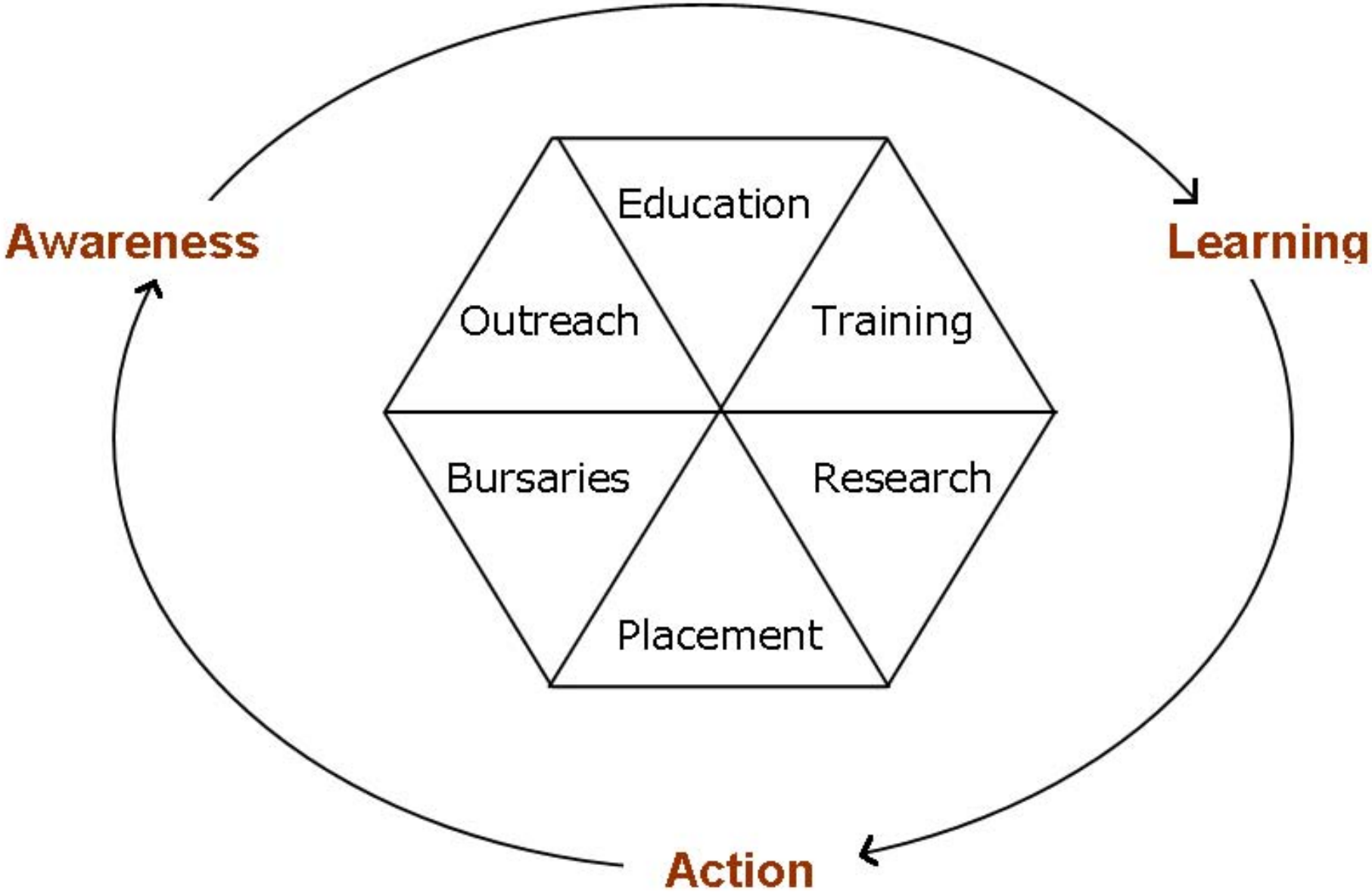
engineers without borders uk

Engineers Without Borders UK

Harnessing the energy of young people

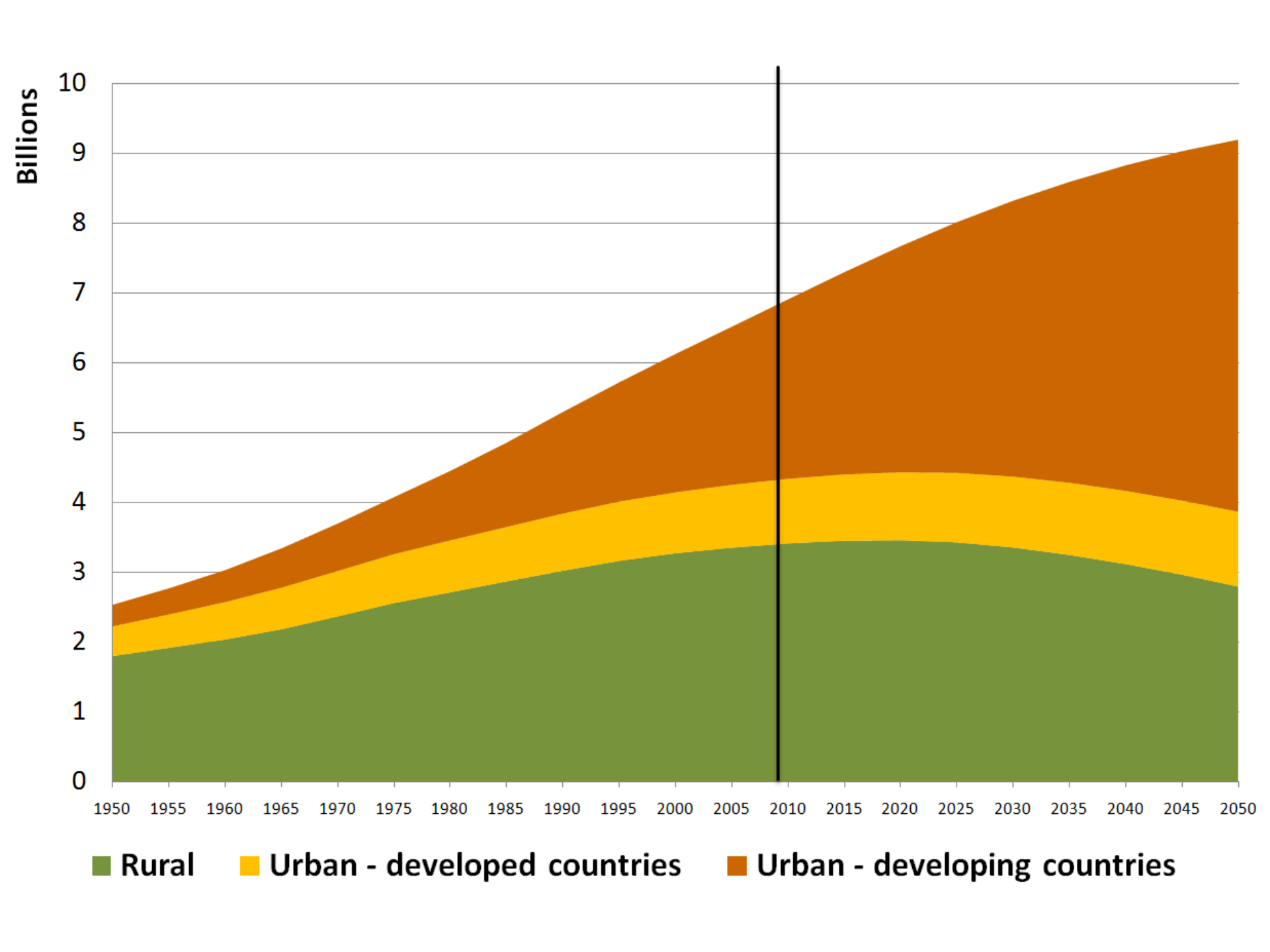
Andrew Lamb, Chief Executive

Association of Civil Engineering Departments
23rd April 2012
Institution of Civil Engineers


Awareness
Learning
Action
Education
Outreach
Training
Bursaries
Research
Placement

Aston
Bath
Birmingham
Bristol
Brunel
Cambridge
Cardiff
City
Coventry
Cranfield
Durham
Edinburgh
Exeter
Glasgow
Guildford
Heriot-Watt
Highlands & Islands
Imperial
Loughborough
Manchester
Newcastle
Nottingham
Oxford
Plymouth
Sheffield
Sheffield Hallam
Strathclyde
Swansea
Tesside
UCL
UWE
Warwick
Bradford
Brighton
Queens, Belfast
Leicester
Liverpool
Portsmouth
South Bank
Southampton
Teeside
Ulster

- 850,000,000 people lack access to safe drinking water
- 820,000,000 people are under-nourished, 1.1billion are over-fed
- 29,000 children die every day from poverty-related causes
- Fewer than 1 engineer per 100,000 in Africa c.f.: up to 500 in Europe
- 1 billion people living in slums
- 99.4% of the urban population of Ethiopia lives in slums


Billions
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2050
Rural
Urban - developed countries
Urban - developing countries

51%


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Improve
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Research
awareness
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talks/presentations
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policy
new
link
improvements
career
EWB-Sheffield
experience
inspire
already
lectures
better
idea
role
generation


Consultants
of the Year 2012

Joanne Beale
2008

In 2008, Joanne was awarded an EWB-UK **bursary** in order to study rural waste management in Bhutan for three months, for her final year **research project** at **Cambridge University**. She then volunteered to chair a new bursary panel in Cambridge to assess future applications.

"The bursary gave me my first experience actually working overseas, and it was great to know my ideas had been endorsed. I wanted to help others do the same and, as a student, becoming a development donor on the panel was a really interesting experience. I thought a lot about what makes 'good' development."

Joanne also got involved in **EWB Cambridge**, and helped to organise water and sanitation events in partnership with **Mott MacDonald**. Another highlight was her 'Go Vegan' challenge in which 30 students adhered to a vegan diet for one month to raise awareness of land, food and resource issues – and **fundraised** over £3,000.

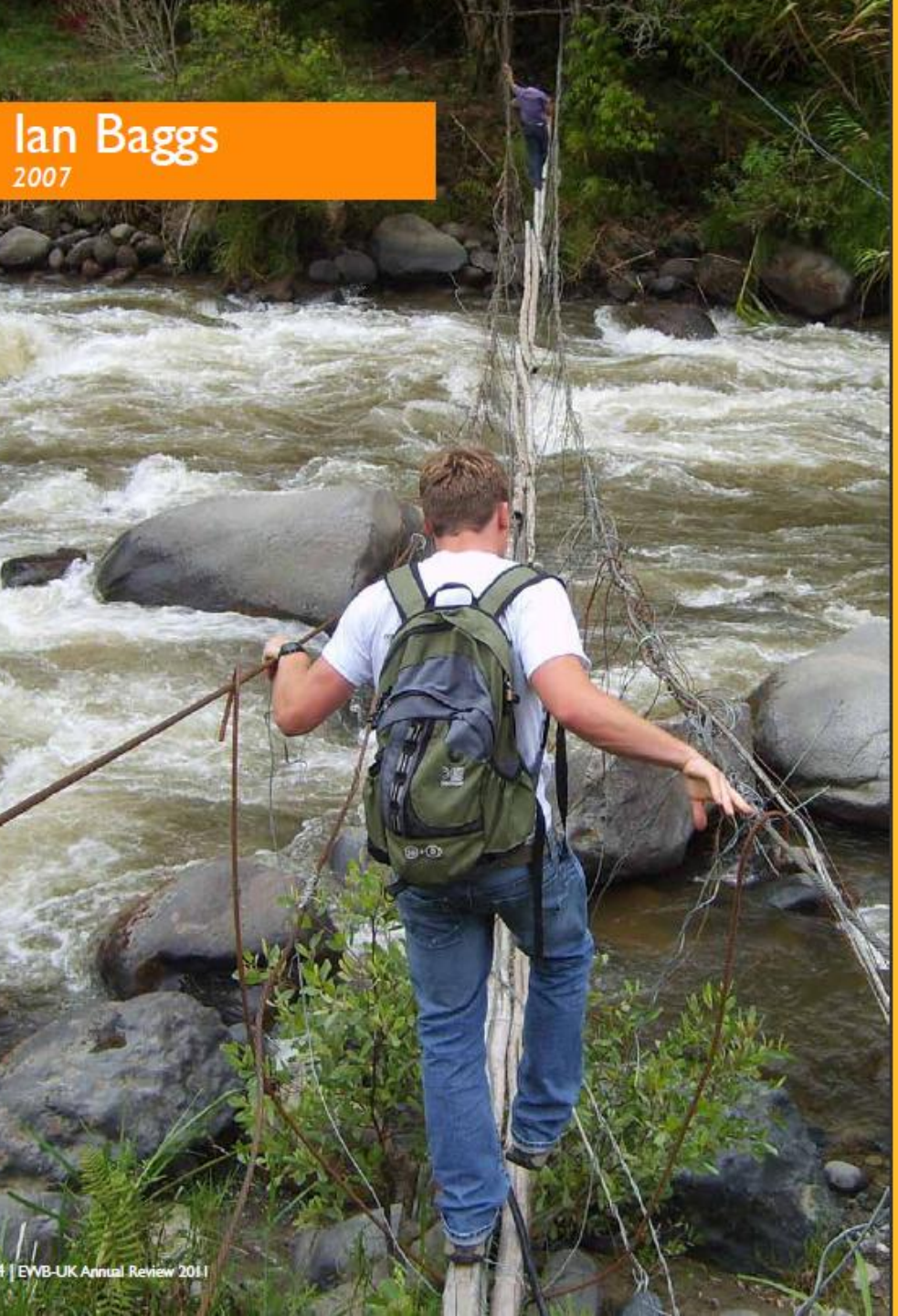
After finishing her Masters degree in engineering, Joanne volunteered for the role of **Bursaries Co-ordinator** on the **National Executive** of EWB-UK. Over the next two years she consolidated the scheme, creating new bursary panels and awarding seventy bursaries totalling over £20,000. She managed the team, plans and budget, oversaw the whole bursary process and reported to its main donors – the **Royal Commission for the Exhibition of 1851** and **Barclays Capital**. She helped to write EWB-UK's Good Practice Guidelines (now part of EWB-UK's strategy) and started developing ideas for a new 'Innovation Hub'.

"It was a privilege to be able to make a difference, to do something I feel passionate about, whilst learning so many new skills. It was a huge learning curve – management, public speaking, networking. In those two years I was also working in Mozambique and for RedR in London, and it was astonishing to find links with EWB-UK wherever I went."

Joanne started work at **Buro Happold** in September 2010 as a graduate in their sustainability team, and is currently part of a small team working on a **city-wide masterplan for Dar es Salaam** where she is responsible for water and sanitation aspects. Her experiences in development are invaluable in making the engineering relevant to the context of Tanzania, and make her a vital member of the company's team. She is also one of three engineers leading their **International Development Community**, providing staff with opportunities in development work and promoting the company's expertise. Joanne supports Buro Happold's work with the **RedR Future Relief Workers Scheme**, which helps staff to become relief workers by gaining field experience on EWB-UK placements.

*"I wanted to work for Buro Happold because of their support for EWB-UK and I think they appreciate the skills I bring from my involvement. I've become an **'EWB-UK Champion'**, a new EWB-UK scheme that helps the company and my colleagues engage more closely. I've also been asked to support the **Education Programme** by becoming a Royal Academy of Engineering visiting lecturer at **Coventry University**. The support network that I have gained through EWB-UK and the example of older members have been such an encouragement to me in getting to this stage of my career and I'm excited to see where it takes me next."*

Most memorable moment
"Setting up a water pump training course at Clare Farm in pouring rain with lots of mud, sledgehammers, tents, big holes and biscuits..."



Ian Baggs

2007

Ian discovered EWB-UK whilst at university at **Bristol** reading Civil Engineering. He had spent his gap year in Mexico teaching English in a rural part of the country and EWB-UK appealed to him because it felt like a constructive way to use the engineering skills he was gaining in the context that he had experienced in Mexico.

*"At sixteen I wanted to study medicine when my physics teacher presented me with an article stating that in the early stages of a disaster engineers can save more lives than medics – that's what sparked my interest in engineering. When I got to university there were so many talks on at lunchtimes but the titles of the EWB-UK **talks** really caught my attention. I was really excited about the prospect of doing some training courses whilst I was at university and even more so about the placement opportunities."*

In his final year Ian became **President of EWB Bristol.** In that year the membership doubled to 250+ members and there was an active committee of around 25 students. This enabled the branch to try new things and they had the capacity to run big events. One such event was the annual EWB-UK **National Conference**, which was held in a city for the first time. Ian and his committee were instrumental in securing the support of the engineering department and the conference was a huge success, with students coming from all over the country to Bristol for talks, workshops and training. Ian went on to be a successful applicant for a **placement** to spend six months in Ecuador.

"I actually ended up staying for a year in Ecuador. It was the first opportunity I had to put some of my engineering teaching into practice on a real infrastructure project. We were building gravity-fed water systems in the jungle. It was so incredibly rewarding."

Ian now works for engineering consultancy **MWH** in the UK, who sponsored him to go to Uganda on another EWB-UK **placement** for three months under the **RedR Future Relief Workers Scheme.** He has shared his knowledge and experience by helping at the **Pre-Departure Course**, giving talks at MWH and EWB branches and assisting with **staff recruitment** for EWB-UK.

*"Uganda was a real eye-opener; being out in the bush digging wells under the hot African sun was both fun and challenging. I'm now back in the office and working on a water supply contract, **getting chartered** and I'm also now an **affiliate of RedR**. The Future Relief Workers Scheme is enabling me to attend some RedR training courses – I've just done one on security in the field – and I would love to gain more experience and one day become a full member."*

Most memorable moment
"Sinking the last culvert in a 30ft-deep shallow well in Uganda."

Yoke Pean Thye

2005

Yoke came to the UK from Singapore to study engineering at Imperial. Having previously done a book-keeping course she volunteered as **treasurer at EWB Imperial** and chaired the Imperial **bursary panel.** In second year, Yoke applied for an EWB-UK **placement** with **Shelter Centre** and spent the summer developing camp planning guidelines that are now being used across the global disaster relief community.

"The roles with EWB Imperial were a real learning experience for me, and really valuable as an international student. As part of the bursary panel, we worked with engineers from the ***Professional Network*** *and we learned a lot from them. And after my placement at Shelter Centre, I was pretty clear that I wanted to do work that made a big difference."*

In Yoke's third year she became EWB-UK's national **Bursaries Co-ordinator** and extended the scheme to fund training and conference fees. And in her final year, she became **Finance Co-ordinator.** Managing all the finances of a rapidly growing international charity is not easy, but Yoke presented financial reports to the board of trustees, remotely managed the part-time book-keeper in Cambridge and established EWB-UK's first finance software.

"The biggest challenge on the finance side was interpretation: I had to find a way to translate all the data into information for the teams. It was a great experience to have that kind of responsibility, and I use some of the skills I learnt then in my current job – I've progressed my career much faster."

Meanwhile, Yoke also undertook a research project for her MEng thesis.

"I wanted to do a water and sanitation project so I found a supervisor who was happy to support me with an EWB-UK project, which was proposed by ***Practical Action****. I studied their work in Bangladesh and created a decision-making tool to choose an appropriate method of emptying pit latrines. I presented my research at the* EWB-UK ***Research Conference*** *and also had the* ***paper published*** *in a journal called 'Critical Reviews in Environmental Science and Technology'."*

After she graduated, Yoke moved back to Singapore and found an opening at the Lien Foundation / Nanyang Technological University 'Environmental Endeavour' project. It is one of very few development organisations in Singapore and they do great work building the capacity of academics from countries across Asia and helping them to improve water and sanitation in their own communities. Yoke **manages the international programme** and is currently overseeing and supporting projects in Indonesia, Myanmar and Sri Lanka.

"I'm just about to go out to Myanmar – we're working with eight communities with very unique cultures in floating settlements. On this trip we are taking some of the students from the university here to share skills with some of the students in Myanmar, in areas such as water quality testing. I'm really excited to be involved with this kind of work and am really grateful for the experience I gained with EWB-UK that has helped me to get to this point."

Most memorable moment
"Being invited to sit in an expert group meeting on pit latrines in Zurich. It was a privilege to have the opportunity to learn from a distinguished group of experienced practitioners."


An Engineer Without Borders
A great engineer
A Global Engineer
An ability to incorporate understanding into engineering practice and decision making
Confident to challenge the status quo and your comfort zone - a questioning attitude
Seeing and comprehend -ing the bigger picture
Understanding your role as an engineer, and particularly ethical responsibilities, in a global society
A good manager, then able to be a good leader
Explorering and learning constantly, particularly in unfamiliar situations
Humility
Passion and willingnes: personally engaged
A broad understanding of the human experience, leading to better design
Beginner's mind - fresh ideas, asking 'stupid' questions, innovation
An holistic systems thinker
Sharing, comfortable working with decentralised systems and knowledge ecologies
Thinking sustainably, in '4D', and able to define the real problem and constraints of solutions
Recognising the potential impacts of engineering practice
A sense of fun and a sense of justice
Incredibly creative and ingenious, in the small and large scales
Embracing systems view of life (concepts like networks, self-organisation and emergence), overcoming subtle cognitive barriers that prevent this – particularly the paradigm of reductionism
Combining neo-newtonian training with experience of adaptive pluralism
Ability to learn from mistakes and from other people's mistakes
Contextual listener, able to interpret meaning and to recognise context
Ability to reflect, perform critical analysis and evaluate decisions throughout engineering practice
Can connect conversations, seeking public discussion and linking issues together rather than seeking a settlement
Ability to synthesise, reflecting that tackling the biggest challenges means connecting many small decisions
An ability to understand both local and global context, its influence and limitations (a 'systems thinking approach to the global dimensions')

Education Programme: Introduction

- **Practical and theoretical workshops**
- **The EWB Challenge**
- Annual lectures
- Guest speakers from the field
- Real design challenges & case studies
- Contributions to module content
- New modules and materials
- Extra-curricular activities such as summer schools

Intro to International Development

Energy

Water and Sanitation

Food and Agriculture

Healthcare

Development in the Digital Age

Industry

Intro to Humanitarian Sector

Transport

Habitat and Shelter

Earth Building Materials

Developing Cities

To design innovative sustainable solutions for a remote community living in Southern India

THE EWB Challenge

* Cut to remove borders

EWB Challenge: Eight Design Themes

Waste Management

Housing

Industry Development

Water and Sanitation

EWB Challenge: Eight Design Themes cont*

Transportation

Energy

ICTs for Education

Building Construction

UK-SPEC learning outcome	Our variation/addition
Understanding of the need for a high level of professional and ethical conduct in engineering	No variation
Demonstration of personal commitment to professional standards, recognising obligations to society, the profession and the environment	Demonstration of personal commitment to professional standards, recognising ethical obligations to our global society, the profession and the environment
Understanding of and ability to apply a systems approach to engineering problems	Understanding of and ability to apply a systems thinking approach to engineering problems
Appreciation of the social, environmental, ethical, economic and commercial considerations affecting the exercise of the engineering judgment	No variation
Ability to comprehend the broad picture and thus work with an appropriate level of detail	Ability to comprehend the broad picture, in both the local and global contexts, and thus work with an appropriate level of detail
Demonstrates creative and innovative ability in the synthesis of solutions and in formulating designs	Demonstrates creative ,innovative , exploratory and ingenious ability in the synthesis of solutions and in formulating designs
Investigate and define a problem and identify constraints including environmental and sustainability limitations, health and safety and risk assessment issues	Investigate and define a problem identifying constraints including environmental and sustainability limitations, health, safety and risk assessment issues and the potential impacts of any solutions
The ability to develop, monitor and update a plan, to reflect a changing operating environment	The ability to develop, monitor and update a plan, to reflect a changing operating environment and to analyse and reflect on engineering practice
Ability to work with technical uncertainty	The Global Engineer Report interprets this as ‘The ability to learn new theories, concepts, methods etc in unfamiliar situations’, Does this relate to our ‘Ability to work outside of one’s own comfort zone’?

[Video]

A survey… so far

- 90% of EWBers have gone into or intend to go into engineering (34% national average)
- 75% of whom at least partially attributed their involvement with EWB to their decision to remain in engineering
- When asked to compare the skills they gained from their involvement with EWB with the skills provided by their degree programmes, nearly 100% selected each of the following:
  - greater understanding of global issues
  - multi-disciplinary working experience
  - hands-on skills training
  - broader understanding of engineering's role in society
- 47% of the respondents were female
- 100% said they joined EWB because it was an 'inspiring subject area'

University vs. Industry

University	Industry
Problems have an answer that is right or wrong	This often not the case
You can check the answer	You have to be confident in your solution
You are provided with all the information you need to answer a question	Projects are often information sparse
Problems have very little context	Projects are in very different contexts which affect the solutions needed
Getting an answer wrong has no impact on anyone but yourself	Projects affect people

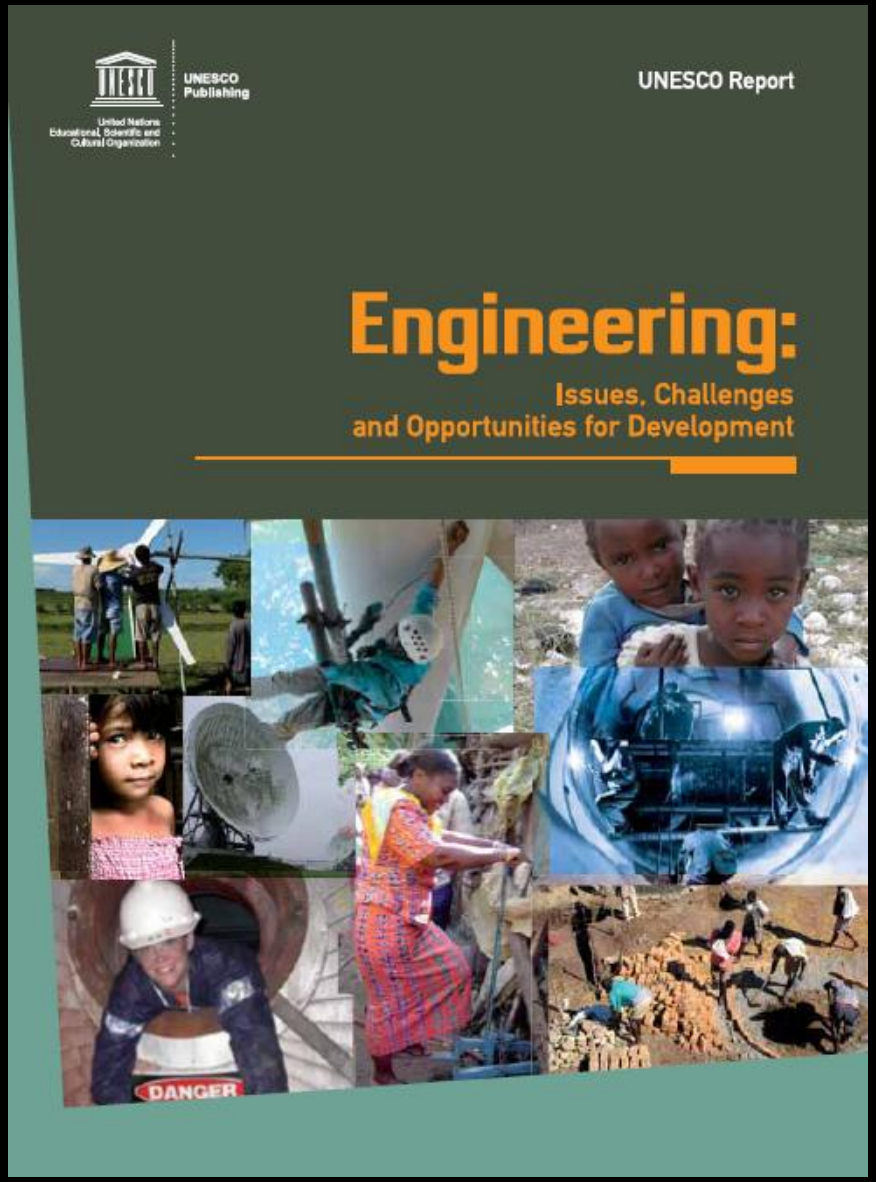
Who doesn't want an engineer who…

- ✓ Has hands on experience
- ✓ Has experience of budgets, team management, team work, delivery to time and budget constraints
- ✓ Has understanding across the engineering world
- ✓ Cares about the why, not just the what
- ✓ Shows drive and initiative
- ✓ Encourages corporate social responsibility

AND has the technical theory too

Problem	Solution
Students need work experience	They run EWB branch at their university or volunteer with us during holidays
Understand basic engineering principles	Working in resource-constrained contexts
Working across engineering disciplines	We can't organise our work by discipline because everything we do is multi-disciplinary e.g.: wind turbines
Not enough young people choosing engineering degrees	Our outreach programme shows attractive people-sized engineering, and we are regularly featured in prospectuses
Not enough graduates staying in engineering	Almost all our 'graduates' go into engineering, whether for a firm, an NGO or governmental agency
Sometimes weak communications and management skills	EWB-UK provides a great place to develop and put these skills into practice
Enthusiasm for engineering	Our members are engineering evangelists as well as drivers of change on poverty, and their work attracts public interest

UNESCO report – CDs available



Thank you!

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