LPTT to raise awareness of environmental concerns affecting Indonesia's coastline, while engineering innovative waste-management solutions.

"This partnership is well-timed to build on the great community work happening now in Indonesia," explains Jennifer Hardi, LSBU. "By bringing together a multidisciplinary group of industrial and academic partners we've enabled a cross-cutting approach that engages government and policymakers too."

The first project proved to be a catalyst for a follow-up: *integrated waste management facilities for coastal Indonesia at three scales – desa (village), kecamatan (district) and kabupaten (region): technical feasibility and multidisciplinary virtual scheme design collaboration*. This project strengthens initial work by drawing on additional expertise from industry through new partners Atelier 10, CLEAR Community and Mantra.

"This partnership allows a cross-fertilisation of ideas where, as industrial partners, we bring experience and practical application to the team and get access to cutting-edge research from the academia in return," explains Ajay Shah, Atelier 10.

Chani Leahong from CLEAR Community adds: "We highly value the engagement with academia because it enables our charitable work to be upscaled and shared more widely than would otherwise be possible."

### IMPACT AND INNOVATION

In Indonesia, coastal tourism is a fast-growing industry that makes a significant contribution to the country's economy. However, rising levels of pollution could prevent tourism from developing. In 2010, Indonesia generated 1.29 million tons of plastic waste, much of which ended up in the ocean. It follows that sustainable waste management has become a priority to help reduce the impact on tourism and local communities.

As part of their first project, collaborators identified new methods for sustainable waste management by working closely with industry on a project based in Batu Karas, a tourism coastal village in Pangandaran Regency, West Java.

"The partnership has allowed us to develop a prototype for a small-scale pyrolysis machine and we've been able to access academic research that identifies ways to improve it," explains Rohadji Trie, LPTT.

A second project has enabled the collaborators to expand their range of environmental technologies while addressing sustainability concerns at different scales. This has involved bringing in building integrated modelling (BIM) approaches that integrate design, construction and operation, which has been especially useful for negotiating different social and economic contexts. One of the results has been research into the use of drones for engineering and surveying techniques in coastal regions.

### MODELS OF ENGAGEMENT

By creating a partnership that values creativity, innovation and knowledge sharing, the collaborators have ensured that the educational benefits of the project

have been widespread. Students at all levels in both academic institutions have gained direct experience of industrial-scale problem solving within an international, multidisciplinary context.

The collaborators have developed a set of case studies that provide insights into solid waste management techniques to realise the development of sustainable tourism. Seminars, training sessions and international workshops have also been organised to support education and international networking. Some of these have been, or will be, hosted or supported by local industry partners.

The team has used community mentoring to raise awareness on the ground in Batu Karas. Meanwhile, dissemination workshops in London and Bandung have helped to raise the profile of work with academic colleagues and a wider range of industry professionals. More are planned for the future as part of the second project.

### FUTURE PLANS

Partners are exploring options for further funding to bring lessons learned from Batu Karas village to other areas in Indonesia. The collaborators also aim to share outcomes at an international conference and have a keen interest in ensuring their work has a long-term impact.

### UK-INDONESIA INDUSTRY ACADEMIA PARTNERSHIP

As a Newton Fund delivery partner, the Royal Academy of Engineering works with RISTEKDIKTI, Indonesia, to co-fund awards that strengthen capacity and develop capabilities within Indonesian engineering higher education and research institutions to carry out excellent teaching, research and innovation-related activities through collaboration with industry and UK counterparts.

### NEWTON FUND

This project is supported by the Newton Fund, which is part of the UK's official development assistance (ODA) and promotes economic development and social welfare by strengthening science and innovation capacity.

### For more information

**W** [newtonfund.ac.uk](http://newtonfund.ac.uk)

**T** [@NewtonFund](https://twitter.com/NewtonFund)

**Front image:** An example of an illegal dumping ground in Batu Karas, Java. A project addressing solid waste management in a coastal tourism village as part of a sustainable tourism strategy. Photo credit: J.Choo.