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Introduction

Under the 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. We have partnered with the Institut Teknologi Bandung (ITB) in Indonesia with industry partners Lembaga Penerapan Teknologi Tepat (LPTT), MANTRA, CLEAR Community and Atelier 10. Together, we have worked on two projects that address the impact of coastal pollution on tourism in Indonesia. In the context of an urgent need in Indonesia to address waste management infrastructure provision in coastal areas, LSBU and ITB are collaborating with the industry partners to deliver a world-standard integrated waste-management engineering model as an exemplar solution for Indonesia. In this IAPP programme, our team combines a wide-ranging Industry and Academic expertise to develop and enhance engineering methodology and technology. It brings innovative approach in addressing Indonesia's waste management challenges. This project is a catalyst for further industry engagement, and a knowledge-based and skills transfer in Engineering research and education. Batu Karas in Pangandaran, West Java has been selected as a UN Sustainable Tourism Observatory and study area for engineering research into waste management, both programmes run by ITB.



First Project: Developing Indonesian Coastal Areas as Sustainable Tourism Destinations – a Replicable Integrated Engineering Model for Exemplary Waste Management

Collaborators:

- Jennifer Hardi and Prof Andy Ford from London South Bank University
- Dr Budi Faisal, Ari Perdana and Benno Rahardjan from Institut Teknologi Bandung (ITB)
- Rohadji Trie from Lembaga Pengembangan Teknologi

Project duration: 18 months

Objectives:

1. Bring together experts from UK and Indonesia to deliver a world-standard integrated waste management engineering model that can act as exemplar for other areas and local communities across Indonesia.
2. Provide practical, simple and deliverable waste management solutions to equip Tourism Destinations in Indonesia to develop with greater sustainability.
3. Increase understanding amongst academia, industry and the wider public regarding the latest technological solutions for affordable community-scale waste and recycling treatment in Indonesia and identify the potential actions required to further improve apply those technologies.

This project exchange has enabled all the above objectives to be successfully met.



The success of the first project continues on with the **Second Project: Integrated waste management facilities for coastal Indonesia at 3 scales: Village, District and Region**

- Jennifer Hardi and Dr Issa Chaer from London South Bank University
- Dr Budi Faisal, Ari Perdana, Benno Rahardyan and Andry Widjowijatnoko from Institut Teknologi Bandung (ITB)
- Chani Leahong from CLEAR Community
- Ajay Shah and Tilly Ford from Atelier 10
- Nino Sean from Mantra

Project duration: 18 months

Objectives:

1. Bring together experts from UK and Indonesia to deliver a world-standard integrated waste management engineering model that can act as exemplar for other areas and local communities across Indonesia.
2. Derive a range of innovative sustainable engineering design and technology to serve three levels of area in Indonesia from village, district to regional scale.
3. Enable academia, researchers and students in both Indonesia and UK to be trained in and practice in implementing the most up-to-date engineering design techniques and softwares, including Building Information Modelling (BIM), in the applied context of solving real world need for waste management infrastructure in Indonesia coastal and rural area.



Impacts and Outcomes:

1. On community level: the workshop and mentoring activities helped raise awareness of waste minimisation, separation and recycling which in turn result in waste reduction to landfill and the ocean.
2. For SMEs: further potential to turn the recycled and reusable materials into sustainable products that they can sell to improve the economy of the area further
3. The industry and academia partnership allow for cross fertilisation of ideas where the industry partners able to bring experience and practical application to the team and to get access to cutting edge research
4. It also enables NGOs to upscale their charitable work
5. It allows LPTT to develop a prototype of a small-scale pyrolysis machine
6. It allows project collaborators and students from ITB and LSBU to address sustainability concerns using multi-disciplinary Building Information Modelling approaches that integrate design, construction and operation. This has been very useful for negotiating different social and economic context.