

Engineering the world out of poverty?

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Just over one hundred years ago, engineering transformed the public health of European cities by providing water and sanitation services that added around twenty years to average life expectancy and provided a huge boost to the economy. The same task is now required on a global scale for the millions of people in developing countries who lack these essential services. Multi-sector partnerships driven by the engineering industry make good business sense and can help combat poverty in developing countries.

“Our ignorance is not so vast as our failure to use what we know.”

M. King Hubbert, Geophysicist

Introduction

The need for essential services, including water and sanitation, was underlined at the World Summit on Sustainable Development in 2002, with a focus on sustainable human development. Central to this was the recognition of the role of engineering in providing the infrastructure and services that underpin human and economic health, and the urgent need for such services to be delivered globally. A recent report compiled by the United Nations children's fund UNICEF and the World Health Organization (WHO) (*Meeting the Millennium Development Goals* (MDGs) drinking water and sanitation target – A mid-term assessment of progress, 2004) has shown that 40 per cent of the earth's population does not have access to the most basic sanitation services. The report also states that, if nothing is done to tackle the problem, around 2.4 billion people will be left drinking unsafe water in 11 years time.

Internationally, we have the knowledge, the finance and clear objectives in the MDGs, but clearly, reducing poverty and improving livelihoods is not as simple as just providing infrastructure services. Indeed there are still major barriers that reduce the benefit that engineering could bring to communities. Delivery itself can also be problematic, and new approaches are needed to speed the creation and delivery of sustainable infrastructure to the Least Developed Countries (LDC's). This article looks at the work that the Institution of Civil Engineers and associated organisations are doing to accelerate progress towards development and the reduction of poverty.

The role of ICE and sustainable development

The Institution of Civil Engineers (ICE) is a world leading organisation that promotes the art of civil engineering and the role of civil

engineers for the benefit of all people. Within that scope, sustainability is key, and the ICE recognises the importance of identifying the needs of society and devising and delivering affordable solutions. The ICE launched its charter on sustainability in June 2003.

Sustainability is particularly important as the ICE looks at how the industry can best contribute to achievement of the MDG's. For this, awareness needs to be raised and responsibility fostered within the civil engineering industry – individually, corporately and institutionally.

A member of the World Federation of Engineering Organisations, a non-governmental international organisation that brings together national engineering organisations from over 90 nations and represents some 8,000,000 engineers from around the world, the ICE has also formed partnerships with indigenous professional engineering organisations in a number of countries. This provides opportunities for engineering links at the most appropriate level.

The ICE has addressed development issues through several channels. In 1984, it formed the Appropriate Development Panel (ADP), bringing

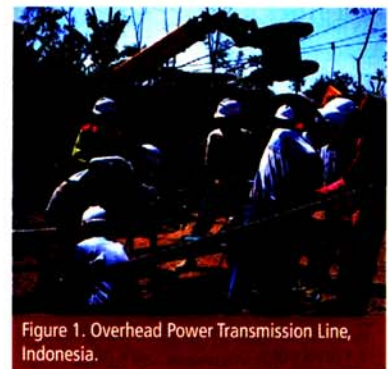


Figure 1. Overhead Power Transmission Line, Indonesia.

together NGO specialists in the appropriate development field with civil engineers providing a forum for exchange of ideas and promotion of technological solutions. The ICE also established a new initiative to engage the wider engineering industry in developing poverty alleviation projects through the “Telford Challenge”, which was subsequently renamed Engineers Against Poverty (EAP).

More recently, the ICE is undertaking a scoping study to assist the United Nations Millennium Project to determine the actions needed to meet the MDGs. Tony Ridley, a past-President of the ICE, is a member of the

The ICE's Appropriate Development Panel (ADP)

- In promoting sustainable technological solutions for poverty alleviation, the ADP provides a 'learned society function' through bringing examples of good practice to engineers, NGOs and a wider public.
- The group organises evening meetings on selected topics both in London and some ICE regions. Participants come from groups such as the Department for International Development (DFID), Engineers against Poverty, the Intermediate Technology Development Group, the Water and Environment Development Centre, the Transport Research Laboratory, the London School of Hygiene and Tropical Medicine and the Television Trust for the Environment. The participation of diverse NGO and government groups enables the ADP to provide a wide cross section of opinion and debate. The panel has co-hosted a research workshop in order to assist DFID in helping them with the development of their new research strategy.
- The ADP has recently submitted both written and oral evidence to a House of Commons Science and Technology Select Committee enquiry into the use of scientific research by the UK governmental departments, with an emphasis on the need to improve infrastructure of developing countries to enable them to move toward meeting the MDGs. Thus the ADP, as a sustainable development information hub, provides a well-established link between professional engineers and fellow experts in the development sector.

Millennium Project's Task Force Ten, addressing the role of science, technology and innovation in delivering the MDGs. In parallel, Douglas Oakervee, the ICE President, has established a Presidential Commission, Engineering without Frontiers, specifically to determine how the ICE can better address issues of world poverty from an engineering stand-point.

In parallel with these groups, Registered Engineers for Disaster Relief (RedR), formed in 1979, has made a significant impact providing engineering relief at times of emergency throughout the world.

ICE and Engineering without Frontiers

The Engineering without Frontiers (EwF) Commission was established by ICE in December 2003 in a further push to highlight development, with the remit to explore and make recommendations on the issues surrounding society, sustainability and engineering, and the achievement of the Millennium Development Goals.

The EwF Commission includes members and advisors covering engineering and development professionals and practitioners, and younger engineers. The Commission has gathered views and information from a wide range of stakeholders through meetings with members, input from its advisory panels and from ICE membership, and through other activities. An in-depth exploration of the initial development engineering themes has been conducted through an Evidentiary Hearing. A few examples of the key issues that EwF is working on at present are:

- The need for engineers and standards to be focused on 'outcomes not artifacts'. *Appropriate Standards* (based on performance rather than specifications) might address this issue.
- The need to *reform current professional formation structures and industry norms* which are currently creating a barrier to those engineers (both young and old) who may wish to contribute their skills to development work but find they are penalised if they do so.
- The need to improve aspects of *delivery and procurement*, so as to unblock development, ensure maximum poverty reduction from project delivery, and make use of the most effective models and partnerships.

EwF will publicise its work to improve awareness of development issues within the ICE and will work with

associated bodies to generate ideas on how to support development and the MDGs.

EwF will also develop dialogue, links and partnerships beyond ICE with relevant political figures and NGO's, and key players such as DFID. It is in the early stages of working with DFID to explore how the ICE could work with other high-level professional bodies from the construction, insurance and banking sectors to lobby governments to build up disaster risk reduction plans.

For the future, the centre-point of EwFs actions for 2005 will be a high-profile event designed to showcase expert opinion from engineers, development professionals, recipients and grass-roots workers on the most effective interventions to enable engineering to deliver development and the MDGs. The event will take place shortly before the UK-based (Gleneagles, Scotland) G8 Summit in July, and the outcomes will be publicised to coincide with the run-up to the G8 meeting, and if possible, submitted to it.

Engineers Against Poverty

Engineers Against Poverty (EAP) is a specialist international development NGO that aims to ensure that the engineering industry remains at the forefront of efforts to reduce and eventually eliminate global poverty.

Established by the ICE and the Institute of Mechanical Engineers (IMechE) in 1998, it develops and promotes innovative strategies for the engineering profession to increase its contribution to the reduction of poverty in developing countries. It does this through brokering multi-sector partnerships, developing business management tools, organising conferences and events and providing support and advice to companies on their corporate social responsibility strategies.

Engineering, CSR and poverty reduction

EAP's current programme is built around the proposition that engineering services contractors are under increasing pressure to improve their social performance, where poverty reduction is considered as a sub-set of a company's social performance. This comes in part from the companies' need to protect and enhance their own brand and reputation, to comply with social and environmental safeguards and to better manage operational risks. It also comes from their clients, particularly brand sensitive private sector clients and government agencies backed by international development finance, who need contractors with capabilities to comply with minimum standards of behaviour and to add value to social performance throughout the project cycle.

However, contractors work to tight profit margins and their capacity to contribute to social performance is constrained by cost. This can be turned into a business development opportunity by repositioning the contractor as a delivery agent of social performance, a service aimed at clients willing to pay for this innovation due to their need to meet Corporate Social Responsibility (CSR) objectives.

This approach is part of an emergent 'second generation' of CSR initiatives. Where earlier approaches were preoccupied with issues of legal compliance and public relations, the new approach encompasses a more complex set of issues that are of strategic significance to business leaders and policy makers. A key challenge is to secure social improvement through mechanisms that also deliver business advantages to contractors and their clients. For it is only when CSR is integrated into core business activities, that the private sector is likely to make a significant impact on poverty reduction.

Why are the Millennium Development Goals important to business?

1. Fighting poverty helps create a good business environment including a healthy and competent workforce, stable markets and prosperous consumers.
2. Problems such as conflict, inadequate health and education systems and environmental degradation can add to the costs and risks of doing business. Companies that help meet these challenges can improve risk management, enhance brand and reputation, reduce costs and improve productivity.
3. Many low and middle income countries, particularly those with large populations and natural resources, offer long term business opportunities to companies able to integrate corporate and social needs.

Adapted from Nelson, J. and Prescott, D. (2003) Business and the Millennium Development Goals, International Business Leaders Forum, London.

Forward-thinking contractors are beginning to appreciate the benefits of CSR strategies that align their 'core competencies' – i.e. those things that they do best and that are integral to their core business – with the development priorities of governments and local communities. Many low and middle income countries have integrated the MDGs into national poverty reduction strategies. These strategies, combined with knowledge of the development priorities of project-affected communities, are a good point of departure for developing CSR strategies.

Engineering and multi-sector partnerships

Poverty is a deep-rooted and complex problem that comprises political, economic and social dimensions. If its causes are multi-dimensional, it follows that any strategy aimed at reducing and eventually eliminating poverty must be similarly multi-dimensional in its approach. This realisation has led to a consensus amongst policy-makers, including the United Nations, the World Bank and DFID, of the need to build strategic partnerships for poverty reduction.

Recognising that no individual sector alone has the resources and expertise to address the challenges of sustainable development, multi-sector partnerships bring together business, government and civil society organisations in strategic alliances intended to deliver mutual benefits to each partner. The modalities of managing these complex relationships are being determined through practice and key players, including EAP, ICE and EwF, have recognised their potential as an important new strategy for poverty reduction.

Conclusions

Development, engineering and empowerment

Power matters in international development. The world is organised in a way that is profoundly unfair and poor people often lack the power necessary to bring about improvements in their own lives. One of the goals of development, therefore, should be to empower those in problematic areas to bring about improvements that are meaningful to them. This is as true of engineering projects, as it is of gender or health programmes.

There are however significant obstacles to empowerment. Patterns of dominance, hierarchy and control

become entrenched over time and efforts to introduce new approaches will usually meet with personal and institutional inertia. This is often as true of the poor and of the organisations working with them, as it is of large corporations and multilateral agencies. It is not surprising, given the entrenched nature of power relations, that poor people often internalise the dominant ideas within society and experience a reduction in their will to think and act for themselves.

It is vital that the engineering industry understands how its operations impact on society and in turn, how society impacts on its bottom line. Forward-thinking companies are beginning to align their business development strategies with the development priorities of people in need. Interventions based on partnerships, on appropriate standards, and on corporate responsibility are increasingly recognised as being good for business and good for society.

Business ethics, partnerships and the poor

Business can have a positive impact on international development despite current imbalances of power. EAP for example is already working with forward-thinking companies to improve the poverty reducing impact of their core business activities. Work by others, such as Transparency International on Business Ethics in the engineering sector compliments this work. Taken together this work is beginning to shift socially and environmentally responsible business practices from the margins to the mainstream.

The term partnership suggests equality, but in practice there are often vast asymmetries of power. Genuine partnerships must acknowledge power relationships, but must also stress the reciprocal and interdependent nature of the collaboration. Engineering contractors and their stakeholders must recognise that they need each other and must remain willing to invest in maintaining the partnership. Partnerships should be processes that are negotiated and adapted in the light of practice and should involve active participation of poor people themselves.

As the UK Government has stated: 'Those who live with poverty...are poverty experts. Their knowledge and experience is far too valuable to be ignored.' For this reason, the engineering profession must continue to improve its ability to seek out, understand, and work with the

knowledge and aspirations of the communities it is asked to 'provide for'. Development should not focus on engineering or on technology, but on people. Projects and methods may be simple or sophisticated – but to provide long-term, appropriate answers, the knowledge and aspirations of local people must be mobilised. In this way the engineering profession can avoid the imposition of inappropriate development and replace it with development that has a deep, lasting and sustainable impact on poverty. The ICE will continue its significant role in this respect.

ABOUT THE AUTHORS AND THE ORGANISATION

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Paul Jowitt, Chair of the EwF Commission, is Executive Director of the Scottish Institute of Sustainable Technology and Professor of Civil Engineering Systems at Heriot Watt University. He is a Vice President elect of the Institution of Civil Engineers (ICE).

Petter Matthews is Director of EAP. He has worked extensively in Africa and Asia on projects related to the built environment and poverty reduction.

Peter Cameron is a past member of the ICE Council and its Executive Board, and is Chairman of the ICE's Appropriate Development Panel.

Engineering without Frontiers (EwF) was set up by the ICE in December 2003 and will run until December 2005. Engineers Against Poverty is a development NGO that promotes strategies for the engineering profession to help reduce global poverty.

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