# SNAPSHOT OF PRO BONO ENGINEERING

## THE SUMMARY REPORT

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ENGINEERS AUSTRALIA

→ 2011 year of humanitarian engineering

engineers without borders AUSTRALIA

# Case Study: Ecoteam

## Engineers volunteer their services to assist with wastewater issues.

### Problem:

Due to the growing orangutan population at Nyaru Menteng, the wastewater system became overloaded. The problem was worsened by the high rainfall in Borneo. The vets at the centre were becoming concerned for the health of the orangutans.

### Project Initiation:

Ecoteam was contacted by the the Australian Borneo Orangutan Survival foundation (BOS), who was looking for consultants to help, Ecoteam immediately agreed to help as the project aligned with one of the aims of Ecoteam, to implement appropriate technology for remote areas and developing countries.

### The Community Organisation:

The BOS was developed in order to prevent the extinction of the Orangutan. At the current rate, there would be no wild populations left in Borneo within 15 years. This sanctuary is home to over 600 orangutans, some of which are in quarantine prior to release back into forest reserves. The sanctuary is also home to a large number of young orphaned orangutans who need to be taken care of and taught how to survive before being released into reserves. Carers raise these youngsters for the first 5 years of their lives by imitating the roles of an orangutan mother.

### The Company:

Ecoteam is an environmental engineering and consulting company located in the Northern Rivers of NSW. They are committed to using eco technology to restore land and water to good health.

Two members of Ecoteam made the journey to Borneo early in 2011 to undertake the first of three visits to the site. The first visit involved designing a sewage system, which would be both simple and robust. The two designers, Dr Keith Bolton and Lise Bolton, came up with a subsurface flow wetland based system, which would treat the wastewater reducing the risk.

When working in developing countries, such as Indonesia, appropriate technology means that in order to achieve the best outcomes for the project, sometimes the use of local resources and practices are necessary. The system needed to be designed to fit in with local procedures and equipment and easily operated and maintained by the local workers. The system could be built using resources that were readily available in the local area and even a local Melaleuca species was used in the design to aid in the treatment process. Further visits were undertaken by Dr Bolton to commence the works, with Jayson Winmill visiting the site in October 2011 to finish the project.

While there were many risks associated with travelling and working in Indonesia, all reasonable preventative measures were taken. All employees needed to be aware of risks of undertaking the project, weighing them up against the many benefits that could be gained by being a part of such an amazing experience.

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# Background to the Research

## The Year of Humanitarian Engineering

The 2011 'Year of Humanitarian Engineering,' has highlighted the power that engineers and the engineering industry have to make significant and lasting impacts on communities in need. Pro bono engineering provides an opportunity for companies[1] to make a contribution to communities through the provision of engineering services at a significantly reduced, or no fee basis. The aim of this research is to provide a snapshot of pro bono engineering in Australia in the 'Year of Humanitarian Engineering.'

Widespread pro bono engineering has the ability to improve the livelihoods of people in disadvantaged communities, enhance the public perception of engineering, and make a career in engineering more attractive, especially to women. Pro bono engineering activities foster a culture of socially aware engineers who can incorporate experiences from pro bono engineering activities into every aspect of their work.

1. 'Company' is used in this report to encapsulate the different forms of engineering organisations to differentiate from the similar 'community organisation'. 'Community organisation' is used throughout this report to encapsulate the different forms of not-for-profit representative groups or 'communities,' with a structure and representatives through which to form a relationship and assist an identified need'.

## Pro Bono Engineering – The Challenge

- More than 1.1 billion people world-wide do not have access to safe drinking water [1].
- 1.4 billion people live in extreme poverty [2].
- 2.6 billion people lack access to improved sanitation [2].

There is no doubt that engineering companies are able to use their skills, knowledge and resources to alleviate poverty and disadvantage. While some engineering companies have engaged in pro bono partnerships and projects across the country, this engagement is rather ad-hoc and is not widespread. When you contrast the engineering industry with the legal industry, during 2007-2008, pro bono legal activity in Australia constituted over 955,400 hours, as reported by the Australian Bureau of Statistics [3].

The industry as a whole lacks a tradition of engaging in pro bono engineering and consequently there are little in the way of supporting infrastructure to enable companies to broaden their corporate social responsibility (CSR) portfolios. At the same time, companies already involved in pro bono engineering are generally disinclined to advertise or celebrate their successes with a broader audience for fear of arousing scepticism about their motives.

*'The driving force behind pro bono engineering is an acknowledgement that the acquisition of our professional engineering skills comes accompanied with a responsibility to use those skills to put back into the community as it is the community that supported the acquisition of those skills.'*

Vaughn Grey, *2008 Young Engineer of the Year*

# Results

The most significant findings from this research have been grouped into the following key themes:

| Themes | Findings |
|---|---|
| Characteristics, Motivations and Benefits of Pro Bono Engineering | Common characteristics of pro bono activities:<br>i) Carried out pro bono (no fee, or significantly reduced rate)<br>ii) Had a client, or community partner<br>iii) Used engineering expertise. |
| | Motivations for pro bono engineering were found to include:<br>i) Professional responsibility owed by engineers to give back to the community<br>ii) Opportunity to address the social and wealth inequality<br>iii Ability of engineering companies to create change. |
| | Benefits of pro bono engineering were found to be threefold:<br>i) Communities have needs addressed by engineers<br>ii) Employees experience positive learning and development outcomes<br>iii) Companies leverage value through staff development and retention, fostering workplace culture and enhanced client engagement. |
| Strategic CSR and Pro Bono Engineering | • Engineering companies of varying sizes and services around Australia have developed a range of Corporate Social Responsibility (CSR), or 'community giving' strategies, that are moving beyond a solely philanthropic model to one that engages with the community on different levels.<br>• Companies engaging in strategic pro bono partnerships were better able to manage expectations and create mutually beneficial outcomes.<br>• There is no 'one-size-fits-all' approach, with strategies found to differ depending on the community need, size and nature of the company, the impact of the overarching CSR program and the structure of the projects.<br>• Respondent companies with structured CSR and pro bono engineering programs overwhelmingly used a CSR budget to manage spending. A proportion also had budgets for pro bono engineering activities that included employee time, disbursements and travel expenses as required. |
| Pro Bono Engineering Partnerships | • The relationships that formed between community organisations and companies are one of the most significant lynchpins of pro bono engineering.<br>• More than a 'commercial client relationship,' a partnership is between two or more organisations working towards community identified aspirations.<br>• A partnership broker, whether internal or external, was identified as being essential to facilitating a successful pro bono engineering partnership – to bridge the gap between complex sectors with different drivers.<br>• The role of the partnership broker may include: scoping and building, managing and sustaining, reviewing and revising and sustaining outcomes [4].<br>**Project Team**<br>• Project Team members were 'highly passionate about contributing to the community and working with people from diverse backgrounds.'<br>• Appropriate training was identified as a key success factor.<br>**Reaching Agreement**<br>• The importance of developing and signing off on a partnership agreement was identified as essential to ensure all parties' motivations are clearly communicated.<br>• Partnering agreements can take many forms and may: provide a structure for the partnership, be co-created by all parties, assist with managing expectations and ensure the partnership is a 'good fit' [5].<br>**Risk Management**<br>• Companies were found to approach questions of risk in differing ways, with some adopting a business as usual approach and others formulating frameworks to designate activities that they will or will not undertake. |
| Evaluation and Celebrating Success | • Many companies are looking to improve: evaluation, methods to measure success and capture lessons learnt.<br>• Current evaluation included: client and employee surveys, identification of goals and a time-line at the outset, and by measurement of the number of employees involved in pro bono activities.<br>• Internal celebration is occurring through presentations to offices and intranets.<br>• External celebration is currently limited but companies are starting to expand through social media, blog sites and company websites. Several companies, including Arup and Origin Energy, are also publicly reporting pro bono engineering or volunteering hours. |

# Recommendations for the Engineering Sector

## *For Companies:*

### 1. Move Towards Strategic Pro Bono Engineering

This research is a call to action for engineering companies across the country to develop strategic approaches to corporate social responsibility and to incorporate pro bono engineering in these strategies.

### 2. Create Pro Bono Engineering Partnerships

It is recommended that when initiating pro bono engineering activities the relationship is approached and managed as a longer term partnership, as opposed to a short term project, in order to encourage 'two-way' sharing and mutually beneficial outcomes.

## *For the Industry:*

### 3. Educate the Industry about Pro Bono Engineering

There is currently a dearth of understanding of the role, potential and benefits that pro bono engineering can bring to both the industry and the wider community, requiring greater education about the value of pro bono engineering.

### 4. Establish a Community of Practise

It is recommended that the industry should establish a network of pro bono practitioners who are keen to share best practice in pro bono engineering activities. Such a network could also:

- Provide leadership in pro bono engineering
- Coordinate celebratory recognition
- Set and regulate aspirational targets for the sector (like the legal sector)
- Advocate to Government bodies on behalf of involved participants
- Expand the number of those who share best practice in pro bono engineering activities
- Direct research into targeted areas of interest.

### 5. Engage Partnership Brokers

There is a need for trained and passionate partnership brokers (whether internal to the partnership or external to the partnership) to connect, facilitate and broker pro bono engineering partnerships.

### 6. Train Engineers

It is recommended that all engineers involved in pro bono engineering undertake appropriate training whether disaster relief preparedness or cultural awareness training to equip them for culturally, emotionally and environmentally diverse environments.

### 7. Deepen Understanding of the Community Perspective

It is recommended that the engineering sector invests in future research in order to better understand the needs of community organisations while gaining a balanced and informed approach to pro bono engineering.

# Case Study: The Bana Yarralji Bubu Indigenous Ranger Base Partnership

The Bana Yarralji Indigenous Ranger Base Partnership Team

In September, 2011, the Bana Yarralji Bubu Indigenous Ranger Base at Shipton's Flat, near Cooktown, Queensland, was officially opened thanks to a landmark collaborative alliance across community, NGO and corporate sectors. This exciting partnership started three years ago with the local Kuku Nyungkal run social enterprise, Bana Yarralji Bubu Inc. contacting the Centre for Appropriate Technology (CAT) to ask for assistance in overcoming challenges with infrastructure upgrades on their community.

## Scoping and Building Partnership

First, a partnership between CAT and Engineers Without Borders Australia (EWB) was developed and leveraged to engage an EWB corporate partner for construction of the infrastructure project through a pro bono tender process. Next, pro-bono support from Aurecon, a large multinational engineering company, was secured to progress the project through a complex planning approval process (which took two years) and onto construction. At the point Aurecon engaged Nick MacDonald to work with CAT in Project Management; a joint partnership was formed between Bana Yarralji Bubu Inc., CAT, EWB and Aurecon. Finally, a team of collaborators including engineers (from Arup), architects (from SKM) and trades (through Indigenous Community Volunteers) converged on Shipton's Flat and worked alongside a local Aboriginal ranger team to build an ablution block, rangers office and establish water and power supply.

## Corporate Partner Outcomes

Key outcomes from this approach to community infrastructure needs include: being able to build at a high quality, consistent with relevant standards and legislation; and reducing the significant technical barriers to livelihood development in a cost neutral manner. "While corporate partners achieve corporate social responsibility goals through exchanging with the community and participating in the project, community members gain hands-on skills in construction techniques, assisting with a build that has resulted in a great sense of pride and ownership" says Andre Grant, project manager, Centre for Appropriate Technology.

## Community Partner Outcomes

Many Indigenous groups are moving towards self-managed ranger programs on country as an appropriate sustainable livelihood activity. These ranger programs are becoming increasingly well supported with funding for wages and on-ground activities. However, a gap exists in sourcing funding for key infrastructure to support people living and working on country in these remote locations. "CAT, Aurecon and EWB's unwavering support … in us in setting up our ranger program and office has given us an opportunity to create a sustainable ranger service business. This has reshaped the lives of some of our rangers and other Nyungkal people. It came at the right time to give us the strength we needed," says Marilyn Wallace, CEO of Bana Yarralji Bubu Inc.

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Centre for Appropriate Technology

aurecon

# References:

[1] United Nations. (2006, July 1). Human Development Report. Available: http://hdr.undp.org/en/media/HDR06-complete.pdf.

[2] United Nations. (2010, July 1). The Millenium Development Goals Report. Available: http://www.un.org/millenniumgoals/pdf/MDG%20Report%202010%20En%20r15%20-low%20res%2020100615%20-.pdf.

[3] Australian Bureau of Statistics. (24 July 2009, Pro Bono Work and Legal Aid. Available: http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/8667.0Main+Features82007-08.

[4] The Partnering Initiative's Partnering Cycle. The Partnering Initiative, a global programme of the International Business Leaders Forum, drives widespread, effective collaboration for a sustainable future through capacity development, action research and direct support to organisations and partnerships. ThePartneringInitiative.org.

[5] Business In The Community. (2011, 25 October). How to develop good relationships with charities. Available: http://www.bitc.org.uk/document.rm?id=12732.

## Photos:

Front Cover: Photo courtesy of The Bana Yarralji Bubu Indigenous Ranger Base Partnership Team.

Page 2: Photo courtesy of Ecoteam.

Page 6: Photo courtesy of Shiptons Flat Project Team.

Page 8: Photo courtesy of Justin Modra.

## Company case studies profiled in the full report:

ARUP, Assetivity, Aurecon, BCA Engineers, Bligh Tanner, BMT, City West Water, Ecoteam, Origin Foundation, SKM, Taylor Thomson Whitting, Wallbridge & Gilbert, Wood and Grieve Engineers, Zor Engineers.

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## Widespread pro bono engineering has the potential to result in:

- Positive social, economic, environmental and cultural outcomes for communities in need.
- Companies embedding pro bono engineering in the way they conduct business so that it becomes part of what engineers 'do.'
- A sector wide cultural shift towards pro bono engineering so that the engagement becomes self-sustaining.
- A culture of socially aware engineers.
- More women in engineering through decreasing the gender disparity.
- General public perception of engineering as a socially responsible profession.

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ARUP aurecon alluvium City West Water ebmpapst GHD

GL Garrad Hassan Lindsay Dynan Origin Foundation SKM WorleyParsons resources & energy Centre for Appropriate Technology