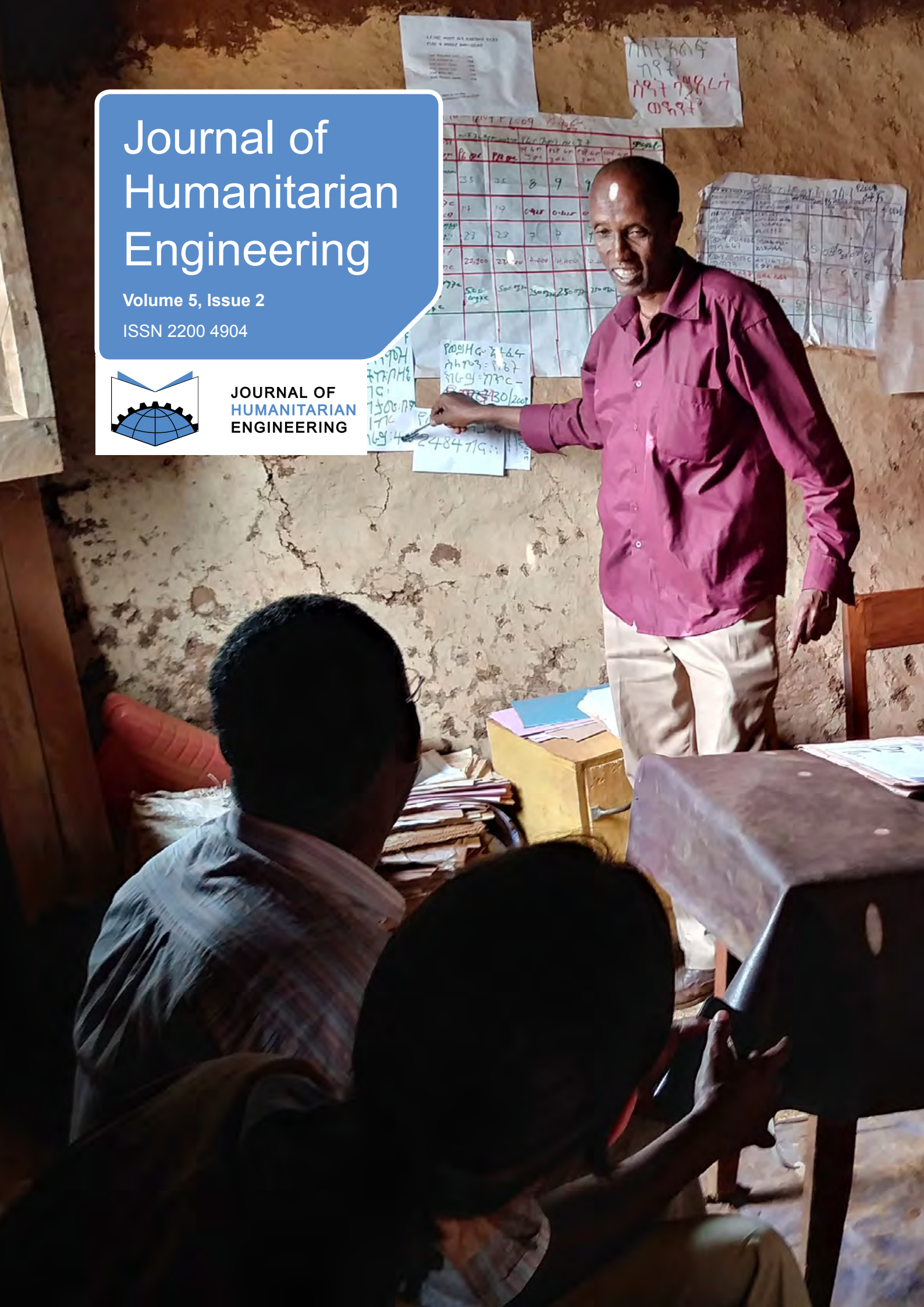

Journal of Humanitarian Engineering

Volume 5, Issue 2

ISSN 2200 4904

JOURNAL OF HUMANITARIAN ENGINEERING

Journal of Humanitarian Engineering (JHE)

The Journal of Humanitarian Engineering (JHE) is an open access publication that publishes outcomes of research and field experiences at the intersection of technology and community development. The field of "humanitarian engineering" describes the application of engineering and technology for the benefit of disadvantaged communities. The field spans thematic areas from water to energy to infrastructure; and applications from disability access to poverty alleviation. The JHE aims to highlight the importance of humanitarian engineering projects and to inspire engineering solutions to solve the world's most pertinent challenges.

For more information, visit: www.ewb.org.au/journal.

PUBLISHING

Engineers Without Borders Australia

INDIGENOUS AUSTRALIAN ACKNOWLEDGEMENT

EWB respectfully acknowledges the Traditional Owners of the Country on which we work.
To learn more about our commitment to reconciliation, read EWB's Reconciliation Action Plan.

Cover photo:
The town water utility in the Southern Nations, Nationalities, and Peoples' Region of Ethiopia manages a water system designed for 2000 people, but due to recent urbanization must shift the distribution to intermittently serve the population of 5100. Mantegabtot Negash, the utility manager, says "with better administration and institutional change, we could have support for our utility so as to fully address the water problems that we are encountering." (Credit: K. Pugel)

JOURNAL OF
HUMANITARIAN
ENGINEERING

Small is Still Beautiful - Appropriate Technology and Humanitarian Engineering
Guest Editorial

I volunteered this Guest Editorial, on the background of humanitarian engineering in appropriate technology and associated philosophy, to present a sense of history to those not around or aware of the activities of the appropriate technology (AT) 'movement' in the later 1960s and 70s. Despite the fact it has been said that "If you remember the '60s, you really weren't there" (although nobody can remember who first said this), and that "appropriate technology is dead", the philosophy and much of the technology that fires humanitarian engineering lives on from the 1960s.

The AT philosophy was epitomised in E.F. Schumacher's *Small is Beautiful: A Study of Economics As If People Mattered* (1973), which champions smaller scale, appropriate technologies to promote sustainable development and empower people. This became one of the most influential books of the 1970s. However, ideas often fail to cross the generations, and many younger engineers are not aware that *Small is Beautiful* was actually a book promoting AT.

I have enough brain cells left from my undergraduate mechanical engineering days in the late 60s and 70s to remember my excitement at discovering AT and the fact that engineering could be vital in addressing the famines, food and energy crises of that time, and got turned on, as they used to say, to AT. I took a year out to go to India and then back to Manchester to do a Masters degree and work in Science and Technology policy. After that I went to work in technology and development at the University of the South Pacific in the 1980s, then to the International Development Technologies Centre at the University of Melbourne, before joining UNESCO in 1993, becoming responsible for the Engineering Programme from 2001 to 2011. My interest in AT continued all along - see *Island Technology: Technology for Development in the South Pacific* (Marjoram, 1994) and *Engineering: Issues, Challenges and Opportunities for Development* (UNESCO, 2010) – the first-ever international report that became one of UNESCO's top publications. I then returned to Australia and the chance to get my hands dirty again. I hope this editorial helps bridge the generation gap with the fascinating background to humanitarian engineering, as best I can remember.

Contrary to some reports, AT is not dead - the idea and technologies are as relevant today as they were in the 1960s, if not more so, given the challenge of climate change, and have also moved on, particularly in response to the need for sustainability. Interest in AT developed in the post-war period of decolonisation and development, against a background of cold war tension and increasing concern for "peace, not war". Appropriate Technology refers to technology and applications that are socially, culturally, economically, environmentally and sustainably appropriate for everybody - "if it's not appropriate for women, it's not appropriate", as emphasised at the Tech and Tools NGO Forum of the World Conference at the United Nations Decade for Women in 1985. Appropriate Technology includes water supply and sanitation, housing, transport and communications, food production and processing and energy systems, such as water pumps, improved toilets and cooking stoves. This contrasts with technology that is inappropriate on these grounds – that may not fit social and cultural values, may be unaffordable for many, may be unsustainable in terms of resource use and or may cause environmental pollution.

Appropriate Technology was also referred to as alternative and intermediate technology, although where AT generally applied to applications around the world, alternative and intermediate technology usually referred to applications in developed countries, particularly environmentally friendly technological alternatives to the development of larger scale industries and nuclear power. Appropriate and alternative technology referred not only to technology, but also to technological choice and the underpinning philosophy and 'movement' that arose. Not for nothing was a seminal book of the time titled *Alternative Technology and the Politics of Technical Change* (Dickson,

1974). The focus on the politics of technical change reveals the increasing interest in technology choice and policy, and the social shaping of technology – while technology shapes society, technology policy also enables the social shaping of technology, in such areas as government support of renewable energy, rather than nuclear power, or the promotion of smaller scale technology appropriate for village development. There was very much a focus on technology 'for the people', rather than for profit. This related to concern regarding the potential negative impact on people of technology for profit, acknowledging that it is not technology that puts people out of work, but the decisions of corporations to develop and use certain technologies.

Appropriate technology developed in the 1970s, with the growth of interest, organisations and publications. One of the stimuli to the development of AT was the publication of *Small Is Beautiful* -as Schumacher noted, "Give a man a fish, and you feed him for a day, teach him to fish and feed him for life ... but teach him to make his own fishing tackle and you have helped him become self-reliant and independent" (1973). Schumacher was one of the founders of Intermediate Technology Development Group (ITDG, UK) in 1966 (which became Practical Action in 2005). Other early organisations included the Swiss Centre for Development Cooperation in Technology and Management (SKAT), German Appropriate Technology Exchange (GATE), Groupe de recherche et d'échanges technologiques (GRET, France), Volunteers in Technical Assistance (VITA, USA) and Technology Transfer for Development (TOOL, Holland). These were joined by others including the Centre for Alternative Technology (UK), Engineers Against Poverty (UK), Appropriate Technology Asia, Appropriate Technology Africa, Program for Appropriate Technology in Health (PATH), Center for Appropriate Technology (GrAT, Austria), Aprovecho (US), Alternative Technology Association and Centre for Appropriate Technology (CAT, Australia), National Centre for Appropriate Technology (US), Appropriate Technology Association (Thailand), the Asian Alliance of Appropriate Technology Practitioners (APPROTECH ASIA). More recent interest includes the increasing number of Engineers Without Borders (EWB) groups around the world. Publications have included books, magazines and journals such as Appropriate Technology and Waterlines, published by ITDG, VITA's *Village Technology Handbook and Appropriate Technology Sourcebook*, 'Undercurrents' (which did much to promote alternative technology in the UK in the 1970s), and the *Whole Earth Catalogue*, published in 1968-72 and onward. Some of the original organisations, magazines and journals continue.

Interest in AT declined in the 1980s, due particularly to cuts in overseas aid and increasing donor interest in free-market structural adjustment and privatisation, as well as hostility due to perceptions of AT as second best, 'poor person's' technology that restricted development, especially in India (where there was a focus on high-tech industrialisation, despite the Gandhian tradition of smaller scale, homespun technology). In recent years, however, India has reversed this view, acknowledging the importance of AT in the village context. Other reasons for the decline related to limited funding and institutional support, difficulties of innovation and technical transfer in tackling rural poverty - while AT was always focused on the grass roots, bottom of the pyramid, this connection was not always made (hopefully open source access to AT knowledge will help bridge this gap). Also, some technologies were less than appropriate in their place of origin, let alone when transferred to other countries and cultures. Whilst AT has attracted alternative thinkers, visionaries and supporters around the world, it is not without its share of egotists and charlatans. This has given AT a bad name, emphasising the need for good technology choice and decision-making.

The market-based approach to technology and innovation to address poverty in the 1980s included such initiatives as International Development Enterprises (iDE), founded in 1981 by Paul Polak, who declared in a 2010 blog that AT was dead. This was somewhat premature, as AT had developed in terms of ideas and technology, with an increasing focus on innovation and the introduction of technology, including marketing, and moved on in the 1980s (see *Small Is Working: Technology for Poverty Reduction*, UNESCO, ITDG, TVE, 2003). As noted, the technology and philosophy is as important today as it was in the 1960s. In the 1980s there was increasing interest in social, cultural, economic and environmental sustainability, with the creation of Ingenieurs Sans Frontieres in France in 1982, and the development of engineering and technical support for humanitarian aid in post-disaster and post-conflict emergencies, with the creation of RedR in the UK in 1980, (see *Engineering in Emergencies: A Practical Guide for Relief Workers*, Davis & Lambert, 2002).

JOURNAL OF
HUMANITARIAN
ENGINEERING

One constraint for the innovation and the introduction of AT related to the availability and communication of information between the AT fraternity and those working at the grass roots. In the 1960s and 1970s this consisted mainly of printed material in magazines and books, mainly in English, that rarely reached the grass roots. The development of the internet in the 1990s provided an ideal platform for the dissemination of information on AT and humanitarian engineering, but this remained a largely unfulfilled promise until the creation of internet open source AT material by groups such as Practical Action, Appropedia, Akvo Foundation, Centre for Alternative Technology, Center for Development Alternatives, Open Source Ecology, Village Earth, Engineers Without Borders and Engineering for Change (E4C) in the US.

Interest in the application and philosophy of AT can therefore be seen to be enjoying a resurgence, with increasing concern regarding the need for sustainability and the development of humanitarian engineering. This is a welcome sign, because the development of humanitarian and sustainable engineers, technology and philosophy is vital if humanity is to address climate change and have a sustainable future on planet Earth. This will require motivation and the development of better links and communication between people, appropriate technologies and associated information and resources, better knowledge of what works in what situations, and importantly, what does not. This in turn will require the development and application of AT choice, transfer and policy. It will also require the greening of engineering, engineering education and institutions and the development and support of AT and humanitarian engineering organisations at national and international levels. It will also require the development of journals such as the Journal of Humanitarian Engineering to encourage the publication and dissemination of such information and ideas.

Tony Marjoram

PhD, CPEngR, FIEAust, MIEEE

References

Davis, J, Lambert, R, 2002, *Engineering in Emergencies: A Practical Guide for Relief Workers*, ITDG Publishing, London.

Dickson, D, 1974, *Alternative Technology and the Politics of Technical Change*. Collins, Glasgow.

Marjoram, T, 1994, *Island Technology: Technology for Development in the South Pacific.* ITDG Publishing, London.

Schumacher, EF, 1973, *Small is Beautiful: A Study of Economics As If People Mattered*. Blond and Briggs, London.

UNESCO, ITDG, TVE, 2003, *Small Is Working: Technology for Poverty Reduction*. UNESCO, Paris.

UNESCO, 2010, *Engineering: Issues, Challenges and Opportunities for Development.* UNESCO, Paris.

Journal of Humanitarian Engineering

Volume 5, Issue 2

ISSN 2200 4904

CONTENTS