ROYAL ACADEMY OF ENGINEERING

Industry-Academia Partnership Programme

COLOMBIA

Under its remit as a delivery partner of the Newton Fund, the Royal Academy of Engineering has partnered with Promigas, Ecopetrol and Ruta N to enhance engineering teaching, research and innovation outcomes in Colombian universities by building bilateral industry-academia links.

One of the projects funded through this scheme seeks to develop an intelligence system to improve the sustainability of oil palm crops through the construction of forecasting maps that integrate adaptive vegetation indices from multispectral aerial views. It brings together researchers from EIA University in Colombia and De Montfort University in the UK in collaboration with Unipalma S.A., a Colombian agricultural company that specialises in the cultivation of oil palm crops.

Newton Fund

BUILDING COLLABORATIVE PARTNERSHIPS

After meeting at an industry networking event in 2014, Dr Alejandro Peña from EIA University used a Newton Mobility Grant to visit Dr Mario Gongora at De Montfort University. This allowed them to explore a mutual interest in developing practical applications of computational intelligence and they have since worked on a variety of projects together.

The collaborators identified the Industry-Academia Partnership Programme as an ideal opportunity to build on EIA University's links with Unipalma S.A. and further their research into oil palm biodiversity.

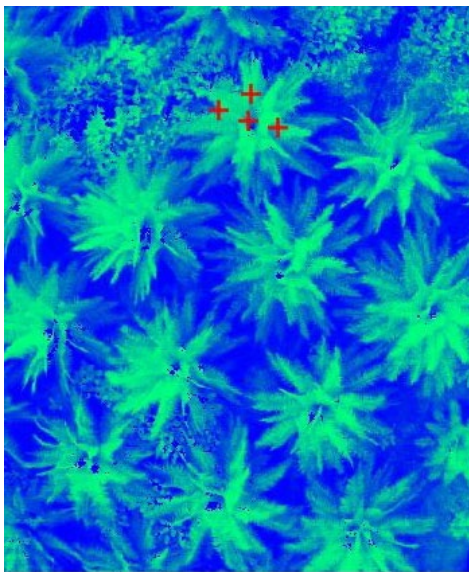
"We do not always have access to the equipment and expertise needed for the research and development activity to improve production processes," explains Iván Erick Ochoa Cadavid, Deputy Director of Research and Development - Department of Improvement and Seeds, Unipalma. "In recent years we have built strategic alliances with academia to achieve real progress in this area."

IMPACT AND INNOVATION

The global demand for palm oil, both as a food source and a biofuel, is increasing. Oil palm crops make a valuable economic and social contribution in Colombia and there is growing interest in developing sustainable approaches to crop production, reducing the use of pesticides and fertilisers.

This project aims to support sustainable practices by using computational intelligence to monitor the health of crops. By working closely with industry, new techniques will be developed to analyse high-resolution images of crops gathered by low-altitude drones. This will lead to faster, more reliable diagnosis of crop disease.

"Unipalma own a number of the crops that will be the experimental grounds for this project," explains Dr Mario Gongora, Deputy Director Centre for Computational Intelligence (CCI), De Montfort University. "They will also provide expertise in diagnostics and crop management and will directly benefit from our joint innovations."



MODELS OF ENGAGEMENT

The project brings together the academics' complementary skills and has created a broader collaborative network that benefits researchers at all levels. Although in its early stages, networking activities have started with academic exchange visits involving two researchers from both universities and they have future plans for a crop visit hosted by the industry partner.

The collaborators have published conference papers based on preliminary findings and regularly engage in opportunities for sharing expertise and experience. This will expand as the project develops. "By the end of the year we hope to have established a mentoring scheme between academic and PhD students," explains Dr Alejandro Peña, EIA University.

FUTURE PLANS

The academic team plans to draw on its industrial partner's experience to help with scaling and commercialising its innovations as they emerge. The collaborative model will also serve as a case study for sustainable oil palm agriculture around the world. Outcomes and new techniques will be shared widely and have potential to transfer to other crops where sustainability is a critical goal.

UK-COLOMBIA INDUSTRY-ACADEMIA PARTNERSHIP

As a Newton Fund delivery partner, the Royal Academy of Engineering has partnered with Promigas, Ecopetrol and Ruta N to co-fund awards that strengthen capacity and develop capabilities within Colombian 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

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Image top: Dr Alejandro Peña (far left) and Dr Mario Gongora (far right), joined by industrial and academic collaborators for a test drone flight.

Image bottom: Multispectral crop images taken by drones for use in assessing oil palm health.

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