Newton Fund:
Case Study - Indonesia

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Foreword

Matt Downing
Deputy Head of Mission
British Embassy Jakarta

It is a real pleasure to be able to write the foreword to this booklet, which aims to showcase the breadth and depth of the Science and Innovation partnership between the UK and Indonesia. Since 2014 the Newton Fund has supported partnerships between the UK and 17 partner countries, including Indonesia. The UK and Indonesia have together rolled out 28 calls for proposals, under 16 schemes, which have benefitted over 300 individuals from 126 organisations in both countries. Research programmes have involved universities in Java, Sumatera, Sulawesi, Kalimantan and Maluku.

The Newton Fund is led jointly by the UK's Department for Science, Innovation and Technology and Indonesia's Ministry for Education, Culture, Research and Technology. This partnership is further facilitated by world leading institutions in their fields including the British Council, UK Research and Innovation, the Met Office, and the Royal Academy of Engineering, the Meteorology, Climatology and Geophysics Agency (BMKG), the Indonesian Science Fund (DIPI), National Research and Innovation Agency (BRIN), and the Education Fund Management Institute (LPDP). The Fund underpins a shared understanding from both countries that recognises science, technology and innovation as important drivers of economic growth and development.

The success of the Newton Fund has led to a step change in our research and innovation relationship. It has brought together some of the best minds from across a number of research fields, fostering research collaborations between UK and Indonesian researchers on topics including health, energy, sustainability, biodiversity and food security as well as creating collaborative solutions to development challenges and strengthening innovation systems. We have more British and Indonesian researchers working together now than ever before, together driving positive change in the lives of many in Indonesia and in the UK.

The UK is keen to continue to be Indonesia's partner of choice in building a world-class research ecosystem and enabling cutting edge science and innovation. The British Embassy Jakarta is committed to continue supporting delivery of the UK government's focus on sharing scientific knowledge, breaking down barriers to even closer scientific collaboration and working ever more closely with the Indonesian science community.

Foreword

Prof. Dr. Ir. M. Faiz Syuaib, M.Agr
Director Research, Technology, and Community Service
Ministry of Education, Culture, Research, and Technology

The Directorate of Research, Technology, and Community Service (DRTPM); Directorate General of Higher Education, Research, and Technology; Ministry of Education, Culture, Research, and Technology will continue funding research collaboration with the Newton Fund in 2022, continuing the programme from the Directorate of Research and Community Service (DRPM), Ristekdikti. DRPM launched a co-funding research project with the Newton Fund from 2015 through 2022. For a total of IDR up to 24 billion, 42 projects have been sponsored.

We are pleased to report that our collaborative research action plan with the Newton Fund is **running well** and successfully. **Lot of** benefits have been acquired from this collaboration, and this book summarizes one of the concrete evidence that exhibits the significant results of the joint research conducted by Indonesia and British scholars. This programme has the capacity to enhance the quality of researchers in institutions in both Indonesia and the United Kingdom. DRTPM implements co-funding research through **match making** of DRTPM's budget with the Newton Fund to improve the quality of researchers in **conducting** research. Furthermore, the benefits of this programme including **to increase** the number of international publications, long-term academic cooperation, exchange of lecturers between two scholars in Indonesia and United Kingdom.

We hope that the **collaboration through** this project will sustain and support the national research priorities and **stimulate** research that leads to innovation, discovery of solutions to problem in society and develop multi stakeholders' involvement in talking future challenges. In the upcoming partnership, we hope for the involvement of young academicians in contributing ideas and research **partnerships**. As one the nation's successors, the younger generation must be assigned responsibility in **facing the upcoming global challenges**.

We believe that collaboration is essential in this era; collaboration generates balance, **mutual understanding** broaden networking, and knowledge exchange. This collaboration would empower us. As quotation from our president declaration "recover together-recover stronger". Cooperation makes us stronger and complements each other. Let us work together to make **more** positive impact, mutual understanding, and prosperity worldwide and globally.

Foreword

Summer Xia
Country Director British Council Indonesia
South East Asia Cluster Lead

The British Council is celebrating its 75th anniversary in Indonesia this year. Our first office in this country was set up in Bandung in September 1948, with a small library of books and films, offering education advice and exams. Fast forward 75 years, our mission to develop cultural relations through building connections, understanding and trust between people in the UK and countries worldwide remains unchanged, including right here in Indonesia. We are proud to have such a long history in this beautiful country, contributing to the government's focus on human capital development. A key part of that effort is to facilitate scientific collaboration between our two countries, which is a powerful tool to build links between researchers and scientists and address real challenges we all face in today's world.

Therefore, it is with immense pride that I am writing this foreword to share with you a collection of science and research impact stories, made possible through the British Council's delivery of the UK government's Newton Fund. After eight years, real results from UK-Indonesia research collaboration are emerging. We selected 13 out of 42 research partnerships supported by Newton Fund through the British Council to showcase the impact we have made.

From finding rice varieties that can flourish in marginal lands with high soil acidity in North Sumatra, to helping seafarers find affordable ways to detect stability problems in small boats which could avoid disasters at sea; from developing diagnostics precast concrete elements with improved resistance to damage during earthquakes, to making cancer diagnostic more accessible for people across Indonesia. There is so much diversity in the 13 cases we have chosen. But they share something in common: all of them tell a compelling story of how researchers have used science diplomacy to respond to national priorities, tackle pressing issues, and help early career researchers grow.

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The Newton Fund builds research and innovation partnerships between the UK and countries around the world to support economic development and social welfare, address global challenges and develop talents. This is done through equitable partnerships and multidisciplinary research based on national strategies as well as nurturing early career researchers with capacity development.

As one of the delivery agencies, the British Council is delighted to have worked closely with strong partners such as Kemdikbudristek (previously Ristekdikti), the Indonesia Ministry of Education, Culture, Research and Technology. From the start, Kemdikbudristek has been fully committed to shaping the programme design, identifying pool of excellent Indonesia researchers to work with their UK counterparts, and providing match funding.

In his address to the nation on the eve of Indonesian Independence Day in 2021, President Joko Widodo stressed that Indonesia must have enough capable human resources who master science and technology to keep the country progressing forward. In this regard, the UK is proud that through Newton Fund, it has been contributing to delivering the President's vision by committing funds to support UK-Indonesia joint research, sharing best practices in research good governance, and providing capacity development for early career researchers.

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The British Council and other UK delivery partners such as UKRI (UK Research and Innovation) have been working to support joint multidisciplinary research based on National Research Priorities. (Prioritas Riset Nasional or PRN). This is made possible by funding of £18 million from the UK's Department for Business, Energy and Industrial Strategy (BEIS) and match funding from Kemdikbudristek, DIPI (the Indonesia Science Fund) and LPDP (the Indonesia Endowment Fund for Education), BMKG and LIPI (BRIN).

All the funding is disbursed through open calls to ensure transparency, fair competition, and research relevance. One of the positive results of good governance in research is that it has attracted others from both public and private sectors to also take part, such as Rolls-Royce, the Ministry of Public Work and Housing (PUPR), the National Disaster Management Agency (BNPB), Pertamina and PT Wijaya Karya Beton.

After eight years of successful collaboration, we are excited to explore new opportunities to work together in science between our two countries going forward. We recognise that funding commitment, good governance in research and capacity development are the building blocks of a healthy research and innovation ecosystem and will continue to champion that.

I hope this publication will serve as reference for future UK-Indonesia research collaboration and a reminder to us all of the power of science in benefitting all walks of life and making this world a better place for all.

About the Newton Fund

The Newton Fund builds outstanding research and innovation partnerships between the UK and partner countries to support economic development and social welfare, tackle global challenges, and develop talent and careers. It does this through equitable partnerships, multidisciplinary research based on agreed national strategies as well as nurturing talent and careers with capacity development.

The Newton Fund is managed by the UK's Department for Business, Energy and Industrial Strategy (BEIS) and delivered through seven UK delivery partners who offer tailored research and innovation programmes in partnership with governments and organisations in each Newton Fund partner country. It has a total UK government investment of £735 million up until 2021, with matched resources from partner countries.

The UK delivery partners are Academy of Medical Sciences, British Academy, British Council, Met Office, RAENG (Royal Academy of Engineering), Royal Society, and UKRI (UK Research and Innovation).

Newton Fund Indonesia is an official collaborative development programme between the UK and Indonesian governments in the area of research and innovation. The eight-year programme, with up to £18 million of UK, and Indonesia matched from funding from Ministry of Research, Technology and Higher Education (MoRHTE)[1], was launched in 2014.

The British Council supports the capacity development of researchers in developing countries and facilitates excellent research and innovation partnerships to help tackle development challenges. In Indonesia, we deliver through:

- **Researcher Links Travel Grants**
  Researcher Links travel grants provide financial support for early career researchers so that they can spend one month or longer abroad. The travel grants are designed to enhance and strengthen links for future collaboration, build research capacity in developing economies and enhance the researchers' career opportunities. Early career researchers, within 10 years of receiving their PhD, can apply.

- **Researcher Links Workshop Grants**
  Researcher Links Workshop Grands are designed to provide financial support to bring together a UK/partner country bilateral cohort of early career researchers to take part in workshops to meet the overarching objectives.

- **Institutional Links**
  Institutional Links grants facilitate research that tackles local development challenges such as extreme weather conditions, access to affordable health care, and food and energy security.

- **Newton Fund Impact Scheme**
  The Newton Fund Impact Scheme is designed to provide previous and current Newton award holders with the opportunity to unlock further impact from their work in a way that strengthens the profile of the Fund. The intention is that the Newton Fund Impact Scheme grants add tangible value to the investment already made by partner funders and the UK.

- **Newton PhD programmes**
  The aim of these programmes is to facilitate the capacity building of individuals and the building of sustainable, long-lasting links between UK and overseas institutions through scholarships, placements and partnerships.

- **Professional Development and Engagement (PDE)**
  British Council PDE programmes aim to support the research and innovation environment and enable optimal impact from research, shaped by the demands and development priorities of the partner country. The programme supports and develops skills and expertise in global higher education, connecting UK and international experts through capacity building grants and strategic projects.

Newton Fund in Indonesia by numbers:

Total UK funding: GBP 18 million (GBP 3 million delivered through British Council)

Total funded projects: 159 projects

UK Delivery Partners:
- British Council
- Innovate UK
- Met Office
- MRC (Medical Research Council)
- NERC (Natural Environment Research Council)
- RAENg (Royal Academy of Engineering)
- STFC (Science and Technology Facilities Council)
- UKRI (UK Research and Innovation)

Indonesia Partners:
- BMKG (Meteorology, Climatology, and Geophysical Agency)
- BRIN (National Research and Innovation Agency)
- DIPI (Indonesia Science Fund)
- LIPI (Indonesia Institute of Science)
- LPDP (Indonesia Endowment Fund for Education)
- Kemdikbudristek (Ministry of Education, Culture, Research and Technology)

For additional information visit: **https://www.newton-gcrf.org**

This case study is commissioned by British Council. Thank you to all parties who are involved particularly Principal Investigators and research team members both from the UK and Indonesia whose research projects are featured here as well as writers from Asia Research News who help shape the story.

[1] Since 2021, the MoRTHE is merged with the Ministry of Education and Culture to form the Ministry of Education, Culture, Research and Technology, while National Research and Innovation Agency separated to a new non-ministerial government agency

Increasing rice yield in Northern Sumatra by combining biotic and abiotic stress tolerance

Getting Indonesia back on the 'rice' path

Gene, greenhouse and field tests could help identify rice varieties that can flourish in the marginal lands of Indonesia's North Sumatra

A research collaboration between the University of York in the UK and Universitas Sumatera Utara in Indonesia is meticulously sifting through hundreds of rice varieties. Their aim is to find cultivars that can tolerate the high soil acidity of Indonesia's North Sumatra region while simultaneously resisting the destructive impacts of bacterial leaf blight.

North Sumatra includes around two million hectares of marginal lands: land that has little to no agricultural value due to the high acidity of its soil. Crop yields in this region are also significantly impacted by the rampant spread of a bacterium called Xanthomonas oryzae pv. oryzae (Xoo for short). Xoo is widely found in parts of Asia, Africa, Australia and the Americas, but it has hit Indonesia particularly badly, leading to yield losses reaching 80% in some parts.

"Marginal lands are often inhabited by the poorest sections of society and are typically managed by small-holder subsistence farmers," says Universitas Sumatera Utara microbiologist Irda Safni, who is an expert in rice disease. "Farmer income could be substantially improved by growing productive rice varieties that can tolerate soil acidity and resist Xoo infection."

Safni and her colleagues at Universitas Sumatera Utara collaborated with University of York plant biologist Frans Maathuis to conduct genetic screening of around 400 rice cultivars for gene markers of tolerance to soil acidity and resistance to Xoo.

This allowed them to narrow down their search to test how well a small number of choice varieties grew in a greenhouse in various types of acidic soil. The investigations led to the identification of several cultivars that had stronger leaf and root growth under acidic soil conditions compared to commonly grown types.

The team also sampled soils in various parts of North Sumatra, finding that the western village of Sumber Tani had the highest incidence of disease with Xoo, while Siabal Abal village in the south was hit with the highest percentage of disease severity.

The research collaboration, funded by a 2018 Newton Fund Researcher Links grant, also involved Safni and her colleagues travelling to the UK for bioinformatics capacity building, where they learned how to use rice genome browser and expression databases, and to analyse and interpret genome wide association data.

Although much was learned over the course of the project, titled "Increasing Rice Yield in Northern Sumatra by Combining Biotic and Abiotic Stress Tolerance", more research is needed.

The team hopes to continue to look for rice cultivars that can simultaneously tolerate soil acidity and resist Xoo infection. They are also keen to find cultivars that do so while producing strong rice yields. "Farmers will only go through the effort of cultivating marginal land if there is a realistic chance of achieving a profitable harvest," says Maathuis. The researchers plan on conducting cost-benefit analyses of the best varieties they identify compared to currently cultivated ones.

Assessing Indonesia's logged forests in a changing climate

Monitoring climate change one tree at a time

An arduous trek through the tropical forests of Borneo is adding to international understanding of the impacts of climate change

In the summer of 2017, ecologist Lan Qie set out on a trek to collect important data about the tropical forests of Borneo, a rugged island shared by Indonesia, Malaysia and Brunei. Data has been gathered from plots on different parts of the island for decades. Continuing this monitoring is helping scientists understand how the world's tropical forests are changing over time.

"This trip was among the most difficult I have led," says Qie, currently a senior lecturer in ecology and conservation at the University of Lincoln, UK. "We lived in temporary camps built from tarpaulin and poles for the entire time. To reach some of the most remote plots, we had to trek for a full day with each person carrying up to 20kg, while living on very basic supplies. Even so, it was one of my most fulfilling experiences," she says, "as it gave me the opportunity to work with local indigenous communities and helped me gain a deeper understanding of their cultures and the impacts of forest loss on their day-to-day life."

Qie's fieldwork involved measuring every tree on 18 one-hectare plots, all located in Malanau, a northern regency in Indonesia's North Kalimantan province on Borneo. These plots have been regularly monitored since 1999, but four had not been visited by researchers since 2009. The work rescues the research value of these four plots and adds to the data that is being used by Qie and collaborators all over the world to measure the impacts of climate change.

"Tropical forests play a key role in controlling climate change as net absorbers of atmospheric CO_2 equivalent to 10% of annual human fossil fuel emissions," explains tropical ecologist Professor Oliver Phillips of the University of Leeds, UK.

Kalimantan has vast areas of tropical forests, but half are being utilized for timber, agroforestry and other uses. If these forests fail to recover quickly enough due to the impacts of climate change, the decaying process of dead trees can turn them from carbon sinks into carbon sources.

In 2016, Qie, Phillips and Sudarmono of the Centre for Plant Conservation at the Indonesian Institute of

Sciences (LIPI) were granted a Newton Institutional Links fund to gather the new data from Borneo's forests with the aim of assessing the impacts of the extreme four-month drought caused by the 2015-16 El Niño and its interaction with logging intensity.

"We found that the 2015-16 El Niño drought substantially cut back logged forest recovery," says Phillips.

But it's not all bad news. The field team was able to use its time in Borneo to engage local communities with the research, giving them extra income and facilitating conversations about the sustainable use of forest resources.

> **We are hopeful that, if research and relationship-building continue, we can empower indigenous communities to move towards community-based forest management schemes, supporting local livelihood for future generations**
>
> **Sudarmono**

The research has also broadened the network of organisations and scientists collaborating in the region, with new partnerships developed with the Forests and Climate Change Programme (FORCLIME), the Functions of Tropical Lowland Rainforest Transformation Systems (EFForTS) project, the University of Göttingen's Faculty of Forestry (Germany), and Universitas Jambi and Universitas Pakuan in Indonesia.

The data gathered during the project are stored and shared on ForestPlots.net, an online data repository for monitoring the world's tropical forests, with contributions from thousands of scientists gathering data from nearly 7,000 locations in 63 countries.

Mainstreaming integrated disaster risk reduction and climate change adaptation into coastal urban agglomeration policy

Streamlining tsunami warnings for Indonesia and beyond

Research in the UK and Indonesia has contributed to a more integrated tsunami warning system for the accurate and timely dissemination of alerts to at-risk communities

Countries with coastal regions face great risks from tsunamis and flooding, especially as their frequency and severity increase as a result of the impacts of climate change. Of all the natural hazards, Indonesia, which has more than 17,000 islands, is most at risk to tsunamis. A number of detection and alert systems were developed and shared between Indonesia and its surrounding countries following the 2004 Indian Ocean tsunami. However, differences in standard procedures, technical and human capacities and legal frameworks at national and subnational levels made it difficult for key agencies to alert coastal communities with timely and accurate warning information.

Now, a team of researchers, led by Harkunti Rahayu at Institut Teknologi Bandung (ITB), Indonesia and Richard Haigh and Dilanthi Amaratunga at the University of Huddersfield, UK, has been contributing to the development of a more integrated tsunami warning system to better monitor, evaluate and disseminate tsunami alerts at national and local levels.

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> **The research has helped us carry out a comprehensive assessment of tsunami preparedness in Indonesia and other countries in the Indian Ocean, allowing us to improve our standard operating procedures**
>
> **Prof. Dwikorita Karnawati**
> the chair of the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWMS) under the Intergovernmental Oceanographic Commission of UNESCO, and the Head of Indonesia's National Agency of Meteorology, Climatology and Geophysics (BMKG).

Both organisations, as well as Indonesia's National Disaster Management Agency (BNPB), were partners in the project.

To better integrate the early warning system, the researchers set out to improve the interface arrangements between pre-event monitoring, forecasting and predicting of tsunami incidents with post-event risk assessment, communications and evacuation. The interface is used by a wide array of partners, including regional warning services, designated national contact points, meteorological services, disaster management agencies, emergency services, the media and community-based organisations. The interface will be vital for enabling authorities to deliver accurate and time-critical warnings to at-risk communities.

To determine the key elements of a coherent system, the team first developed a conceptual framework by reviewing literature on tsunami early warning. They then analysed various guidelines and reports from previous simulation exercises inside and outside the country, and interviewed government agency representatives. The researchers identified critical areas for efficient interface arrangements, including establishing decision-making protocols, defining actors, standardising procedures, identifying technical and human capacities, ascertaining spatial and socio-cultural factors that could impact the response, and ensuring vertical and horizontal coordination, formal and information communication and post-event evaluation. This information empowered the researchers to develop an interface that improves on the existing early warning systems.

Field surveys and focus groups with members of government, industry, local universities, NGOs and religious groups also helped them identify the vulnerabilities and capacities of coastal communities in Indonesia, and involved the broader community with the project.

As part of the ICG/IOTWMS efforts for improving

tsunami preparedness, the researchers helped guide the implementation of a survey to assess tsunami preparedness capacity at national tsunami contact points in all Indian Ocean member states. Additional research looked at various tsunami warning approaches in the Maldives, Myanmar and Sri Lanka that can be used in different national and local contexts.

The findings from the interface study and regional survey of tsunami preparedness are being used to inform capacity building and training of regional tsunami service providers, tsunami national contact points and various subnational emergency centres in Indonesia and elsewhere in the Indian Ocean region.

The researchers are now working to improve the efficiency of the integrated tsunami warning system so that it can be used to assist communities that are within a 30-minute range before the first tsunami wave hits. A practical guide for improving tsunami warning capacities in other countries is also underway. Other on-going research aims to enable the system to adapt and operate under new challenges, such as social restrictions imposed by COVID-19.

The team has secured further research funding and plans to develop ways to provide more localised tsunami early warnings and to improve risk management in the Ciliwung River Basin, a source of frequent flooding in Indonesia's capital, Jakarta.

Improving the earthquake resilience of Indonesia's new capital city

A safe new city for Indonesia

Seismic sensing and software-driven data analysis is generating the information needed to build an earthquake-resistant new capital for Indonesia

Nusantara, Indonesia's new capital city, will soon begin to rise in East Kalimantan on the east coast of Borneo. Scientists on a Newton Fund funded project are working to help make it resilient to earthquakes.

Titled 'Improving the earthquake resilience of Indonesia's new capital city', the project is a partnership between researchers at the University of Cambridge, UK, and Institut Teknologi Bandung in West Java, Indonesia. The partners estimate that Indonesia experiences more earthquakes than any other nation worldwide.

"Building the city requires accurate information on the likely level of ground shaking produced by earthquakes in order to erect suitably resilient structures," says Nicholas Rawlinson, the project's UK principal investigator. To address that challenge, the team have deployed a dense array of temporary seismic stations, capable of recording even small earthquakes.

"The data to be incorporated into a new earthquake archive will address many of the issues required to protect the new city," says Sri Widiyantoro, the project's principal investigator in Indonesia.

The earthquake archive uses software called QuakeMigrate that can automatically pinpoint the precise origin of earthquakes. This will allow the researchers to calculate the magnitudes of each tremor and in many cases the likely underlying geological mechanisms involved.

Seismic imaging will also be used to analyse the structure of the Earth's crust in the region. This will identify any previously undiscovered faults, and image the shallow structure beneath the proposed site. The combined seismic analysis will be passed on to Pusat Studi Gempa Nasional (PuSGeN) or Indonesia's National Centre for Earthquake Studies, which will incorporate them into new seismic hazard models, used to set appropriate building codes.

"Without this information that we will gather, it would be difficult to formulate appropriate construction guidelines, potentially leading to buildings, roads, bridges etc. that could not withstand the level and pattern of earthquakes that may occur in the future," says Sri Widiyantoro.

The seismometers deployed in the field have recorded a new and unique dataset that will be valuable not only for this project, but also for future work undertaken by the project partners and other researchers in the field.

Nicholas Rawlinson
Project's UK principal Investigator

Transboundary Fire Haze: Regional Characterisation, Prediction and Mitigation in SE Asia (TransFoRM)

Peatland restoration could reduce fires in Indonesia

Restoring degraded peatland areas in Indonesia could greatly reduce the frequency of fires that damage health and cause significant economic loss

Air pollution from fires exposes more than 70 million people in Indonesia, approximately 25% of the population, to episodes of unhealthy air quality causing thousands of premature deaths each year. Research supported by the UK's Newton Fund provides insights into the links between land use and fires in South East Asia. It demonstrates how restoration of peatlands can reduce the frequency and impact of fires, leading to better air quality and improved public health.

The project, entitled "Transboundary Fire haze: Regional characterisation, prediction and Mitigation in SE Asia (TransFoRM)" was a collaboration between IPB University (Institut Pertanian Bogor), in Indonesia and the University of Leeds, UK.

Indonesia contains large areas of peatland that have been drained and cleared of natural vegetation, making them susceptible to burning. The researchers explored the emissions from fires, their health impacts, and the significance of peatland drainage and forest clearing on fire frequency. They also considered potential costs and benefits of restoring peatlands.

In 2015, Indonesia experienced some of the largest fires in recent years. The researchers concluded that peatland restoration could have reduced the area burned by fires in 2015 by 6% and reduced carbon dioxide emissions by 18%. It would also have reduced the emission of fine particulate matter that can penetrate deep into the lungs by 24%, thereby preventing 12,000 premature deaths. Peatland restoration would also have greatly reduced the economic losses and damages caused by fires, resulting in savings estimated at 4 billion US dollars.

The impact of land use on fire risk is dramatically demonstrated by the frequency of fires being from 10 to 100 times lower in protected conservation areas compared to those in oil palm and timber plantations. Notably, however, the research revealed that fires were rare in areas of natural forests where selective logging is permitted.

This suggests an option for more sustainable forms of timber production.

"Our work clearly highlights that the Indonesian government's commitment to restore degraded peatlands is an important and cost-effective strategy to reduce the harm caused by peatland fires," says Dr. Imas Sitanggang of the IPB University team. She adds that the economic savings from restoration would far outweigh the costs.

> The international collaboration between UK and Indonesian researchers was vital to the success of this research, providing access to local data, knowledge and expertise to inform our analysis and interpretation
>
> **Professor Dominick Spracklen**
> Team Leader - University of Leeds

An added benefit of this Newton-funded project has been to help the work of a consortium of UK and Indonesian universities. Known as the Kali Project, this will take a multidisciplinary approach to develop a holistic understanding of the complex issues surrounding drought and peat fires in Indonesian Borneo.

"Future climate change will put Indonesian peatlands, and peatlands all over the world, at greater risk to further degradation and fire. The efforts being made by the Indonesian government

to restore their peatlands could be a leading example in the years to come," Dr Sitanggang concludes.

Embedding COVID-19 preparedness into local disaster disk reduction

Disaster resilience in Indonesia and beyond

Studying the response to the COVID-19 pandemic in Indonesia is revealing lessons for local planners, with relevance worldwide

Researchers at the Global Disaster Resilience Centre, University of Huddersfield, UK, and Universitas Andalas, Indonesia, are working to improve disaster risk reduction (DRR) strategies to prepare for future threats from COVID-19 and other infectious diseases.

Their Newton Fund funded project entitled 'Embedding COVID-19 preparedness into local disaster risk reduction' also involves the National Disaster Management Agency of Indonesia and the Local Disaster Management Agency, Public Works Office, Health Office and Social Office of West Sumatra Province.

"Better pandemic preparedness seems essential in making communities resilient for upcoming pandemics," says Professor Dilanthi Amaratunga, the University of Huddersfield's principal investigator on the project.

The research is exploring the extent to which COVID-19 preparedness is currently embedded in Indonesia's DRR planning. This is helping to identify how public health aspects can be better integrated into resilience strategies, both locally and nationally, to combat the dual challenges of COVID-19 and other disasters. The partners are also developing guidelines to address the risks of COVID-19 and similar threats using methods that coherently link national and local stakeholders.

The Newton Fund funding has supported visits across Indonesia to conduct interviews and focus group discussions with local stakeholders and experts responsible for pandemic preparedness and disaster risk reduction. The funding has also enabled the international travel needed to develop close relationships between the experts in Indonesia and the UK, which will prove useful well beyond the project's duration.

The project is largely focused on learning from the examples in and around Padang city on the west coast of Sumatra. But the partners' work has also explored the challenges facing the villages surrounding the active volcano Mount Merapi in Java. Evacuations required during eruptions in 2021 and 2022 presented a dual disaster resilience challenge due to the continuing spread of the COVID-19 pandemic. Self-evacuation planning was very successful during the eruption. There were no reported cases of COVID-19 during the evacuation, demonstrating a successful approach to tackle the dual challenge using community-based approaches. These bonds formed between a network of 'sister villages' surrounding the volcano offer a model for community cooperation and preparedness during ongoing disasters elsewhere.

> **This is one of the success stories in promoting the importance of pandemic preparedness in disaster risk reduction. It shows how it can be done through community empowerment, by strengthening local communities with knowledge and capacities to face multiple hazards successfully**
>
> **Dr Taufika Ophiyandri**
> Andalas University principal investigator on the project.

Ophiyandri adds that the project's work has already led to publications and presentations that include guidance for improving pandemic preparedness, based on both on observed good practices and limitations to be addressed. This will be followed up with further dissemination, both locally and globally,

as the data gathered in Indonesia is collated and analysed.

One key lesson that is immediately evident is that more work is needed to identify the likely challenges of the future, where risks have become systemic. This will guide the development of better strategies to overcome these challenges and promote better integration of all aspects of risk reduction, in a collaborative way, linking national to local stakeholders in order to fight systemic risks.

"Looking more widely across the globe, at present most countries don't have both strategic and operational level experience in handling a combination of natural and biological hazard preparedness planning," says Amaratunga. "We are very hopeful that lessons from our project can help address that."

Training researchers in Indonesia to harness biomass for energy and chemicals

Scientists from Indonesia have received training at the University of Warwick, UK, to develop and analyse materials that can help exploit abundant biomass as a source of energy and useful industrial chemicals

Developing countries face a huge challenge to meet their ever-increasing energy demands while unable to rely on the fossil fuels that powered the development of other nations from the industrial revolution onwards. The need to find alternative sustainable sources of energy is driven by declining fossil fuel reserves, the remoteness of remaining reserves, and the urgent need to reduce the emissions responsible for climate change.

Academics in Indonesia and the UK collaborated on a project to train scientists from Indonesia in the advanced techniques needed to support efforts to find environmentally friendly energy sources and new routes to commercially useful chemicals.

Biomass, including plant and animal waste materials, will be at the centre of sustainable energy and chemical supply solutions, especially for locations far from the major centres of population and industry.

"Indonesia produces approximately 140 million tons of biomass per year which could provide a resource to meet these challenges," says project co-leader Yuni K. Krisnandi, Associate Professor at Universitas Indonesia. Krisnandi explains that the training programme and networks formed between industry and government should ultimately change the treatment of waste biomass to divert it into the production of green energy sources and other useful chemicals.

The Newton Fund funding allowed five researchers from Indonesia to travel to the University of Warwick in the UK, where they received training allowing them to study promising biomass materials prepared in their home laboratories in Indonesia. A key advantage of the funding is that it allowed the researchers from Indonesia to analyse and characterise their own materials at the atomic scale, using the advanced techniques available at Warwick. This interdisciplinary work involved facilities in the Department of Chemistry, X-ray instrumentation from Warwick's Research Technology Platforms, and assessment of catalysis

properties in the School of Engineering. The most effective materials can then be developed in follow-on projects in Indonesia, for eventual use at industrial scale.

> **Through this collaboration we have already developed new functional materials that can catalyse specific chemical reactions needed to convert biomass into fuels and feedstocks for chemical manufacturing**
>
> **Professor Richard Walton**
> The project's UK-based co-leader

One innovation developed chemicals that allow fuel cells to extract the energy available from the urea that is abundant in animal waste. Other work has helped develop catalysts to convert glucose, readily produced from plant biomass, into chemicals that can be used to make a variety of drugs, plastics and agrochemicals.

The team are discussing possible collaboration between the Indonesian company PT Pertamina and Warwick's Energy Innovation Centre, to explore work towards new energy storage devices. PT Pertamina have also established a spin-off collaboration with Universitas Indonesia to develop new corrosion inhibitors from palm oils.

"The abundance of biomass in tropical regions provides a rich source of carbon for the production of fuels and chemical precursors, instead of it being combusted and releasing even more carbon dioxide into the atmosphere," says Walton,

emphasising the possible significant long-term impact of this project.

Click2Build: Leveraging digital transformation and modular precast construction to revolutionise future urban developments
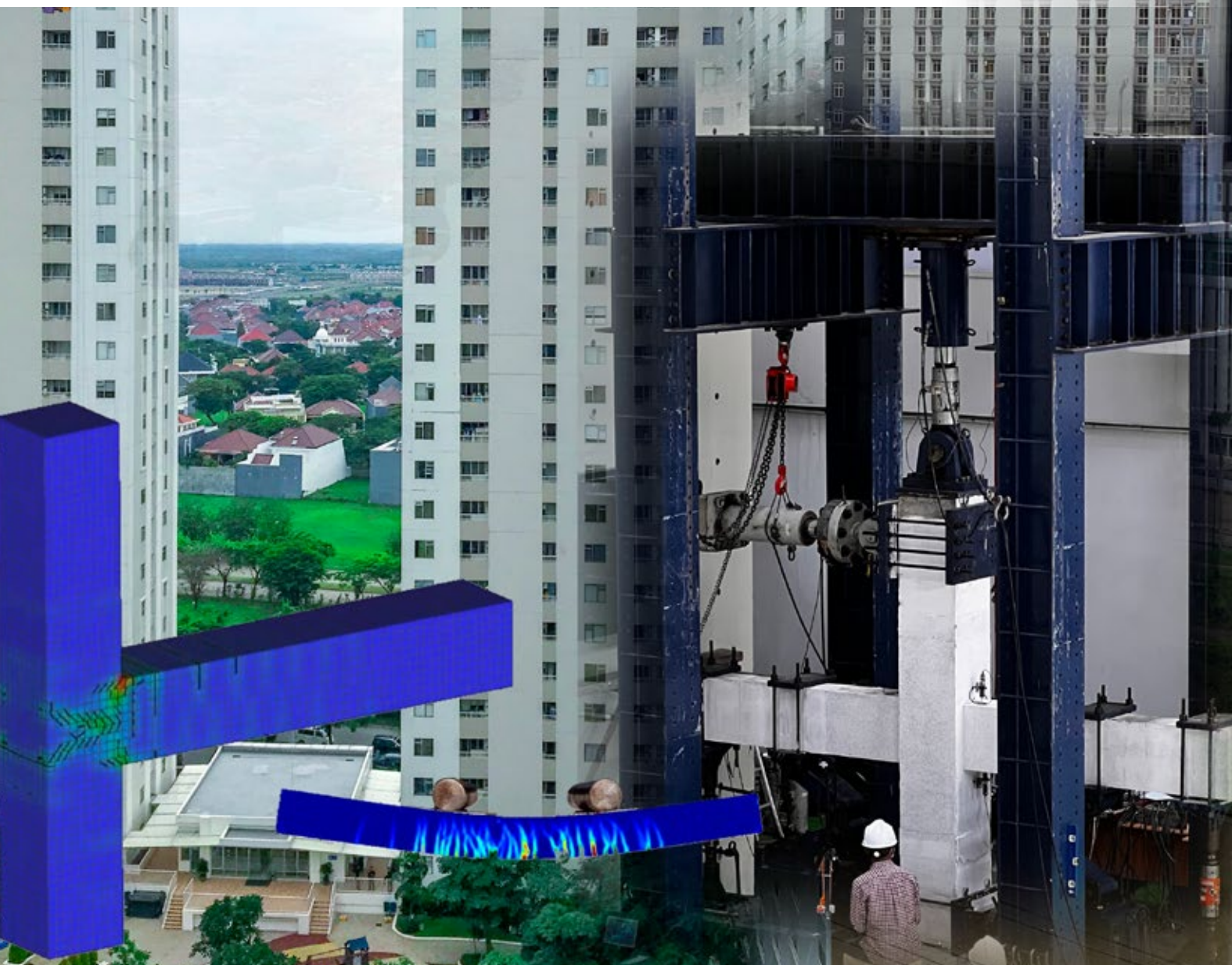
Clicking together safer buildings for Indonesia

Partners in the UK and Indonesia are developing and exploring the potential of modified precast concrete elements with improved resistance to damage during earthquakes

With a rising population of over 275 million, Indonesia faces major challenges in providing safe and affordable housing, particularly in urban areas where population is growing most rapidly.

The Click2Build project, with Newton Fund funding, is addressing Indonesia's housing challenge by promoting the potential of modular precast construction (MPC) building components and digital technology in building high-rise housing.

This initiative is expected to facilitate faster construction at lower costs and with a lower carbon footprint than traditional construction methods.

The partners are undertaking experimental work and digital modelling investigations on precast structural elements that are designed to be resistant to seismic movement during earthquakes. Such structural elements include those developed in a previous project funded by the British Council.

The Click2Build project, with a full title 'leveraging digital transformation and modular precast construction to revolutionise future urban developments', is a collaboration between Heriot-Watt University, in Scotland, UK, and Indonesian partners including Institut Teknologi Sepuluh Nopember (ITS) and an engineering construction company, PT Wijaya Karya Beton Tbk.

Seismic-resistant building elements come in a variety of forms. In this project, flexibility and damage-resistance are introduced into ordinary concrete by including micro-fibres. This generates damage-tolerant and ductile structural elements that form the focus of the project's investigations.

The experimental work ranges from small-scale tests of performance in the testing laboratories at Heriot-Watt University and Institut Teknologi Sepuluh Nopember (ITS), to full-scale testing of structural components such as beam-column subassemblies at the Research Institute for Human Settlements (PUSKIM) in Indonesia.

> **Our work is transferring the latest developments in the field to help tackle what is a particular problem for Indonesia, where a significant percentage of urban developments is located in earthquake-prone regions**
>
> **Dr Benny Suryanto**
> Heriot-Watt University Team

He adds: "We are also empowering young researchers and engineers in Indonesia to realise the role that they can play in addressing the issue."

Professor Priyo Suprobo of ITS in Indonesia comments: "We have achieved large scale processing of damage-tolerant concrete, using standard equipment in a concrete batching plant, while making considerable use of materials locally sourced in Indonesia."

The computer-simulation techniques developed and applied by the project complement the physical testing, allowing more detailed prediction and analysis of a building material's response to stress and damage. Dr Asdam Tambusay of ITS, who leads this part of the project, says: "We use the latest developments in the field, using the Advanced Tool for Engineering Nonlinear Analysis (ATENA) software, to simulate the full response of reinforced concrete structural components, which are critical for ensuring safety and performance." He also adds: "The digital image correlation

technique developed and applied to in the project helps to guide material development and provide objective assessment of structural damage."

The partners believe that their work will significantly contribute to ensuring that future high-rise buildings in Indonesia are safe and can be produced in a more environmentally-friendly way.

Development of a green and sustainable ship recycling industry for Indonesia

Developing a sustainable ship recycling industry in Indonesia

Researchers in the UK and Indonesia have developed a new framework to encourage safe and sustainable ship recycling practices in Indonesia

Ship recycling is a major challenge for Indonesia. As the world's largest archipelago, it is reliant on ships to stay connected. However, the country currently operates a large fleet of around 1,400 outdated vessels, many of which are over 25 years old and will need to be decommissioned soon.

Recycling is a more environmentally friendly alternative to sinking or abandoning obsolete ships, as well as being an important source of materials such as steel. But ship recycling is also one of the world's most dangerous occupations. Without proper facilities and safety measures, it can lead to injuries and fatalities, as well as contamination of marine and food resources with toxic materials.

In order to address these issues, a team of researchers from the University of Strathclyde and Universitas Indonesia, supported by colleagues at Institut Teknologi Sepuluh Nopember and Institut Teknologi Adhi Tama Surabaya, embarked on a project to develop a new framework for safe, sustainable and environmentally sound ship recycling practices in Indonesia.

"Many Indonesian ship recycling yard workers and other public stakeholders are not aware of the hazards that may arise from ship recycling activities," says Rafet Emek Kurt, Associate Professor at the University of Strathclyde. "The country's existing ship recycling yards are not set up to ensure safe operation and prevent environmental pollution. Developing better practices for health, safety and environmental protection will enhance the well-being of workers and local communities, as well as provide economic benefits."

The goals of the project are threefold: to develop an evidence-based understanding of the challenges involved in ship recycling in Indonesia, to create a clear roadmap for regulators, and to set up support systems for stakeholders. In the long term, the project aims to contribute to the economic development of Indonesia by boosting the international ship recycling trade, creating more job opportunities and providing a source of much-needed scrap metal.

To gather evidence about the current situation in Indonesia and identify shortcomings in human and environmental safety, the researchers first conducted a series of field studies, measurement campaigns, stakeholder consultations and gap analyses.

Using the information gathered, they designed a model for a safe, green and sustainable ship recycling yard that will meet international requirements and improve the welfare of the local community. They also assessed potential locations for ship recycling yard developments. To demonstrate the potential impact of their work, they developed a model to predict how improved ship recycling practices could benefit the local economy. They presented their findings in journal and conference papers, workshops and public engagement events.

> **Our simulation-based shipyard improvement framework can provide the most required evidence to decision-makers when assessing alternative measures or new standards to improve ship recycling conditions**
>
> **Dr Kurt**
> Associate Professor, University of Strathclyde

To support the implementation of their new framework, the team produced a roadmap for the government and provided guidelines, strategies, case studies, business models and training programmes for stakeholders, including an online hazard identification and risk assessment tool. They developed specialised coaching for the trainers to ensure that local experts would be able to continue running the training programmes after the project's completion.

The project has led to new collaboration opportunities, generating greater public and government awareness than initially anticipated.

As a result of discussions with the Indonesian Classification Bureau (BKI) and government ministries, the BKI published a technical information letter on ship recycling for their customers. In addition, the Indonesian government has issued two new regulations on ship recycling.

The project has encouraged an initial partnership with the international Belgium-based NGO Shipbreaking Platform, an organisation that fights for shipbreaking workers' rights to safe working conditions and environmental standards.

The project has also attracted interest from several Indonesian ship repair yards seeking guidance on how to meet international requirements and become more competitive in the market.

As a result of the project's success and newly formed collaborations with Politeknik Perkapalan Negeri Surabaya (PPNS) and the International Labour Organization (ILO), the University of Strathclyde was awarded a new project as part of the ILO's Skills for Prosperity Programme, which aims to promote employment for young people from disadvantaged backgrounds. Through this new initiative, the researchers hope to continue to nurture their relationship with Indonesian maritime institutions and stakeholders.

Ensuring safety of Indonesian seafarers and fishers in the time of COVID-19 and beyond.

Smart safety for small vessels

Motion sensors in smartphones can be used to detect stability problems in small boats, which could avoid disaster at sea

A partnership between researchers in the UK and Indonesia has developed a smartphone app that could significantly improve the safety of seafarers worldwide. The Newton-funded project is being delivered by University College London (UCL), Institut Teknologi Sepuluh Nopember (ITS) and Universitas Pattimura.

"There is a huge safety problem to address in Indonesia, which is one of the worst three nations worldwide for fatalities in the fishing industry, largely due to a lack of stability monitoring, poor vessel design, and the fishers' poor safety culture," says Professor Giles Thomas of UCL, the UK principal investigator of the project called 'Ensuring the safety of Indonesian seafarers and fishers in the time of COVID-19 and beyond'.

Thomas explains that an initial focus on the impact of COVID-19 on the maritime industry in Indonesia involved modelling the spread of the SARS-CoV-2 virus on board commercial vessels. This led to conclusions on best practice in aspects such as ventilation and air-conditioning to minimise the risks for the spread of COVID-19 and future similar threats.

The partners' focus then moved on to developing the vessel stability app, called Kora Kora, named after a traditional canoe from the Maluku islands. This has already operated well in trials and is now being further developed to produce a version suitable for public release.

As small fishing vessels increasingly move into deeper water to catch dwindling reserves of fish, better ways to assess stability are becoming vital. "Our app offers a cheap and effective way for fishers to accurately determine the stability characteristics of their vessel," says Professor I Ketut Aria Pria Utama, the project's principal investigator in Indonesia.

He explains that most Indonesian fishers do not have the budget for sophisticated sensors, but they do have smartphones. The app uses the motion sensors incorporated into phones to estimate a vessel's key characteristic known as the natural roll period. This readily indicates how stable a vessel is.

A traffic light system indicator warns of instability issues and the app then provides guidance on how to improve stability. "This can often involve something as simple as moving weight due to water tanks or stores lower into the vessel," says Utama.

Having completed proof of concept work, the partners are seeking funding to develop their final version. They have used their Newton Fund funding for some initial awareness-raising activities with the fishing industry, but they are also seeking further funding for the more widespread efforts that will be required.

> **The wider global impact could be significant, especially in other countries such as Bangladesh and the Philippines, which are also suffering from unacceptable levels of fisher fatalities**
>
> **Professor Thomas**
> BT Chair of Maritime Engineering
> University College London

Improving Clinical Outcome in Indonesia with a Novel Diagnostic Test for Colorectal Cancer (ICONICC)

Democratising cancer molecular diagnostics

An early health scare has motivated a young researcher to make cancer diagnostics accessible for people in Indonesia

When she was not yet 30 years old, Susanti was diagnosed with stage III colorectal cancer. Now, only eight years later, she is the recipient of Cancer Research Horizons' Early-Career Entrepreneur of the Year Award 2022. Her biotech start-up, PathGen, is developing a game-changing diagnostics kit for the detection of a genetic form of the disease that may disproportionately affect young people in Susanti's home country of Indonesia compared to those living in the UK.

Lynch syndrome is an inherited condition caused by mutations in 'mismatch repair genes', which are involved in correcting mistakes made when DNA is copied inside cells. People carrying these mutations are predisposed to different types of cancer at an early age. The most common type of cancer in Lynch Syndrome is colorectal cancer, which is normally treated with the chemotherapeutic drug fluorouracil. But cancers caused by mismatch repair gene mutations may not respond to this drug and could even get worse. Determining if a mismatch repair mutation exists would allow the detection of Lynch Syndrome and help clinicians choose the appropriate treatment strategy for patients with colorectal cancer.

Susanti has been working with Mohammad Ilyas at the University of Nottingham in the UK to validate and commercialise a diagnostic test for mismatch repair gene function for use in Indonesia. The work is based on a simple and robust PCR-based molecular test, called N_LyST, that was originally developed in Ilyas's lab for detecting loss of mismatch repair gene function. In 2020, Ilyas secured a Newton Fund Institutional Links grant to further validate and establish N_Lyst in the Indonesian context.

The team, which also included medical oncologist Susanna Hutajulu and pathologist, Didik Setyo Heriyanto, of Indonesia's Universitas Gadjah Mada (UGM), used N_LyST to screen Indonesian patients with colorectal cancer for Lynch syndrome. Surprisingly, they found a high incidence (13.85%) of the condition among the 231 colorectal patients they tested. The team has now developed a registry of more than 1,000 colorectal patients and are conducting whole-exome gene sequencing to elucidate the molecular biology of early-onset colorectal cancer in Indonesia.

The Newton Fund also supported capacity building for more than 400 Indonesian clinicians and researchers through the delivery of a molecular diagnostics training school. This included basic training on molecular techniques and on interpreting the results of molecular testing for Lynch syndrome. Focus group discussions with healthcare providers also laid the groundwork for the adoption of N_LyST into clinical practice.

With further support from the Islamic Development Bank, Susanti set up her start-up PathGen, which has incorporated N_LyST into BioColoMelt, an affordable molecular diagnostic kit for patients with colorectal cancer in Indonesia. PathGen is now collaborating with the Indonesian pharmaceutical company BioFarma to manufacture and distribute BioColoMelt for wider clinical implementation in Indonesia.

> **Susanti's initiative showcases the diaspora's concrete contributions and demonstrates the commitment from various institutions in the UK and Indonesia, including academia, governments and private sectors, towards enhancing cancer detection**
>
> **Desra Percaya**
> Indonesia's ambassador to the UK, Ireland and the International Maritime Organization

"I am hopeful that this impactful partnership will serve as a prime example to be replicated in a wider range of collaborations to achieve more accessible cancer diagnostics for all.

"It is a moment of great pride to see lab work translated into a product that will undoubtedly influence patient treatment and outcome," adds Ilyas. "As well as allowing patients to be screened for Lynch syndrome, BioColoMelt provides the same information for treatment decision-making for patients in Indonesia that is used for patients in the West; a true democratisation of cancer diagnostics!"

Soft robotics for affordable healthcare in Indonesia
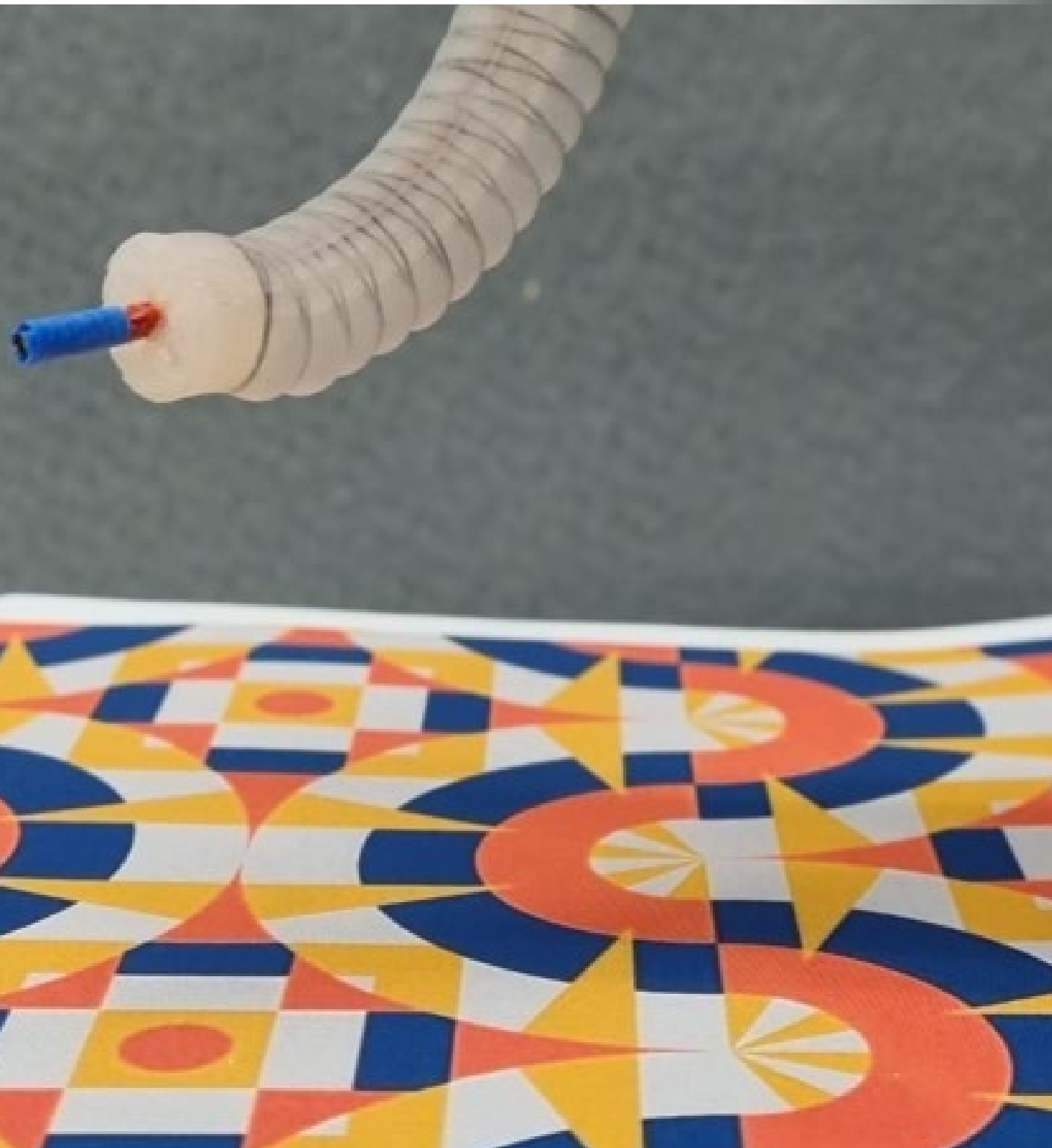
Better respiratory care with soft robotics

Partners in the UK and Indonesia have refined a soft robotic intubation system to help address the burden of respiratory disease in Indonesia

Endotracheal intubation, which inserts a tube into the throat and windpipe, can assist the diagnosis of respiratory diseases and is used to deliver mechanical ventilation of the lungs during acute respiratory infections or after trauma. It is, however, a risky procedure which can cause harm or death if misused or applied inexpertly.

A soft robotic actuator developed and patented by the Imperial College of Science and Technology (IC) in London, UK, has served as basis for an intubation device during a project to bring improved airway interventions to Indonesia. The researchers hope that their work will eventually significantly reduce the level of expertise required to safely deliver intubation or other endoluminal procedures – those accessing hollow organs such as the stomach and the intestines, or blood vessels.

The innovation will help address the huge burden that respiratory diseases impose on Indonesian healthcare and the economy, with more than one million cases per year. The unique geography of Indonesia, which consists of over 13,000 islands, severely limits the population's access to essential care. The specific nature of COVID-19 has complicated the use of intubation for that condition, since a careful inspection of the airways before intubation is often not possible. The medical staff also need personal protective equipment, which limits their movement. The pandemic has highlighted how the scarcity of life-saving equipment and experienced clinicians can significantly increase fatalities.

The Newton Fund funded project, called Soft Robotics for Affordable Healthcare in Indonesia, was a partnership between Imperial College and Institut Teknologi Bandung (ITB) in Indonesia.

"As a professor in medical robotics, I have developed several robotic systems that can be deployed in clinical settings to address the challenges of intubation," says Ferdinando Rodriguez y Baena, Principal Investigator of the IC team. Rodriguez y Baena's group have now worked together with ITB to develop an affordable version of their slender and soft robotic manipulator that can be produced using available manufacturing

technologies in Indonesia. They have explored the use of the system in diagnosis, with expansion into routine use for mechanical ventilation expected in future.

"Our team at ITB was able to acquire specialised knowledge on the design, manufacturing, and control of soft robotic manipulators from the experts at Imperial College," says Indrawanto, the project's Principal Investigator in Indonesia. "In turn, the focus on affordable and sustainable design has motivated the team at IC to investigate low-cost actuation and sensing strategies for soft robots, which could eventually lead to new intellectual property."

Arnau Garriga-Casanovas of the IC team explains some of the refinements achieved during the project, saying: "We conducted simulations of the deformation of the robotic manipulator when pressurised, revealing the root cause of some undesirable buckling. We then explored potential design and control solutions to that issue, which will lead to better manipulators capable of higher accuracy."

> **Thanks to the Newton Fund funded project, the team at ITB secured additional internal funding to investigate new sensing methodologies for soft robots and other further developments. "We have conducted research on applying the system more widely for endoscopy of the gastrointestinal tract"**
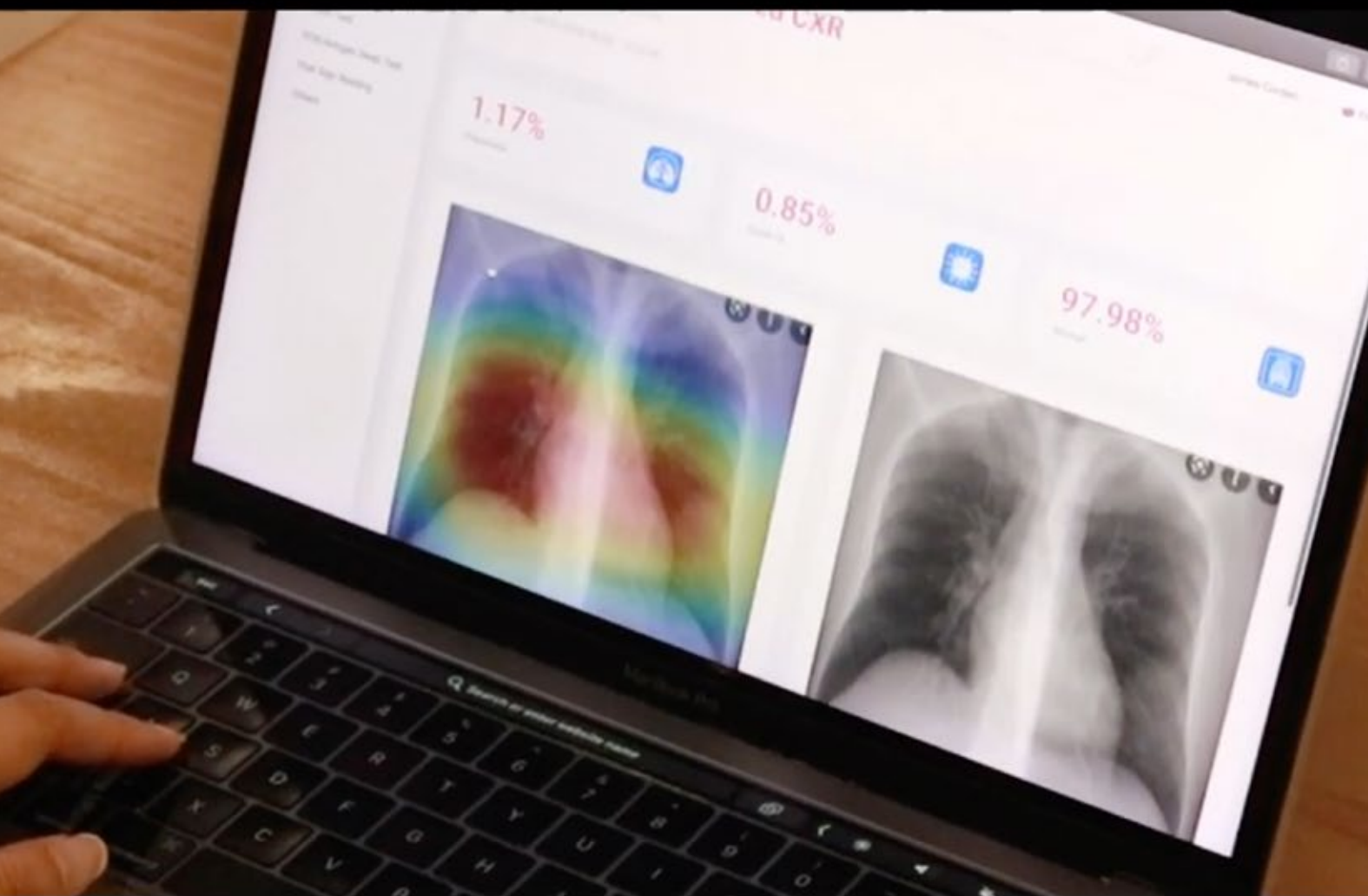>
> **Indrawanto**
> Project's Principal Investigator in Indonesia

AI-based telemedicine for COVID-19 patients

Artificial intelligence to detect high-risk COVID-19 remotely

Automated collection and assessment of clinical data remotely can speed up urgent evaluation of COVID-19 patients, avoiding delay for the most threatening cases

The Newton Fund funded project entitled 'AI-based Telemedicine for COVID-19 Patients' is working to harness the power of artificial intelligence (AI) to remotely identify COVID-19 patients at risk of severe and life-threatening complications. Its outputs should be of global use and significance, although at present it is focussed on a partnership between the University of York, UK, and Bina Nusantara (BINUS) University in Indonesia.

The idea of the project originated when the leaders of the York and BINUS teams realised the need to accelerate assessment of cases and identify those at greatest risk, and that they could help by combining their programming skills with knowledge from professionals treating COVID-19 patients.

"The main initial contribution of the project was to develop our new software platform for telemedicine," says computer scientist Dimitar Kazakov, the project's UK principal investigator at the University of York.

The software that the project has developed uses diagnostic AI modules to analyse numerical, textual and imaging data that can detect COVID-19 related symptoms and thus provide support to clinicians performing patient assessment (triage) and diagnosis. The system can be accessed via a Web browser or a mobile device application, and runs on the AWS (Amazon) virtual platform.

"We have now taken significant steps towards commercialisation, and we are in the developers' partnership programme of Garmin, which is a leading manufacturer of wearable devices," says Kazakov. "We have already successfully trialled the system for continuous monitoring outside of hospitals."

> **Newton Fund has enabled us to work with a public hospital in Jakarta, to design and build the system as well as to engage students**
>
> **Nunung Nurul Qomariyah**
> Artificial Intelligence Researcher

Wider benefits from the funding include dissemination through several peer-reviewed research papers describing the automated diagnostic procedures, and training of undergraduate students, recent graduates, PhD students and postdoctoral researchers in the AI or software engineering aspects of medical applications related to pulmonary disease or telemedicine.

"Much of this work is not limited to COVID-19 patients," adds Nunung Nurul Qomariyah. "It can be applied to a broader range of pulmonary conditions, as can our wearable hardware that can remotely monitor the health of outpatients."

The project's achievements were recognised by winning the Hackathon award at the Mendix Virtual Hackathon 2021, in Jakarta, Indonesia. It was also among the top 20 apps in The 6th OPEN INNOVATION commercialisation funding competition organised by the Indonesian Medical Education and Research Institute (IMERI).

Annex 1: List of Newton Fund Indonesia grant recipients managed by the British Council

Institutional Links grants

Project	Project ID	Project Title	University/ Institution	Principal Investigator
IL1 2014-2015	172600309	What happens to the family when women migrate? An international collaborative programme on the impact of female international migration on poverty, children, elderly, spouse and fertility in East Java	Universitas Brawijaya	Keppi Sukesi
			University of Portsmouth	Saseendran Pallikadavath
IL1 2014-2015	172719105	Forest Fruit and Rural Nutrition (FFARN) Bangor-Mulawarman Joint Programme	Universitas Mulawarman	Enos Tangke Arung
			Bangor University	Mark Rayment
IL1 2014-2015	172720125	Indonesian marine energy - Network ignition	Institut Teknologi Sepuluh Nopember	Mukhtasor Lsp
			Robert Gordon University	Alan Owen
IL1 2014-2015	172725418	Improvement of energy and environmental sustainability in marine transportation system through understanding and management of bio-fouling in wall-bounded turbulence	Institut Teknologi Sepuluh Nopember	I Ketut Aria Putra Utama
			University of Southampton	Bharathram Ganapathisubramani
IL2 2015-2016	217195589	The everyday political economy of resettlement: urban design, women's empowerment and the rehousing of low income groups from slum areas in Jakarta	Universitas Indonesia	Chusnul Mar'iyah
			University of Warwick	Juanita Elias
IL2 2015-2016	217488952	Transitions towards renewable energy based communities: A strategic communication and community engagement approach to the Indonesian energy self-sufficient villages project	Universitas Atma Jaya Yogyakarta	Gregoria Yudarwati
			University of Huddersfield	Anne Gregory
IL2 2015-2016	217494906	Evaluating locally sourced agricultural residue in ameliorating heavy metal uptake by cocoa and minimising pest infestation to increase yield in Indonesia	Universitas Hasanuddin	Ade Rosmana
			Cranfield University	Ruben Sakrabani
IL2 2015-2016	217513670	Tempe to Improve Memory and prevent dementia in Elderly (TIME)	Universitas Indonesia	Tri Budi Rahardjo
			Loughborough University	Eef Hogervost
IL2 2015-2016	217532609	Integrated renewable energy for a resilient Aceh	Universitas Syiah Kuala	Muhammad Dirhamsyah
			Robert Gordon University	Leuserina Garniati
IL2 2015-2016	217539254	Designing safe, green and sustainable vessels for Indonesian coastal transport and fishing operations	Institut Teknologi Sepuluh Nopember	Setyo Nugroho
			University of Strathclyde	Rafet Kurt
IL2 2015-2016	217544274	Towards sustainable infrastructure through structural health monitoring: centre for intelligent infrastructure	Institut Teknologi Bandung	Bambang Budiono
			University of Warwick	Irwanda Laory

Project	Project ID	Project Title	University/ Institution	Principal Investigator
IL3 2016-2017	261682033	Enhancing urban flood resilience for 1 million people through Blue-Green Infrastructure (BGI) in Semarang, Indonesia	Universitas Diponegoro	Jati Utomo Dwi Hatmoko
			Loughborough University	Robby Soetanto
IL3 2016-2017	261824838	Mainstreaming integrated risaster risk reduction and climate change adaption strategies into coastal urban agglomeration policy	Institut Teknologi Bandung	Harkunti Rahayu
			University of Huddersfield	Richard Haigh
IL3 2016-2017	261865161	BLESS U - Bandar Lampung Enhanced Smart-health Services with Smart Ubiquity	Universitas Lampung	Helmy Fitriawan
			University of Bradford	Yim-Fun Hu
IL3 2016-2017	261872695	Decreasing the vulnerability of Indonesia's fishing communities: countering the threats of illegal and unsustainable fishing	Universitas Indonesia	Melda Kamil Adriano
			Coventry University	Math Noortman
IL3 2016-2017	261877914	Assessing Indonesia's logged forests in a changing climate	LIPI	Sudarmono
			University of Leeds	Oliver Philips
IL5 2017-2018	332204932	Fibre optic sensor for food safety applications	Universitas Airlangga	Moh. Yasin
			Aston University	Sergei K. Turitsyn
IL5 2017-2018	332247832	Earthquake hazard mitigation in Sulawesi and Kalimantan	Institut Teknologi Bandung	Sri Widyantoro
			University of Cambridge	Nicholas Rawlinson
IL5 2017-2018	332397925	Transboundary Fire haze: Regional characterisation, prediction and Mitigation in SE Asia (TransFoRM)	Institut Pertanian Bogor	Imas Sitanggang
			University of Leeds	Dominick Spracklen
IL5 2017-2018	332400539	Development of high performance concrete using agricultural waste from rice harvestation	Universitas Sriwijaya	Heni Fitriani
			Leeds Beckett University	Ash Ahmed
IL5 2017-2018	332435675	INSPIRE: Indonesia School Programme to Increase Resilience	Universitas Syiah Kuala	Ella Meilianda
			University College London	Carmine Galasso
IL7 2018-2019	413871894	Boosting solar energy capacity of Indonesia without compromising protected areas: an integrated GIS tailoring solar energy resource and local information (SolarBoost)	Politeknik Negeri Pontianak	Alfeus Sunarso
			University of Leicester	Harold Steven Ruiz Rondan
IL7 2018-2019	414140726	Increasing rice yield in Northern Sumatra by combining biotic and abiotic stress tolerance	Universitas Sumatera Utara	Irda Safni
			University of York	Frans Maathuis
IL7 2018-2019	414184312	Enabling wayang's contribution to environmental discourse: community, puppet theatre and climate change in Indonesia	Institut Seni Indonesia Yogyakarta	Dewanto Sukistono
			Royal Holloway and Bedford New College	Matthew Isaac Cohen
IL7 2018-2019	414700507	Exploring the potential of giant swamp taro as a future staple food	Universitas Negeri Manado	Jantje Nagangi
			University of Nottingham	Sofie Sjogersten Turner

Project	Project ID	Project Title	University/ Institution	Principal Investigator
IL7 2018-2019	414701123	MacroBio-sustainable utilisation of macro algae in Indonesia	Universitas Brawijaya	Sri Suhartini
			Birmingham City University	Lynsey Melville
IL7 2018-2019	414707757	Unlocking the Potential of Precast in Sustainable Urban Development (UPP-SUD)	Institut Teknologi Sepuluh Nopember	Priyo Suprobo
			Heriott-Watt University	Benny Suryanto
IL7 2018-2019	414709933	Development of green and sustainable ship recycling industry for Indonesia	Universitas Indonesia	Sunaryo
			University of Strathclyde	Rafet Emek Kurt
IL7 2018-2019	414713098	Targeting non-communicable diseases through Interactive Health Ecosystems in Indonesia (TANDEM)	Universitas Telkom	Dodie Tricahyono
IL8 2019-2020	527290660	Advanced materials for future energy and environmental applications in Indonesia	University of Warwick	Richard I. Walton
IL8 2019-2020	527323010	Development and manufacture of FDA approved bone repair materials: establishing affordable healthcare in Indonesia.	Institut Pertanian Bogor	Yessie Widya Sari
			University of Nottingham	Ifty Ahmed
IL8 2019-2020	527323300	Socio-technical solutions to water security challenges in urban areas and post-disaster scenarios	Institut Teknologi Bandung	Anindrya Nastiti
			University of Manchester	Seth Schindler
IL8 2019-2020	527558574	Improving Clinical Outcome in Indonesia with a Novel diagnostic test for Colorectal Cancer (ICONICC)	Universitas Gadjah Mada	Susanna Hutajulu
			University of Nottingham	Mohammad Ilyas
IL8 2019-2020	527633722	Improving the thermal stability of DTP vaccine for transport and storage without refrigeration in Indonesia	Universitas Muhammadiyah Purwokerto	Didik Setiawan
			University of Bath	Asel Sartbaeva
IL9 2020-2021	622261152	Embedding COVID-19 preparedness into local disaster risk reduction	Universitas Andalas	Taufika Ophiyandri
			University of Huddersfield	Dilanthi Amaratunga
IL9 2020-2021	623457938	Ensuring the safety of Indonesian seafarers and fishers in the time of COVID-19 and beyond	Institut Teknologi Sepuluh Nopember	I Ketut Aria Putra Utama
			University of College London	Giles Thomas
IL9 2020-2021	623531377	Soft robotics for affordable healthcare in Indonesia	Institut Teknologi Bandung	Indrawanto
			The Imperial College of Science, Technology, and Medicine	Ferdinando Rodriguez y Baena
IL9 2020-2021	623793160	AI-based telemedicine for COVID-19 patients	Bina Nusantara University	Nunung Nurul Qomariyah
			University of York	Dimitar Kazakov
IL9 2020-2021	623808393	Resilience of Indonesian tuna fisheries to the current COVID-19 pandemic and future uncertainties	Universitas Indonesia	Mufti Petala Patria
			University of Hull	Charlotte Hopkins

Newton Fund Impact Scheme grants

Project	Project ID	Project Title	University/ Institution	Principal Investigator
NFIS2 2020-2021	623411594	Earthquake hazard mitigation in Sulawesi and Kalimantan	Institut Teknologi Bandung	Sri Widyantoro
			University of Cambridge	Nicholas Rawlinson
NFIS2 2020-2021	624574431	Integrating pandemic preparedness and disaster risk reduction to protect economic assets and people in the 'new normal' for the Greater Bandung Metropolitan area of Indonesia	Institut Teknologi Bandung	Harkunti Rahayu
			University of Huddersfield	Richard Haigh
NFIS2 2020-2021	624577537	Click2Build: Leveraging digital transformation and modular precast construction to revolutionise future urban developments	Institut Teknologi Sepuluh Nopember	Priyo Suprobo
			Heriott-Watt University	Benny Suryanto

Researcher Links Workshop/Travel grants

Project	Project ID	Project Title	University/Institution	Principal Investigator
RLTG Oct 2013		Exploring interrelationship between access to resources and maternal nutrition: an ethnographic study of a village in West Sumatra, Indonesia		
RLTG Oct 2013		Achieving sustainable and self-sufficient food security in the Indonesian's beef industry: a public policy analysis using Agent-Based Modelling and Group Model Building		
RLTG Nov 2013		Mobile learning: designing activities about critical visual literacy to English teaching		
RLTG Nov 2013		Effect of environmental conditions on functional genes for lipid biosynthesis in microlage		
RLTG Nov 2013		HIV – related chronic pain of predominantly neuropathic origin – opportunities for future research		
RLTG Nov 2013		Arsenic in the post-mining ecosystem of post-mining ecosystem of the Bakyrchik gold deposit, Kazakhstan		
RLTG Nov 2013		Playfulness and academic performance		
RLTG Nov 2013		Key indicators in cost management in the organisation with new economic activities (high-tech enterprises)		
RLTG Nov 2013		Cultural inequality and social differentiation		
RLTG Nov 2013		Formation and application of new gold dithiocarbamate compexes		
RLWK3 2014-2015	150857902	MCEE: Materials Chemistry for Energy and the Environment	Universitas Indonesia	Yuni K. Krisnandi
			University of Aberdeen	Russell Howe
RLWK3 2014-2015	172700404	Natural hazards, disaster-risk reduction, resilience and culture: A multidisciplinary workshop	Universitas Gadjah Mada	M. A. Subandi
			Coventry University	Gavin Sullivan
RLWK3 2014-2015	172704536	Sustainable and clean energy for all	Institut Teknologi Sepuluh Nopember	I Ketut Aria Putra Utama
			University of Strathclyde	Iraklis Lazakis
RLWK3 2014-2015	172724097	Decentralised sustainable energy for wider Indonesia - towards energy security and independence.	Universitas Nasional	Novieta Hardeani Sari
			Robert Gordon University	Leuserina Garniati
RLWK3 2014-2015	172733461	Workshop on developing resilient, connected communities to tackle coastal hazards	Institut Teknologi Bandung	Harkunti Rahayu
			University of Huddersfield	Richard Haigh
RLWK5 2015-2016	216421939	Adopting an R-Urban model: empowering local communities to develop sustainable built environments in developing countries	Universitas Islam Indonesia	Yulianto Purwono Prihatmaji
			University of Nottingham	Timothy Heath

Project	Project ID	Project Title	University/Institution	Principal Investigator
RLWK5 2015-2016	217523023	Maternal and infant health and nutrition in Indonesia: and interdisciplinary workshop exploring opportunities and challenges for collaborative research, policy and practice development	Universitas Andalas	Hardisman Dasman
			Sheffield Hallam University	Sadiq Bhanbhro
RLWK5 2015-2016	217539700	Tropical forest biodiversity and carbon storage: developing a roadmap for a long-term forest monitoring network in Indonesia	Badan Penelitian, Pengembangan, dan Inovasi Hutan dan Lingkungan Hidup, BLI, Kementerian Lingkungan Hidup dan Kehutanan (Forestry and Evironment Research Developemt and Innovation, FORDA-MOF)	Hendra Gunawan
			Manchester Metropolitan University	Francis Brearley
RLWK5 2015-2016	217542234	M2B (Maximising Migration Benefits): Indonesian migrant workers from security to development	Universitas Indonesia	Sulistyowati Irianto
			SOAS, University of London	Carol Tan
RLWK5 2015-2016	217543417	Enhancing early psychosis care: transforming the nursing workforce through innovation in evidence based practice	National Centre for Mental Health (Marzoeki Mahdi Mental Hospital)	Irmansyah
			University of Manchester	Alison Yung
RLTG7 2016-2017	261870390	Genome-wide association study of anti-tuberculosis drug induced liver injury and multi drug resistant tuberculosis in the Indonesian population	Universitas YARSI	Rika Yuliwulandari
			University of Oxford	Adrian Hill
RLTG7 2016-2017	10215	Pilot study of a population – based survey to assess the impact of nutritional status and genetic factors on non-communicable diseases in Minangkabau women	Universitas Andalas	Nur Indrawaty Lipoeto
			University of Reading	Vimal Karani S.
RLTG7 2016-2017	10236	A staggered finite volume method for shoreline change in groyne system	Institut Teknologi Bandung	Ikha Magdalena
			Swansea University	Dominic Reeve
RLTG7 2016-2017	10317	Sustainable modernisation of the artisan fishing vessel fleet in Indonesia	Politeknik Perkapalan Negeri Surabaya	Muhammad Anis Mustaghfirin
			Newcastle University	Dawei Wu
RLTG9 2017-2018		Healthy lifestyle: Implications of positive spiritual wellbeing for young people with depression	Universitas Riau	
			Leeds Trinity University	
RLTG9 2017-2018	10615	Correlation of Swedish weight sounding method with cone penetration test for future liquefaction hazard assessment in Western Sumatra, Indonesia	Universitas Riau	Muhamad Yusa
			University of Sheffield	Elisabeth Bowman

PhD scholarships

Project	Name	Home University	UK University	Study programme	Research title
PhD 2017	Asrul Harun Ismail	Universitas Pancasila	University of Birmingham	Mechanical Engineering	Optimized trajectory planning using the bees algorithm
PhD 2017	Janwar Nurdin	Universitas Malikussaleh	University of Manchester	Civil Engineering	Resilience of coastal structures to fluid-debris loading in tsunamis
PhD 2017	Muhammad Faris Adrianto	Universitas Airlangga	The School of Pharmacy at Queen's University Belfast	Pharmacy	Potential of bioactive chitosan from seafood wastes as in situ injectable ocular implants for sustained drug delivery to the posterior segment of the eye
PhD 2017	Saadudin	Universitas Hasanuddin	University of Leeds	Earth and Environment	Spatial-temporal analysis of physical and dynamical parameters of oceanic-atmospheric interaction toward precipitation diversity in Indonesia
PhD 2017	Siti Fariya	Institut Teknologi Adhi Tama Surabaya	University of Strathclyde	Naval Architecture and Marine Engineering	Development of ship recycling yard in Indonesia through technical and economic analysis