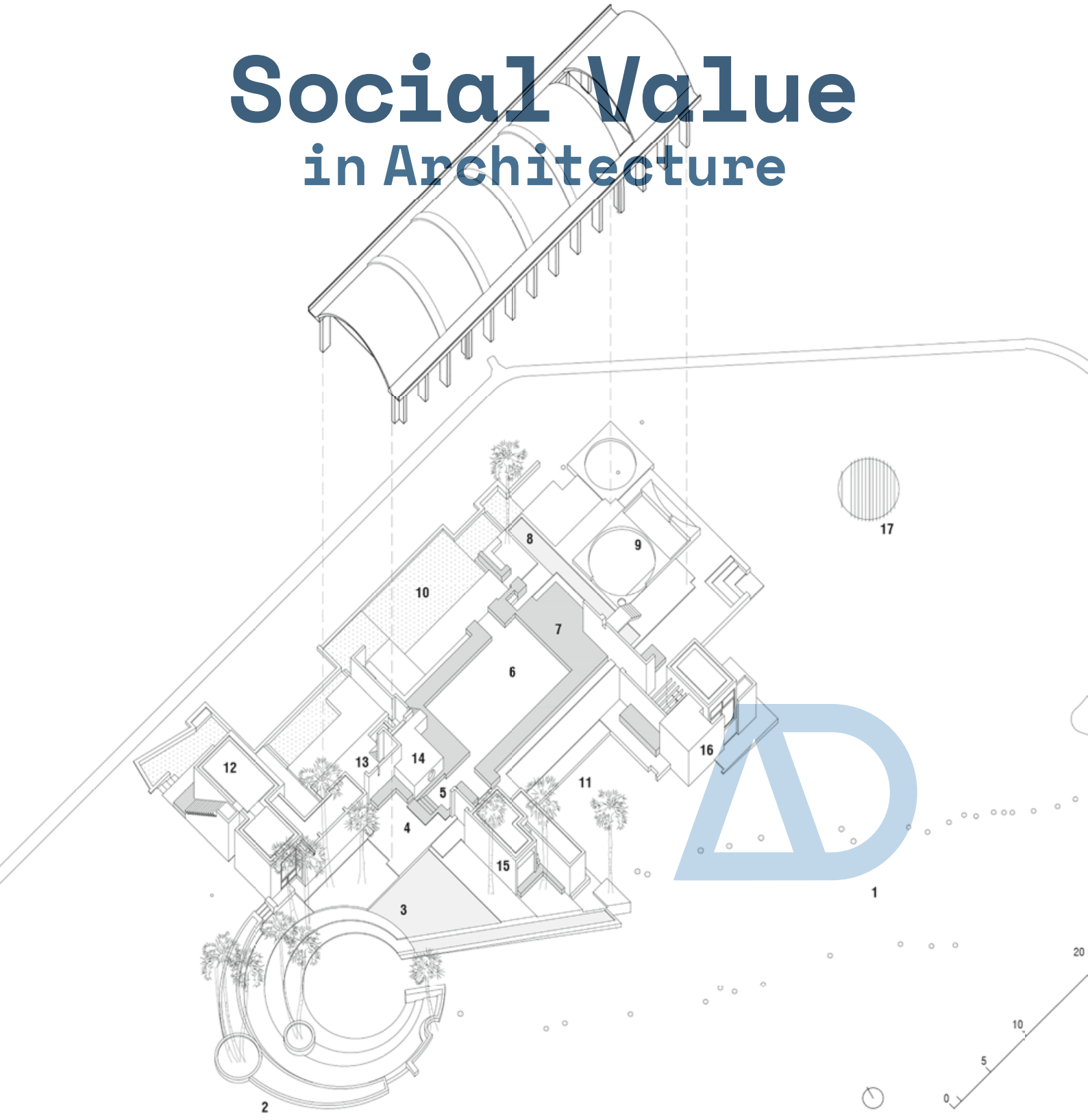
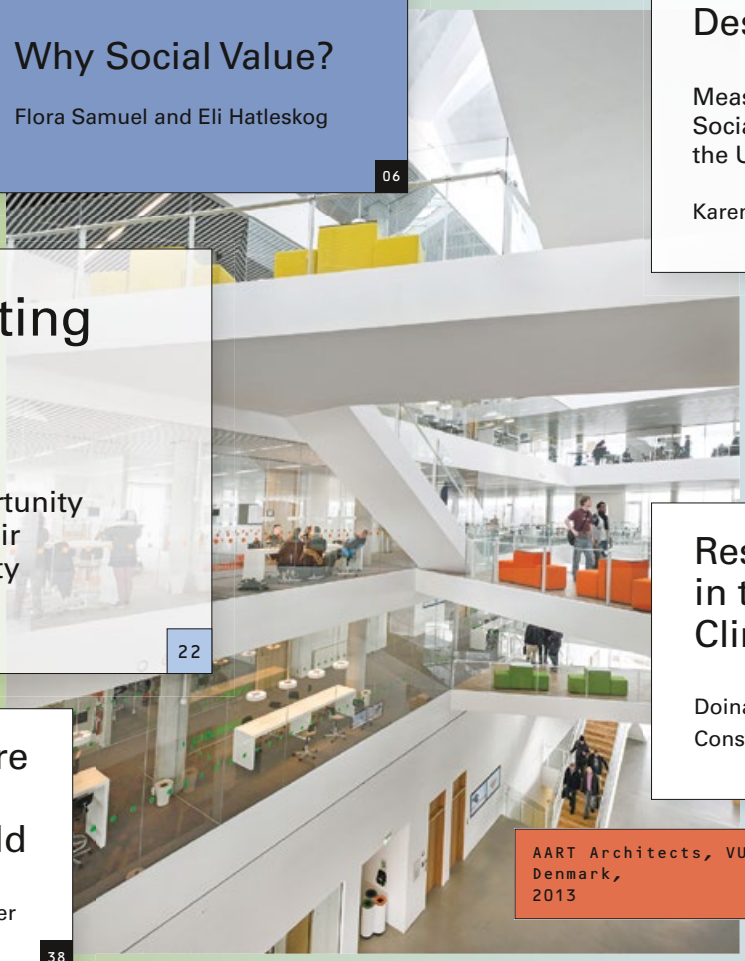
Guest-edited by
FLORA SAMUEL and ELI HATLESKOG

Social Value
in Architecture



04 | Vol 90 | 2020

https://onlinelibrary.wiley.com/toc/15542769/2020/90/4



AART Architects, VUC Syd, Haderslev, Denmark, 2013

MESA community mapping event, Orts Road Estate, Reading, 2019

ISSN 0003-8504
ISBN 978 1119 576440

Guest-edited by **Flora Samuel and Eli Hatleskog**

Edward Ng, Li Wan, Xinan Chi and Wenfeng Bai, Prototype house for Guangming village post-earthquake reconstruction, The Chinese University of Hong Kong and Kunming University of Science and Technology, 2016

Taylor and Hinds Architects, krakani lumi, wukalina-Mount William National Park, Tasmania, 2018

Editorial Offices
John Wiley & Sons
9600 Garsington Road
Oxford
OX4 2DQ

T +44 (0)1865 776868

Editor
Neil Spiller

Commissioning Editor
Helen Castle

Managing Editor
Caroline Ellerby
Caroline Ellerby Publishing

Freelance Contributing Editor
Abigail Grater

Publisher
Paul Sayer

Art Direction + Design
CHK Design:
Christian Küsters
Barbara Nassisi

Production Editor
Elizabeth Gongde

Prepress
Artmedia, London

Printed in Italy by Printer Trento Srl

Journal Customer Services
For ordering information, claims and any enquiry concerning your journal subscription please go to www.wileycustomerhelp.com/ask or contact your nearest office.

Americas
E: cs-journals@wiley.com
T: +1 781 388 8598 or
+1 800 835 6770 (toll free in the USA & Canada)

Europe, Middle East and Africa
E: cs-journals@wiley.com
T: +44 (0)1865 778315

Asia Pacific
E: cs-journals@wiley.com
T: +65 6511 8000

Japan (for Japanese-speaking support)
E: cs-japan@wiley.com
T: +65 6511 8010 or 005 316 50 480 (toll-free)

Visit our Online Customer Help available in 7 languages at www.wileycustomerhelp.com/ask

Print ISSN: 0003-8504
Online ISSN: 1554-2769

Prices are for six issues and include postage and handling charges. Individual-rate subscriptions must be paid by personal cheque or credit card. Individual-rate subscriptions may not be resold or used as library copies.

All prices are subject to change without notice.

Identification Statement
Periodicals Postage paid at Rahway, NJ 07065.
Air freight and mailing in the USA by Mercury Media Processing, 1850 Elizabeth Avenue, Suite C, Rahway, NJ 07065, USA.

USA Postmaster
Please send address changes to *Architectural Design,* John Wiley & Sons Inc., c/o The Sheridan Press, PO Box 465, Hanover, PA 17331, USA

Subscribe to AD
AD is published bimonthly and is available to purchase on both a subscription basis and as individual volumes at the following prices.

Prices
Individual copies:
£29.99 / US$45.00
Individual issues on AD App for iPad:
£9.99 / US$13.99
Mailing fees for print may apply

Annual Subscription Rates
Student: £90 / US$137 print only
Personal: £136 / US$215 print and iPad access
Institutional: £310 / US$580 print or online
Institutional: £388 / US$725 combined print and online
6-issue subscription on AD App for iPad: £44.99 / US$64.99

Front and back cover: Nerea Bermejo Olaizola, Creative Canal drawing in a hypothetical location, 2015. © Drawing by Nerea Bermejo Olaizola of HTA Design LLP, from the London Society White Paper No 2: Building Greater London: www.londonsociety.org.uk/product/white-paper-no2 <http://www.londonsociety.org.uk/product/white-paper-no2>
Inside front cover: Gehl, Times Square intervention, New York City, 2008. Used with permission of the City of New York. © 2009. New York City Department of Transportation. All rights reserved

Page 1: Jateen Lad, Sharanam Centre for Rural Development, near Pondicherry, India, 2016. © Jateen Lad, drawing by Alexandre Rossignol and Arianne Pizem

04/2020

AD ARCHITECTURAL DESIGN

July/August 2020

Profile No. 266

CONTRIBUTORS

Nabeela Ahmed is a postdoctoral research fellow at the Sheffield Institute of International Development (SIID) at the University of Sheffield. She is a critical geographer focusing on precarity, gender and labour in urban settings in the global South, and developing innovative participatory methodologies for understanding these themes. She completed her PhD in 2018 at the University of Sussex, and worked as a postdoctoral research associate for the British Academy-Funded project 'Disconnected Infrastructures and Violence Against Women' at King's College London.

Nicola Bacon is the co-founder of the Social Life enterprise, which focuses on place-based innovation and social sustainability. Until July 2012 she was the Young Foundation's Director of Local and Advisory Projects. She has worked across sectors, in the UK government, as director of a youth homelessness charity, and as Director of Policy at housing charity Shelter. She is a Young Foundation Fellow, a fellow of the Academy of Urbanism, a Design Council Built Environment Expert and a mentor for Bethnal Green Ventures. She is also a member of the Brent Design Advice Panel.

Irena Bauman is a practising architect and a founding director of Bauman Lyons Architects and of start-up fabrication company MassBespoke. She developed the MassBespoke digital fabrication system with Matt Murphy at Bauman Lyons Architects with the support of three Innovate UK research grants. She is currently the holder of the Royal Commission 1851 Fellowship 2018–2019, developing business models for the Built InCommon neighbourhood-based housing fabrication workshops.

Ayona Datta is a professor in the Department of Geography, University College London (UCL) researching gender citizenship, urban futures and smart cities in the global South. She is author of *The Illegal City: Space, Law and Gender in a Delhi Squatter Settlement* (Ashgate, 2012), and co-editor of *Translocal Geographies: Spaces, Places, Connections* (Ashgate, 2011) and *Mega-Urbanization in the Global South: Fast Cities and New Urban Utopias* (Routledge, 2016). She is editor of the *Urban Geography* journal and on the editorial boards of *Antipode, Digital Geography and Society* and *EPD: Society and Space.*

Cristina Garduño Freeman is an early career academic focused on understanding, evaluating and designing for people's connection with places. Her research contributes to the fields of architectural history, critical heritage and digital humanities through the discourses of reception, place attachment, social value and participatory culture. She is the author of the book *Participatory Culture and the Social Value of an Architectural Icon: Sydney Opera House* (Routledge, 2018). She has also practised professionally in architecture, landscape architecture and urban design, and in visual communication design.

Paul Goodship is a data scientist at Atkins, where he models and analyses built-environment data. Until the beginning of 2019 he worked for Social Life as a researcher, focusing on placemaking in London. In 2018 he completed a PhD in urban morphology and socio-spatial analysis within the Space Syntax Laboratory at University College London (UCL). His thesis explored the role of spatial connectivity in the upgrading process of informal settlements, and how this transformation alters local commercial and movement activities, researched through the case of Medellín, Colombia, and its urban cable-car intervention.

Kerry Harker is the founder and Artistic Director of the East Leeds Project. She was formerly co-founder and Artistic Director at The Tetley, a contemporary art space in the city. She is also currently a final-year PhD candidate in the School of Fine Art, History of Art and Cultural Studies at the University of Leeds, where her research considers artist-led initiatives in the UK's visual arts sector since the 1990s.

Mat Hinds is a Tasmanian-based architect and the founding director of Taylor and Hinds Architects, which he established with Poppy Taylor in 2013. He has held lecturing positions at his alma mater, the University of Tasmania, since 2009. In 2019 he was a juror for the Australian Institute of Architecture National Architecture Awards programme. Through original and strategic design thinking, Taylor and Hinds has established a national reputation for context-specific work that is conceptually rigorous, tectonically refined and functionally considered. In 2018, its krakani lumi eco-tourism project in Tasmania was awarded the Best Building in the Asia-Pacific at the INDE Design Awards.

Anthony Hoete is the founder of WHAT_ architecture based in East London. Editor of the spatial mobility book *ROAM* (Black Dog Publishing, 2004), his practice-based research Game of Architecture posits that architecture today is a much-contested field of guidelines and regulations. In order to thwart professional marginalisation and to change the game, architects must be active in both rule disruption through interrogation and interpretation, and change their role through increasing adaptability. To this end, the Game of Architecture Ltd is now acting as managing contractor and developer in the construction of a newbuild residential block in Peckham.

Tara Kennedy practises and teaches architecture, with expertise in collaborative public projects, engaging with a wide range of organisations and institutions. She graduated with a Master's in architecture from University College Dublin (UCD) in 2013. She also has a BA in sculpture from the National College of Art and Design, Dublin. Working with John McLaughlin Architects since 2014, she coordinated the 'Making Ireland Modern' centennial exhibition in 2016. In 2008 she co-founded the practice Culturstruction, and was also a co-founder of the community-based design organisation Commonage. She was co-curator of Free Market, the Irish Pavilion at the 2018 Venice Architecture Biennale. She is a lecturer at the Cork Centre for Architectural Education.

Karen Kubey is an urbanist specialising in housing and health, and a Faculty Fellow in Design for Spatial Justice at the University of Oregon. She is the guest-editor of Δ *Housing as Intervention: Architecture Towards Social Equity* (July/August 2018), and served as the first executive director of the Institute for Public Architecture. Holding degrees in architecture from the University of California, Berkeley and the Columbia University Graduate School of Architecture, Planning and Preservation (GSAPP), she began her career as a designer of below-market housing. She has received support from the New York State Council on the Arts and the MacDowell Colony.

Jateen Lad is an architect based in Manchester, UK and Pondicherry, India. His work is guided by a belief that good architecture and ethical construction practices can be a force for social change. He set up in the aftermath of the 2004 Indian Ocean tsunami and brings a holistic approach integrating bespoke architecture, environmental design, construction management and the delivery of buildings in a socially empowering manner – often in challenging contexts where design skills are most needed.

Mhairi McVicar is a Reader at the Welsh School of Architecture, Cardiff University, and is Academic Lead of Community Gateway, a platform that facilitates long-term partnership projects between the university and the city's Grangetown district. Following BSc studies in the UK and a US Master's, she practised in Chicago and worked on architectural projects in London and the Orkney Islands. Her research examining the pursuit of architectural quality within the processes of professional architectural practice has been published in *Architectural Research Quarterly*. She is the author of the book *Precision in Architecture: Certainty, Ambiguity and Deviation* (Routledge, 2019).

Aoibheann Ní Mhearáin is a practising architect and academic. She was educated at the UCD School of Architecture and Princeton University, and is Associate Director at John McLaughlin Architects. She is an assistant professor at the UCD School of Architecture, Planning and Environmental Policy. Her essay on St Brendan's Community School in Birr, published in *InfraÉireann: Infrastructure and the Architectures of Modernity in Ireland* (Ashgate, 2015) provided the starting point for the Getty-funded research on the school, which she has been co-ordinating since its award in 2018. She was a participant in the 2018 Venice Biennale in the group exhibition 'Close Encounters'.

Jenni Montgomery is the Business Development Director at Barton Willmore, the largest independent planning and design consultancy in the UK. Her role includes identifying market challenges and growth opportunities, and driving innovation that enables all aspects of the practice to respond to these. She has been intrinsic in the Greenkeeper development programme from the successful, original bid for grant funding, to commercialisation and preparation for launch in 2020. Greenkeeper lies at the heart of Barton Willmore's approach to urban and new settlement planning and design, but the collaborative approach has allowed all to benefit from emerging methods at the forefront of social value measurement.

Edward Ng is an architect and Yao Ling Sun Professor of Architecture at the School of Architecture of the Chinese University of Hong Kong. He specialises in green building, environmental and sustainable design, and urban climatology for city planning. In early 2014, noting the cultural and socioeconomic needs of remote villagers in Southwest China, he established the One University One Village initiative to continue his humanitarian work with his students. He believes that knowledge creates the future, and it is the responsibility of academia to chart this future.

Constantin Petcou is an architect and semiologist, and a co-founding member and director of atelier d'architecture autogérée (aaa). He has coordinated numerous research, urban and architectural projects in the field of strategic design and participative architecture, including R-Urban, CivicLine and Wiki Village Factory. His work with aaa has been exhibited at the Museum of Modern Art (MoMA) in New York, the Venice Architecture Biennale, Pavillon de l'Arsenal in Paris and Canadian Centre for Architecture (CCA) in Montreal, and has received numerous distinctions and awards including the Building4Humanity prize for resilient building (2018), European Prize for Political Innovation (2017), Curry Stone Design Prize (2013) and European Prize for Public Space (2012).

Doina Petrescu is Professor of Design Activism at the University of Sheffield, and a co-founding member of atelier d'architecture autogérée (aaa). Her research concerns issues of gender, co-production, resilience and urban commons in relation to architecture. Her publications include *Architecture and Resilience* (2018), *The Social (Re)Production of Architecture* (2017), *Altering Practices: Feminist Politics and Poetics of Space* (2007) and *Architecture and Participation* (2005), all published by Routledge.

Peter Andreas Sattrup is a Danish architect, Senior Advisor on Sustainability at the Danish Association of Architectural Firms, and a board member of the Green Building Council Denmark and the Sustainability Work Group of the Architects' Council of Europe. He is dedicated to documenting and communicating how architecture creates social, environmental and economic value, and works with policymaking, innovation and development within the construction sector. He is the prize-winning lead author of *ARCHITECT – Document Your Value Creation*, a guide to how architects can document the value of their work and create new business opportunities.

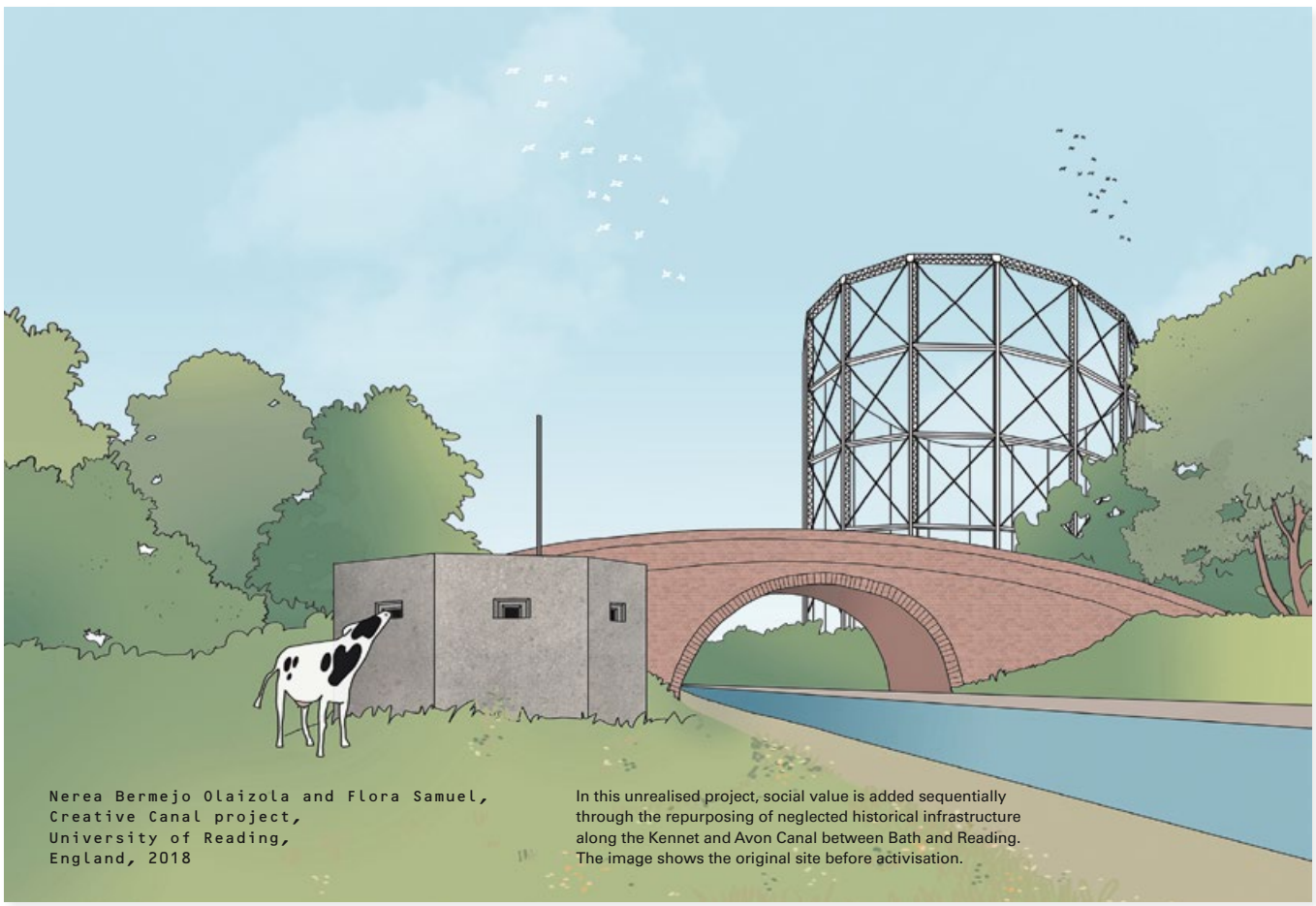
Neil Spiller is Editor of Δ, and was previously Hawksmoor Chair of Architecture and Landscape and Deputy Pro Vice Chancellor at the University of Greenwich, London. Prior to this he was Vice Dean at the Bartlett School of Architecture, University College London (UCL). He has made an international reputation as an architect, designer, artist, teacher, writer and polemicist. He is the founding director of the Advanced Virtual and Technological Architecture Research (AVATAR) group, which continues to push the boundaries of architectural design and discourse in the face of the impact of 21st-century technologies. Its current preoccupations include augmented and mixed realities and other metamorphic technologies.

Li Wan is a research associate at the School of Architecture of the Chinese University of Hong Kong. She specialises in sustainable building design and assessment systems in poor rural areas of China. She is also a co-founder and the CEO of the One University One Village initiative. The team's rural projects have received numerous international awards including the UNESCO Asia Pacific Awards for Cultural Heritage Conservation, Terra Award, AR House Award and World Architecture Festival Building of the Year.

Why Social Value?

INTRODUCTION

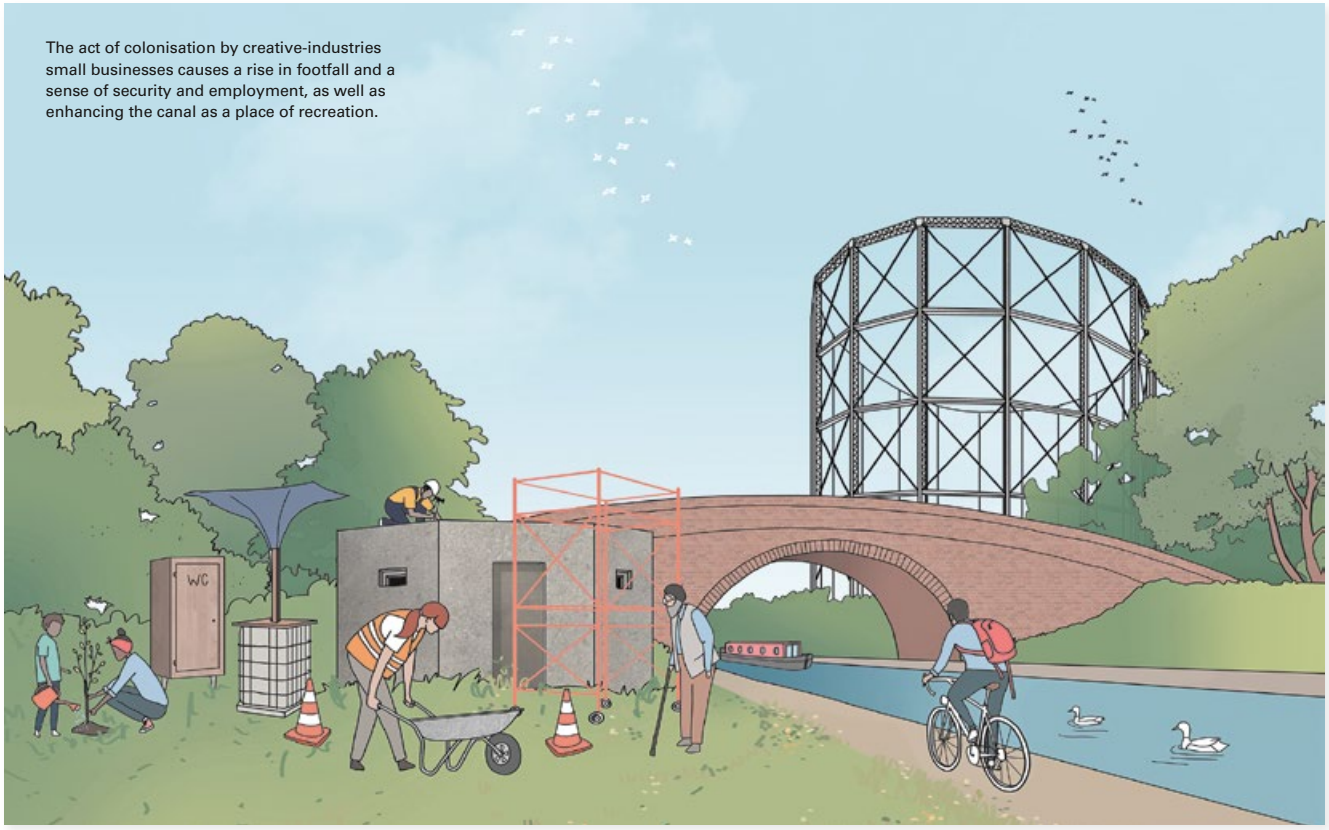
FLORA SAMUEL AND ELI HATLESKOG



Nerea Bermejo Olaizola and Flora Samuel, Creative Canal project, University of Reading, England, 2018

In this unrealised project, social value is added sequentially through the repurposing of neglected historical infrastructure along the Kennet and Avon Canal between Bath and Reading. The image shows the original site before activisation.

The act of colonisation by creative-industries small businesses causes a rise in footfall and a sense of security and employment, as well as enhancing the canal as a place of recreation.



Some of the potential social value generated by the repurposing of 19th-century infrastructure for 21st-century industry and community.

As societies face impending challenges relating to climate change, densification and social upheaval, now is an opportune moment to discuss what we value most and how architects and architecture can play a role in improving people's lives. If architects are to reverse their current trajectory into the margins of an increasingly 'lean' and economically driven construction sector, it is important to reflect on the value of architectural design. This issue of AD explores the meaning and potential of social value as an instrument of change in the built environment.

It includes a range of case studies from across the globe of architects who are developing methodologies for creating, measuring and mapping social value, arguably the most intangible and important impact of architectural activity. The first two articles, by Karen Kubey (pp 14–21) and Peter Sattrup (pp 22–9), provide important contextual reviews of the social value scene in the US and Denmark, respectively. The following contributions explore the mapping and measuring of the social value of communities using different methodologies and media that converge on its cultural dimension, and the concluding articles act as a timely reminder that social value is a neoliberal construct that does not necessarily translate to authentic cultures of respect and love.

Baseco,
Manila,
The Philippines,
2016

below: Children sifting through waterborne rubbish in floodwater caused by extreme weather conditions. Architects and architecture can assist in alleviating these conditions.

bottom: The devastating social and environmental impact of climate change on communities. Architects have an ethical duty to consider the impact of their actions on people near and far.

Valuation

'If we cannot define what we mean by value, we cannot be sure to produce it, nor to share it fairly, nor to sustain economic growth.'[1] The economist Mariana Mazzucato provides a compelling critique of valuation practices across the globe, making an important distinction between value creation (for example, the work of the public sector for public good) and value extraction (financial gain from the trading of stocks and shares). 'Value' is a contradictory word. Like the architectural concept of 'transparency', it can be a tool for accountability and inclusion, but also a medium of control. Where value is mentioned, audit follows, and this always begins with classification – a 'powerful' technology that is both 'political and ethical'.[2]

While architects have a cultural aversion to seeing themselves as an increment of economic gain, they create value that they very often fail to record or capture. Until this value is expressed in a format that can be fed into policy and procurement, it will remain invisible and ignored, leaving economic value the sole dominant currency of built environment transactions. Though definitions may be limiting, they are necessary at this point in time to 'externalise' and make known the knowledge of architects.

Design value is widely accepted to be the sum of environmental, economic and social value,[3] in other words the commonly used 'triple bottom line' of sustainability. While environmental value is generally measured in embodied and operational carbon (sometimes with the addition of biodiversity), and there are existing practices (albeit flawed) for measuring economic value, there are no agreed measures of social value.

Flora Samuel and Eli Hatleskog,
Design value constituents,
2018

The triple bottom line of sustainability. Architects need to be clear about types of value generated by architecture or run the risk of being ignored by decision-makers.

Defining Social Value

Geoffrey C Bowker and Susan Leigh Star note in their book *Sorting Things Out: Classification and Its Consequences* (1999) that orderings are always culturally and temporally specific and therefore need to be constantly under review. They call for a new form of information science that mixes 'formal and folk classifications'.[4] Such is the ordering that is posited here. Social value has much in common with 'resilience', which can be understood as a transformative condition that allows us not only to adapt, but also to transform and reinvent our society towards a more balanced, more equitable way of living on Earth.

It is difficult to say what social value is, but you know it when you see it. For the purposes of this Δ, it is understood to relate to the wellbeing generated through the procurement of buildings and places, sometimes quantified. It has five overlapping dimensions. The first is the creation of jobs and apprenticeships, the version that has become a standard requirement of procurement in the UK and tends to be quite a blunt, tickbox-type exercise. Filling in the social value section in pre-qualification questionnaires (PQQs) and invitations-to-tender (ITTs) in the UK takes considerable expertise, experience and time, which is why larger organisations are often better at it, ironically excluding the smaller companies that social value legislation was designed to protect.

Flora Samuel and Eli Hatleskog,
The five overlapping dimensions of the social value of architecture,
2020

Architecture generates social value in multiple ways, but these are poorly understood.

It is important for construction teams to create jobs and training that deliver widespread long-term benefits to an area, both economic and social, as can be seen in Li Wan and Edward Ng's article on the benefits of utilising local technologies within village communities in China (pp 74–81). Similarly, Irena Bauman and Kerry Harker (pp 38–45) chart the development of Built InCommon, a network of neighbourhood-owned fabrication workshops designed to promote widespread innovation at a local scale. This is also a powerful theme in Doina Petrescu and Constantin Petcou's discussion of atelier d'architecture autogérée's R-Urban strategy (pp 30–37).

The second dimension of social value is the wellbeing generated by the design of a building or place – connecting inhabitants, promoting freedom and flexibility, encouraging positive emotions (for example, through exposure to nature) and meaningful engagement by allowing people a say in the design of their environments. The third dimension is the learning generated through construction. Jateen Lad's Sharanam project outside Pondicherry in India (pp 82–7) provides an exemplar of how communities can be involved in construction, acquiring new skills while creating a building that works well environmentally and facilitates contact with the natural environment.

Fourthly, there is social value in the learning that takes place when local people are involved in the design of their environment. Building a building should be a relationship, not an affair – an evocative metaphor delivered by the Grangetown community about a Community Asset Transfer bowls pavilion project in Cardiff, Wales, as discussed by Mhairi McVicar in her article (pp 46–51). It is not just about the building though; the real asset being transferred is the knowledge and confidence to make change, which is a two-way street between the community and the professional team.

As well as assisting with the design of their built structures, communities are increasingly also being involved in their construction. Building collectively was once traditional, and still is in some parts of the world. This empowering experience has been locked into the curriculum of architecture students at the University of Reading in Berkshire, UK. Their Urban Room, developed with Invisible Studio architects, was realised in 2019 and longlisted for the RIBA MacEwen Award for 'architecture for the common good'. Made as a temporary art venue, it was later dismantled and rebuilt in the grounds of a local primary school.

The last, much neglected dimension of social value is the benefit of building with local materials and typologies, and in doing so creating local jobs. Going against the grain of legislation and procurement, this is something that UK-based practice ADAM Architecture works hard to achieve, for example in their Nansledan ongoing extension to the town of Newquay in Cornwall.

What, then, is the appropriate response for an architect when a community values things other than architecture? This issue is problematised by Anthony Hoete in his article on the Māori *whare* (house) (pp 112–19), and is a conundrum faced by Mat Hinds in his contribution on the design of the Krakani Iumi centre for eco-tourism in the cultural homelands of the palawa-pakana, the first peoples of Iutruwita (Tasmania) (pp 120–27).

Capturing Social Value

The UK policy context is an exemplar of why social value is growing in traction in governments across the world. Since the advent of the Social Value Act 2012 and the Future Wellbeing of Generations (Wales) Act 2015, it has been gaining significance as a requirement of procurement, contracts and planning in the public sector.[5] Commonly expressed as the social value of the

As well as assisting with the design of their built structures, communities are increasingly also being involved in their construction

Invisible Studio,
Coppice Workers' Shelter,
Westonbirt Arboretum,
Tetbury, England,
2019

Making as connecting – empowering people and delivering new skills through the design and construction of simple structures.

Invisible Studio,
Urban Room,
School of Architecture,
University of Reading,
England,
2019

Co-designed and built with students as a forum for conversation, the project delivers multiple dimensions of social value.

Building collectively was once traditional, and still is in some parts of the world. This empowering experience has been locked into the curriculum of architecture students at the University of Reading in Berkshire

ADAM Architecture,
Nansledan,
Newquay,
England,
2013–

Designed for the Duchy of Cornwall, this urban extension scheme adds social value through the use of local materials and details, but this takes tenacity from both architect and client as it works against the grain of current project delivery.

process and not the product, there is, however, growing consensus on the wellbeing impact of design and placemaking,[6] particularly now that 'social prescribing' is becoming such an integral part of National Health Service activity.[7] COVID-19 has brought the impact of places and the way they are designed into relief.

Organisations such as the Housing Associations' Charitable Trust (HACT) have been developing social value proxies for use by housing associations and local authorities to collect information on their portfolios, but as yet there are no mechanisms to capture the social value of design specifically, or to consider how it might be captured spatially. This is why independent research organisation Social Life's work on evaluating neighbourhood wellbeing, as discussed in Nicola Bacon and Paul Goodship's article (pp 60–67), is so significant.

The Social Value Toolkit for Architecture, developed bottom-up by the University of Reading with the London-based Research Practice Leads (RPL) group and published by the Royal Institute of British Architects (RIBA), is the first to offer architects a methodology for the monetisation of social value through the use of social return on investment (SROI), a technique that is gaining considerable traction across the UK and beyond.[8]

Post-occupancy evaluation (POE), returning to a building or place after it has been in use to find out how well it is performing, rarely happens, but is crucial for the measuring and mapping of intangible impacts such as social value, as well as the more tangible, for example energy performance. The boundaries between POE, conservation and history are blurred in Aoibheann Ní Mhearáin and Tara Kennedy's insightful study of St Brendan's, a 1960s community school in Ireland (pp 94–103). That the issue of scale is important can also be seen from Ayona Datta and Nabeela Ahmed's examination of gender safety and public infrastructure in the city of Thiruvananthapuram in India using participatory techniques as well as crowdsourced mapping to create a rich and inclusive account of women's experiences (pp 104–11).

New technologies, if used in an ethical and critical way, are set to make the capturing of social value much easier in the near future

New technologies, if used in an ethical and critical way, are set to make the capturing of social value much easier in the near future. There has been a surge of interest in data across research-led architecture practices in the last year. Jenni Montgomery's discussion of Greenkeeper, a pioneering digital platform that uses mobile phone data to monitor the usage of green space, provides an important illustration of a new type of innovation that is taking place in practice (pp 68–73). In her article, not only does Cristina Garduño Freeman chart social media traffic to measure the impact of the Sydney Opera House on Australia's identity, culture and economy, she also forensically captures the cumulative impact of stuff, the millions of fridge magnets, tea towels, bags and ephemera that celebrate its image across the globe (pp 88–93).

Why is Social Value Important?

Categorisation, the clustering of information, is the infrastructure of our 'built moral environment'.[9] Setting to one side the obvious ethical imperative to make buildings that are good for people (and by implication the planet), there are some important practical reasons to define and measure change in social value quantitively as well as qualitatively in an increasingly data-driven environment. We need to find ways to capture intangible impacts or they will not figure in future city models, BIM, parametric design, the assessment of project bids, the calculation of insurance premiums or outcomes-based building procurement in the delivery.[10] A multitude of tools are emerging within other disciplines to assist with this process, several of which are discussed in this issue, but it would be better if architecture could develop its own, to avoid becoming marginalised from the debate altogether. Leadership is urgently needed to communicate the role they play in generating social value in the built environment. AD

Notes

1. Mariana Mazzucato, *The Value of Everything: Making and Taking in the Global Economy*, Allen Lane (London), 2018, p xix.
2. Geoffrey C Bowker and Susan Leigh Star, *Sorting Things Out: Classification and Its Consequences,* MIT Press (Cambridge, MA), 1999.
3. Bilge Serin *et al, Design Value at the Neighbourhood Scale,* UK Collaborative Centre for Housing Evidence, 19 November 2018: http://housingevidence.ac.uk/publications/design-value-at-the-neighbourhood-scale/.
4. Bowker and Leigh Star, op cit.
5. UK Green Building Council, *Driving Social Value in New Development: Options for Local Authorities,* 2019: www.ukgbc.org/wp-content/uploads/2019/03/UKGBC-Driving-social-value-in-new-development-Options-for-local-authorities-1.pdf.
6. Design Council and Social Change UK, *Healthy Placemaking,* April 2018: www.designcouncil.org.uk/sites/default/files/asset/document/Healthy_Placemaking_Report.pdf.
7. NHS England, *Healthy by Design: The Healthy New Towns Network Prospectus,* 2018: www.england.nhs.uk/wp-content/uploads/2018/01/healthy-by-design-healthy-new-towns-network-prospectus.pdf.
8. Flora Samuel *et al, Social Value Toolkit for Architecture,* Royal Institute of British Architects (London), 2020: www.architecture.com/knowledge-and-resources/resources-landing-page/social-value-toolkit.
9. Bowker and Leigh Star, *op cit,* p 32.
10. Flora Samuel, *Why Architects Matter: Evidencing and Communicating the Value of Architects,* Routledge (London), 2018.

High Science and Low Technology for Sustainable Rural Development

Li Wan and Edward Ng

Houses of Guangming village, Yunnan province, China, after the earthquake, 2014

Most of the traditional rammed-earth houses were seriously damaged by the earthquake.

Is it possible to mitigate the poor housing, poor safety and lack of dignity of the population in vast areas of rural China without adding to the environmental load? Co-founders of the One University One Village initiative **Li Wan and Edward Ng,** of the School of Architecture at the Chinese University of Hong Kong, believe that it is, and describe their activities to this end in these regions.

‘Architecture is a tool to improve lives.’

— Anna Heringer[1]

Daily life in poor rural areas of China can be quite different from that in urban areas. There are 14 contiguous destitute areas in China.[2] Children in these areas may face challenges such as living in mountain villages with poor transportation and little access to education. The agricultural income of families is low due to poor environmental conditions and frequent natural disasters. Old houses, which were built decades ago using local natural materials and manpower, have become uncomfortable and unsafe to live in. Residents’ only hope is to rebuild their houses using brick, steel and concrete that need to be brought from other locations and transported into the village. To earn enough money to pay for construction materials and hire a construction team, parents have to leave their homes to become migrant workers in cities. Hence, children are left alone with their grandparents. Eventually, these children develop the same desire to leave the village when they grow up.

China has a vast territory and a large population of 1.39 billion. Rural construction and development is a key issue in China – as of 2017, 41.48 per cent of the population were living in rural areas.[3] Under a series of top-down rural support and development policies since 2005, the government has increased funding for rural infrastructure, such as roads, irrigation, water supply systems, power supply systems, communication systems and biogas.[4] The country’s rural areas have been subjected to rapid development and construction. In those which have relatively convenient transportation, the modernisation development model has significantly improved quality of life and urban–rural integration.[5]

Conventional new buildings, which use industrial materials, are usually unaffordable to poor rural residents. Even when people borrow money to improve their buildings, the quality and performance remain unsatisfactory because of unfamiliarity with modern design and construction practices. A large amount of rural construction with industrial materials can lead to a sharp increase in energy consumption and consequent environmental load. Moreover, top-down planning and construction, which often lack public engagement and consideration of the actual needs of villagers, have led to a reduction of cultural identity and sense of belonging.[6]

Xuefeng He, an expert on rural policy and management, has observed that large-scale, mechanised cultivation is unsuitable for poor rural areas, especially mountainous ones, where land is divided into small pieces. Most rural residents who work in urban areas still want to return to their rural hometowns upon reaching old age because urban areas cannot provide a decent life for them, given the current level of urban development. Chinese rural development needs to provide economic and social support to small-scale peasant economies and aged farmers. He also argued that the aim of Chinese sustainable rural development should be to provide a proper rural living environment, where most rural residents can live a decent life, rather than bringing rural residents’ standard of living up to urban levels.[7]

Influenced by rural development at home and abroad, in 2013 the Chinese government proposed the construction of The Beautiful Countryside, which stressed the value of the natural environment and local culture.[8] In 2015, China’s State Council launched a series of specific poverty alleviation strategies, which consider environmental prevention, local resident empowerment and endogenous development.[9] In this way, the rural development model has become increasingly diversified and humanised.

The Significance of Socioeconomic Value in Rural Development

Research has shown that socioeconomic value is crucial in sustainable rural construction and development. In most poor rural areas, including the 14 contiguous destitute areas mentioned above, the main problem is not high energy consumption and carbon emission, as the environmental load of traditional houses built using local natural materials and manpower is low. The real problem is how to improve the safety, quality and dignity of the living environment without adding substantial environmental load. Raising hundreds of millions of people’s standard of living can lead to a considerable environmental load if the wrong strategy is adopted.

Relying on external funds, non-local industrial materials and high technologies can cause huge environmental risks to poor rural areas. It is unrealistic for rural residents to stay in their village and contribute to the local development if they have no confidence in their local resources, lifestyles and abilities. Even if a new farmhouse can be built with external funds and support, villagers will still try to get rid of everything ‘local’, which in their mind represents poverty. Only by endogenous development which values local resources, local technologies and local culture can villagers see a bright future for their homes.

Choosing appropriate building materials, building technologies and construction workers is crucial and tricky in poor rural areas. While the architectural form and total construction cost is important, the architect must also consider bioclimatic design, the proportion of material costs to labour costs, the source of materials and workers (an important aspect of social value) and the operability of building technology.

Practice and Experience from Guangming Village

Guangming village is located in a mountainous region in Yunnan province – one of China’s 14 contiguous destitute areas. Most of its houses were built decades ago out of rammed earth. Indoor spaces were dark and poorly ventilated because of the limited building height and window openings that this traditional construction method entails. When a 6.1-magnitude earthquake seriously damaged 90 per cent of these buildings in August 2014, the villagers lost confidence in them.

Similarly to most rural residents, the Guangming villagers needed to make a choice between local vernacular and modern brick-concrete building methods during the post-earthquake reconstruction. Most chose the latter, even though it was

expensive. The reason behind this was a lack of knowledge and motivation to innovate amongst the local craftsmen because a substantial number of them had chosen to become migrant workers in urban areas. The urban lifestyle has influenced people's views of vernacular architecture. Most rural residents thought that earthen buildings indicated poverty. Moreover, high-speed top-down rural construction built with external capital has limited the time and space available for innovation with local traditional methods.

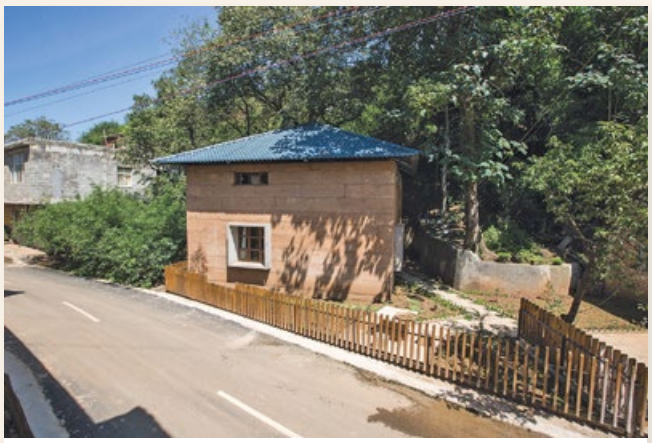
The post-earthquake reconstruction project in Guangming village was developed in response to this situation. Its aim was to improve upon the traditional rammed-earth building method to provide a safe, economical, comfortable and sustainable reconstruction system which the villagers can afford, own and pass on, and which focuses on seismic capacity, thermal comfort and cost-effectiveness. It was organised by the One University One Village (1U1V) rural programme of the Chinese University of Hong Kong (CUHK), which was financed by the Chan Cheung Mun Chung Charitable Fund. The project was supported by Kunming University of Science and Technology (KUST) and the University of Cambridge in terms of seismic performance improvement.

To achieve systematic and sustainable rural reconstruction work with innovative ideas, scientific research is essential in order to understand the context and identify the problem. On the basis of a literature review of earthen building technology[10] and a study of weak points of local traditional rammed-earth houses, several innovations including building structure optimisation, soil composition optimisation, and construction tools improvement were proposed to improve seismic performance. A series of mechanical property tests and shaking table tests were conducted to validate the innovative technology. Results reveal that the seismic performance of the new rammed-earth building has significantly improved, thus fulfilling the local seismic codes perfectly.

To promote endogenous development and empower residents, a prototype house was designed for an elderly couple based on all the research and testing that had gone before. It was then built by locals, between December 2015 and April 2016. Villagers can learn about the new technology, understand the construction costs, and appreciate the building quality directly, by themselves. Basic human needs, such as safety and comfort, are highlighted in the project to allow the residents to feel cared for and respected. Locals then become more willing to try to participate in the testing and training. Furthermore, they can easily feel and understand the benefit of the innovative technology after the completion of the demonstration project. This process is essential for the villagers to accept the innovative technology.

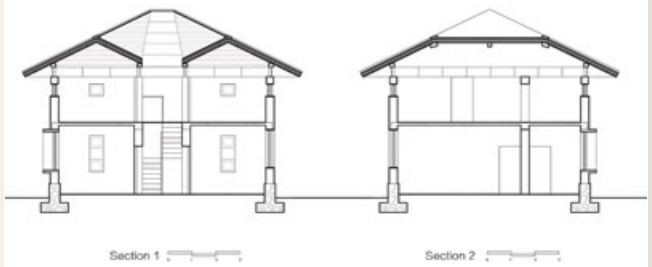
The architectural design of the house has also been carefully considered to fit the rural lifestyle. Bioclimatic design with recycled materials gathered from local ruins can ensure high building performance and low environmental load. The semi-outdoor atrium can provide a comfortable and artistic living environment for the couple, with a skylight and cross-ventilation. In addition to the thermal mass of the thick earthen wall, the double-glazed windows and insulated roofs further improved the building's thermal performance. Multifunctional spaces in the upper floor, which can be used

Edward Ng, Li Wan, Xinan Chi and Wenfeng Bai,
Prototype house for Guangming village post-earthquake reconstruction,
The Chinese University of Hong Kong and Kunming University of Science and Technology,
2016



All architectural elements were properly designed, thereby resulting in a natural and desirable atmosphere in harmony with the surrounding environment and the local cultural heritage. Contrasting with the brick house next to it, this house allows the villagers to recall the traditional construction system and local culture.

The building is integrated with semi-outdoor spaces to provide a comfortable and artistic living environment for the resident elderly couple, Mr and Mrs Yang. Its design is simple and easy to implement based on the current technology and the ability of villagers.



The semi-outdoor atrium has natural cross-ventilation and a skylight for daylighting. Double-glazed windows and insulated roofs were used to improve the building's thermal performance. A steel roof structure and aluminium alloy windows were employed to increase building quality and airtightness.

as storage rooms, guest rooms or workplaces, have been provided to adapt to the villagers' agricultural production activities and rural lifestyles. Again, the building design is simple, and can be easily understood and implemented on the basis of villagers' existing knowledge and ability.

Local Material, Local Technology, Local Labour

The response to the specific historical context of Guangming village has not been to imitate the form of the local traditional buildings but to regenerate local culture by following the principle of '3L': local material, local technology and local labour. It attempts to rekindle the endogenous vitality of traditional architecture rather than maintain the appearance of traditional architecture without consideration of residents' new physical and social needs. Instead of promoting the benefits of imported bricks and concrete, the project team addressed the shortfalls of traditional rammed-earth technology and the fragility of village life in situ. The easiest way to teach the technology to villagers is to innovate on the basis of the technology they are already familiar with. It is the '3L' principle that makes the project not only 'a project in the village', but more importantly, 'a project for villagers'.

The use of natural and recycled materials from seismic ruins has minimised construction costs. The cost of the prototype houses was only approximately 60 per cent of that of a local conventional brick-concrete building. Unlike the brick-concrete building, where the materials are costly but less is spent on labour, these two types of cost for the prototype houses were balanced at roughly half-and-half, which means that this type of rammed-earth building values human labour and unique local skills rather than building materials.

Villagers who were trained and employed to build houses were able to use these skills to make a living. For example, the construction team leader, Mr Yang, had sworn that he would never build earth houses again because his wife had been killed by a collapsing earth house during the earthquake. After learning about the research, testing and design of the 1U1V team, he volunteered to be the leader of the construction team for his parents' house because he used to be a construction worker. His confidence in the innovative rammed-earth building method grew as the construction progressed, and as the project eventually won several international awards including World Building of the Year Award at the World Architecture Festival 2017, an *Architectural Review* (AR) House Award in 2017 and a Grand Award in the Hong Kong Green Building Awards 2019. After the tragedy of the earthquake, Mr Yang and his family regained a decent life and confidence in the future. Nowadays, he can pay for his children's tuition fees and support his elderly parents using his earnings from construction work in surrounding villages. Such success stories have proved the high social and economic value of this 'high-science and low-technology' strategy with the 3L principle.

Edward Ng, Li Wan, Xinan Chi and Wenfeng Bai, Prototype house for Guangming village post-earthquake reconstruction, The Chinese University of Hong Kong and Kunming University of Science and Technology, 2016

Multifunctional spaces that can be used as storage rooms, guest rooms or workplaces have been provided to adapt to the villagers' lifestyles. The result has convinced many local government officers and residents that rammed-earth houses can be safe, clean, comfortable and beautiful.

The semi-outdoor atrium is bright and comfortable. Mrs Yang can devote more of her time to embroidery.

The easiest way to teach the technology to villagers is to innovate on the basis of the technology they are already familiar with

Edward Ng, Li Wan, Xinan Chi and Wenfeng Bai, Prototype house for Guangming village post-earthquake reconstruction, The Chinese University of Hong Kong and Kunming University of Science and Technology, 2016

right: All construction team members were local villagers. An electric rammer was used, along with aluminium alloy formwork instead of wood, to make the wall very compact and smooth. The technology is easy for villagers to learn and operate.

below: Householders Mr and Mrs Yang in front of the prototype house. After the earthquake, they thought they would have to live in a tent for the rest of their lives. Fortunately, this project allows them to regain the dignity of living. They feel very proud of their house when people visit and give positive comments.

Architects, builders and owners discussing in the village. An architect lived on site in the village to guide the construction work and ensure its quality. A strong relationship of trust between the project team and the villagers was established.

Allowing the Villagers to Become the Owners

Rural construction is not a one-way output from architects to villagers, but a mutually beneficial process. In the Guangming village post-earthquake reconstruction project, multidisciplinary university resources, which include architecture, civil engineering and earthquake engineering, are fully supportive of rural reconstruction. The initiative has provided the project team with valuable research resources and local experience that were unavailable to them in the ivory tower. They contribute to scientific research and on-site guidance, with residents providing the local experience and manpower. The project team has learned just as much from the experience as the villagers have; if the effort from either side had been lacking, it would not have been a successful venture. A relationship of trust between the project team and villagers was established during the construction process – a collective form of social value.

Since the construction of the prototype, 17 more village houses have been rebuilt using this innovated rammed-earth building method in Yunnan and Sichuan provinces. More than 70 houses are now under construction. The benefits in terms of social, economic and environmental value have been immense.

China's architects have been involved in more and more rural improvement projects over the last 10 years, but most of them are not prepared for this task, as they have so little experience of rural life. If architects want to use architecture as a tool to improve lives in rural areas, as Anna Heringer – a German architect who was famous for designing the METI Handmade School in Bangladesh – has argued, and if they want to improve the social-economic value of rural areas, the first step is to stand in the villagers' shoes. In many ways the environment and culture of rural areas is more varied and complex than in urban ones, which have been influenced by globalisation. Architects need to learn to integrate into rural life and find the opportunities within local development, rather than impose strategies from outside that are inappropriate to the setting. The only way to improve social-economic value in rural construction is to allow the villagers to become the masters of their buildings and their lives. ⌀

Notes

1. 'Vision': www.anna-heringer.com/.
2. Yuan Tian, Zheng Wang, Jincai Zhao, Xuan Jiang and Rongxing Guo, 'A Geographical Analysis of the Poverty Causes in China's Contiguous Destitute Areas', *Sustainability*, 10 (6), 2018, p 1895.
3. National Bureau of Statistics of China, *China Statistical Yearbook 2018*, China Statistics Press (Beijing), 2018: www.stats.gov.cn/tjsj/ndsj/2018/indexeh.htm.
4. Xianghu Lu, 'A Retrospect of "No 1 Document" and its Corresponding Enlightenments for Implementing the Strategy of Rural Vitalization' (in Chinese), *Journal of Chongqing Jiaotong University (Social Sciences Edition)*, 19, 2019, pp 6–11.
5. Yichi Zhang and Ruixi Dai, 'Influence of Rural Infrastructure on the Economic Growth of Agriculture: An Empirical Analysis Based on the National Provincial Panel Data' (in Chinese), *Journal of Agrotechnical Economics*, 3, 2018, pp 90–99.
6. Chaoying Zhang, Chenxia Suo and Wei Deng Solvang, *Efficiency and Effectiveness of Energy-efficient Building Technology in Chinese Rural Area* (in Chinese), Economic Science Press (Beijing), 2010, pp 36–9; 'Planning and Construction of Villages and Towns in the Age of Ecological Civilization' (in Chinese): www.mohurd.gov.cn/jsbfld/200903/t20090316_187287.html.
7. Xuefeng He, 'Agricultural Modernization for Whom?' (in Chinese), *Open Times*, 2015, pp 36–48.
8. Qiuhong Chen and Fawen Yu, 'A Review of the Research and Practice of the Beautiful Countryside Construction' (in Chinese), *Study and Practice*, 6, 2014, pp 107–16.
9. 'Decision of the CPC Central Committee and the State Council on Winning the Tough Battle against Poverty' (in Chinese): http://news.xinhuanet.com/politics/2015-12/07/c_1117383987.htm.
10. Hugo Houben and Hubert Guillard, *Earth Construction: A Comprehensive Guide*, Intermediate Technology Publications (London), 1994, pp 73–106.