

Institution: Coventry University
Unit of Assessment: 7
<p>a. Context</p> <p>Our approach to supporting and promoting research impact has led to the development and transfer of new knowledge and methodologies across key R&D and industrial applications, society and the environment. The main types of impact resulting from the Unit's research are economic impacts (e.g. Mason's research with Chongqing's Haifu to help them access new markets), impacts on public policy and services (e.g. Harris's research influencing the Kenyan Government's approach towards Prosopis); and environmental impacts (e.g. Charlesworth's work in monitoring the water quality improvements of infiltrating polluted water through Lafarge Tarmac's Porous Asphalt Paving). The main beneficiaries of the research include: government and non-government agencies, both overseas and UK-based; major oil and construction companies as well as water companies, SMEs, the Environment Agency and Government Authorities.</p>
<p>b. Approach to impact</p> <p>The Unit has adopted two main strategies for impact: (1) anticipating the needs of external organisations through long-term research collaboration; and (2) proactive identification of new opportunities through dissemination of curiosity-led research. Examples of how these approaches have led to impact are given below:</p> <p>(1) Fostering long term relationships</p> <p>Investment from industry: Contact with companies and consultants has successfully built up over time, based on the quality and focus of our research. This has enabled the Unit to understand and anticipate the future needs of business and generate economic impact. For example, as a result of Charlesworth's high profile research, Lafarge Tarmac approached her with a request to investigate the pollutant retention capabilities of their porous asphalt products. This developed into a series of consultancy projects, over a five year period. Similarly, contact with Bostik in October 2007 developed from research into the microbial quality of harvested rainwater and the application of microbiologically safe surfaces to rainwater harvesting tanks. This resulted in three contracts to investigate microbially-safe surfaces, involvement in a registered design for a bathroom tile (registration no: 401979B) and the development of a patent for the KBF99 Anti Microbial horse brush (PCT/GB2012/052961). The latter has resulted in the sales revenues of £180,000 for a local SME. Both Lafarge Tarmac and Bostik have confirmed the economic impact of this research, stating that it significantly influenced how they marketed their products to clients. Our direct long-term engagement with consultants has also delivered impact. For example, Harris has worked with FPro Development Solutions, who promote trade and economic links between Nigeria and the British Chamber of Commerce based on the brand "Grow Africa". This five-year relationship has resulted in the development of a yam export programme to the UK, with economic benefit to Nigerian farming communities.</p> <p>Examples of sponsorship of postgraduate research projects with a commercial focus: Coventry City Council part-funded (£8,000) a PhD to develop a decision-making tool to enable Local Authorities to predict the impact of installing SUDS (Sustainable Urban Drainage System) devices on local flood magnitude, frequency and duration. The commercialisation of the tool is progressing with the support of Coventry City Council. Our relationships with BWB Consulting (MicroDrainage), Coventry City Council and Hanson Formpave have supported two PhDs, providing access to experimental hardware and in-service SUDS sites for monitoring and modelling the impact of SUDS devices on storm peak attenuation. In addition, two PhDs worked with industrial contacts on commercially sensitive projects on alternative energy sources from algae and extraction of pharmaceuticals from plant materials.</p> <p>Engagement with policy makers: Our close-working relationships with policy makers have enabled the Unit to inform and influence national and regional policy. For example, Mason has been a Consultant for national and regional government bodies including The Foresight Team (Government Office for Science, sponsored by the Department for Business, Innovation and Skills) on a two-year project assessing 'The Future of Manufacturing to 2050', investigating the manufacturing potential of Power Ultrasound (see case study). Charlesworth's research led to invitations to meet with the Planning Department in Coventry City Council which has subsequently</p>

produced guidance for the inclusion of suitable SUDS in the early stages of planning, funded by Severn Trent Water and the Education Funding Agency. This led directly to a change in policy where local secondary schools have SUDS designed in. **Charlesworth** has been asked to monitor this 'SUDS management train' to provide data on its performance and dynamics, giving both the water company and the Local Authority access to the Unit's expertise, data and analysis. This test project will have a direct widespread impact on current and future policy regarding implementation of SUDS in the UK. In addition, a GIS of 100 years of flood incidents in Coventry has been developed (<http://tinyurl.com/p7ds8e5>), leading to invitations to attend the Environment Agency's flood forum to raise awareness of SUDS and provide information needed for SUDS Approving Boards, as required by the Flood and Water Management Act 2010.

(2) Proactive development of new relationships

The Unit has a strategy for the proactive identification of new relationships through dissemination of curiosity-led research at user-oriented conferences and in journals and books aimed at industry. Articles have been published in industry publications including *Circuit World*, *Water Science and Technology*, *European Chemical Engineering and Processing*, and *Transactions of the Institute of Metal Finishing*. Members of the Unit have given keynote talks at policy and practitioner events, including The Infrastructure Show; Association of Researchers in Construction Management's workshop; Institute of Environmental Management and Assessment's Knowledge Exchange.



Charlesworth has developed the SUDSnet conference into a 3-day international event, which encourages industry-academic interaction and subsequent collaboration. At the 2012 SUDSnet conference keynote speakers from the USA and Holland attended, with 65 delegates from companies, governmental departments and other agencies (e.g. CIRIA), where 35 papers were presented, including four from Unit members.

An excellent Coventry University resource for promotion of research impact is its London Campus, as the location enables researchers to be closer to relevant influencers. For example, in 2011 **Harris** held an international workshop at the London Campus on "Stabilization Agriculture". This was attended by 40 senior personnel from leading international NGOs and consultancies with practical and applied expertise in agriculture, business and development. In May 2012, **Harris** held a workshop at the London Campus on Prosopis as a food source for developing countries (see **case study 7.2**). The workshop included speakers from France, Kenya, Portugal, UK, USA and attracted an audience of 25 senior representatives from relief, aid and donor agencies.

Use of institutional support: Institutional support provides time to drive engagement and impact-generating activities with the research beneficiaries. Funded travelling scholarships enable visits abroad to engage with government agencies, practitioners and researchers, and to influence industrial processes and policy. For example, **Blackett** was funded to attend the China Mining Conference (2011) and he presented his research on the strategic impact of disasters on supply and demand of raw materials. The audience included government officials, industry leaders, and experts from both Chinese and foreign mining industries, banking and environmental sectors. Similarly, **Anifowose** presented at The 35th Technical Seminar on Environmental Contamination and Response in Vancouver, organised by the Arctic and Marine Oilspill Program. This was attended by representatives from all the major oil companies (Exxon and Shell) as well as international environment agencies (including USEPA and Environment Canada) and environmental consultancies. The University's 'Industrialist in Residence Scheme' facilitates engagement with commerce to generate international impact. For example, a Spanish Environmental Consultant and Civil Engineer worked with **Charlesworth** for three months in 2012, collaborating with Coventry City Council to promote green roofs as drainage devices as well as designing 'SUDS management trains'.

To ensure that impact is generated, collected, evaluated efficiently, a £15k JISC funded initiative (ERIC) will extend the University's existing Research Information Management System. This is a rigorous methodology and set of tools which will provide guidance to each project's Principal

Impact template (REF3a)

Investigator in identifying and collecting appropriate impact measures. Evidence of impact for large projects can include use of independent external organisations, such as RAND, whereas for smaller projects, ERIC provides support delivered through a structured impact tool.

Communicating with users: The University provides a portfolio of staff development programmes, for example to support researchers in communicating with end-users. Externally-led media training courses target communication to a wider, non-academic audience. For example, **Sparks** appeared on a BBC1 documentary to discuss the changing timings of the British seasons (“The Great British Year”, Episode 4: Autumn, 2013) and **Charlesworth** has carried out national interviews on Radio 4’s “Today” programme and “You and Yours”, discussing the benefits of SUDS. Staff also actively develop and contribute to international networks to engage with government agencies, practitioners and researchers. The University’s social media team ensure the Unit maximises impact through channels such as blogs, Facebook, Twitter and Brandwatch.

c. Strategy and plans

The Unit’s strategy is to continue to grow its high quality research, consultancy and knowledge transfer activities. Plans for the future are to develop impact from current and future research by investing in personnel and infrastructure. The specific plans are as follows:

- **Fostering long term relationships with industry:** We will extend our established relationships with partners such as Shell, Lafarge Tarmac and FPro Development Solutions, to support them in the development of their future commercial strategies. We will be flexible in our approach to the management of projects and ensure that impact is delivered, collected and assessed to the benefit of the external partners and the Unit. We will facilitate sponsorship of postgraduate research projects with a commercial focus. We will continue to build on our successes with industry-sponsored PhD studentship programmes, supported by NERC and EPSRC Industrial CASE studentships.
- **Engagement with policymakers:** We will maximise the multi- and cross-disciplinary expertise available in our Unit and identify opportunities to extend our reach by engaging more fully in advisory and policy support roles. Some members of the Unit (e.g. **Mason, Charlesworth, Schmutz**) already have such roles, and will support less experienced members of the Unit (e.g. **Blackett, Anifowose**) to secure advisory roles in Government at National and European levels.
- **Proactive development of new relationships:** We will explore new opportunities for effective, high impact collaborations with companies such as Shell, BP, RSK Environment; Jeremy Benn; Halcrow; WRA; Royal Haskoning; EMS, as well as beneficiaries in the public sector such as Local Government, Environment Agency, and water companies. We will work proactively to engage them by identifying and pursuing innovative areas of research which can be translated into better processes and practices. We will make our research highly visible and attractive to business by developing online publicity materials together with attending relevant industry conferences, exhibitions and workshops.
- **Use of institutional support:** The University is investing £60M in a new Science Building equipped with analytical suites and research laboratories with state-of-the-art instrumentation to be completed in 2016. The building is designed to support collaborative use by industry. This will include ISO9001 accreditation of key laboratories, to ensure they are suitable for commercially sensitive collaborative research. This building will enable the Unit to develop its novel and applied laboratory and field sampling and analyses to support original, significant and rigorous work with high impact.

d. Relationship to case studies

The case studies are both based on the Unit’s strategy for developing long-term relationships with external organisations (approach 1). The Ultrasound case study (7.1) illustrates the way in which research is built up from initial contact through to larger projects involving pilot studies and upscaling work. The case study details the impact arising from 30-years research at Coventry in high-power ultrasound. Impact through the land management case study (7.2) focuses on East and South Africa, with a combination of a field identification guide and policy briefs influencing policy on Prosopis management in Kenya and an expert workshop in communal rangelands influencing land management policy in South Africa.